

2021 Food Solutions Challenge Brief

Made possible by Bayer, the World Business Council for Sustainable Development, and the Coca-Cola Company

What's inside:

2021 Food Solutions Challenge Overview

- [Introduction](#) 2
- [Challenge Question](#) 2
- [Timeline](#) 2
- [Prizes](#) 3
- [Submission details and eligibility](#) 3
- [Selection criteria](#) 4

The Case

- [Introduction](#) 5
- [Examples of challenges facing smallholder farmers](#) 6
 - [Supply chain disruptions and access to markets](#) 6
 - [Financial services](#) 6
 - [Local support networks](#) 7
- [Farmers stories from the field](#) 7
 - [Umakant, a vegetable farmer in the north Indian state of Uttar Pradesh](#) 8
 - [San, a rice farmer in the Tra Vinh province, Mekong Delta, Vietnam](#) 9

Crafting a solution

- [Forming a team](#) 10
- [Ideating a solution](#) 10
- [Refining your solution](#) 11
- [Sample solutions](#) 13

Citations

15



2021 Food Solutions Challenge Overview

Introduction

The Food Solutions Challenge is an accelerator and pitch competition that challenges today's brightest minds to find solutions to the most pressing issues in food and agriculture. This year, we are focusing on strengthening smallholder farming resilience.

Up to five semi-finalist teams will be selected to participate in an eight-week accelerator program run in partnership with Eidos Global's Social Innovation Warehouse. **During this accelerator, teams will receive mentorship from industry experts** to develop a proof of concept for their solution that will transform it into an economically sustainable enterprise. Semi-finalist teams will leave the accelerator with a clear plan on next steps, including knowing where to go to for start-up funding and business incorporation. Semi-finalist teams will present at a pitch session and **compete to win \$5,000** in funding to help bring their solution to life.

Read through this entire brief to learn more about the challenge question and topic, timeline, judging criteria, and most importantly, how to submit your solution to go for the big prizes. This brief also includes last year's winning solution as well as personas, or examples of real life smallholder farmers and the challenges they face, to get your creative juices flowing.

The Challenge Question

In the Food Solutions Challenge, we ask you – the next generation of thinkers, inventors, and entrepreneurs – to design collaborative, innovative solutions that address the challenge question:

Climate change is already negatively affecting smallholder farmers, whether it is through droughts, floods, pests, less predictable weather patterns, or other impacts. The COVID-19 pandemic has only added to farmers' challenges. Despite this, smallholder farmers are an integral part of the food production ecosystem, providing up to 80% of the food needed in developing countries. Strengthening smallholder resilience to crises like these is critical to building a more sustainable and secure food production system. **How might we strengthen the resilience of smallholder farming through market-based solutions?**

Timeline

Phase 1

February 15, 2021: Challenge launches, submission form opens.

March 15, 2021: Early bird deadline #1. Teams who submit by either one of the two early bird deadlines will get personalized feedback from Net Impact. Teams will have the option to revise and resubmit before the final submission deadline.

April 15, 2021: Early bird deadline #2.

May 15, 2021: Final submission deadline.

June 1, 2021: Semi-finalist teams selected and notified.

Phase 2

Approx. June 7 – July 30, 2021 (8 weeks): Accelerator with Eidos Global's Social Innovation Warehouse

Approx. July 26 – 30, 2021: Final pitch presentation to a panel of expert judges. The winning team will be selected.



Prizes

Semi-finalists: Up to five semi-finalist teams will be chosen to participate in an eight-week virtual accelerator run in partnership with Eidos Global through their Social Innovation Warehouse. The virtual accelerator experience will support teams by:

- Facilitating access to an established network of peers, business mentors, and industry experts from food and agriculture;
- Providing customized coaching to refine execution and commercialization plans;
- Supporting the development of a proof of concept, including creating an impact assessment and identifying the concept's theory of change;
- Providing business pitch coaching in order to make successful funding pitches in the future.

Semi-finalist teams chosen for the accelerator will form a cohort of food and agriculture-focused social entrepreneurs. **Semi-finalists teams are expected to commit to a period of concentrated participation, dedicating approximately six hours each week during the two month accelerator**, refining their solutions via virtual group training and coaching calls with mentors and experts. Participants can expect to receive support to build elements of their solution (e.g. support with business development, landscape analysis). At the culmination of the accelerator, teams will pitch their refined solution to a panel of judges that represent expertise in food and agriculture.

Eidos Global is an international organization that designs meaningful learning experiences. Their goal? That 7 billion people around the world are ready to face the challenges of the Future of Work. Their Social Innovation Warehouse was created to bridge the gap between youth innovative solutions and stakeholders (e.g. governments, NGOs, and other individuals) that can replicate these solutions in other parts of the world, while providing resources for young social innovators to increase their impact and boost their capacity as changemakers.

Finalists: Three finalist teams will win a cash prize. The first place team will win \$5,000 in funding to support the development of their business. The second and third place teams will win \$1,000 and \$500, respectively.

Submission details and eligibility

Each team is required to submit their proposal using [2021 Food Solutions Challenge Submission Form](#).

Submissions must be received prior to 11:59pm Pacific Time on May 15, 2021. **Submissions should be 500-words and focus on a market-based solution that addresses the challenge question.**

- Undergraduate students, graduate students, and professionals are welcome to apply.
- Submissions must come from teams of 2 to 4 members, ideally with a variety of academic backgrounds or perspectives. If your team has more than 4 people, up to 4 can be chosen to participate in the final pitch competition. Please reach out for special circumstances.
- If selected, semi-finalist teams will be expected to commit to participating in the Accelerator – a six hour per week commitment for eight weeks – from early June through late July 2021. The six hour commitment is per team and can be spread out among team members.

Early Bird Deadlines: Teams who submit by either one of the two early bird deadlines (March 15, April 15) will receive personalized feedback from Net Impact. Teams will then have the option to revise and resubmit before the final submission deadline.



Selection Criteria

Submissions will be reviewed according to the following criteria:

- **Clarity of goals and objectives (10 points):** The proposal should clearly identify which part of the challenge (which players, part of the value chain, etc.) it's addressing. The solution should focus on strengthening smallholder farming resiliency.
- **Innovation (15 points):** The proposal should be fundamentally innovative and generate value by applying a unique solution or an existing solution in a new way. The proposal should focus on systemic thought and strategy rather than single-solution gadgets, apps, or products.
- **Feasibility (25 points):** The proposal should be able to be reasonably implemented in the next 3-5 years and have a growth trajectory for the next 5-15 years.
- **Impact – UN SDG Goal 2 – Zero Hunger (25 points):** The proposal should meaningfully increase the amount of food available (e.g. increased farming yield, diverting crops from waste).
- **Impact – UN SDG Goal 13– Climate Action (25 points):** The proposal should meaningfully reduce the impact on the environment. This reduced impact can be shown through multiple angles including reducing greenhouse gas emissions, fewer farming inputs needed (e.g. fertilizer), less water usage, better soil management for carbon capture, etc.



Introduction

The Food Solutions Challenge is informed by the United Nations Sustainable Development Goals, which tackle 17 key areas for development. They are a shared vision of the world we want and a blueprint for how to get there. One exciting aspect of these goals is that they are interrelated. When action is taken on one, it can have an impact on another. For example, by reducing poverty you will almost certainly reduce hunger – helping achieve both goals 1 and 2. **Smallholder farmer resiliency has the ability to make an impact on all of the goals that you see here.** Smallholder farmers are so important that the UN SDGs have pinpointed their impact as a key way to achieve progress on these goals.



In particular, we are informed by UN SDG Goal 2, Target 3, which states:

By 2030, we aim to double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment.

Nearly two-thirds of the developing world’s 3 billion rural people live in smallholder farmer households, working on land plots less than 2 hectares (~5 acres).ⁱ **These farmers produce more than 80% of the food required by developing countries.**ⁱⁱ However, many face poverty and food insecurity. These challenges are only getting worse for smallholders due to crises such as climate change and the COVID-19 pandemic. In order to have a secure food future, we must increase smallholder farmer resilience to these challenges.

Climate change is expected to increase food prices and reduce food availability, incomes, and food production of smallholder farmers. It’s estimated that climate change will decrease crop yields up to 25% by 2050. At the same time, the global demand for food will increase by 60% as the population reaches 10 billion.ⁱⁱⁱ The impacts of climate change are not just a future concern; they are already being felt. Smallholder farmers are already experiencing 20% more extreme heat than in the 1990s^{iv}. Higher temperatures have adverse effects on crops, including drying out air and soils, increased pests and diseases for both livestock and crops.^v Climate change also leads to more extreme weather patterns, including extreme drought and flooding. As climate change worsens, so will these conditions and the impacts on smallholder farmers.

Remember: Review the selection criteria included in this brief! You want to make sure that your solution responds to each criteria so that you get full points!

In addition to climate change, the COVID-19 pandemic presents another challenge for smallholder farmers. COVID-19 sent shockwaves through agriculture, disrupting regular supply chains, movements, and markets. This has had a hugely disruptive effect on smallholder farmers’ lives as their margin for error is very small.^{vi} Most smallholder farmers rely on the productivity of their farm to not only produce the food they need to eat but also enough to sell and make a small profit to live off of. But with major disruptions to supply chains and markets, smallholders are experiencing decreased profits. At the same time, the cost of operation (seeds, fertilizer, and basic nourishment for farmworkers) has increased.^{vii} As such, smallholder farmers are facing a double crisis of decreased profit for outputs and increased cost for inputs – leaving more smallholder farmers in poverty. By



Increasing resiliency to these and future crises, smallholder farmers will be able to better withstand the impacts of climate change and other unexpected world events, like the COVID-19 pandemic. Keep reading to learn more about some of the specific challenges that smallholder farmers are facing to help you start ideating ways to help strengthen smallholder resiliency.

Examples of challenges facing smallholder farmers

There are many challenges smallholder farmers face; these are only a few of the major ones. Your solution can address one or more of these challenges presented here or you can address a different challenge that impacts smallholder farmers in your solution **as long as your solution answers the challenge question**. Also, we don't expect any single solution to solve every single challenge.

1. **Supply Chain Disruptions and Access to Markets:**

Disruptions in the supply chain can be devastating for smallholder farmers. These farmers rely on accessing markets in order to sell their products. Currently, many countries have mandated lockdowns and/or shut down public transportation systems due to the COVID-19 pandemic, restricting farmers' physical access to markets. However, even if farmers are able to physically make it to the market, their ability to sell their products has likely been reduced. As one farmer in southern Uganda said, "I used to sell two sacks of passion fruit each week at 300,000 shillings [approximately \$82USD] a bag. Now, due to the suspension of transport systems, closure of markets, and closing of borders, I can only get 50,000 shillings [approximately \$14USD] a bag. Sometimes, I fail to find a buyer, and they spoil in the garden."^{viii}



TIP! The best teams are teams with diverse backgrounds and skills. Check out the "Key features of a successful team" section to learn more about how to put together a strong team!

The disruption to supply chains can be catastrophic for smallholder farmers as their margin for error is small, and if they don't get the price they were expecting, they have the potential to become food insecure. TechnoServe, a nonprofit working with entrepreneurs in developing countries, surveyed the 800 smallholder farmers they work with to better understand the impact of supply chain disruptions and market access. Their survey found that 69% of smallholder farmers have experienced income loss due to supply chain disruptions and market access issues, which has impacted their ability to feed their families.^{ix} One northern Nigerian farmer wrote, "I am facing a serious problem in terms of food. As I am speaking now, I don't have anything to feed my family today."^x Supply chain disruptions are not only caused by COVID-19; climate change also impacts farmers' supply chains. Increased extreme weather events such as floods or droughts and pest outbreaks like the 2019-2020 desert locust infestation in eastern Africa, the Arabian Peninsula, and the Indian subcontinent all disrupt the supply chain and negatively impact smallholder farmers.

What kind of intervention could help farmers better withstand market depressions so that they are less destabilizing? How might we improve smallholder farmers' access to markets overall?

- ### 2. **Financial Services:** Access to credit markets and financial services are critically important pathways for farmers looking to improve their farming outcomes. That is because smallholder farmers use that credit to invest in their farms. Access to credit allows smallholder farmers to invest in new technology such as machines and tools that can improve yield, new water-smart irrigation equipment, improved plant varieties and animal breeds, fertilizers, and improved pest control measures and management,

REMEMBER! Your idea isn't expected to fix every challenge facing smallholder farmers. Choose a specific challenge you are trying to solve for and ideate around that.



etc. These and similar types of investments all improve the efficiency of a farm. These investments can often increase a smallholder farmers' capacity to weather difficult events such as a drought or pest infestation. However, it is often very difficult for smallholder farmers to access credit. To do so, one typically needs capital – meaning an asset that will guarantee the loan should the credit seeker default. In agriculture, most banks or financial services require the person looking for a loan or insurance to own their land. However, many smallholder farmers do not own their land. Moreover, female smallholder farmers, who represent nearly 50% of all smallholder farmers, experience even more difficulties accessing financial services. In some regions there are cultural biases against loaning money or establishing lines of credit for women. Some financial services will simply not lend to a woman or will not do so unless she has a male to co-sign with her.

How might we increase access to credit markets for smallholder farmers, and in particular, female smallholder farmers? What types of interventions would be needed? How might financial services be incentivized to offer loans to smallholder farmers who might not otherwise qualify?

- 3. Local Support Networks:** Local support networks are essential to smallholder farmer success. In particular, extension services serve a critical role. Extension services encompass the wide range of services provided by local experts in the areas of agriculture, agribusiness, health, etc., and are designed to improve productivity and the overall wellbeing of rural populations. Agricultural extension services cover a broad area including access to improved crop varieties, better livestock control, improved water management, and the control of weeds, pests, or plant diseases. For example, when a new method of pest control is released, extension services are the agents for sharing this information with rural farmers. Extension services are often operated by national or regional governments and/or non-governmental organizations. However, access to these services is fragile and unreliable. Restrictions to reduce the spread of COVID-19 have impeded access in many locations, and most smallholder farmers live in rural areas with limited access to the internet or cellular data. When in-person gathering isn't possible, farmers have few other ways of connecting. Moreover, traditional extension service methods often have limited success in providing climate change responsive agricultural methods to farmers.^{xi} Climate change responses require innovative practices and methods. Many extension services “do not consider fundamental changes to their conventional strategies and initiatives... as a consequence, a call has emerged to re-think and revise the current [extension services sectors] agendas and strategies.”^{xii}

Extension services provide critical education and support to smallholder farmers. However, the COVID-19 pandemic has interrupted many regular services. How might local support networks, like extension services, continue to provide support and assistance during crises like the COVID-19 pandemic? How might extension services be modernized to provide educational support that tackles climate change in a meaningful way?

Farmers' Stories from the Field

Reading through that list of challenges might seem overwhelming. You might be asking yourself: how do I start to tackle this problem? Who am I solving for? Where do I begin?

Here, we provide two personas to help answer those questions and point you to an area to start ideating around. The following two personas are examples of situations facing smallholder farmers. They are inspired by real stories from real farmers but are fictional accounts. You are welcome to consider these personas as starting points for your ideation session. They provide a great way to start thinking about *who* you are solving for and *how* you are going to solve for them. Your solution is not required to respond to one of the personas. But if you are having trouble finding a place to start, the personas are the best way to begin.



Umakant, a vegetable farmer in the north Indian state of Uttar Pradesh*

Umakant, 50, is a vegetable farmer in the northern Indian state of Uttar Pradesh. He, his wife, and three children work on their farm, which is 2 hectares (~5 acres). His children are in school but help out at the farm when they are able to. He grows a variety of crops including peas, tomatoes, chilies, beans, potatoes, garlic, and wheat.

The COVID-19 pandemic has had an immediate and negative affect on Umakant's livelihood. He traditionally sold his crops to traders in bulk at local marketplaces known as mandis. Due to the pandemic, mandis are closed, and Umakant can no longer sell his crop that way. As such, he is only able to sell in his local village, which is usually not in bulk.

Umakant loses a huge profit margin when he is only able to sell in his local area. For example, before COVID-19 when markets were open, Umakant sold his chilies at 25-30 Indian rupees per kilogram. In his village, Umakant earns 5-6 Indian rupees per kilogram. He has experimented with using digital communication services like WhatsApp to connect with bulk buyers, but the demand is no longer there due to the closure of hotels and restaurants. With demand being so low, prices for crops have plummeted. Umakant finds that it is often not worth the cost of transporting his crop to a bulk buyer now, even if he connects with one over WhatsApp, because the price he will get for it will be less than his inputs. As such, he has left thousands of kilos of fresh food to rot on his farm.

Umakant has limited savings. Not being able to sell his crops for a fair price has put his family into a precarious financial situation that will likely take years to get out of.

Questions to consider:

- What challenges does Umakant face? How are his challenges impacted by the COVID-19 pandemic?
- How might smallholder farmers like Umakant sell their crops for a fair price during the closure of mandis or during other periods when prices are depressed? What ideas from other settings or industries could enable Umakant to help solve this problem?
- How might we reduce the amount of food going to waste (and the carbon impact) due to lack of buyers? Are there business methods for incentivizing farmers like Umakant to not let their crops rot?

*This persona is inspired by [Farming through the Covid-19 pandemic: Meet Umakant Singh](#)



San, a rice farmer in the Tra Vinh province, Mekong Delta, Vietnam

San, 45, is a smallholder farmer in the Tra Vinh province in the Mekong Delta, the heart of the rice producing region in Vietnam. She is married with four adult children, three of whom no longer work on the farm. She and her husband do not own their land. San and her husband split their duties on the farm fairly evenly. San is involved in all aspects of crop planting and farm management. Additionally, she is in charge of the family's vegetable garden as well as all household chores.

San and her husband's primary crop is rice. However, they also cultivate crops such as peanuts and sweet potatoes to make an additional profit at the local market. San wants to increase their income so that they can prepare for retirement, but she is not sure how to do this. The main way to increase their income is to increase the yield of their rice crop, but climate change is making this incredibly difficult to do. Rising sea levels mean that sea water is infiltrating their rice fields, and rice cannot grow in salt water. As a result, San has seen their rice production decrease by 50% over the last five years. Often, San doesn't know if the water she is using to irrigate her rice fields is salt water or not. She tastes the water for salinity before using it, but this is not a very precise or effective method. Often, the water is more saline than she can taste and the salt water ruins her rice crop. She has seen some of her neighbors invest in new technology to better understand water salinity as well as keep salt water from seeping into the fields in the first place. But San is worried about being able to secure a loan from a traditional bank or lending service to invest in these new technologies because she and her husband do not have enough credit to qualify.

Furthermore, even if she was able to secure a loan, San knows that to use any new technology or techniques, she or her husband will require additional training. With all their time already consumed with tending to their farm, San isn't sure how or when they would be able to get the education they need to implement any changes. She is worried that instead of being able to plan for retirement, that she and her husband will end up in poverty due to decreasing crop yields.

Questions to consider:

- What challenges does San face? How are San's challenges impacted by climate change?
- How might smallholder farmers like San secure a loan when they have little to no capital? What kind of interventions could San implement to lessen the impact of climate change? What ideas from other settings or industries could enable San to help solve this problem?
- How could others, including local extension services, financial services, banks, or NGOs, enable San to gain access to the needed financial services and education?

Crafting a solution

Forming a team

The first step to create an innovative and strong submission to the Challenge is to form a strong, diverse team. As you are putting together your team for this year's challenge, consider the following:

Does your team have clear roles and responsibilities? Assigning roles to each team member is a smart way to divide up the work, play to each team member's strengths, and provide structure for the team. Consider the following team roles:

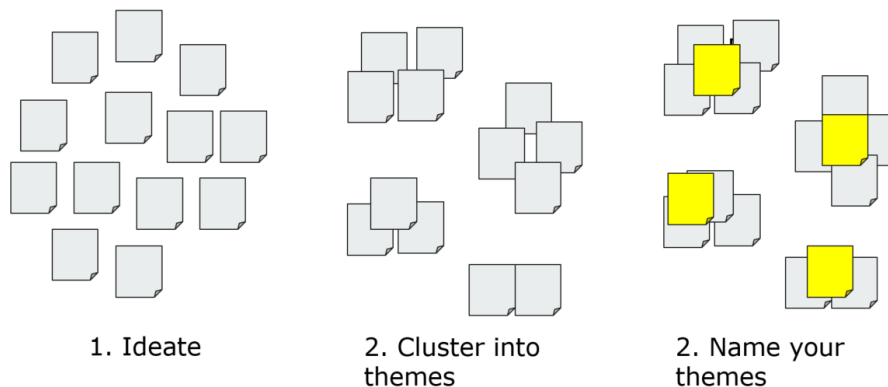
- **Team leader:** Ensures engagement of all team members throughout the entire process and leads solution submission.
- **Researcher/Connector:** Actively conducts deeper research on the topic (if needed) and finds and connects team members with experts to learn from and further iterates the submission idea.
- **Documenter:** Documents and shares all team meetings through written notes, photographs, etc.

Does your team have people who wouldn't usually collaborate? Diverse backgrounds, interests, and skills can help to spark innovative ideas, especially when using a design thinking process. If you are having trouble finding team members, reach out to other departments on your campus (if you're a student) or professionals in your network to ask for introductions to people who would be interested in collaborating.

Does your team have people with varying strengths and weaknesses? Depending on your solution, your team will need different strengths. For example, if your solution involves creating an app, it would be a good idea to have someone on your team with that strength. Other key strengths to consider for this project: ideation facilitation, team leadership, research and development, knowledge of this issue, connection to people working on this issue, and business marketing.

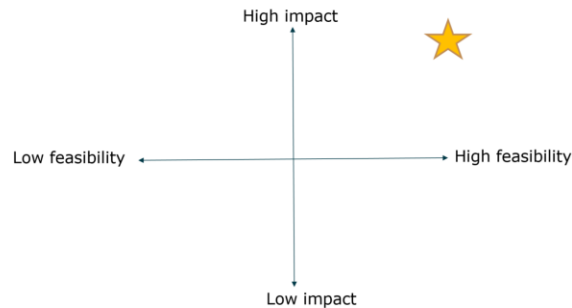
Ideating a solution

Once you've formed your team, we recommend you meet for an ideation session to help narrow down your solution. If you aren't sure where to start, ideation and clustering is one creative problem-solving method you can use. In this method, your team writes down every idea you have that could possibly solve the challenge question. And I mean every idea – both the feasible and the wild. Then after 5 minutes, you come back together and go over all the ideas you came up with and start grouping them into themes. This can help your team see where you have similar ideas and where your out-of-the-box ideas are.





Then, take the top ideas/themes that your team comes up with and map them on the 2X2 matrix by feasibility and impact. As you can tell from the [selection criteria](#), these are the two categories that have the most points. So you want to make sure your idea is somewhere by the gold star to ensure that you are hitting both high feasibility and high impact. This is a great tool to remove ideas that are interesting but won't get your team to the finals because they are too infeasible and/or lack a real-world impact.



If design thinking is new to you and you're curious to learn more and also be guided through the step-by-step process, check out this short video [introduction to the design thinking process](#).

If you are interested in learning more about design thinking and want to try different methods, check out the following resources:

- [Brainstorming](#) (IdeoU)
- [Creative workshop module](#) (DIY)
- [Fast idea generator](#) (DIY)
- [Thinking hats](#) (DIY)
- [How to Prototype a New Business](#) (IdeoU)

Refining your solution

Once you have decided on your solution, it's important that your team continue to develop and refine it. As your team begins writing out your submission, consider the following questions. Strong submissions will be able to answer all of these questions:

1. What specific challenge is your solution trying to solve for? Why is this challenge important to solve?
2. Who does this challenge impact? How does it impact them?
3. How is this challenge related to crises such as climate change or the COVID-19 pandemic?
4. How does your solution strengthen smallholder resiliency? For example, does it help smallholder farmers overcome challenges with market access or help them improve their yield, and how so?
5. How is your solution innovative? Is there a market for your solution? If so, why is there not a solution already?
6. Where will your solution be implemented (i.e. what geographical location)? How will it be implemented? What are some of the challenges to implementation?

REMINDER! There are two early bird deadlines (Mar 15 & Apr 15) – meaning a chance to get feedback from Net Impact experts that you can use to refine and re-submit your solution! Be sure to submit your solution prior to one of these deadlines.

A business canvas is another tool that can help your team refine your solution and ensure that it is responding to the [selection criteria](#).

Business Canvas

CHALLENGE QUESTION: Climate change is already negatively affecting smallholder farmers, whether it is through droughts, floods, pests, less predictable weather patterns, or other impacts. The COVID-19 pandemic has only added to farmers' challenges. Despite this, smallholder farmers are an integral part of the food production ecosystem, providing up to 80% of the food needed in developing countries. Strengthening smallholder resilience to crises like these is critical to building a more sustainable and secure food production system. **How might we strengthen the resilience of smallholder farming through market-based solutions?**

EXECUTIVE SUMMARY: Briefly describe your solution. What specific challenge of smallholder farming are you addressing and how will addressing it strengthen resiliency? What is the value it provides? How does your solution reduce climate impacts while increasing the amount of available food? How feasible is the solution? Will it be able to come to market in the next 3 to 5 years? What are the barriers to implementation?

ANTICIPATED OUTCOMES

- In what ways is your solution a game-changer? Is your idea brand new or an existing solution presented in a brand new way?
- Where do you anticipate your solution being implemented? Why did you chose this location?
- Describe the market for your solution. Who are the end users?

SHORT TERM & MEDIUM TERM GOALS

- What are the first steps toward implementation?
- What will your solution accomplish within the first 5 years after launching?
- What might your solution accomplish in the 5 to 15 years after launching?

IMPACT

- How does your solution reduce the impact of climate change? (e.g. GHG emission reductions, less water usage, etc.) Describe in detail the impact of said reductions.
- How does your solution make more food available? (e.g. increased crop yield, diverting crops from waste) Is this method of increasing food availability sustainable over the next 5 to 15 years?



Sample Solutions

Lastly, the following are sample solutions. These submissions came from previous year's semi-finalists and are examples of the types of submission that make it to the semi-finals. We encourage you to read these submissions to gain inspiration for how your team can structure your solution and what of information to include.

In particular, these submissions' strength comes from clearly indicating *what* problem they are trying to solve; *why* it is important, feasible, and innovative; *where* they want their solution to be implemented; and *how* their solution will be implemented.

SOLUTION 1

Introduction

In Ghana, it's estimated that female farmers account for over 70% of total food production, yet they receive only a fraction of the inputs and support that their male counterparts receive (World Bank, 2008: 7). One of these inputs is extension services and the public sector remains the primary provider of extension services which is underfunded and lacks coordination, resulting in underserved farming populations. The current ratio of farmers to public sector extension agents is 1:2,500 (Duncan, 2004: 79). With 10% of agricultural extension agents being women (Duncan, 2004: 81), only 4.5% of female farmers have access to extension services (Duncan, 2004: 80), which is inadequate for providing high-quality extension services to all farmers. One challenge behind this imbalance is that socio-cultural gender norms may make it difficult for male agricultural extension agents (AEAs) to interact with female farmers (FAO, 1996).

To help reduce these challenges, a portable audio recording device (talking book) used by the Ministry of Food and Agriculture staff members' record quarterly technical messages for farmers. However, the cost of replacing batteries has been a challenge (Hird-Younger and Simpson, 2013). We proposed a two-face project. Face 1: Improving productivity of female farmers through accessing quality information for better farm practices and techniques by employing solar-powered technology tablets with translated video recordings demos in their languages. Face 2: Partnering with Ghana Bamboo Bikes Initiatives to build cart and bikes for female farmers traveling long distances to their farms to save some time and energy.

Project and Country

VisForFarmer (stands for demonstrating farm practices/techniques or sharing information to female farmers by employing the ear-audio and eye- video where the farmer can understand the information in her language without intervention) would start in Accra where we would build partnerships with the Ministry of Food and Agriculture, experts and NGOs to explore resources and information for recordings and launching of the project. Accra serves as the best site for launching because of its resources, potential partners and easy accessibility of information for VisForFarmer database development.

Model of Solution

VisForFarmer demos would be recorded by experts in the field of agriculture, extension, and knowledge for female farmers. These demos show the processes/procedures, important practices and techniques in 15-20 minutes video format (On-farm) by experts. At each Region, we launch stations to disseminate pre-recorded demos (different languages) to female farmers on mini solar-powered tablets through the assistance of the Ministry of Food and Agriculture. This approach would help reduce some gender-specific problems such as; extension officers favoring male farmers. Video demos capture information quarterly on-farm, saving female farmers and extension officers' time and money to travel while reducing their carbon footprint.

Economic Justification

Launching VisForfarmer would increase productivity, food security for food production among female farmers. Increasing stations in the regions have a higher success of reducing the estimated yearly losses of about 20 to 30% cereals and legumes and about 20 to 50% of root tubers, fruits, and vegetables in storage during transport or at the market.



SOLUTION 2

Problem statement

Small holder farmers in Zimbabwe face a number of challenges; inclusive of difficulties in securing consistent markets, adequate post-harvest facilities, affordable and renewable energy options, skills and information. These contributes to high poverty, hunger and income insecurity levels. According to the Zimbabwe National Critical Skills Survey report (2018) the country lacks 88% of the critical skills needed to drive the economy which is agro based. Women constitute the major of the people involved in agriculture.

Our innovation

Murewa Agribusiness Innovation and Incubation Hub is a project that have evolved in the past two years from a 2018 Drawdown event that was conducted by Net Impact EARTH University Leader Respect Musiyiwa in his rural home in Mvurwi Zimbabwe on harnessing solar the power of solar energy to help solve the problem of post-harvest food loss and wastage. He trained his community on producing dehydrated fruits, vegetables and food powders using local based resources and solar energy.

The team significantly participated in the Net Impact Foods Solutions Challenge 2019 and were the second runners up. The technical, financial and networking support offered by Net Impact allowed the team to broaden the idea and turn it into a one stop center for capacity building of rural smallholder farmers focusing on women and youth. They have turned the project into a youth and women farmer incubation, training and capacity building initiative. It aims to facilitate creation of collaborative, efficient and commercially viable agricultural ventures that will develop and sustain the agricultural and food production value chain system.

Objectives

The incubation center will offer youth and women farmers these services and facilities;

- 1. Access to information, knowledge and technology through agribusiness, entrepreneurship, skills training and capacity building*
- 2. Access to post harvest facilities*
- 3. Training and capacity building on climate smart agriculture*
- 4. They will be trained on financial literacy and management services. We facilitate access to funding, impact financing, seed capital management, networking events and crowd-funding.*
- 5. During training and incubation period we will facilitate access to land, farming infrastructure and equipment.*
- 6. We will facilitate domestic and export markets for local smallholder farmers*
- 7. Collaborative, co-working and co-creating. The trainees will be availed to co-working space with computers and internet. They will be assisted with company registration, partnerships and collaborations.*

Our Impact

We are working with several community groups and farmers' association with an impact to over 1500 farmers. We aim to have a direct impact to the operations of over 50 000 farmers in five years' time.

Short-term plan

- 1. Complete the construction of our Agribusiness Innovation and Incubation Hub and fully operationalize it. n<https://www.facebook.com/respect.musiyiwa/posts/2585928464838658>*
- 2. Fully operationalize our E-learning Platform nwww.startupuniversity.online*
- 3. Establish partnership with various stakeholders like farmers' groups, NGOs, government ministries and community leaders.*

Long-term Plan

Replicate the project in other rural communities of Zimbabwe

Partners

Potential partners include: Net Impact, SNV Zimbabwe, UNICEF ZIMBABWE, Tony Elumelu Foundation, Zimbabwe Farmers Union, Ministry of Agriculture, Zimbabwe, Ministry of Youth, Zimbabwe.'



SOLUTION 3

Introduction

The Indian government has increasingly started investing in rural development. The government has launched various initiatives such as Rural Infrastructure Development Fund (RIDF), Irrigation Benefits Programme, Pradhan Mantri Gram Sadak Yojana (PMGSY), National Rural Employment Guarantee Act (NREGA). However, female smallholder farmers continue to face many biases when it comes to financial services, education, and technology. We propose leveraging the existing village infrastructure to deal with the problems faced not only by female farmers but also females, in general.

Project

“Krishak (A Hindi word for Farmer) “will be launched in the small town of Rampur in Uttar Pradesh, India. Rampur comprises 166 villages that fall under its jurisdiction. Rampur lies in the fertile alluvial plains of the Ganges basin. This town is an ideal location to start the project “Krishak “as 65% of the population of Uttar Pradesh is employed in agricultural activities. Approximately 165.98 million hectares are used for cultivation (UPagripardarshi,2020).

Model

‘Krishak’ aims to directly work with NGOs such as Haritika, BGSVS to educate and train female farmers about the latest technologies and rotational farming practices. Rotational farming, if implemented, will lead to an almost 35% reduction in nitrous oxide emissions. This training session will take place 5 days a week for a month during an offseason. We plan to collaborate with the Town administration and Village Panchayats to use the government schools in the area for these sessions. At the end of the training, we will provide every attendee a tablet loaded with tutorials on how to use the latest technologies, sustainable farming practices, rotational farming, etc in the local language so that farmers can watch them in their spare time.

Farmers will also be able to rent the latest equipment, fertilizers, high-quality seeds at a very nominal cost from Krishak which will, on one hand, reduce the financial burden of purchasing and on the other hand help them increase the yield per acre. After harvesting, Krishak will directly purchase the produce from all those farmers who will apply the taught sustainable practices and will offer them price above the Minimum Support Price (MSP) offered by the government and sell their produce in the cities.

Krishak will also provide women farmers with the benefits of a financial institution by helping them manage a Community/Grameen bank. Non-farming women are also welcomed to attend these sessions which can allow them to be employed as farming laborers/helpers in the fields and can help them make some extra income.

Prospects: Short term

The initial program will be tested in five villages. Cost of leasing equipment and tablets to be funded by a combination of government and personal funds. The initial cost of setting up community banks will be borne by the company. We plan to collaborate with corporates in their CSR activities to raise initial funds to support these women farmers.

Prospects: Long term

We plan to expand our business to the neighboring agriculture intensive towns. Subsequently, we plan to expand Krishak to the neighboring states of Bihar and Jharkhand.

ⁱ Rapsomanikis, George. The Economic Lives of Smallholder Farmers: An Analysis Based on Household Data from Nine Countries. Food and Agriculture Organization of the United Nations, 2015, www.fao.org/3/a-i5251e.pdf.

ⁱⁱ Smallholders, Food Security, and the Environment. International Fund for Agricultural Development (IFAD), 2013, www.ifad.org/documents/38714170/39135645/smallholders_report.pdf/133e8903-0204-4e7d-a780-bca847933f2e.

ⁱⁱⁱ Climate Change and Your Food: Ten Facts. Food and Agricultural Organization of the United Nations, www.fao.org/news/story/en/item/356770/icode/.



-
- ^{iv} Adapt Now: A Global Call for Leadership on Climate Resilience. The Global Commission on Adaptation, Sept. 2019, reliefweb.int/sites/reliefweb.int/files/resources/GlobalCommission_Report_FINAL.pdf.
- ^v Adapt Now: A Global Call for Leadership on Climate Resilience. The Global Commission on Adaptation, Sept. 2019, reliefweb.int/sites/reliefweb.int/files/resources/GlobalCommission_Report_FINAL.pdf.
- ^{vi} 5 Ways COVID-19 Is Affecting Smallholder Farmers Around the World. TechnoServe, 25 Aug. 2020, www.technoserve.org/blog/5-ways-covid-19-is-affecting-smallholder-farmers/.
- ^{vii} 5 Ways COVID-19 Is Affecting Smallholder Farmers Around the World. TechnoServe, 25 Aug. 2020, www.technoserve.org/blog/5-ways-covid-19-is-affecting-smallholder-farmers/.
- ^{viii} 5 Ways COVID-19 Is Affecting Smallholder Farmers Around the World. TechnoServe, 25 Aug. 2020, www.technoserve.org/blog/5-ways-covid-19-is-affecting-smallholder-farmers/.
- ^{ix} 5 Ways COVID-19 Is Affecting Smallholder Farmers Around the World. TechnoServe, 25 Aug. 2020, www.technoserve.org/blog/5-ways-covid-19-is-affecting-smallholder-farmers/.
- ^x 5 Ways COVID-19 Is Affecting Smallholder Farmers Around the World. TechnoServe, 25 Aug. 2020, www.technoserve.org/blog/5-ways-covid-19-is-affecting-smallholder-farmers/.
- ^{xi} Kamruzzaman, M., Daniell, K. A., Chowdhury, A., Crimp, S., & James, H. (2020). How can agricultural extension and rural advisory services support agricultural innovation to adapt to climate change in the agriculture sector?. *Advancements in Agricultural Development*, 1(1), 48-62. <https://doi.org/10.37433/aad.v1i1.9>
- ^{xii} Kamruzzaman, M., Daniell, K. A., Chowdhury, A., Crimp, S., & James, H. (2020). How can agricultural extension and rural advisory services support agricultural innovation to adapt to climate change in the agriculture sector?. *Advancements in Agricultural Development*, 1(1), 48-62. <https://doi.org/10.37433/aad.v1i1.9>