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ACRONYMS

Agtech    agricultural technology
AIWW     Amsterdam International Water Week
AWP      acceleration work plan
CEO      Chief Executive Officer
COP      Chief of Party
COR      USAID Contracting Officer’s Representative
Desal    Desalination (as in the Desal Prize)
DST      South Africa Department of Science and Technology
DUNS     Data Universal Numbering System
LL       lessons learned
M&E      monitoring and evaluation
MOU      memorandum of understanding
NGO      non-governmental organization
Rd. 1    Round 1, Round 2, etc.
SAM      System for Award Management
Sida     Swedish International Development Cooperation Agency
SME      small- to medium-sized enterprise
SNV      Synovus Financial Corp., an international not-for-profit development organization in the Netherlands
SO       strategic objective
SOW      scope of work
SWFF     Securing Water for Food
USAID    United States Agency for International Development
EXECUTIVE SUMMARY
Since its inception more than three years ago, the Securing Water for Food (SWFF): A Grand Challenge for Development (GCD) has made significant progress toward its overall goal of producing more food with less water and making more water available for the food value chain. The program now has funded 40 innovations, with the recent addition of the Rd. 4 cohort.

Small SMEs that haven’t yet begun to scale face numerous challenges on the ground. However, many are beginning to have some early success helping farmers combat drought and increase resilience to changing rainfall patterns. Since the program began, SWFF innovators have helped save approximately 1.5 billion liters of water, have helped produce nearly 650,000 tons of food, and have reached more than 1.5 million farmers and other customers. More than 600,000 hectares of rangeland and cropland are under improved practices due in part to SWFF innovations. To date, our innovators have leveraged SWFF funding for almost $13 million in additional funding through more than 100 partnerships and achieved more than $2 million in sales.
The SWFF program, through the SWFF Technical Assistance Facility (TA Facility), using more than two years of collected data, has begun to analyze the overall impact of the program as a whole and the impact of individual innovations. Though in a nascent stage, these analyses and lessons learned will help the program make more cost-effective, more efficient choices and increase the likelihood some innovations will reach sustainable scale by the end of the program. So far:

- Nearly 60% of SWFF innovations experienced increased usage/uptake.
- More than 50% of SWFF innovators, with support from the SWFF TA Facility, have increased technical capacity.
- Approximately 60% of acceleration support given to innovators was a long-term success.

See details on pages 6–8.
About Securing Water for Food

Securing Water for Food’s goals include enhancing access to innovations that help agricultural producers grow more food with less water, improving water storage practices, and increasing the use of saline water and soils to grow or process food. Through a competitive process, the program pre-screened water-for-food innovations and selected only those with the highest potential to receive grant funds and ongoing acceleration assistance to support the innovators’ business development. Ultimately, SWFF works to alleviate poverty by identifying and accelerating science and technology innovations and market-driven approaches that improve water sustainability and boost food security.

The Securing Water for Food ecosystem includes four founding and funding 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).
In addition, the ecosystem includes the SWFF TA Facility, supported by a $10.76M contract awarded to The Kaizen Company and led by Dr. Donna Vincent Roa, Chief of Party. Team members include Kevan Hayes, Acceleration Facilitator; Rami Khyami, Grants & Contracts Specialist; Steve Simon, M&E Specialist; Cassy Rodriguez, Jr. Program Coordinator, and a suite of associates. Julia Hedlund, The Kaizen Company Home Office SWFF Project Manager; Elizabeth Heller, Program Management Coordinator; and Nikki deBaroncelli, Program Management Coordinator, provide administrative, contract, and procurement support. The Voucher System of Support Vendors comprises 38 firms and individuals providing acceleration support to SWFF innovators.

Since the 2013 launch, Securing Water for Food has issued four calls for innovation: the first in November 2013; the second – the Desal Prize – in May 2014; the third in March 2015; and the fourth in August 2016. The 16 first-round innovators, representing exceptional initiatives with high potential for transformative impact, were announced on September 1, 2014, at World Water Week in Stockholm, Sweden. The two Desal Prize winners were announced on April 22, 2015. The 12 innovators of the third round were announced at Amsterdam International World Week (AIWW). The 10 innovators of the fourth round were announced March 2017 at the Global Agripreneurs Summit in Johannesburg, South Africa.
Through semi-annual reporting, the SWFF TA Facility documents each year’s project achievements, major activities, challenges, solutions developed to address those challenges, and innovators’ success stories. This report, covering November 2016 through May 2017, includes analysis of innovator and program data amassed since the start of the project. A more thorough analysis will be completed for the 2017 Annual Report.
Through the needs-based assessment process and use of a diagnostic tool, the SWFF TA Facility identifies and delivers integrated packages of support services (e.g., technical support, training, and access to specialist service providers) to help innovators achieve milestone targets and overcome economic, financial, and institutional barriers to scale.

The TA Facility then engages with selected support providers and innovators to draft and agree on detailed work plans and to ensure objectives and deliverables are met. Imagine H2O and SNV, the SWFF TA Facility’s Consortium partners in Year 1 and Year 2, provided expert business support services and offered input into innovators’ services design.
By the beginning of Year 3, the SWFF TA Facility noted a change in innovators’ business needs. They required a more diverse and wide-ranging set of skills and resources than the consortium partners could provide. After a thoughtful review of innovator needs and consortium partner strengths, the SWFF TA Facility decided to discontinue Imagine H2O’s and SNV’s roles as consortium partners and invited them to join the SWFF Voucher System of Support Vendors (Voucher System). As of Year 3, acceleration support is provided through three lines: the SWFF TA Facility, USAID and its partners, and the Voucher System.

The TA Facility periodically contacts the innovators to ensure a high level of customer service and satisfaction with the service provider who is engaging with them. To date, the TA Facility has identified more than 100 scopes of work (SOWs) for delivery directly to innovators (30 SOWs will be delivered in Year 3). SOWs address core components of the business model, product design and enhancement, sales and marketing strategy, investor readiness, and operational capacity building.

The SWFF Voucher System of Support Vendors is now running efficiently, with set processes in place for developing SOWs with innovators. The Voucher System posts SOWs to pre-approved groups via Screendoor and Podio technology platforms, and evaluates responses before selecting the best-value service provider. In this Year 3 reporting period, 14 call orders were issued through the Voucher System, resulting in subcontracts totaling more than $180,000.

(Percentage of Support Request Deliveries by Line)

<table>
<thead>
<tr>
<th>Consortium Member</th>
<th>44%</th>
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<tbody>
<tr>
<td>Voucher Vendor</td>
<td>30%</td>
</tr>
<tr>
<td>TA Facility</td>
<td>16%</td>
</tr>
<tr>
<td>USAID / Partner</td>
<td>10%</td>
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</table>
The first year of SWFF TA Facility acceleration support focused on developing and honing processes through which advisory services and support engagements were delivered, as well as providing insight and guidance to SWFF innovators on factors limiting their ability to scale. In years two and three, the primary focus of acceleration support was delivering innovator results, with a secondary focus on minor process modifications.

With two full years of experience, we now have enough data to identify what is working, what needs to be improved, and what activities and practices should be discontinued. The vast majority of support engagements for Year 3 (2017) are still in the delivery stage, and it is too early to measure results. Our analysis focused primarily on support provided by the TA Facility, the Consortium, and Voucher System vendors. Key findings include:

| Number of Vendors by Category before Round 3 | 10 | 10 | 13 | 7 | 6 | 5 | 7 | 5 | 3 | 2 | 3 | 5 | 3 | 4 | 0 | 4 | 2 | 1 | 0 | 0 |
| Number of New Vendors in Round 3 | 3 | 4 | 4 | 2 | 2 | 5 | 3 | 2 | 4 | 2 | 1 | 1 | 2 | 1 | 0 | 1 | 2 | 0 | 0 | 3 | 0 |
| Number of New Vendors in Round 4 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Total Vendor Coverage as of January 2017 | 14 | 15 | 17 | 10 | 9 | 10 | 11 | 7 | 7 | 5 | 4 | 6 | 7 | 5 | 4 | 1 | 6 | 2 | 1 | 3 | 2 |
KEY FINDING #1: Support engagements resulting in both immediate and long-term success have increased year over year.

A support engagement is defined as an immediate success if deliverables formally agreed to by the innovator in the work plan were delivered as the innovator expected. In 2015, only 60% of acceleration support could be classified as an immediate success. In 2016, immediate success rose to 90%.
This improvement likely is related to enhancements made to the acceleration support planning process, which were implemented in Year 2. On the front end of the process, we implemented the Innovator Needs Diagnostic Tool, used to more systematically specify organizational, strategic, and operational gaps. This diagnostic tool enabled a more focused support discussion with the innovator, driving very specific support goals and expected outcomes.

In Year 3, we also revised the work plan template. Before we deliver acceleration support, we use the template to document specific activities, deliverables, assumptions, and stakeholder commitments. The work plan now includes what is in and out of scope, as well as time commitments expected from innovator staff and the support provider.

Additionally, the Acceleration Facilitator now takes a more proactive role in driving the work plan to greater specificity and clarity. We made these changes with the intention of removing deliverable ambiguity and increasing the likelihood innovators will receive the services they expect.

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**ACCELERATION SUPPORT SUCCESS RATE — LONG-TERM**

Percentage of support engagements resulting in long-term positive outcomes
A support engagement is identified as a long-term success if the product or advice delivered is actually adopted by the innovator and results in recognized value, 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% of TA Facility support engagement resulted in long-term success. In 2016, long-term success rose to 66%.

The SWFF TA Facility has become increasingly embedded in the innovators’ context and we have become more aware of potential root causes of challenges in scaling. As a result, in some cases, we have been more credible and proactive advisors, promoting support engagements that address those root causes. This and the use of the diagnostic tool may explain the increase in long-term success of acceleration support engagements. In some cases, long-term impact was enabled by support from local operational advisors, as opposed to strategic support delivered by providers without knowledge of local marketplace realities.

### KEY FINDING #2: Innovator experience with acceleration support is improving.

As mentioned above, Year 1 activities were focused on building SWFF TA Facility acceleration support processes and tools. During that year, we relied primarily on consortium members to deliver support directly to innovators. The support choices were limited and, as a result, support requests were allocated to the most relevant support provider. However, the most relevant provider was not necessarily the ideal provider in all cases. Some support requests required local marketplace knowledge or operational assistance in-country that was not available in the limited provider pool.

In Year 2, the Voucher System network expanded and more service providers were added. This expanded the choices available to each innovator. After these changes, innovators reported an improvement in overall satisfaction with support delivery, and Net Promoter Scores improved. Net Promoter Scores indicate the likelihood SWFF innovators would recommend a provider to other SWFF innovators. Based on innovator feedback surveys, average overall satisfaction with a support engagement was 4.07 out of 5. In 2016, average overall satisfaction improved to 4.39. The average Net Promoter Score improved from 6.93 out of 10 in 2015 to 8.25 out of 10 in 2016.
KEY FINDING #3: While local context and knowledge is required for certain support requests, it is not a determinant of innovator satisfaction in all cases.

In discussions with innovators following the completion of Year 1 support engagements, innovators consistently requested more local support. They believed local providers who knew the local commercial landscape and participated in established local networks, could add greater and more lasting value than support providers based in the United States or Europe.

It is clear that knowledge of the country and the local cultural context is critical in some cases (e.g., requests for support in planning and delivering regional product promotion workshops). In response to innovators’ requests for more local support, the TA Facility initiated a recruitment drive and increased the number of qualified support providers in the Voucher System vendor network that are based in geographic areas where innovation implementation takes place.
In 2015, local vendors delivered only 21% of support engagements. In 2016, this increased to 31%. In 2017, the majority of support engagements (53%) are being delivered by local support providers. However, after this change was made, data collected from 44 innovator post-support surveys showed local support was not valued as highly as originally expected.
Innovators reported overall satisfaction with support delivered by non-local providers was higher than support delivered by local providers (4.5 vs. 4.0, on a scale of 0 to 5, with 5 being “very satisfied”). In addition, innovators were more likely to recommend a non-local provider to other SWFF innovators (Net Promoter Score of 8.4) than they were to recommend a local provider (Net Promoter Score of 7.1).
Feedback from innovators who were least satisfied with local support included: “mismanagement from the start,” “huge [provider staff] turnover,” “the story changed every time we spoke with them,” “they disappear for long periods of time,” and “I expected a real expert to take ownership [sic].”

Receiving support from a local provider did not increase the likelihood of immediate success. In 2015, 67% of support engagements delivered by non-local providers resulted in immediate success, while only 43% of support engagements delivered by local vendors did.

However, in 2016, this metric improved drastically for both non-local (93%) and local (92%) providers. This improvement is likely due to the changes mentioned above in driving greater specificity and clarity of activities and expected deliverables at the scoping phase. Reducing the potential for misunderstanding contributed to achievement of deliverables better aligned to each innovator’s vision.
KEY FINDING #4: Some providers are distinguishing themselves as go-to providers, and some support types are emerging as core competencies.

In the acceleration support process, innovators receive a variety of services from a variety of vendors. The TA Facility has now delivered 15 different types of support engagements using 20 different support providers.

In surveys, innovators reported high levels of satisfaction in a number of specific service categories that are emerging as core compete. The graphic on the following page shows support types that have received at least a 4.0 average overall innovator satisfaction score and vendors that have received an average Net Promoter Score of at least 8.0.
The TA Facility’s effectiveness in providing support in the gender category is significant. Prior attempts to address gaps in innovators’ approaches to gender, focused on workshops addressing the topic broadly, without specific innovator-contextualized recommendations. These workshops were poorly rated by innovators (averaging less than 50% positive ratings).

As a result, SWFF experts were assigned to Global Entrepreneurship Congress in Johannesburg to work with SWFF innovators on gender issues. Åsa Torkelsson, a gender expert from Sida and advisor on the SWFF International Investment Advisory Committee (IIAC), and Sattva, a vendor in the Voucher System of Support Vendors. The team provided office hours during which innovators could explore gender-related challenges and goals. The experts helped innovators identify gender-related opportunities, provided context-specific recommendations and action items, and addressed gender-related issues affecting innovators’ technology, marketing, and sales efforts. As a result, gender support has shifted from a poorly rated support category to one of our highest-rated categories.

The experts helped innovators identify gender-related opportunities and issues that affected their technology, marketing, and sales efforts.

<table>
<thead>
<tr>
<th>Support Type</th>
<th>Overall Satisfaction (out of 5)</th>
<th>Net Promoter Score (out of 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>5.00</td>
<td>10.00</td>
</tr>
<tr>
<td>Partner identification</td>
<td>5.00</td>
<td>9.00</td>
</tr>
<tr>
<td>Organizational capacity building</td>
<td>4.75</td>
<td>9.25</td>
</tr>
<tr>
<td>Business and financial modeling</td>
<td>4.69</td>
<td>8.00</td>
</tr>
<tr>
<td>Investor readiness and pitching</td>
<td>4.40</td>
<td>7.80</td>
</tr>
<tr>
<td>Sales, marketing, communication, branding</td>
<td>4.14</td>
<td>7.86</td>
</tr>
<tr>
<td>Human resources management</td>
<td>4.00</td>
<td>9.67</td>
</tr>
<tr>
<td>Product development, refinement, and diversification</td>
<td>4.00</td>
<td>7.33</td>
</tr>
<tr>
<td>Supply chain development</td>
<td>4.00</td>
<td>9.00</td>
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</table>
Surveys also showed innovators would likely recommend certain vendors to other innovators. These vendors are emerging as preferred support providers. Average Net Promoter Scores document this trend.

<table>
<thead>
<tr>
<th>Support Provider</th>
<th>Score</th>
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<tbody>
<tr>
<td>Oratoria (non-local)</td>
<td>10.0</td>
</tr>
<tr>
<td>TA Facility (non-local)</td>
<td>9.83</td>
</tr>
<tr>
<td>Open Capital (local)</td>
<td>9.5</td>
</tr>
<tr>
<td>Sattva (local)</td>
<td>9.26</td>
</tr>
<tr>
<td>Georgetown University (non-local)</td>
<td>9.0</td>
</tr>
<tr>
<td>I-DEV (local)</td>
<td>8.5</td>
</tr>
<tr>
<td>MRI Global (non-local)</td>
<td>8.33</td>
</tr>
<tr>
<td>SNV (non-local)</td>
<td>8.0</td>
</tr>
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ACCELERATION SUCCESS STORIES
aQysta uses government contracting to support scaling opportunities. aQysta’s water-powered pumps make it possible for smallholder farmers to irrigate without having to depend on expensive, unsustainable diesel-fueled systems. aQysta continues to transition from early adoption in Nepal to a larger scale with expansion to additional countries. By the end of Year 2 in the program, the company had sold 21 pumps. In the first six months of Year 3, aQysta sold 70 pumps, as well as spiraling bodies (its key innovation) for 80 more pumps. The increase in demand is accompanied by economies of scale, with production costs dropping by 53% since the start of the project. A corresponding drop in price makes the pump accessible to even more customers.

aQysta also is expanding to new markets, including Guatemala, Colombia, and Ghana. They sold 20 pumps this year in Indonesia. Acceleration support through the TA Facility played a key role in helping aQysta increase sales volume. SWFF Voucher System vendor SNV connected aQysta with a local distributor as part of an engagement focusing marketing efforts on high-potential geographies. The distributor negotiated a deal with the Nepalese government to subsidize the purchase of as many as 200 aQysta pumps by smallholder farmers.

Aybar diversifies its customer base. To date, Aybar has relied on the Ethiopian Ministry of Agriculture (MOA) to purchase its Broad Bed and Furrow Maker (BBM) and distribute them to Ethiopian farmers, with the Ministry comprising greater than 80% of Aybar’s historical sales. However, Aybar’s dependence on the government as its largest distributor for the BBM caused challenges. Aybar was unable to create demand forecasts for the BBM without timely information from the government. This led to last-minute orders that could not be filled and inconsistent product promotion. Based on recommendations from SWFF Voucher System vendors (Open Capital Advisors, I-DEV, and Imagine H2O), Aybar looked for opportunities to diversify distribution channels. The company approached 20 full-service farm centers and signed agreements with seven of them. Based on first-year performance, Aybar will look into granting sole supplier licenses covering specific geographic areas.
Green Heat secures investment capital for expansion. Maintenance on a biogas digester typically is performed by the woman of the house, and high maintenance can preclude some families from owning a system. Green Heat’s slurry separation system requires less maintenance than other models and makes it possible for more households to own a biogas digester. Green Heat sold 50 systems in Year 1 of the project, with an additional 169 sales to date, impacting more than 5,750 end users and saving over 5 million liters of water.

SWFF Voucher System vendor Imagine H2O worked with Green Heat to validate a customer segmentation and value proposition, build an investor pitch deck, and implement new sales and marketing approaches based on customer feedback and analysis. Green Heat used the pitch deck to approach angel investors and secured a convertible loan of Euro 51,000. The loan is based on initial conversations from the 2016 Social Capital Markets Conference (SOCAP) that Green Heat attended through SWFF. Green Heat’s leaders believe the updated marketing plans and brand enhancements recommended by Imagine H2O are key to increasing investor confidence in the company’s ability to scale.

Ignitia AB enters new markets in West Africa. Ignitia AB delivers highly localized, accurate weather forecasts via SMS, helping small-scale farmers manage daily activities that depend on rainfall to increase crop yields. In Year 1, Ignitia AB focused on serving 83,703 farmers in Ghana. At the end of Year 1, the company had added 70,821 Ghana farmers and expanded to surrounding countries, with 28,975 farmers in Mali, Nigeria, and Burkina Faso. To ensure the poorest farmers can benefit from the SMS service, Ignitia AB partners with local NGOs that provide SMS service for free. Farmers can use extra income from increased crop yields to become customers the following year. SWFF TA Facility acceleration support encouraged expansion of Ignitia’s customer base (e.g., institutional clients, multinational corporations, and organizations supplied by or employing large networks of farmers). Acceleration support included market-ready messaging tailored to the contexts of high-potential customer prospects in Ghana, Mali, Nigeria, and Senegal.

In interviews with 31 farmers during SWFF’s site visit, the poorest farmers said significant yield increases were a result of better timing. They could anticipate rains and avoid wasting fertilizer – two challenges that can derail a planting season.
Meat Naturally Pty

Meat Naturally Pty incorporates and grows into new markets. Meat Naturally Pty (MNP) trains cattle herders (Ecorangers) to use communal herding techniques, and employs conservation clearing teams to minimize negative impacts of alien plant invasions in South African grasslands. MNP has achieved positive ecological impacts and, through innovative mobile auctions, has increased market access for 336 poor livestock owners. The company’s services have generated increases in farmer income totaling more than $245,000. Small-scale livestock owners typically have been excluded from commercial sales due to their lack of registration and certification with local authorities. MNP services empower first-time sellers to enter the market and increase availability of grass-fed beef.

Before earning a place as a SWFF innovator, Meat Naturally Pty separated from Conservation South Africa and faced the challenges of becoming a standalone, commercial entity. The SWFF TA Facility helped them to define internal processes and standard operating procedures (e.g., accounting, financial, and customer relationship management processes) to facilitate growth and expansion.

Reel Gardening

Reel Gardening moves forward with a Buy One Give One (BOGO) model to expand its positive impact on disadvantaged populations in South Africa. From the beginning, Reel Gardening has served the poor by providing the means to grow healthy vegetables at low cost. Funding has come largely through a Unilever partnership. Reel Gardening recognized dependency on Unilever put its business, and therefore its mission to serve the poor, at substantial risk. So, the organization is shifting its focus from a company dependent on partners to help the poor, to a company focused on profitable product sales, which it can use to subsidize its work with schools and other beneficiaries.

With acceleration support provided by Sattva, Reel Gardening developed a BOGO component for its business model and created financial forecasting tools to manage its business going forward. Reel Gardening is rolling out its BOGO model throughout 2017. Claire Reid, founder of Reel Gardening, says, “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 our revenue and social impact.”
In Year 3, the SWFF TA Facility will continue working to deliver support services that help innovators face challenges and find solutions. Two key challenges are increasing long-term successes and providing acceleration support faster.

**Increasing the likelihood of long-term acceleration support successes.** In 2015, only 52% of SWFF support engagements resulted in long-term value and recognized successful outcomes. In 2016, the long-term success rate improved to 66%; however, this is far below the 90% immediate success rate. Improving long-term success is an important focus for SWFF in 2017.

We can improve long-term outcomes by focusing on them from the beginning, as innovators and support providers develop work plans to guide the support engagement. With long-term recommendations, deliverables, goals, and applications at the forefront throughout the engagement, immediate deliverables are more likely to be designed with long-term success in mind.

The recent MyRain sales and marketing support engagement provides a useful early example. Rather than merely tasking the support provider with drafting a sales and marketing strategy, MyRain encouraged the vendor to craft a strategy that would support a long-term goal of increasing sales by $500,000 within three years. The support provider used the goal to help MyRain pilot approaches that would enhance the company’s ability to hit that target.

**ONGOING CHALLENGES AND POTENTIAL SOLUTIONS**
Rolling out acceleration support faster. The acceleration support process was created to ensure the right support is delivered to the innovator by the most qualified vendor. In response to innovator feedback, and in the interest of ensuring better service engagement outcomes, the SWFF TA Facility began allowing innovators to participate in selecting service providers.

Here’s how it works: First, an evaluation panel consisting of SWFF TA Facility and Kaizen home office staff completes a full proposal review. Then, innovators are put in touch with the top two vendors with acceptable proposals. Innovators receive an interview guide for these discussions to ensure consistent, fair evaluations. They also are given the opportunity to connect directly with prospective vendors, so they can ask questions about the vendor’s approach and qualifications. Innovators and vendors have both responded well to this process change, which should result in better-fit selections for service engagements.

On the other hand, the process can be time consuming. It takes time to schedule vendor conversations and complete back-and-forth revisions to the scope of work and the work plan. This extra work, as valuable as it is, can lead to delays in receiving the actual support.

In the second half of 2017, the TA Facility will explore methods to reduce the time it takes to get to actual support delivery. We also aim to better align support with any time frame critical to helping innovators meet goals for the year. Early thoughts on potential solutions include establishing a dedicated window of time within which the Acceleration Facilitator will commit up to 100% of his time to writing the scope of work. Another thought is to add associate support from a qualified person with a business background. An associate may be able to help coordinate with innovators during negotiation and drafting of scopes of work.

Consistency in the review process. Over time, with the addition of more pre-selected vendors to the Voucher System, response evaluation and proposal selection grew more complex. The process was complicated further as vendors gained experience; their SWFF SOW responses improved and grew more sophisticated. To help manage the increased complexity, the SWFF TA Facility created an evaluators’ guide, complete with a rubric to help ensure consistency across evaluators’ scores. In addition, the TA Facility added a Quality Assurance/Quality Control function to ensure that evaluators provide fully documented, consistent scores and comments.
Over the three years of the program, the depth and quality of information collected from innovators has increased.

SWFF M&E support is grouped into two portfolios. The first portfolio builds performance-monitoring capacity of SWFF innovators and helps SWFF Team Lead, Dr. Ku McMahan, evaluate data quality and progress reported by SWFF innovators.

The second portfolio monitors performance of the TA Facility itself, resulting in the SWFF TA Facility Performance Monitoring Summary.

All innovator performance monitoring data are currently reported by innovators, who directly input data into the Cognito data collection tool. The SWFF M&E Specialist completes data quality checks on supporting documentation. The M&E Specialist also conducts program-wide reviews of past data to eliminate double-counting of metrics across years and to capture late-reported outcomes.

Over the three years of the program, the depth and quality of information collected from innovators has increased. Indicators such as matching/leveraged funds are refined to better fit the USAID Global Development Lab’s monitoring frameworks. Semi-annual gender reporting has been refined to remove ambiguity the earlier questions introduced.

INNOVATOR MILESTONE PROGRESS
Overall, we’ve made significant progress in building capacity of SWFF innovators to report results to the SWFF program. As of May 31, 2017, 10 innovators are in their third year of implementation, and seven innovators are in their second year of implementation. Sixteen innovators participated in a semi-annual review of their awards, and one innovator will submit a six-month report in September.

As can be seen above, and consistent with prior years, most innovators have not submitted complete reporting at this time. This is due to numerous factors including unexpected delays in importation and government approval, short-term setbacks caused by drought, and inability to submit harvest data at this time. Interestingly, almost all innovators have already met this year’s matching funds requirement and a few select innovators have already met their annual targets after only six months of implementation. Most innovators seem to be on track to meet their annual targets based on both data and conversations with the innovators during the semi-annual review process.

The Acceleration Facilitator, USAID Team Lead, and the M&E Specialist have finalized target setting for 10 new Rd. 4 innovators, employing the most systematic effort to-date. In addition, the TA Facility M&E Specialist, the SWFF Team Lead, and a water specialist from the International Investment Advisory Committee (IIAC) are leading an effort to ensure that relevant water indicators are assigned in a way that is rigorous enough for SWFF to accept, yet a proportional effort to the resources available to innovators. Feedback to innovators, based on this assessment, will allow them to gather data in their first project year that will (or will not) substantiate their water impact claims, freeing them to focus on other data collection in future years.

The SWFF program verifies impact through multiple channels. Innovators’ semi-annual data submissions are validated by field visits and independently administered end-user surveys. The SWFF program began trial evaluations of three innovators, with graduate students working as field evaluators during the summer of 2017. Chosen for their backgrounds and the support provided by their home universities, these field evaluators will spend from 10 to 12 weeks directly interviewing end users of SWFF innovations. Their assignment is to gain further insight into changes in water usage, crop yield, income growth, and time spent by end users.

The data and detailed feedback field evaluators collect will help innovators better understand end user needs, and will serve as an independent validation of reported data. Going forward, the SWFF TA Facility will expand evaluation recruitment to more universities, so it can serve a larger subset of innovators in 2018 and beyond.
INNOVATOR TRENDS ANALYSIS

The SWFF TA Facility has begun to pivot toward an analysis of trends and relationships indicated in innovator data. We will provide a full analysis in the 2017 Annual Report. Analysis completed to date examines these questions:

- To what extent have innovators progressed toward targets set in acceleration work plans?
- What is the impact of donor funding per U.S. dollar across major indicators?

To what extent have innovators progressed toward targets set in acceleration work plans?

Overall, for Rd. 1 and Rd. 3 innovators, if innovators missed two or fewer targets, the number of targets missed was not a strong predictor for whether they continued or moved to alumni status. However, innovators missing three or more targets were more likely to become alumni. In a few cases in Rd. 1, alumni missed only one target, but that target was critical to their chances of achieving long-term sustainability and impact. Because extremely early-stage innovators are largely absent from Rd. 3, there is a clearer relationship between missing targets and exiting the program than there was in previous rounds.

SWFF innovators collect data on binding indicators (such as adoption number, yields, sales, matching funds). The IIAC uses binding indicators to recommend whether the Founding Partners continue funding from year to year. Innovators also collect data on non-binding indicators (such as water-consumption reductions and water reallocation to the food value chain), which also demonstrate positive impact. However, it is acknowledged that target setting on non-binding indicators can be difficult to collect due to variance in market timing with real customers.

Across Rd. 1 and Rd. 3 innovator cohorts, innovators have as few as one and as many as nine binding indicators. On average, they collect data on 6.5 binding indicators. Whether innovator origins are local or non-local plays a small role in the number of indicators they are assigned. Local innovators
report an average of seven, and non-local entities report an average of six indicators. Across successive innovator cohorts (from Rd. 1 to Rd. 3), the average number of binding indicators has slightly increased from six to seven, but, more importantly, the variance has decreased.

Each year, the IIAC reviews past progress of innovators and offers guidance to those who missed two or more targets and are at high risk for not receiving additional funding. In their first year of the program, 19 innovators missed two or fewer targets and eight missed three or more. Innovators who continued into Year 2 missed an average of 1.3 targets, while exiting alumni missed an average of 3.1 targets. This demonstrates that meeting targets is a predictor of continued funding.

There is variance. However, some innovators who missed just one indicator exited and became alumni. This is largely because innovators were accepted into the program during Rd. 1 with the understanding that the technology had to be proven in the field in the first year. When the technology was not proven viable, the innovators exited the program.
What is the impact of donor funding across two major indicators: total customer adoption and water savings?
The SWFF TA Facility compared total funding provided to innovators to date (including grant funding and acceleration support) with water savings and total customer adoption data. Results are discussed below. However, it is important to note, while the amount of funding to date is trackable in real time, reporting of results data is uneven as noted above. This analysis will be updated in the annual report to better account for impact data that might be missing, as well as for revisions of existing data.

Adoption per U.S. dollars funded
Tier 1 innovators, who each receive as much as $500,000 in SWFF funding over three years, currently account for 22% of SWFF’s overall impact, affecting about 345,000 end users. Tier 2 innovators, who receive an average $2,000,000 of funding over three years, currently account for 78% of SWFF’s overall impact, affecting about 1,225,000 end users.

Of the total $12.09 M in overall funding (through 2017) provided to innovators through grant funding and acceleration, Tier 1 innovators received 69% of funding ($8.34 M) and Tier 2 innovators received 31% of funding ($3.75 M).

In real terms, this means Tier 2 awards are significantly more efficient than Tier 1 awards in terms of number of dollars spent per end user. Tier 2 awards cost on average $1.32 per end user, as compared to an average cost of $17.33 per end user among Tier 1 innovators. This is not unexpected, because SWFF gives Tier 2 awards to organizations farther along in commercialization and scaling.
To further examine USD-per-end-user efficiency, the chart below shows the range of results for Tier 1 innovators only. Results for innovators who continued into Year 2 (current innovators) are shown on the left in each category and results for alumni are shown on the right.

Among Rd. 1 innovators, the most efficient of the alumni ($1,150/end user), still spent much more money per end user than the upper range of innovators who stayed in the program ($885/end user). This clear difference between alumni and current innovators in the number of U.S. dollars spent per end user is repeated in the average Rd. 1 cost per end user ($4,010 for alumni vs. $14 for current innovators).
Among Rd. 3 innovators, these measurements contrast much less. Upper and lower boundaries of U.S. dollars spent per end user are relatively similar, as are average U.S. dollars spent per end user, regardless of whether an innovator was an alumni or continuing innovator. It is suspected that the difference in dollars spent between Rd. 1 and Rd. 3 could be due to inclusion of multiple near-pilot-level Rd. 1 projects that exited as alumni. Those alumni spent more money on start-up costs than later-stage innovators that focused more on increasing adoption of their innovations.

When comparing of Rd. 1 and Rd. 3 innovators who continued in the program (current innovators), the data show Rd. 1 innovators have a much lower USD cost per end user. However, these data are somewhat skewed by one innovator with a very low USD-per-end-user cost that accounts for more than 70% of the overall end user costs reported by all Tier 1 innovators. With this outlier removed, average U.S. dollars spent per end user for Rd. 1 current innovators rises to $74.41.
The data show that innovators with local origins are serving more end users per USD on average than non-local innovators. However, this is expected, because the two Tier 2 innovators are local and are naturally further along in scaling and commercialization than Tier 1 innovators.

If we exclude Tier 2 innovators and alumni, Tier 1 local innovators still are more efficient in terms of U.S. dollars spent per end user; they serve one end user for every $2.75 spent vs. $49.94 spent per end user by innovators with foreign origins.

**Water Consumption**

A small subset of SWFF innovators (12 out of 27) offer innovations targeting agricultural water-consumption reductions. These innovators can measure impact in the field. Among water-consumption-related innovators, Tier 1 companies have proven to be more efficient than Tier 2 companies in generating water savings per U.S. dollars spent since the beginning of the program.

Tier 1 innovators saved 572 liters of water per each U.S. dollar of funding, and Tier 2 innovators saved 41 liters of water per each U.S. dollar of funding. When limiting the comparison to Tier 1 innovators, data show continuing innovators saved more water per each USD of funding than alumni (628 liters/USD spent vs. 277 liters/USD spent). The data also show local innovators generated 963 liters of water savings per USD compared to 73 liters of water savings generated by non-local innovators.
As Year 3 of the SWFF program has progressed, the following key challenges in the M&E portfolio have emerged:

**It is not easy or straightforward for all innovations to report the various forms of water impacts SWFF tracks.**

More so than in past years, SWFF is formalizing the process the TA Facility and IIAC use to deliver guidance to innovators. Based on experience gained training Rd. 3 innovators to conduct valid water measurements, SWFF created a mini-survey of new innovators that has led to more systematic feedback and more timely follow-up.

**As the number of innovators has increased, it has become more challenging to check data quality in innovators’ semi-annual reports.**

The M&E Specialist is mitigating this concern by creating legacy documents and detailed checklists allowing other members of the team (usually an associate) to take a larger role in data quality checks. However, the program welcomed 10 new Rd. 4 innovators, and it is unclear whether the associate will be able to manage the added workload.
SUMMARY OF SWFF TA FACILITY METRICS

SWFF TA Facility portfolios are structured to address the following metrics: usage/uptake, technical capacity, financial sustainability, public awareness, and efficient management of milestone-based funds. The figure below illustrates how activities comprising TA Facility portfolios contribute to those end results.
The table on pages 42-43 summarizes TA Facility progress toward the metrics by which these activities are measured. It is important to note, at the time of this review, some metrics are not yet available for Year 3. However, we can review trends from past years and partial data from this year.

Overall, SWFF innovators’ technical capacity has increased, with assistance from the SWFF TA Facility. Technical capacity climbed from 71% in Year 1 to 95% in Year 2. Uptake of SWFF innovations has increased, with about 60% of innovators showing at least a 10% Year 1 increase in customer base and more than 80% showing at least a 10% Year 2 increase.

The average level of documented evidence for SWFF innovators rose from 1.65 in Year 1 to 2.6 in Year 2, due to efforts by the TA Facility and USAID to help awardees gather higher-quality data and to innovators’ own data-gathering efforts. SWFF also noted innovators improved their financial systems, with many transitioning from poor financial management systems to acceptable financial controls. Thirteen percent of innovators moved from acceptable financial systems to strong financial systems. Though significant progress has been made, it will take time for the SWFF program and SWFF innovators to create viable long-term paths toward sustainable scale.
<table>
<thead>
<tr>
<th>INDICATORS</th>
<th>Y1 TARGET</th>
<th>Y1 ACTUAL</th>
<th>Y2 TARGET</th>
<th>Y2 ACTUAL</th>
<th>Y3 TARGET</th>
<th>Y3 ACTUAL*</th>
<th>TARGET MET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TECHNICAL ASSISTANCE &amp; SCALING</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.1 Average Net Promoter Score received on innovator service delivery surveys</td>
<td>7/10</td>
<td>6.93</td>
<td>7/10</td>
<td>8.25</td>
<td>8/10</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>1.2.2 % of SOWs started and completed within the time frame agreed upon with the innovator during the support planning discussions</td>
<td>N/A**</td>
<td>41%</td>
<td>N/A**</td>
<td>50%</td>
<td>85%</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>1.2.3 % of SOWs with providers from emerging markets</td>
<td>N/A**</td>
<td>21%</td>
<td>N/A**</td>
<td>31%</td>
<td>50%</td>
<td>53%</td>
<td>No</td>
</tr>
<tr>
<td>1.2.4 % of innovators with increased technical capacity from SOWs</td>
<td>N/A**</td>
<td>71%</td>
<td>N/A**</td>
<td>95%</td>
<td>80%</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>1.2.5 % of innovators with increased usage/uptake of SWFF innovations (Y/N)</td>
<td>N/A**</td>
<td>62%</td>
<td>60%</td>
<td>86%</td>
<td>80%</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>1.2.6 % of SOWs where defined “desired outcomes” were met</td>
<td>N/A**</td>
<td>52%</td>
<td>N/A**</td>
<td>68%</td>
<td>90%</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>GRANTS &amp; FINANCIAL MANAGEMENT</strong></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2.1.1 % of innovators reporting positive effects from PAS process on their organization</td>
<td>N/A**</td>
<td>80%</td>
<td>50%</td>
<td>62%</td>
<td>50%</td>
<td>94%</td>
<td>YES</td>
</tr>
<tr>
<td>2.2.1a % of innovators with an increased rating of awardee financial systems from TA Facility (Poor / Acceptable / Strong)</td>
<td>N/A**</td>
<td>0% of Poor move to Acceptable</td>
<td>75%</td>
<td>100% of Poor move to Acceptable</td>
<td>100% of Poor move to Acceptable</td>
<td>100% of Poor move to Acceptable</td>
<td>YES</td>
</tr>
<tr>
<td>2.2.1b % of innovators with an increased rating of awardee financial systems from TA Facility (Poor / Acceptable / Strong)</td>
<td>N/A**</td>
<td>13% of Acceptable move to Strong</td>
<td>N/A**</td>
<td>13% of Acceptable move to Strong</td>
<td>20% of Acceptable move to Strong</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>MONITORING &amp; EVALUATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.1.1 Average level of evidence of SWFF innovators</td>
<td>N/A**</td>
<td>1.65</td>
<td>2.63</td>
<td>2.60</td>
<td>2.75</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>3.2.1 % of innovators using MBE data to advance their innovation or business</td>
<td>N/A**</td>
<td>N/A**</td>
<td>40%</td>
<td>86%</td>
<td>80%</td>
<td>99%</td>
<td>Yes</td>
</tr>
<tr>
<td>INDICATORS</td>
<td>Y1 TARGET</td>
<td>YEAR 1 ACTUAL</td>
<td>Y2 TARGET</td>
<td>YEAR 2 ACTUAL</td>
<td>Y3 TARGET</td>
<td>YEAR 3 ACTUAL*</td>
<td>TARGET MET</td>
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<td>----------------------------------------------------------------------------</td>
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<tr>
<td><strong>COMMUNICATION, VISUAL IDENTITY, &amp; PARTNERSHIPS</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>4.1.1 # of LL/communication materials produced by TA Facility (including reports, stories, case studies, etc.) that are shared</td>
<td>N/A**</td>
<td>22</td>
<td>N/A**</td>
<td>124</td>
<td>175</td>
<td>104</td>
<td>TBD</td>
</tr>
<tr>
<td>4.2.2 # of partnerships leveraged to address the critical barriers of the SWFF Grand Challenge (Gin 6) by TA Facility</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>Yes</td>
</tr>
<tr>
<td>4.2.3 % of innovators with increased partnerships</td>
<td>50</td>
<td>75%</td>
<td>50%</td>
<td>45%</td>
<td>50%</td>
<td>29.41%</td>
<td>No</td>
</tr>
<tr>
<td>4.2.3 $ and % of outside funding beyond SWFF award funding</td>
<td>N/A**</td>
<td>$6,092,064.26</td>
<td>N/A**</td>
<td>$10,600,000</td>
<td>$12,000,000</td>
<td>12,883,000</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>TA FACILITY ADMINISTRATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1.1 % of innovators that rate TA Facility responsiveness at 6/7</td>
<td>80%</td>
<td>95%</td>
<td>80%</td>
<td>100%</td>
<td>80%</td>
<td>100%</td>
<td>Yes</td>
</tr>
<tr>
<td>5.1.2 % of innovators that rate TA Facility understanding of awardee needs at 6/7</td>
<td>80%</td>
<td>75%</td>
<td>80%</td>
<td>95%</td>
<td>80%</td>
<td>77%</td>
<td>No</td>
</tr>
<tr>
<td>5.1.3 % of innovators that rate TA Facility as helpful toward awardee goals at 6/7</td>
<td>80%</td>
<td>79%</td>
<td>80%</td>
<td>76%</td>
<td>80%</td>
<td>77%</td>
<td>No</td>
</tr>
<tr>
<td>5.2.1 $ value of volunteer services/$ value of paid services (ratio)</td>
<td>N/A**</td>
<td>20%</td>
<td>5%</td>
<td>24%</td>
<td>25%</td>
<td>14%</td>
<td>No</td>
</tr>
</tbody>
</table>

Note:
* Year-to-date numbers reported against the yearly target.
** Some of the indicators were recently approved by the SWFF Founding Partners.
N/A represents either missing data or a space where we did not have a target.
TBD To be determined.
The TA Facility made significant improvements in many categories of acceleration support provided to innovators. Though it narrowly missed the target for Net Promoter Scores, it exceeded the target by more than 10 percent in Year 2 and appears to be on track to meet the target in 2017, as well.

The timeliness of service delivery increased from 41% on time in Year 1 to more than 50% on time in Year 2. One important caveat is that in multiple instances, the service delivery occurred within one month after the deadline. Had those instances been considered timely, the TA Facility on-time delivery rate would have been more than 55% in Year 1 and more than 70% in Year 2.

Another notable success is long-term outcomes. As mentioned earlier in this report, the percentage of SOWs for which desired long-term outcomes were reached rose from 52% in Year 1 to nearly 70% in Year 2. This may have been, in part, because the amount of technical assistance provided by local vendors increased to 53% this year from 21% in Year 1.

As an organization built to provide acceleration support, the SWFF TA Facility highly values feedback from SWFF innovators. Our customer service metrics are a critically important way to determine whether service delivery meets innovators’ expectations. As noted in the external SWFF Mid-Term review, innovators told us they greatly appreciate the responsiveness of the TA Facility, and it shows in a steadily increasing trend toward satisfaction that recently reached 100% of innovators appreciating the staff’s responsiveness. In addition to this customer satisfaction metric, the TA Facility nearly met Year 3 targets for understanding innovator needs and being helpful to innovators.
The Securing Water for Food Program provides capacity building and support through the grants and contracts portfolio to Rd. 1, Rd. 3, and Rd. 4 SWFF innovators to help them comply with USAID rules and regulations (USAID operational policies and procedures). The level of support has changed over time as the quality of innovators sourced by the program have changed. The table below lists the specific areas of support.

**GRANTS COMPLIANCE STAGES**

<table>
<thead>
<tr>
<th><strong>PRE-AWARD</strong></th>
<th><strong>POST-AWARD</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>DUNS &amp; SAM</td>
<td>Compliance with Award Requirements</td>
</tr>
<tr>
<td>Pre-award Survey Assessment (PAS)</td>
<td>Award Funding &amp; Financial Reporting</td>
</tr>
<tr>
<td>Award Certifications</td>
<td>Budget Modifications</td>
</tr>
<tr>
<td>Assessment of Environmental Consequences</td>
<td>Implementation of PAS Requirements</td>
</tr>
<tr>
<td>Budget &amp; Budget Narrative</td>
<td>Capacity Building Activities (Strengthening Innovators Financial Systems) &amp; Acceleration Support</td>
</tr>
<tr>
<td>Award Documents</td>
<td></td>
</tr>
</tbody>
</table>
The fourth SWFF call for innovations was officially closed at the end of the first quarter of 2017. Of the 555 applicants and 24 finalists, 10 companies passed the technical requirements and assessments to become SWFF award nominees. Pre-award activities for the 10 nominees concluded by the end of April 2017. The SWFF TA Facility streamlined the pre-award survey (PAS) and created an easy-to-use online tool with the help of Associate Beshoy Masood.

As a result of these improvements, the process became more robust, which led to timely completion and submission of the PAS form. (Please see SWFF annual reports from 2015 and 2016 for further details about PAS.) Five out of the 10 organizations met all PAS requirements. The other five met most requirements, with a few areas of improvement identified. The areas needing improvement were communicated to the nominees and requirements were included in their award documents.

The table to the right illustrates PAS assessment results, and indicates the level of efficiency and robustness of SWFF Rd. 4 innovators’ financial systems. We count it as a success that most Rd. 4 innovators have access to 35 % of their funds from the beginning of their tenure as innovators.

<table>
<thead>
<tr>
<th>SWFF RD. 4 INNOVATOR</th>
<th>PAS Gaps Identified</th>
<th>FINANCIAL SYSTEMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Alba</td>
<td>Met PAS Requirements</td>
<td>Advanced</td>
</tr>
<tr>
<td>Hydroponics</td>
<td></td>
<td>Operational</td>
</tr>
<tr>
<td>Naireeta Ltd</td>
<td></td>
<td>Acceptable</td>
</tr>
<tr>
<td>MimosaTEK Ltd</td>
<td></td>
<td>Operational</td>
</tr>
<tr>
<td>Lal Teer Seed Ltd</td>
<td></td>
<td>Advanced</td>
</tr>
<tr>
<td>University of Malawi</td>
<td></td>
<td>Acceptable</td>
</tr>
<tr>
<td>SkyFox Ltd</td>
<td></td>
<td>Advanced</td>
</tr>
<tr>
<td>Stichting WASTE</td>
<td></td>
<td>Operational</td>
</tr>
<tr>
<td>Central University of Technology</td>
<td></td>
<td>Acceptable</td>
</tr>
<tr>
<td>IVL Swedish</td>
<td></td>
<td>Operational</td>
</tr>
</tbody>
</table>

○ PAS Gaps Identified
● Met PAS Requirements

Acceptable: Basic accounting operation.
Operational: Standard operating procedures, periodic financial reporting, and annual audits completed.
Advanced: Financial analysis, budgeting, and forecasting.
SWFF INNOVATORS’ ORGANIZATIONAL SUSTAINABILITY

SWFF Rd. 1, Rd. 3, and Rd. 4 cohorts are highly diverse. SWFF innovators are from various geographical areas around the globe, and most of the organizations are local and operating in water-stressed areas. Some organizations are for-profit, while others (such as community centers, public universities, and foundations) are not-for-profit, as demonstrated in the diagram and table below.

DEMOGRAPHICS OF SWFF INNOVATORS, BY ROUND

SWFF INNOVATORS, BY ORGANIZATION TYPE AND ANNUAL TARGET STATUS

<table>
<thead>
<tr>
<th>Organization Type</th>
<th>Round 1 Innovators</th>
<th>Round 3 Innovators</th>
<th>Round 4 Innovators</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Profits</td>
<td>72%</td>
<td>75%</td>
<td>TBD</td>
</tr>
<tr>
<td>Non-Profits (including foundations, universities, etc.)</td>
<td>40%</td>
<td>37%</td>
<td>TBD</td>
</tr>
<tr>
<td>Total Percentage Met Targets</td>
<td>63%</td>
<td>50%</td>
<td>TBD</td>
</tr>
</tbody>
</table>
The organizational capacities of all innovators are carefully assessed upon their entrance into the SWFF program. Pre-award activities focus on the robustness of financial systems (i.e., proper accounting and record keeping, periodic financial reporting, and budgeting and forecasting). The table below illustrates the status of Rd. 3 and Rd. 4 SWFF innovators’ financial systems upon their entry into the program, as well as annual targets met; Rd. 3 numbers reflect targets met in the first half of the year, just before publication of this report.

### SWFF INNOVATORS FINANCIAL SYSTEMS UPON ENTERING THE SWFF PROGRAM

<table>
<thead>
<tr>
<th></th>
<th>RD. 1 INNOVATORS ANNUAL TARGETS MET</th>
<th>RD. 3 INNOVATORS ANNUAL TARGETS MET</th>
<th>RD. 4 MET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acceptable:</strong> Basic accounting and financial reporting functions.</td>
<td>50%</td>
<td>0%</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Operational:</strong> Standard accounting procedures, periodic financial reporting, and basic budgeting functions.</td>
<td>85%</td>
<td>60%</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>Advanced:</strong> Standard practice of future (3-5 year) financial forecasting and analysis.</td>
<td>42%</td>
<td>65%</td>
<td>TBD</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>16 / 10</td>
<td>12 / 6</td>
<td>10</td>
</tr>
</tbody>
</table>

During the time innovators participate in the SWFF program, they receive direct support through the SWFF TA Facility, and some of that assistance is focused on strengthening organizational capacity (see Acceleration Support, page 9, in this mid-term report).

As seen in the table above, of the two Rd. 1 innovators who entered the program with an acceptable financial systems status, one received direct assistance specifically related to developing financial capacity and establishing standardized accounting operations. By the end of 2017, this innovator will advance to operational status.

Of the seven innovators who entered the program at an operational status level, three developed their financial systems to advanced status. The SWFF team directly impacted this advancement through additional business and financial technical assistance provided by the Grant & Contracts Specialist.
For Rd. 3, the two innovators who entered the program with an acceptable financial systems status did not make it to Year 2, because they did not meet all target requirements. Of the seven Rd. 3 innovators with operational status, three received SWFF support to help them develop a business model, but none have yet received direct support to reinforce their financial systems. Therefore, no progress can be reported at this time.

The table below demonstrates how quickly SWFF innovators use their funds on time (by year and by round).

**SWFF INNOVATORS’ BURN RATE**

<table>
<thead>
<tr>
<th></th>
<th>Y1</th>
<th>Y2</th>
<th>Y3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rd. 1 (Cost reimbursement-based funding)</td>
<td>80%</td>
<td>60%</td>
<td>50%</td>
</tr>
<tr>
<td>Rd. 3 (Milestone-based funding)</td>
<td>100%</td>
<td>100%</td>
<td>n/a</td>
</tr>
</tbody>
</table>
MAJOR ACTIVITIES AND EVENTS
INTERNATIONAL INVESTMENT ADVISORY COMMITTEE (IIAC)

This is the only time I’ve ever had so many experts in the room at one time talking about so many aspects of innovations in development contexts.

The SWFF IIAC is a standing panel of technical experts, business specialists, sustainable development experts, and researchers with extensive experience in water and agriculture innovation. These committee members participate in application review and make award recommendations for each new round of innovators. Award recommendations take into account factors such as underlying science and engineering aspects of innovations and business viability of the solutions, including their potential for wide-scale application. IIAC members also review applications with regard to broader gender, economic, social, and environmental consequences that could potentially stem from each innovation.

The IIAC participates in selection of innovator technical and financial milestones for both initial and future tranches of funding. The IIAC is one of the most unique advisory boards in international development, because it relies on outside world-class experts to help donors make better real-world decisions. One particularly extraordinary aspect of the IIAC is the in-person convenings the committee conducts, where the world-class experts hold intense discussions to determine which of the SWFF finalists will get awards. More than a few of the IIAC members have noted the value of these opportunities. One IIAC member said, “This is the only time I’ve ever had so many experts in the room at one time talking about so many aspects of innovations in development contexts. I’ve learned so much coming to these meetings.”
SWFF partnered with the Future Agro Challenge (FAC) to host the Global Agripreneurs Summit in Johannesburg, South Africa, March 12–15, 2017. The Summit offered a varied program, including an innovation marketplace, one-on-one investor matchmaking sessions, a coaching camp, and an awards ceremony. SWFF innovators and other select agriculture innovators showcased their innovations at the GEC Agripreneur Marketplace to an estimated 5,000 registered GEC visitors visiting from more than 173 countries.

In a survey completed by 71% of the attending innovators, 100% stated the conference fulfilled their reason for attending (networking and funding were the main reasons they said they attended). In the survey, 81% of the innovators said 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% of all the attending innovators met as many as five new potential partners, and 42% said they met more than six (6% met more than 10). Although it is still too early to see the full impact of this opportunity, some innovators have told us they have already received investment interest as a result of their participation in the Summit.

The GEC survey also captured challenges from the sessions and suggestions for improvements for future events. Preparation time for the investor one-on-one sessions was too short due to unexpected, last-minute changes by 27% of the stakeholders (both innovators and investors), as well as the visa delays and travel cancellations of Rd. 4 innovators. The matchmaking process was challenging because innovators were from many different geographic areas, but a large number of the attending investors were from the local region. Some investors were only interested in investing in Africa. We believe many international investors were reluctant to travel long distances to the Summit. The Summit survey helped us identify a number of pre-event support services some attendees were dissatisfied with – 11% of the innovators said pre-event support was either not sufficient or the process did not work for them. Through the survey, we also learned from investors and jury members that innovators need more preparation before pitching their ideas.
After the Global Entrepreneurship Congress, SWFF innovators participated in the 2nd annual innovator-led “Unconference.” During eight formal discussions, innovators shared lessons learned through both successes and failures. They advised fellow innovators on various entrepreneurial processes and strengthened bonds of friendship among themselves. Sessions included: “Past Experiences: Five-Year Financial Forecasting,” “How to Convert Investor Connections to Actual Investments: Lessons Learned,” and “Ways of Documenting Projects for Improved Communication to Influence Others.”

SWFF innovators said they found the “Unconference” sessions to be informative, interactive, and the “best value-added session from the convening...encouraging interactions with other innovators.” More than 92% of attending innovators either “somewhat” or “to a great extent” learned something new from the sessions. Seventy percent found a new idea they would like to try in their SWFF project.
The Untapped Market for Agricultural Innovations in Emerging Economies: A Practical Workbook to Help Innovators Reach Women Smallholder Farmers was published May 2017. Initially discussed at the USAID Ag Cluster meeting in December 2016, Feed the Future’s Partnering for Innovation program created the working concept. SWFF TA Facility Chief of Party, Dr. Donna Vincent Roa, with technical support from Sattva Consulting and input from multiple gender experts representing SWFF Founding Partners, created the workbook. It is 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
- Target business growth with a focus on women smallholder farmers
- Highlight resources and tools for designing and marketing products, services, and technologies to reach this market
- Guide assessment of barriers and opportunities to reach the missing market of women smallholder farmers
- Create a framework for expanding to other countries and markets
- Examine the entire business cycle, from product design to market entry, to plan for customer retention and company growth
Fast Company magazine, the world’s leading business magazine focusing on innovation in technology, leadership, and design, selected the Securing Water for Food Technical Assistance Facility to receive a Finalist Award in the 2017 World Changing Ideas Awards, in the food category. The competition, which garnered more than 1,200 entries from all over the world, honors businesses, policies, projects, and concepts that offer innovative solutions to the issues facing humanity.
EXTERNAL INDUSTRY PARTNERSHIPS

External partnerships add value to the SWFF ecosystem. The SWFF Technical Assistance Facility establishes strategic alliances through memorandums of understanding (MOUs) with partners to complement the acceleration services provided to innovators. Partnerships established in this reporting period include:

• **Georgetown University** – From October 2016 through May 2017, Georgetown graduate students worked with the SWFF TA Facility to address the following question: “How can M-Fodder better communicate its value proposition to increase its user base and expand the benefits of its technology to more farmers in Kenya?” The team provided M-Fodder with a situational analysis, using SCQ, PEST, SWOT, competitor, and stakeholder analysis tools. In addition, it provided operational framework (communication strategy and recommendations) to disrupt the fodder market in Kenya and extend its reach to the rest of Africa.

• **George Washington University** – The Capstone Project Team was tasked with conducting an analysis of transitional funding opportunities for emerging market enterprises. Particular emphasis was put on external incubators and accelerators. The team created a list of effective partnerships with private-sector agricultural producers, NGOs, and government entities, as well as ag-water incubators and accelerators. The TA Facility shared this foundational list with SWFF innovators looking for additional connections and funding, and will continue to improve upon the list and share it with SWFF innovators.
Over the past two and a half years, the SWFF TA Facility accessed a variety of organizations to source volunteer associates. In the past reporting period, the SWFF TA Facility hired two associates from The Washington Center, as well as receiving virtual student support from partnerships with Georgetown University and George Washington University.

The onsite associates, who each worked for 32 hours per week, supported TA Facility strategic initiatives and portfolios in areas such as grants and financial management, acceleration work planning, the Voucher System, innovator-specific outputs, and communication. They also completed general tasks to support the Chief of Party.

Select deliverables contributed by associates included the catalytic funding report, website updates, innovator and program blog articles, acceleration research, country development coordination strategies, SWFF alumni transition protocols, Global Entrepreneurship Congress support in South Africa, transitional funding research and funding-source identification, USAID communication submissions research, Voucher System vendor reviews, and innovator and investor one-pagers.
External partnerships and strategic alliances add tremendous value to the SWFF ecosystem and expand acceleration service options and provision to innovators.
In February, the SWFF TA Facility hired Hattaway Communications, Inc., a strategic communication firm in Washington, D.C., to engage innovator audiences with story-driven content, empower SWFF innovators with tools and techniques to become effective messengers, and amplify the program narrative and innovator stories through selected channels. The team already has begun collecting content and formatting a SWFF newsletter. The newsletter is designed to maximize interest and engagement, with a focus on stories featuring innovator impacts and results. The Hattaway team produced two blog pieces for the SWFF website based on conversations with our innovators—with several other blogs on the way. As the team conducts ongoing storytelling trainings, it will continue to develop compelling content for the SWFF website.
To provide clear added value for SWFF innovators, Hattaway conducted two-hour trainings with innovators and completed strategic storytelling training sessions with Water Governance Institute, Si Technologies, and Green Heat. These trainings equip innovators to think strategically about their communications goal and priorities, as well as communicate their values and goals in a motivating way. Through the training, innovators accessed tools to help them develop stories that create impact. They also learned best practices for disseminating those stories to key audiences. Hattaway also helped each innovator create an online story bank to collect ideas for stories.
PROGRAM COMMUNICATION AUDIT

The Hattaway team analyzed internal and external communication from both SWFF and innovators. This process identified communication trends that could be improved upon and generated recommendations for communicating more clearly. The process included suggestions for tailoring content and stories to innovators’ targeted audiences. The TA Facility addressed specific action items in the audit and changed a number of processes and outputs to increase communication effectiveness.
FORTHCOMING ACTIVITIES
13TH ANNUAL GRAND CHALLENGES MEETING

In Washington, D.C., October 1–4, 2017, the Bill & Melinda Gates Foundation, USAID, Grand Challenges Canada (GCC), Wellcome Trust, and additional partners will host the 13th Grand Challenges Annual Meeting. Each annual meeting aims to accelerate the transformation of innovation into impact for global health and development. The meeting is a forum where researchers can share their work, learn about cutting-edge developments in the field, and build collaborations with other investigators and organizations.

Claire Reid, Founder of Reel Gardening, was invited to present her innovation at the meeting and announce her partnership with Girl Scouts of the USA. Other select SWFF innovators will be invited to attend and showcase their innovations.
ANNEX A: INNOVATOR SUMMARY TABLE
# INNOVATOR INNOVATION PRODUCT SUMMARY

## SWFF ROUND 1

<table>
<thead>
<tr>
<th>INNOVATOR</th>
<th>INNOVATION</th>
<th>PRODUCT SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adaptive Symbiotic Technologies (For-Profit)</strong></td>
<td>BioEnsure™</td>
<td>A fungus found in Yellowstone National Park that reduces water consumption, increases drought tolerance, and enhances crop yields with no negative impact when applied to seeds.</td>
</tr>
<tr>
<td><strong>aQysta (For-Profit)</strong></td>
<td>Barsha Pump</td>
<td>A low-cost, hydro-powered irrigation pump that does not require any fuel or electricity, has no operating expenses, and does not emit any polluting greenhouse gases.</td>
</tr>
<tr>
<td><strong>Aybar Engineering PLC (For-Profit)</strong></td>
<td>Broad Bed and Furrow Maker (BBM)</td>
<td>Broad Bed and Furrow Maker (BBM) reduces planting time and drains excess water away from crops, using lighter-weight materials appropriate for Ethiopian farmers.</td>
</tr>
<tr>
<td><strong>FutureWater (For-Profit)</strong></td>
<td>Flying Sensors</td>
<td>FutureWater provides smallholder farmers with insights from near infrared imaging that are critical to improving their application of limited resources such as water, seed, and fertilizer.</td>
</tr>
<tr>
<td><strong>International Center for Biosaline Agriculture (ICBA) (Non-Profit)</strong></td>
<td>Salt-Tolerant and Resilient Crops</td>
<td>A non-GMO, salt-tolerant quinoa that can enable significant food production in saline soils, without the need for fresh water.</td>
</tr>
<tr>
<td><strong>MetaMeta/SaltFarm Texel/Jaffer Brothers (For-Profit)</strong></td>
<td>Sait-Tolerant Potato</td>
<td>A non-GMO, salt-tolerant potato that requires very little fresh water for cultivation. Scaling up access to this potato will contribute to better use of lands and waters that have high salinity and will reduce the pressure on freshwater resources.</td>
</tr>
<tr>
<td><strong>My Rain LLC (For-Profit)</strong></td>
<td>Rainmaker</td>
<td>A customized irrigation system design tool that removes the complexity of drip irrigation design and installation for small agro-retailers across India.</td>
</tr>
<tr>
<td><strong>Practical Action Bangladesh (For-Profit)</strong></td>
<td>Sandbar Cropping</td>
<td>A low-cost model that transforms previously unused sandy islands that appear after each rainy season into large-scale pumpkin farms.</td>
</tr>
<tr>
<td><strong>Reel Gardening (For-Profit)</strong></td>
<td>Biodegradable Seed Tape</td>
<td>A simple, quick, and effective biodegradable paper tape that encases organic fertilizer and seeds at the correct depth and distance apart, resulting in a potential saving of 80% in water consumption.</td>
</tr>
<tr>
<td><strong>World Hope International (For-Profit)</strong></td>
<td>Affordable Greenhouses</td>
<td>Affordable greenhouses that address food insecurity, conserve water, and promote the equal participation of women in the economy.</td>
</tr>
</tbody>
</table>

## SWFF ROUND 3 INNOVATORS

<table>
<thead>
<tr>
<th>INNOVATOR</th>
<th>INNOVATION</th>
<th>PRODUCT SUMMARY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Meat Naturally Pty (For-Profit)</strong></td>
<td>Communal Grazing Systems and Ecorangers</td>
<td>Meat Naturally Pty uses ecological science, a government job-creation program, and market interest in sustainable meat to implement communal grazing systems that result in improved water and food availability.</td>
</tr>
<tr>
<td><strong>Ignitia AB (For-Profit)</strong></td>
<td>Mobile Weather Forecasts</td>
<td>A highly accurate weather model that helps farmers to sow, fertilize, and harvest at the optimum time, manage their daily activities, improve crop yields, and optimize food production.</td>
</tr>
<tr>
<td><strong>Green Heat Uganda Ltd (For-Profit)</strong></td>
<td>Slurry Separation System</td>
<td>A slurry separation system that vastly reduces the water demands of anaerobic digesters, creates a solid fertilizer that is easy to handle, increases gas production, and improves pathogen kill.</td>
</tr>
<tr>
<td>INNOVATOR</td>
<td>INNOVATION</td>
<td>PRODUCT SUMMARY</td>
</tr>
<tr>
<td>-----------------------------------</td>
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<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Institute for University Cooperation (ICU) – Peru (Non-Profit)</td>
<td>Irrigation Scheduling System</td>
<td>An irrigation scheduling system that provides farmers with direct indications on when and how much to irrigate. Through a climate station, the system measures air temperature, humidity, wind speed and direction, intensity of solar radiation, and rains.</td>
</tr>
<tr>
<td>Si Technologies International BV (For-Profit)</td>
<td>NewSil</td>
<td>NewSil applies silicic acid to food crops in an affordable and environmentally friendly way that substantially reduces crop loss in times of water stress and drought.</td>
</tr>
<tr>
<td>Water Governance Institute (Non-Profit)</td>
<td>Aquaponics Farming</td>
<td>Promoting commercial aquaponics farming among smallholder farmers/households for water efficiency, food security, and livelihoods improvement.</td>
</tr>
<tr>
<td><strong>SWFF ROUND 2 (DESAL PRIZE)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIT-Tata (For-Profit)</td>
<td>Electrodialysis Reversal (EDR) System</td>
<td>EDR is a desalination process in which an electric potential is applied to electrodes, and dissolved salt ions are pulled through ion exchange membranes to separate the salts from the water.</td>
</tr>
<tr>
<td><strong>SWFF ROUND 4</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central University of Technology, Free State (University)</td>
<td>Drought Early Warning System</td>
<td>This drought early warning system integrates indigenous and scientific drought forecasting that uses a mobile application, a web portal, and SMS to pool weather information through a network of sensors that monitor weather conditions for small-scale farmers.</td>
</tr>
<tr>
<td>Hydroponics Africa Ltd (For-Profit)</td>
<td>Simplified All-Inclusive Hydroponics Services</td>
<td>In Kenya, Hydroponics Africa leverages the use of local materials to grow healthy plants and helps farmers produce maximum yields on small areas without use of soil, while using 80% less water.</td>
</tr>
<tr>
<td>IVL Swedish Environmental Research Institute Ltd (Research Organization)</td>
<td>SPONGE</td>
<td>SPONGE is an innovative irrigation technology – a techno-biological system – that may improve water utilization and supply in Bhutan, Bangladesh, Belize, India, and Nepal. Using water from fog and dew, SPONGE increases water reliability in a region with abundant, but highly intermittent, water availability.</td>
</tr>
<tr>
<td>Lal Teer Seed Ltd (For-Profit)</td>
<td>Saline-Tolerant Vegetable Cultivation</td>
<td>The innovation combines locally developed, saline-tolerant vegetable seeds with easily adoptable methods for cultivating in high-saline areas of Southern Bangladesh, and includes micro-finance linkages, ICT support, and extension advisory services.</td>
</tr>
<tr>
<td>MimosaTEK (For-Profit)</td>
<td>Internet of Things Platform</td>
<td>MimosaTEK’s solution – an Internet of things platform for precision agriculture in Vietnam – monitors and analyzes data on farms by sensors (to measure soil moisture, rain, wind, light) to recommend to farmers a precise irrigation schedule in real time.</td>
</tr>
<tr>
<td>Naireeta Services (For-Profit)</td>
<td>Bhungroo</td>
<td>Bhungroo guarantees food security and income growth to smallholder farmers on the India-Pakistan border who are vulnerable to extreme weather and lack of irrigation facilities. Using handmade pipes 10 to 15 centimeters in diameter, Bhungroo filters, injects, and stores rainwater underground for use in lean periods.</td>
</tr>
<tr>
<td>INNOVATOR</td>
<td>INNOVATION</td>
<td>PRODUCT SUMMARY</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Project Alba (For-Profit)</td>
<td>Innovative Business Model for Disseminating Water Management Technologies</td>
<td>Project Alba has an innovative business model that allows for rapid dissemination of water management technologies to farmers in Cambodia.</td>
</tr>
<tr>
<td>SkyFox Ltd (For-Profit)</td>
<td>Integrated Aquaculture and Crop Production</td>
<td>SkyFox Ltd’s innovation involves top-of-the-hill aquaculture ponds capable of producing two tons of catfish twice a year and nutrient-rich water for irrigating 25-acres at the base of the hill. SkyFox will lease ponds and irrigation land and provide extension services to resource-poor farmers.</td>
</tr>
<tr>
<td>University of Malawi (University)</td>
<td>Flask-Wall Mushroom Growing House</td>
<td>An innovative, water-efficient, flask-wall mushroom growing house design for smallholder farmers in Malawi.</td>
</tr>
<tr>
<td>Stichting WASTE (Non-Profit)</td>
<td>Circular Economy with Black and Greywater Recycling</td>
<td>Circular economy with black and Greywater recycling for exotic vegetables cultivation in Nilgiris District, Tamil Nadu, India.</td>
</tr>
<tr>
<td>ARCADIS (For-Profit)</td>
<td>Freshwater Management System</td>
<td>A freshwater management system that may prevent groundwater salinization in coastal areas.</td>
</tr>
<tr>
<td>Center for Sustainable Dryland Ecosystem and Societies (CSDES)–University of Nairobi (For-Profit)</td>
<td>M-Fodder</td>
<td>M-Fodder enables smallholder livestock farmers to send an SMS and receive high-quality, hydroponically-produced fodder for their livestock.</td>
</tr>
<tr>
<td>Centre for Environment Concerns (Non-Profit)</td>
<td>SWAR</td>
<td>The innovation delivers assured spread moisture at the plant root zone to cultivate vegetables, flowers, fruit/forestry trees using only one fifth of water compared to Indian drip irrigation systems.</td>
</tr>
<tr>
<td>Deutsche Welthungerhilfe e.V. (Non-Profit)</td>
<td>Greenhouse</td>
<td>A combination of low-cost rainwater harvesting and greenhouse technology that allows vegetable production during colder months when no water for agricultural production is typically available.</td>
</tr>
<tr>
<td>Driptech Inc. (For-Profit)</td>
<td>Affordable Drip Irrigation</td>
<td>A high-quality, low-cost drip irrigation system that uses an innovative laser-punching technology that ensures uniform water application at the root zone of all crops in a field.</td>
</tr>
<tr>
<td>Institute for University Cooperation (Non-Profit)</td>
<td>The Buried Diffuser</td>
<td>Patented underground irrigation technique for trees, shrubs, vegetables in fields and greenhouses that enhances efficiency of water resources, increases crop productivity, and makes rain-fed agriculture sustainable.</td>
</tr>
<tr>
<td>INNOVATOR</td>
<td>INNOVATION</td>
<td>PRODUCT SUMMARY</td>
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<td>-----------</td>
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<td>----------------</td>
</tr>
<tr>
<td>Institute for University Cooperation (Non-Profit)</td>
<td>Groasis Waterboxx</td>
<td>An integrated planting technology that allows planting fruit, fodder trees, and shrubs in degraded farmland and rangelands.</td>
</tr>
<tr>
<td>Islamic Relief Kenya (IRK) (Non-Profit)</td>
<td>AgroSolar</td>
<td>SunCulture’s AgroSolar Irrigation Kit (ASIK) is a combination of off-the-shelf, proven, no-frills, cost-effective, solar-powered pumping and drip irrigation technologies.</td>
</tr>
<tr>
<td>MetaMeta Research B.V. (Non-Profit)</td>
<td>Waterpads®</td>
<td>A sandwich of paper and jute with an inner layer of 0.5 mm large granular polymers in dry form. The polymer absorbs 100 times its own weight of water (7 grams absorb 1 liter of water), retaining water at binding tension.</td>
</tr>
<tr>
<td>Puralytics (For-Profit)</td>
<td>LilyPad</td>
<td>A reusable, chemical-free solar-activated water treatment product that floats on a body of water to kill viruses, bacteria, and protozoa in water used for agriculture.</td>
</tr>
<tr>
<td>Trans African Hydro-Meteorological Observatory (TAHMO) – Weather Index Micro-Insurance (Non-Profit)</td>
<td>Weather Index</td>
<td>TAHMO’s 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, providing accurate, localized, and timely weather information.</td>
</tr>
<tr>
<td>University of Texas – El Paso (University)</td>
<td>A Zero Discharge Desalination (ZDD) Technology</td>
<td>ZDD is a hybrid process that combines reverse osmosis (or nanofiltration) as the primary desalter and electrodialysis metathesis (EDM) to recover additional water from the desalination brine.</td>
</tr>
<tr>
<td>Wageningen University &amp; Research Center (Research Organization)</td>
<td>Salt-Tolerant Quinoa</td>
<td>A non-GMO, salt-tolerant quinoa that enables significant food production in saline soils, without the need for fresh water.</td>
</tr>
</tbody>
</table>
Since its inception more than three years ago, SWFF has made significant progress toward its goal of producing more food with less water and making more water available for the food value chain."
The table below is a summary of the support engagements assigned to the TA Facility’s lines of support that are slated for completion in this project year ending in October 2017.

<table>
<thead>
<tr>
<th>SUPPORT PROVIDER</th>
<th>SUPPORT TYPE</th>
<th>INNOVATORS SUPPORTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOUBLE-O MARKETING</td>
<td>Sales, Marketing, Communication, and Branding</td>
<td>Green Heat</td>
</tr>
<tr>
<td>ELLAE CREATIVE</td>
<td>Sales, Marketing, Communication, and Branding</td>
<td>Ignitia</td>
</tr>
<tr>
<td>INTELLECAP</td>
<td>Business Model and Strategy Development</td>
<td>Meat Naturally Pty</td>
</tr>
<tr>
<td>MRI GLOBAL</td>
<td>Business Model and Strategy Development</td>
<td>Si Technologies</td>
</tr>
<tr>
<td></td>
<td>Product Development, Refinement, and Diversification</td>
<td>FutureWater</td>
</tr>
<tr>
<td></td>
<td>Product Development, Refinement, and Diversification</td>
<td>Adaptive Symbiotic Technologies</td>
</tr>
<tr>
<td>SATTVA</td>
<td>Gender Advisory</td>
<td>Adaptive Symbiotic Technologies</td>
</tr>
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AFFORDABLE GREENHOUSES

WORLD HOPE INTERNATIONAL

CHALLENGE

Approximately 70% of Sierra Leone’s and Mozambique’s populations are employed in the agricultural sector – growing, selling, buying, and preparing food for their families. However, with growing water insecurity, agriculture is not a reliable source of income.

SOLUTION

In partnership with Pennsylvania State University, World Hope is producing and distributing Affordable Greenhouses that enable a year-round growing season and reduction in water consumption. The greenhouses can be constructed in just two days at a price point of $500. The greenhouses are durable and last over five years.

MILESTONES AND ACHIEVEMENTS

World Hope’s Affordable Greenhouses have reached over 16,000 end users/customers. The innovation exceeded its outreach to households by over three times, has helped produce more than 370 tons of produce and saved over 770,000 liters of water. Farmers are seeing a full payback in the cost of greenhouse expenditures in 2-3 growing cycles. Many of the customers/end users have reported positive outcomes as a result of the innovation – including one customer who started two successful hydroponic systems for lettuce.

World Hope is currently seeking funding to create small grant facility to remove obstacles to GRO vegetable sellers accessing markets. In Year 3, World Hope plans to get closer to profitability and continue marketing to institutions and vulnerable groups.

TA FACILITY ACCELERATION SUPPORT

1. Support developing marketing materials and staff build sales skills
2. Assistance listing potential NGOs and making introductions where appropriate to sell to and/or partner with and subsidize the greenhouses for end users
3. Support simplifying highly scientific and complex calculation methods for tracking and reporting on water consumption and reduction results
4. Review of the business model to ensure sustainability and viability going forward
5. Guidance on best practices in marketing to bottom-of-the-pyramid consumers
6. Expand funding sources and make connections with potential investors
The Barsha Pump
AQYSTA HOLDING BV

CHALLENGE
For small- and medium-sized farmers in the Himalayan Mountains of Nepal, watering crops can be a challenge. Irrigation solutions such as diesel and solar-powered pumping exist; however, they are not sustainable. They require constant repairing, refueling, or large upfront investments. Simple solutions are needed to help farmers keep crops watered.

SOLUTION
aQysta’s Barsha pump is a low-cost, innovative solution for smallholder farmers to irrigate their fields without using any fuel or electricity. The hydro-powered pump is easily implemented anywhere there is flowing water nearby and requires little maintenance. Barsha pumps can save up to 70% of irrigation costs compared to fossil-fuel-based pumps and compared to similar-capacity solar pumps, Barsha pumps are up to two times less capital intensive.

MILESTONES AND ACHIEVEMENTS
To date, aQysta has reached 489 households and 2,571 end users/customers with its hydro-pump technology. The innovator has sold 70 Barsha pumps across Nepal in diverse socioeconomic conditions. In Year 3, aQysta received an order of 200 pumps from the Nepalese government. aQysta has leveraged more than $350,000 in outside funding, and has seen a profit margin of 29%.

TA FACILITY ACCELERATION SUPPORT
1. Intensify marketing and branding campaign in Nepal and assist with prospective customer workshop planning and coordination
2. Assist with assessing the possibility of using a mobile payment platform to handle pump sales
3. Counsel on aQysta’s overall business model in order to identify the most optimal path to scale
4. Help collaborating with USAID’s Nepal projects and help positioning the pump technology to local farmers
5. Provide recommendations on connecting with relevant investor audiences such as venture funds, impact funds, and family foundations
6. Support developing a micro-financing option model to approach micro-financing institutions
7. Help designing a complete irrigation and pump system for packaged sales.
8. Help to define target customer segments, identify high potential customers within each priority segment, and reach out to those organizations or individuals
Biodegradable Seed Tape

REEL GARDENING

CHALLENGE
Planting a home garden can be a daunting task requiring access to large volumes of water, start-up capital, and at least some gardening knowledge. For many low-income communities, committing precious resources to seeds, fertilizer, and water, just to have a garden fail, can be a deterrent to growing their own produce, which can feed a family or be sold for extra income.

SOLUTION
Reel Gardening has developed a unique seed system that can be grown in a vegetable or herb garden in nearly any climate. The innovator pre-packages a paper strip with seeds and fertilizers so it can be easily planted at the correct depth and maintained. It takes just five minutes to plant, uses 80% less water, and provides hours of joy and months of food.

MILESTONES AND ACHIEVEMENTS
Reel Gardening has reached nearly 500,000 end users/customers with their innovation. They have implemented their Garden-in-a-Box technology in over 200 schools. Reel Gardening has saved 19.5 million liters of water, farmed 51 hectares of land, and produced approximately 37,570 tons of produce from their seed tape. Reel Gardening has partnered with Unilever and PnP Foundation to roll out 2,300 primary school grow pods and teacher guides.

TA FACILITY ACCELERATION SUPPORT
1. Support identifying grant opportunities relevant to the organization
2. Support developing and implementing an agent distribution model
3. Assistance in efficient and effective forecasting and cash flow management processes
4. Aid in developing a buy-one-donate-one retail model and determining how this model could be marketed and implemented without overpricing the product
**BioEnsure®**

**ADAPTIVE SYMBIOTIC TECHNOLOGIES**

**CHALLENGE**

Some of the greatest threats facing agricultural sustainability are abiotic stresses including drought, rising salinity, and poor water quality. Simultaneously, increasing populations, urbanization, soil degradation, and the reduction of arable farmland are decreasing global agricultural growing capacity.

**SOLUTION**

Adaptive Symbiotic Technologies’ BioEnsure® is a fungal seed and plant treatment that, when sprayed onto seeds, helps plants to adapt to water-related stress. By applying BioEnsure®, crops can grow in sub-optimal conditions and use 50% less water. BioEnsure® is the only product on or soon to be on the market that can confer stress tolerance.

**MILESTONES AND ACHIEVEMENTS**

BioEnsure® users in India have seen a 30%–57% increase in crop yields. Even users farming in difficult growing conditions are seeing an increase in plant resiliency. Adaptive Symbiotic Technologies (AST) is on pace to achieve all the final year milestones which include: $10,000 of sales in India, regulatory approval in a new country, an additional U.S. partner, continuing testing success with at least a 15% yield increase in India, and increasing reach to at least 150 small rural farmers.

AST has already demonstrated a high degree of visibility and impact. AST has brought in $5.8 M in investment and an additional $200 K in grant funding.

**TA FACILITY ACCELERATION SUPPORT**

1. Help to identify and connect to organizations, ideally locally in India, that can help AST define the program they are pursuing to equip women in local Indian villages to become seed treaters
2. Support designing and building an automated fermentation system using the same substrate as the manual systems to meet international scale-up demands
3. Expand funding sources and make connections with potential investors
4. Support identifying partners in target countries to set up an in-country testing facility and conduct seed tests
OBSTACLE
In the Ethiopian highlands alone, there are about 7.6 million hectares of vertisols out of which farmers use only 25% for crop production.

ORGANIZATION
Aybar Engineering

INNOVATION
Broad Bed and Furrow Maker (BBM)

ORGANIZATION TYPE
For-Profit

COUNTRY
Ethiopia

CONTACT
Melesse Temesgen
melesse_tem@yahoo.com
www.aybareng.com

CHALLENGE
Vertisols are important to Ethiopian agriculture. In the Ethiopian highlands alone, there are about 7.6 million hectares of vertisols out of which farmers use only 25% for crop production. In traditionally cultivated fields, farmers’ crops are suffocated by water and yields are significantly reduced.

SOLUTION
Aybar’s Broad Bed and Furrow Maker (BBM) is used at planting time in order to drain excess water away from crops. It is a multi-purpose ridger and bed maker used to drain excess water and conserve moisture in dry areas. The innovator is currently working primarily in Ethiopia, where only 25% of the land is cultivated due to waterlogging. The BBM has been developed using lighter-weight materials appropriate for Ethiopian farmer needs. The use of their BBM has improved wheat yields from 0.5 tons per hectare to 3.8 tons per hectare.

MILESTONES AND ACHIEVEMENTS
Aybar Engineering has delivered BBMs to 61,744 farmers and has a total of 246,976 family users. The BBM has shown to improve yields by up to 500% or as high as $800 per hectare, per year. Over 44,500 hectares of land are under improved practice as a result of the innovation.

TA FACILITY ACCELERATION SUPPORT
1. Partner identification and introduction
2. Support setting up proper accounting and financial systems
3. Support in navigating the Ethiopian, small-plot farmer market and agricultural economy
4. Review of the business model with accompanying feedback that will help them solidify and expand their value proposition and operations
5. Aid in communicating with local government officials to increase engagement with Aybar
Flying Sensors
FUTUREWATER

CHALLENGE
In Mozambique, some of the most common crops—maize, cassava, and sorghum—have very low yields per hectare. Most farmers do not have access to reliable information on the status of their crops and are afraid to risk using costly inputs, such as high-quality seeds, on-time irrigation, and fertilizer, for fear of wasting these precious resources.

SOLUTION
FutureWater provides smallholder farmers with insights that are critical to improving their application of limited resources, such as water, seed, and fertilizer. The Flying Sensor provides high-resolution spatial information beyond the visual spectrum. Flying Sensors are equipped with near-infrared sensors that detect crop stress up to two weeks before it is observable by the human eye.

MILESTONES AND ACHIEVEMENTS
FutureWater has reached over 17,000 end users/customers. They have trained 14 operators, which have conducted flyovers on 1,600 hectares of land. A subset of end users/customers reported that using the Flying Sensor resulted in a 39% water reduction. In Year 3, FutureWater has set up a support unit in the country and hired a field manager to find potential commercial clients in Mozambique. This will make it possible to use payment from these clients to keep helping smallholder farmers, manage current operating activities, and conduct PR and dissemination.

TA FACILITY ACCELERATION SUPPORT
1. Identify grant opportunities relevant to FutureWater
2. Assist with sales training for drone operator staff
3. Support to navigate and accelerate the Mozambique government’s approval process
4. Create a marketing and communication strategy
5. Help to establish baseline metrics for water-consumption reduction and productivity

OBSTACLE
Most farmers do not have access to reliable information on the status of their crops and are afraid to risk using costly inputs, such as high-quality seeds, on-time irrigation, and fertilizer, for fear of wasting these precious resources.
Rainmaker
MYRAIN LLC

CHALLENGE
In India, 41 million smallholder farmers rely on flood irrigation, a method that stunts crops and washes away valuable soil nutrients. Drip irrigation increases the efficiency of water and fertilizer by 20% to 50% and increases yields by 30% to 100%. Drip irrigation also preserves nutrients in the soil and increases land longevity. Due to weak distribution chains and product complexity, drip technology has proliferated to only 5% of these farmers.

SOLUTION
MyRain is a wholesaler of drip irrigation products. MyRain’s Rainmaker (patent-pending) is a point-of-sale and design application that makes it easy for retailers to customize drip irrigation systems for small-plot farmers based on entering a few parameters. This intuitive app removes the barrier of retailer engineering expertise and increases the ease and opportunity to advise, sell, and order drip irrigation components.

MILESTONES AND ACHIEVEMENTS
To date, the MyRain has helped save over 235 million liters of water and reached 7,300 end users/customers, 3,526 of which are women. Farmers have used MyRain-supplied irrigation products on 614 hectares of land. MyRain has sold more than $330,000-worth of irrigation and hardware products.

TA FACILITY ACCELERATION SUPPORT
1. Review current business processes/systems and assist in identifying the optimal systems for the processes to be supported
2. Help MyRain better understand its end user/customer purchase decision and assist in creating a sales strategy and implementation support
3. Support to better understand the agricultural retailer market in India
4. Assist in making connections with local Indian banks to link MyRain’s retailer network to working capital and financing
5. Make introductions to potential investors
Salt-Tolerant and Resilient Crops

INTERNATIONAL CENTER FOR BIOSALINE AGRICULTURE

CHALLENGE

The West Asia and North Africa regions are two of the most water-scarce regions in the world with agriculture consuming over 75% of freshwater resources. Many of the groundwater-based agro-ecosystems and river-based irrigated agricultural lands in this region are affected by salinity and water logging, which is a major constraint to crop production.

SOLUTION

ICBA is working to establish salt-tolerant seed production and exchange chains in Yemen and Egypt, where freshwater is scarce.

Specifically, the innovator is looking at key crops such as barley, triticale, fodder beet, pearl millet, sorghum, safflower, and quinoa. They seek to improve the livelihoods of small-scale farmers.

MILESTONES AND ACHIEVEMENTS

During the first six months of their SWFF award, ICBA’s primary objective was to shift their focus from production in the Sinai to scaling in the New Valley region of Egypt. Partner meetings took place in early May to ramp up activities in the New Valley. Exceeding the household target by nearly double and reaching over 2,100 end users, the innovator’s efforts are now centered on continuing to recruit farmers for seed production and sales.

TA FACILITY ACCELERATION SUPPORT

1. Advisory support to help ICBA work through a business model that will be most successful in Egypt and Yemen
2. Support helping the innovator establish a better understanding of developing an integrated supply chain
3. Consulting on sales and marketing to help ICBA clarify the value proposition to better engage and mobilize the private sector
Salt-Tolerant Potato

METAMETA & SALTFARMTEXEL

**CHALLENGE**

The UN estimates that at least 1 billion hectares of land are currently affected by salinity and the world loses at least 3 hectares of arable land every minute due to salinization. In Pakistan, 4.2 million hectares of land are affected by salt. With limited freshwater resources available, farmers are forced to use brackish groundwater to water their crops, reducing overall yields and quality.

**SOLUTION**

MetaMeta is a Netherlands-based development consultancy that partnered with SaltFarmTexel and Jaffer Brothers to introduce salt-tolerant potatoes to the Pakistani market. In Pakistan, floods and sea water intrusion wipe out crops with increasing regularity. Their salt-tolerant potato crop offers an alternative to 250 million people globally that live on salt-affected soil. MetaMeta’s non-GMO, salt-tolerant potato requires very little fresh water for cultivation. Scaling up access to this potato will contribute to better use of lands and waters that have high salinity and will reduce the pressure on freshwater resources.

**MILESTONES AND ACHIEVEMENTS**

MetaMeta has reached 327 end users/customers and has helped farmers produce 21 tons of salt-tolerant potatoes and saved nearly 1.2 million liters of water. The innovator successfully grew their crop in water with a salinity level of 8.7 dS/m. MetaMeta is setting to commit as much as farmers require to growing the approved potato varieties, following a successful multiplication season from 2017 into 2018.

**TA FACILITY ACCELERATION SUPPORT**

1. Support with business model and strategy development
2. Provide partner identification and introductions
3. Advice creating a legal structure upon which the three partners in the innovator’s consortium can operate and conduct business
4. Assistance building brand awareness among potential growers of the salt-tolerant potato and promoting partnership opportunities with local growers
Sandbar Cropping
PRACTICAL ACTION

CHALLENGE
Once the rainy season has ended, large sandbanks appear in the major rivers of Bangladesh. These sandbars usually disappear after five months and thus cannot be cultivated year-round. However, during the dry season these lands can be used by extremely poor farmers to grow high-nutrition crops.

SOLUTION
Practical Action’s sandbar cropping technique enables landless families in Bangladesh to diversify their incomes by growing pumpkins and other crops on previously barren land. Farmers can overcome seasonal food shortages and reduce risks that threaten their livelihoods with sandbar cropping. Practical Action teaches farmers how to identify suitable sandbar cropping space, dig pits, fill them with compost, and add pumpkin seeds. Crops thrive and the pumpkins last for up to a year, enhancing food security and improving earning potential among extremely poor farmers.

MILESTONES AND ACHIEVEMENTS
Practical Action has reached 3,863 end users/customers, 1,783 of which are female end users. Their unique sandbar cropping technique has helped produced nearly 7,000 tons of pumpkins and has led to a 54% reduction in water usage. Approximately 407 hectares of land are under improved practices as a result of the innovation. Practical Action has seen a 100% repayment rate from pumpkin farmers to date, and the income of farmers has increased by an average of $532 annually.

At the national level, the innovation has a great influence in the formulation of a seven-year national plan to support extreme poverty eradication and suitable technologies. At the organisational level, Practical Action is focusing the innovation as a vehicle for change in areas both at home and abroad. The biggest achievement of the innovation is involving rural and underdeveloped women communities to join in productive activities for their greater change. The innovation is not only providing food security, but showing multiple solutions to meet other socio-economic causes.

TA FACILITY ACCELERATION SUPPORT
1. Support assessing a business and operating model that enables sustainability without donor support
2. Help creating a comprehensive branding engagement and developing branding materials to share with institutional buyers
3. Support water quality testing to ensure that water supplies downstream from the sandbar cropping are not adversely affected by the pumpkin growing process
4. Assistance creating a business and marketing strategy and identifying opportunities for pumpkin export to other countries
5. Help exploring the potential for growing and exporting other pumpkin varieties and vegetables using the sandbar approach
Electrodialysis Reversal System

MIT/TATA CENTER FOR TECHNOLOGY AND DESIGN

CHALLENGE

All too often, groundwater is brackish and not suitable for human consumption or crop irrigation. Irrigation with brackish water is not sustainable, and ultimately leads to low crop yield and salinization of the soil. In India, 60% of the land is underlain by salty water. The nation is in need of freshwater for crop, human, and animal consumption. Further, electric grids that can run conventional reverse-osmosis desalination plants are not widely available in India.

SOLUTION

MIT designed a photovoltaic-powered electrodialysis reversal (EDR) system that desalinates water. This system uses electricity to pull charged particles out of the water and further disinfect it by using ultraviolet rays. The system was designed for low energy consumption, limiting costs especially in off-grid areas.

MILESTONES & ACHIEVEMENTS

MIT partnered with the Tata Center for Technology and Design and General Electric (GE). In January 2017, MIT installed the first optimized EDR System in India and trials have begun. As their test pilot period begins, MIT plans to automate their system with electronic valves, so the unit can automatically turn on and off. Additionally, this automated system would allow for reversal of the electrodialysis process, as well as automatic separation of potable from agricultural water.
Aquaponics Farming

WATER GOVERNANCE INSTITUTE

CHALLENGE

Declining water availability and limited access to commercially viable farmland are just two of the challenges facing growers in Uganda. The food system in the nation faces hurdles with a declining fish-eating culture resulting from dwindling fish supply in lakes, high local and international demand, and high costs. Without access to protein-rich foods like fish, many Ugandans, especially children, must cope with nutritional deficiencies.

SOLUTION

Water Governance Institute’s Aquaponics system closes the loop between fish and horticultural crop farming. The system helps provide much-needed nutritional supplements and alternative incomes to Ugandan citizens and farmers living in rural, urban or peri-urban household settings. The all-in-one system uses less water and allows for crop production and fish rearing at home.

MILESTONES AND ACHIEVEMENTS

Water Governance Institute’s Aquaponics system has reached 164 end users/customers. Aquaponics is resulting in earlier crop yields in a 2.5-month period than the anticipated three months in the traditional screen-house and natural systems.

In Year 3, Water Governance Institute is conducting community-based awareness raising and sensitization on the value of Aquaponics in project districts. The innovator is also benchmarking and conducting site inspection of potential Aquaponics sites in project districts.

TA FACILITY ACCELERATION SUPPORT

1. Help refining the business model canvas supported by a financial model
2. Support in helping to better understand potential customers
**Communal Grazing Systems and Ecorangers**

**MEAT NATURALLY PTY. (FORMERLY CSA)**

**CHALLENGE**

Nearly 90% of South Africa’s water for agriculture comes from surface catchment areas that are vulnerable to alien plant spread and bush encroachment, which is often triggered by communal livestock. Degradation of rangelands across Africa is destroying water catchment functions and driving livestock farmers into poverty. Restoring catchments infested by non-native species is a national priority in South Africa for efficient water management.

**SOLUTION**

Trained cattle herders and communal herding techniques minimize the negative impacts of alien plant invasions to wetlands and riparian zones. Conservation South Africa uses an innovative business model, Meat Naturally Pty, to implement communal grazing systems that result in improved water and food availability. The business model is based on training herders and supporting market access in a way that improves livestock condition, croplands, rangeland ecosystems, and, by working at scale, ensures sustainability in formal private sector markets.

**MILESTONES & ACHIEVEMENTS**

Meat Naturally Pty. has reached nearly 10,000 end users/customers and over 240,000 hectares have been under improved practice as a result of Meat Naturally’s communal grazing system. The Meat Naturally business model has recently been adopted in a project in Lesotho which supports 87 farmers on 400,000 hectares of the water catchment region for the city of Johannesburg (a city of 4.4 million).

Meat Naturally is entering into a partnership with SA National Parks to manage the Anatolian dog breeding center. Anatolian dogs provide a non-lethal predator management option to the overall offering by MNP to farmers. In addition, Meat Naturally secured new national government support from Botswana for a $56 million six-year pilot program from the Office of the President.

**TA FACILITY ACCELERATION SUPPORT**

1. Support performing the due diligence and business modeling that will help make a decision on a vertical integration to incorporate a retail seller into its business model
2. Assistance with business process definition and supporting systems
Irrigation Scheduling System

INSTITUTE FOR UNIVERSITY COOPERATION

CHALLENGE

In Peru, access to information about climate and weather patterns is both limited and expensive. Data that is collected and provided by the public authority covers only a small portion of the country. Marketing companies that sell climate stations exist, but only provide services to large farming institutions because of high costs.

SOLUTION

ICU offers Peruvian smallholder farmers an innovative technology that permits widespread sharing of information on climate and irrigation at an accessible cost. The irrigation scheduling system helps farmers know when and how much to irrigate.

MILESTONES & ACHIEVEMENTS

ICU – Peru’s Irrigation Scheduling System technology has reached over 13,000 end users/customers and has helped produced over 3,000 tons of produce in nearly 1,500 hectares of land under improved practices. Current clients include associations, cooperatives, and social enterprises that unite small- and medium-sized farm owners who work as a production unit. Crops grown include asparagus, corn, quinoa, and sugarcane.

TA FACILITY ACCELERATION SUPPORT

1. Support creating a sales and marketing strategy that will better define the most effective distribution channels
2. Support creating a business model canvas
Mobile Weather Forecasts
IGNITIA AB

CHALLENGE
Extreme weather variability hinders farmers from capitalizing on rainfall for crop production, especially in regions near the equator. Predicting the weather based on traditional forecasts is often insufficient for small-scale farmers living in these weather volatile regions. Of the estimated 1.4 billion hectares of cropland worldwide, around 80% is rainfed and accounts for about 60% of the global agricultural output. Reliable and accurate weather forecasts help farmers sow, fertilize, and harvest at the ideal time to realize greater yields.

SOLUTION
Ignitia AB has developed a highly accurate weather model to help small-scale farmers in West Africa manage their daily activities to predict water availability and improve their yields to optimize food production. Designed with end users in mind, Ignitia delivers highly localized, accurate forecasts and a lightning-fast warning system to alert farmers in case of sudden storms. Current global weather forecast models all fail to provide accurate forecasts in the tropics. Ignitia’s forecasts are accurate 84% of the time compared to its competitors, which are accurate only 39% of the time.

MILESTONES & ACHIEVEMENTS
To date, Ignitia has reached over 730,000 end users/customers and has helped produced over 623,000 tons of produce in nearly 252,000 hectares of land under improved practices. End users/customers have reported yield increases of 47%-97%. In Year 2, Ignitia has started forecasting in Ghana, launched projects in Burkina Faso and Mali with cotton organizations, and expanded their project with GIZ Nigeria.

TA FACILITY ACCELERATION SUPPORT
1. Support reviewing the current sales and marketing strategy and providing recommendations
2. Support recruiting the right high-caliber staff
3. Support creating a marketing pilot
NewSil
SI TECHNOLOGIES INTERNATIONAL

CHALLENGE
Worldwide droughts cause severe agricultural losses. Prolonged lack of rainfall inhibits the photosynthesis of plants, causes chlorophyll changes, and damages the photosynthesis apparatus. Plants are inhibited by photochemical activities and experience decreased enzyme activities.

SOLUTION
Si Technologies found a way to stabilize silicic acid to strengthen crop resilience against droughts and extreme weather. With their product, NewSil, food crops can absorb silicon, resulting in a reduction of water consumption of 30%-50%. Applying silicic acid to food crops is an affordable and environmentally friendly solution to reduce drought stress. Crops can therefore overcome periods of water shortages which saves harvest.

MILESTONES & ACHIEVEMENTS
Si Technologies’ NewSil has helped improve over 11,000 hectares of land and have reached over $104,000 in product sales. Si Technologies completed a second trial in India with an agricultural cooperative. With 50 farmers, NewSil was tested on nine crops. The results were comparable to the earlier trial in 2016. The results showed crop yields increased by 27% resulting in higher water efficiency of almost 24%.

With assistance from the TA Facility, Si Technologies will be upgrading the production facilities in Mumbai. In Year 2, Si Technologies is expanding the business in Indonesia and setting up the small production unit in South Africa.

TA FACILITY ACCELERATION SUPPORT
1. Support upscaling of NewSil production in India and provide experts in chemical mechanics to review plans and provide feedback and recommendations
2. Provide investor readiness coaching/consulting for pitching to attract capital

OBSTACLE
Prolonged lack of rainfall inhibits the photosynthesis of plants, causes chlorophyll changes, and damages the photosynthesis apparatus.

ORGANIZATION
Si Technologies International

INNOVATION
NewSil

ORGANIZATION TYPE
For-Profit

COUNTRY
India

CONTACT
Bart de Jonge
bart@sitecin.com
www.sitecin.com
Slurry-Separation System

GREEN HEAT UGANDA LTD

CHALLENGE

Anaerobic digestion transforms organic wastes into methane and fertilizer, which saves money while improving energy security, air quality, public sanitation, and crop yields. Unfortunately, in Uganda, 50% of digesters are abandoned within a year because farmers find the process unsustainable. Current designs require every kilogram of waste to be mixed with a kilogram of water for the system to function. Women and children must fetch more than 80 liters of freshwater a day to feed their digesters, wasting precious natural and labor resources.

SOLUTION

Green Heat Uganda Ltd.’s innovative slurry-separation system greatly reduces water demand. The system creates an easily managed fertilizer product while increasing gas production. Utilizing a solar-powered sewage pump and innovative heating process, slurry is dewatered and converted into solid fertilizer that can be packaged, stored, or applied directly to the fields. Water by-products are separated during the process and re-used to mix with organic wastes later in the system. Green Heat Uganda increases the potential of success by enabling all farmers to enjoy the benefits of digesters, regardless of their water access.

MILESTONES & ACHIEVEMENTS

Green Heat has been able to cumulatively install 219 slurry separation systems (SSTs), in households, dairy farms and schools benefiting 5,750 end users/customers, of which 3,632 are females. The installed systems have been able to save over 4,000,000 liters of water. This has resulted in saving women and children time which they would otherwise spend collecting and transporting digester water. Green Heat end users/customers have reported an increase in crop yields for the different crops.

Green Heat has partnered with a biogas installation company, Tusk Engineering, that has been able to distribute the systems. The Ministry of Energy and Mineral Development (MEMD) is planning to have the systems included in their biogas designs and aim to build over 3,000 demonstrational biogas digesters in the next 3-5 years.

Finally, through the assistance provided by the TA Facility, Green Heat Uganda has been able to provide flexible payment options to their end users/customers.

TA FACILITY ACCELERATION SUPPORT

1. Support in defining a brand and associated messaging that readily communicates the mission and value of Green Heat
2. Partner identification and introduction
3. Sales and marketing strategy definition
Bhungroo Handmade Pipes
NAIREETA SERVICES

CHALLENGE
Poor women farmers in India face significant economic, social and environmental barriers to water for food security, particularly since they lack equal access to economic assets and education. Smallholder farmers are urgently in need of a cost-effective and environmentally-sustainable irrigation solution since they cannot afford to pay for water. Droughts and floods often result in crop failure leading to food insecurity and financial loss.

SOLUTION
Bhungroo guarantees food security and income growth to smallholder farmers on the India-Pakistan border who are vulnerable to extreme weather and lack of irrigation facilities. Using handmade pipes 10 to 15 centimeters in diameter, Bhungroo filters, injects, and stores rainwater underground for usage in lean periods. In addition to providing food security during rainy periods and crop survival in lean periods, Bhungroo can also supplement household water needs.

OBSTACLE
Poor women farmers in India face significant economic, social and environmental barriers to water for food security.

ORGANIZATION
Narieeta Services

INNOVATION
Bhungroo Handmade Pipes

ORGANIZATION TYPE
For-Profit

COUNTRY
India

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WWW.SECURINGWATERFORFOOD.ORG
SECURING WATER FOR FOOD TECHNICAL ASSISTANCE FACILITY
GRAND CHALLENGE INNOVATOR | MAY 2017
Circular Economy With Black and Greywater Recycling

STICHTING WASTE

CHALLENGE

In India, rainfall is becoming more and more unpredictable and groundwater availability is declining. Groundwater is used extensively for flood irrigation and there is a declining soil fertility due to excessive application of chemical fertilizers. There is also a growing demand for exotic vegetation by the hospitality industry. However, there is an absence of financing tools to adopt innovations.

SOLUTION

Stichting WASTE’s innovation involves recycling of blackwater (wastewater containing feces, urine) and greywater (streams without fecal contamination) from households for production of market-quality compost for cultivation of exotic vegetables. The innovation enables women agri-entrepreneurs to have a better quality of crops with compost application and an extended crop season.

TA FACILITY ACCELERATION SUPPORT

1. Support with sales, marketing, communication, and branding
Drought Early Warning System
CENTRAL UNIVERSITY OF TECHNOLOGY, FREE STATE

CHALLENGE
Droughts remain the number one disaster in Africa; of all the people affected by all types of disasters, drought is responsible for over 88% of them. There is currently no appropriate drought-forecasting tool for smallholder farmers; very few of them know about the services offered by the meteorological departments. Farmers continue to rely on their indigenous knowledge to reach critical cropping decisions. They also find the scientific terminologies used are difficult to translate to their contexts and have no access to the dissemination media (e.g., TV) used.

SOLUTION
Central University of Technology’s drought early warning system integrates indigenous and scientific drought forecasting that uses a mobile application, a web portal, and SMS service to pool weather information through a network of sensors that monitor weather conditions for smallholder farmers.

The system is anchored on the novel integration framework called Information Technology and Indigenous Knowledge with Intelligence (ITIKI). Indigenous knowledge ensures that the system is relevant, acceptable and resilient. ITIKI further employs three ICTs (mobile phones, wireless sensor networks, and artificial intelligence) to enhance the system’s effectiveness, affordability, sustainability, and intelligence.
Flask-Wall Mushroom Growing House
UNIVERSITY OF MALAWI

CHALLENGE
The major problem faced by mushroom farmers in Malawi is the large demand for water for cultivation. The dry season lasts about nine months and mushroom cultivation has a limited growing season in an open air environment. If farmers use an indoor growing house, the challenge is precisely humidifying the growing house to create the required micro-environment for growing mushrooms.

SOLUTION
The “flask-wall” mushroom growing house reduces moisture escape and enhances recycling of water through condensation and the water required by the crop is reduced. The technology sets a micro-hydrological cycle where the initial water supplied into the house re-circulates as water vapor and excess loss to the external environment is prevented. The design greatly reduces labor requirements and watering frequency allowing growers, mostly women, to attend to other household chores.

TA FACILITY ACCELERATION SUPPORT
Support with business model and strategy development

OBSTACLE
In Malawi, the dry season lasts about nine months and mushroom cultivation has a limited growing season in an open air environment.

ORGANIZATION
University of Malawi

INNOVATION
Flask-Wall Mushroom Growing House

ORGANIZATION TYPE
University

COUNTRY
Malawi

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Integrated Aquaculture and Crop Production

SKYFOX LTD.

CHALLENGE

Farmers inhabiting hilly drylands have no access to suitable wetlands and have poor knowledge about efficient water technologies. Farmers interested in aquaculture often lack the capital needed to construct and manage water infrastructure for fish production and the costly and bureaucratic procedures for acquiring permits makes it even more challenging.

SOLUTION

SkyFox Ltd’s innovation involves top-of-the-hill aquaculture ponds capable of producing two tons of catfish twice a year and nutrient-rich water for irrigating 25-acres at the base of the hill. SkyFox leases ponds and irrigation land and provides extension services to resource-poor farmers.

TA FACILITY ACCELERATION SUPPORT

1. Support with business model and strategy development
Internet of Things Platform

MIMOSATEK

CHALLENGE

Excessive usage of water in farming practice affects plant health and depletes limited groundwater availability. Smallholder farmers in the central highland areas of Vietnam are facing severe water shortages. By early April 2016, nearly 170,000 hectares of crops had been affected by the drought, of which 7,100 hectares were left fallow and more than 95,000 hectares were deficient in irrigation.

SOLUTION

MimosaTEK's solution – an Internet of things platform for precision agriculture in Vietnam – monitors and analyzes data on farms by sensors to measure soil moisture, rain, wind, and light. The platform recommends a precise irrigation schedule in real time. The user can further activate their irrigation system or other equipment in their greenhouses automatically via the mobile application anytime and from anywhere. MimosaTEK's innovation enables farmers to improve productivity while minimizing expenses and water use and mitigating risks of plant diseases due to over- or under-irrigation.

TA FACILITY ACCELERATION SUPPORT

1. Support with business development

OBSTACLE

Excessive usage of water in farming practice affects plant health and depletes limited groundwater availability.

ORGANIZATION

MimosaTEK

INNOVATION

Internet of Things Platform

ORGANIZATION TYPE

For-Profit

COUNTRY

Vietnam

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Saline-Tolerant Vegetable Cultivation

LAL TEER SEED

**CHALLENGE**

In the Southern areas of Bangladesh, saline intrusion is reducing agricultural productivity and creates a negative impact on millions of farmers’ livelihoods. Vegetable cultivation, which is important both from a nutritional and income generating perspective, is almost non-existent. Availability of appropriate seeds and farming techniques is poor; Farmers are applying ad hoc solutions that have adverse impact in the long run. Alternatively, they leave their farms in search of employment in urban areas.

**SOLUTION**

Lal Teer Seed combines locally developed, saline-tolerant vegetable seeds with easily adoptable methods for cultivating in high saline areas of Southern Bangladesh, and includes micro-finance linkages, information and communications technology support, and extension advisory services. The key aspects of the model for Bangladeshi smallholder farmers are the saline tolerant seeds which show good germination rates and higher than average yields.

**TA FACILITY ACCELERATION SUPPORT**

1. Support with sales, marketing, communication, and branding
Simplified All-Inclusive Hydroponics Services
HYDROPONICS AFRICA LTD.

CHALLENGE
Agriculture uses 70% of the world’s total water. Water scarcity, which already affects one in three farmers, is set to increase in magnitude as the global population grows.

SOLUTION
Hydroponics Africa leverages the use of local materials to grow healthy plants by helping farmers produce maximum yields on small areas without the use of soil, while using 80% less water. Hydroponics Africa has developed 5 hydroponics methods based on crop type, water availability, user, land size, climate, and culture.

For these simplified hydroponics units to be adapted by the poor, mostly women, Hydroponics Africa has developed a business model where there is no financial investment for unit and installation, and farmers pay a fixed fee per month. High production and high quality is guaranteed with less water, labor, and nutrients.

OBSTACLE
Water scarcity, which already affects one in three farmers, is set to increase in magnitude as the global population grows.

ORGANIZATION
Hydroponics Africa Ltd.

INNOVATION
Simplified All Inclusive Hydroponics Services

ORGANIZATION TYPE
For-Profit

COUNTRY
Kenya

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SPONGE
IVL SWEDISH ENVIRONMENTAL RESEARCH INSTITUTE

CHALLENGE

Issues such as sandy/stony soil with poor water capturing capacity, intermittent/seasonal access to water, and both labor- and cost-intensive processes hamper food production and traditionally excludes women and poor groups from the local economy. The need for mitigation is underlined in the Nepal National Water plan, Bhutan Water Policy and by the West Bengal Government.

SOLUTION

SPONGE is an innovative irrigation technology – a techno-biological system – that greatly improves water utilization and supply. Using water from fog and dew, SPONGE increases reliability in a region with abundant but highly intermittent water availability, improving soil moisture content – while reducing technical maintenance and operation of machinery. It can be applied on existing fields as well as on marginal, rocky or sandy soils unsuited for conventional farming – and even where reliable springs or wells are lacking. Soil moisture content is increased and kept at optimal levels through a cascading system of buried SPONGEs (foam/cotton units), supplied through fog and dew harvested water. Water is applied in gauged volumes and recycled, minimizing water loss.

OBSTACLE
Sandy/stony soil with poor water capturing capacity, intermittent access to water, and both labor- and cost-intensive processes hamper food production.

ORGANIZATION
IVL Swedish Environmental Research Institute

INNOVATION
SPONGE

ORGANIZATION TYPE
Research Organization

COUNTRIES
Bhutan, Bangladesh, Belize, India, Nepal

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AgroSolar Irrigation Technology

**ISLAMIC RELIEF KENYA**

**CHALLENGE**

There are 5.4 million hectares of arable land in Kenya, but 83% of that land is unsuitable for rain-fed agriculture leaving it in need of irrigation and water-pumping technology. Unfortunately, only 4% of the land is currently under irrigation, mainly using diesel, electric or treadle pumps for furrow irrigation. These processes are inefficient, environmentally unfriendly and costly. This trend is not isolated in Kenya, but persists across Africa.

**SOLUTION**

Islamic Relief Kenya, in partnership with SunCulture, is transforming the status quo with their affordable solar-powered drip irrigation technology – AgroSolar Irrigation. This innovation is designed to meet the needs of smallholder farmers and improve productivity and profitability. AgroSolar Irrigation is both low-maintenance and long-lasting, providing farmers with high-quality fruits and vegetables for just a fraction of the cost of traditional irrigation technology.

**HOW DOES IT WORK?**

AgroSolar Irrigation is a solar powered drip irrigation system built to support the cooperatives in Kenya. SunCulture links potential users to training and financial service providers, who in turn offer loans to cooperative members to acquire the technology. The system is ultra-efficient, saving about 80% of the water used in furrow irrigation, and delivering water and fertilizer directly to crop roots. Farmers can expect yield gains of over 300%.

Utilizing clean energy services over current diesel water pumping practices results in a cost and labor savings of almost $14,000 per acre. This unique business model takes a whole value chain approach to improving upon the fragmented value chain currently found in Kenya and ensures that barriers for smallholder farmers are removed.
In Tunisia, 43% of the families are completely dependent on agriculture for their means of survival. Unfortunately, agriculture-based incomes can be unreliable as smallholder farmers are often affected by droughts, especially in disadvantaged rural areas. Drip-irrigation systems, currently the most efficient irrigation system spread on the market, can be costly and energy inefficient for smallholder farmers struggling to survive.

**SOLUTION**

The buried diffuser is a new underground irrigation technique for trees, shrubs, and vegetables in fields and greenhouses. This innovative technology allows for water and energy savings as well as drought mitigation. In south central Tunisia, the buried diffuser can keep trees alive during dry periods and improve olive yields that constitute the main source of income for the farmers in the region—thus contributing to poverty reduction.

The buried diffuser provides underground irrigation that delivers water to plants at the root level, and lessens the likelihood of water loss from evaporation. The system is comprised of diffusing parts, which facilitate water infiltration of the soil. A connection to a water distribution pipe helps regulate water flow to plants.

The buried diffuser works with gravity, as well as conventional water pressure to ensure that crops are efficiently getting the water they need. This innovation performs better than currently widespread irrigation methods, and should allow farmers to decrease production costs up to 30%. Additionally, the buried diffuser uses 30% less water to produce the same weight of crop.
Disseminating Water Management Technologies

PROJECT ALBA

CHALLENGE
There is often not enough water during the dry season for farmers to grow crops, and too much water during the rainy season prevents them from sowing. This leaves farmers with low yields and low funds to invest in drip irrigation. With growing scarcity, the vulnerability of rural households increases rapidly.

SOLUTION
Project Alba’s innovation allows for rapid dissemination of water management technologies. Project Alba offers partnerships to farmers and provides technical support, inputs and tools at no upfront cost; and guarantee to buy 100% of the harvest at pre-agreed prices. In drought-affected Cambodia, farmers thus increase yields and income at reduced risks for them. As Project Alba guarantees they will buy their produce, provide technology at no upfront cost and provide the technical support to use it, farmers can adopt technology, adapt quickly to markets and create significantly more value rapidly.

TA FACILITY ACCELERATION SUPPORT
1. Support building organizational capacity
Freshwater Management System

ARCADIS

CHALLENGE

Water demands in coastal Mexico are on the rise, while freshwater resources are increasingly becoming limited. Economic growth and growth in population exacerbate existing freshwater shortages and increase pressure on shallow fresh groundwater reservoirs. Additionally, saltwater intrusion is making aquifers unsuitable for irrigating agricultural lands.

SOLUTION

Subsurface water technologies provide an innovative and practical approach to freshwater management in coastal areas. ARCADIS’s Freshkeeper product stops and reverses salinization of aquifers and water wells by intercepting intruding brackish groundwater. Fresh and brackish water are pumped simultaneously from different depths to control the fresh-brackish intercept.

MILESTONES AND ACHIEVEMENTS

ARCADIS has completed an analysis for a business case in Mexico that highlights opportunities for their product in the Mexican market. The innovator is exploring a potential customer base of both farmers and municipalities. Their first working visit to Mexico entailed establishing a coordinated effort among local stakeholders and gathering information on the local geohydrology and salinization problems.
Greenhouse

DEUTSCHE WELTHUNGERHILFE E.V.

CHALLENGE
From October to April, irrigation canals are closed for repairs, making water extremely scarce for food production.

SOLUTION
Deutsche Welthungerhilfe e.V. has combined a rainwater harvesting mechanism with greenhouse technology. In their focus country, Tajikistan, greenhouses enable vegetable production from October to April, which will significantly reduce the cost to consumers. Rainwater is captured by roof catchments. Greenhouses are sinotype and use an isolation system to capture heat.

MILESTONES AND ACHIEVEMENTS
Deutsche Welthungerhilfe e.V’s primary goals were to increase the broad knowledge of the technology among the potential customer base, select the initial group of farmers to implement the greenhouse, and construct and put into operation 10 greenhouses.

Deutsche Welthungerhilfe e.V held 14 information sessions to build knowledge and conducted individual meetings with 45 farmers. 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 running costs. To date, five greenhouses have been completed with two additional under construction.

OBSTACLE
Long winters reduce the amount of time for growing crops in Tajikistan.

INNOVATION
Greenhouses

ORGANIZATION TYPE
Non-Profit

COUNTRY
Tajikistan

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Groasis Waterboxx
INSTITUTE FOR UNIVERSITY COOPERATION

CHALLENGE
In MENA countries, a rising demand for agricultural products combined with a fragile natural environment is rapidly adding pressure on scarce land and water resources. This unsustainable balance between production limitations and demand calls for a meaningful change in water efficiency in the region.

SOLUTION
The Groasis Waterboxx (GW) is an integrated planting technology that allows fruits, trees and shrubs to grow in degraded farm and rangelands. The GW surrounds the bases of a plant to collect water necessary for crop survival. This innovative and inexpensive technology revitalizes degraded ecosystems, while simultaneously providing valuable nutrient sources of fruits and feed to both humans and animals.

HOW DOES IT WORK?
The GW is a 20-liter box that is placed around a young seedling at transplanting. The box builds up a water column under the plant by collecting dew and rainwater, and distributes it over a long period of time to avoid evaporation.

In practice, the transplanted seedling will receive just enough water from the GW to survive while it searches for water deep in the soil to develop a strong taproot. The taproot developed in this way will make the whole plant resilient to prolonged drought periods. The GW requires less inputs and management when compared to other water-saving technologies such as drip irrigation—and farmers may see a 95% money savings per hectare over a period of ten years.
Lilypad
PURALYTICS

CHALLENGE
Man-made ponds and large diameter open tanks have chemicals and micro-organisms.

SOLUTION
Puralytics has pioneered a photochemical technology for water purification. The Lilypad provides both an environmentally safe and effective water treatment solution for cleaning ponds and managing catchment areas. This reusable, floating purifier continuously destroys chemicals and micro-organisms and works in man-made ponds and large diameter open tanks.

MILESTONES AND ACHIEVEMENTS
Puralytics has developed a strong relationship with Driscoll’s, a berry producer in Mexico. Driscoll’s has agreed to serve as a demonstration partner to prove out the Lilypad product. Puralytics is negotiating with Hidro Industrial to be a distribution and installation partner.

During the company’s first year in Securing Water for Food, its 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.
M-Fodder
CENTER FOR SUSTAINABLE DRYLAND ECOSYSTEM AND SOCIETIES (CSDES) – UNIVERSITY OF NAIROBI

CHALLENGE
There is an urgent need for change in the agricultural and livestock systems of Africa. Livestock feed prices are escalating due to water scarcity caused by lack of space and remain unaffordable to poor smallholder farmers. These farmers comprise 80% of the agricultural workforce in East Africa. With high feed prices, large-scale livestock and crop production are stunted.

SOLUTION
M-Fodder, a mobile phone application, connects smallholder livestock farmers to high-quality fodder through SMS messages. This technology is game changing in two ways: first, it promotes production of high quality affordable hydroponic fodder, which utilizes about 10% less water than traditional fodder. Second, the production, technology dissemination, and marketing of the fodder utilizes the fastest and most affordable means of communication—mobile phone technology.

MILESTONES AND ACHIEVEMENTS
M-Fodder’s SMS system enables farmers to access a reliable source of low-cost, sustainable hydroponic fodder right through their phones. Livestock farmers send the distributor an SMS with the fodder quantity required and their location. The farmer will receive a call from the fodder producer within minutes and receive a delivery of hydroponic fodder within seven days.

M-Fodder is capitalizing on the rapid uptake of mobile technology by farmers and creates a gateway for communication between growers and fodder producers. Hydroponic fodder is water efficient and sustainable and may help decrease the number of farmers out of work due to drought and feed price.
Salt-Tolerant Quinoa
WAGENINGEN UR

CHALLENGE
In agricultural lands impacted by high salinity, smallholder farmers experience lower than average yields and reduced incomes. In these regions, improving food production and creating new opportunities for earning a livelihood are desperately needed.

SOLUTION
Researchers at Wageningen UR have come up with a non-genetically modified salt-tolerant quinoa that not only grows, but also thrives in saline soils. By making this high-value super grain available to farmers in areas impacted by high salinity, there is a potential to reduce fresh water consumption, reduce food scarcity, reclaim unused or underused agricultural lands, and create new livelihood opportunities for smallholder farmers.

MILESTONES AND ACHIEVEMENTS
Wageningen has sown field trials of the salt-tolerant quinoa in China and Vietnam, as well as set up tests to determine maximum salt level tolerance. In Chile, they have harvested 60 hectares and, through their partner AbbottAgra, signed an agreement with SPS Chile, a production chain managing company that licenses them to use the non-bitter varietals in country. Wageningen has submitted an EU-H2020 project proposal aimed at improving productivity of quinoa under abiotic stress conditions and improving agronomy by extensively testing genotype, environment, and management interactions.

TA FACILITY ACCELERATION SUPPORT
1. Improve farmer adoption of salt-tolerant quinoa crops
2. Enhance volume of seed sold
3. Build networks in China and Vietnam

OBSTACLE
In agricultural lands impacted by high salinity, smallholder farmers realized lower than average yields and reduced incomes.

INNOVATION
Salt-tolerant quinoa

ORGANIZATION TYPE
University

COUNTRIES
Chile, China, Vietnam

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OBSTACLE
Half of the arable land in India is subject to low rainfall and prone to frequent drought.

INNOVATION
SWAR

ORGANIZATION TYPE
Non-Profit

COUNTRY
India

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CHALLENGE
Half of the arable land in India is subject to low rainfall and prone to frequent drought. Risk derived from unfavorable weather patterns drives debts and leaves farmers vulnerable to financial and mental disrepair—farmer suicides are not uncommon. Irrigation sourced from canal and groundwater has a limited scope and current pressure on natural resources leaves irrigation practices in India in need of improvement.

SOLUTION
The Centre for Environment Concerns introduces SWAR: the world’s first sub-surface drip irrigation system that releases moisture when ‘asked’ for by the crop. This underground, gravity-based irrigation system provides moisture to plants at the root level. SWAR enhances soil nutrients, uses harvested or stored water, provides irrigation to low rainfall areas, and in turn, transforms the livelihoods of poor farmers to help them grow more food.

HOW DOES IT WORK?
SWAR technology consists of low-pressure drip irrigation components like overhead tanks and drip lines, but is extended with adapted and permeable clay pots. Pots are placed at the root zone and connected to drip lines. Water oozes out of the pots and wets the soil and then ‘sweats’ to maintain a favorable soil moisture condition. This method assures moisture is spread at the plant’s root zone to cultivate vegetables, flowers, fruit and forestry trees using only one fifth of other drip irrigation systems in India. SWAR is automated but doesn’t require electricity and results in huge water savings.
Obstacle
Large inequity in water and food accessibility exists in Turkey.

Innovation
Waterpads®

Organization Type
Non-Profit

Countries
Ethiopia, Turkey

Contact
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Challenge
Large inequities in water and food accessibility exist in Turkey. Farmers and refugees living in the arid regions of the southeast struggle to gain access to land and precious resources like freshwater. Currently, the region is home to two million Syrian refugees. With this demand for water and space, the pressure on groundwater resources during the six-month dry period is enormous.

Solution
Waterpads, through the organization MetaMeta Research B.V., increases water efficiency in the international vegetable and fruit tree sector through their low-cost water buffering technology. This innovation is essential for water-deprived farmers who need to reach higher yield in crops with a limited supply of water. The low weight polymer pads are placed close to the roots of plants, helping avoid evaporation and the loss of useful runoff water.

Waterpads are a sandwich of paper and jute with an inner layer of granular polymers in dry form. The polymer absorbs 100 times its own weight of water, retaining water at binding tension. Placed at root level, the pads increase farmers’ irrigation efficiency by 40%, while increasing yields between 10% and 25%. With this technology, young plants and trees are significantly more likely to survive the dry times. Waterpads are low-cost, easy to produce and reliable for farmers in arid regions.

TA Facility Acceleration Support
1. Increase the likelihood of young plants and trees to survive the dry times
2. Provide low-cost Waterpads for farmers in arid regions
Weather System
TRANS AFRICAN HYDRO-METEOROLOGICAL OBSERVATORY (TAHMO)

CHALLENGE
Without climate information, you cannot optimize crop selection or ensure it without knowing the risks.

SOLUTION
The TAHMO weather system is the first continent-wide weather network that allows free data to non-commercial users including researchers. The innovative, solar-powered sensor system delivers accurate, localized, and timely meteorological and water resource information to farmers multiple times per day via a mobile device. The network helps enhance food security and reduce the risk to smallholder farmers that rely on rain-fed agriculture to cultivate crops.

MILESTONES AND ACHIEVEMENTS
In addition to reducing agricultural water consumption in targeted areas, TAHMO tested alternative business modalities and is having some success with a direct-marketing approach to schools. The system was presented at the Addis GEF meeting, where weather observation was the focus of the meeting for East Africa. Ministers saw the stations and invited TAHMO to pilot in 5 countries.
Zero Discharge Desalination

UNIVERSITY OF TEXAS – EL PASO

CHALLENGE

By 2050, water demand is projected to increase by 55% globally, meaning that the number of people impacted by water scarcity and stress will continue to rise. Importantly, more than 70% of global water use occurs in the food value chain. By 2025, two-thirds of the world’s population could be living in severe water stress conditions and developing countries will see the impact on human health and food production. To satisfy future water demand, we must augment traditional water supplies with brackish groundwater.

SOLUTION

The University of Texas at El Paso (UTEP) Center for Inland Desalination Systems (CIDS) designed a zero discharge desalination (ZDD) technology that reduces water waste in the desalination process.

HOW DOES IT WORK?

Zero discharge desalination (ZDD) technology provides an order-of-magnitude reduction in the amount of water wasted in the desalination of groundwater by conventional processes. Electrodialysis metathesis uses a DC voltage to remove undesirable ions from water and strategically pairs them with other ions to produce a precipitate that can then be used by farmers for soil augmentation. UTEP plans to optimize their technology primarily by simplifying their operational process to include controlled set points.

The team plans to go to a single electrodialysis stack and to feed sodium chloride precipitated from their system back into the process, forming a closed loop. The team plans to work with local agriculture extension agents affiliated with the university to provide farmer outreach and to coordinate farmer training at the pilot test location in Honduras.
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 30 low-resource countries with tools they need to produce more food with less water.

To learn more about Securing Water for Food, visit www.securingwaterforfood.org and follow @SecuringWater on Twitter.