- 1. Identify a real potential funding source for your project. Seek sign-off from faculty mentor and develop a detailed outline for the proposal with specific insights, arguments, and accomplishments (outline)
 - a. Development Innovation Ventures grant- from the United States Agency for International Development. This is a good fit for our project because this source funds any valid venture that can bring original solutions to the critical challenges affecting millions of people around the world. This organization provides funding to research that is American based and also for countries around the world that it already supports. This source might fund us to scale up our ventures because it currently has an application that provides a good sum of money for scaling as long as we can provide proof of evidence that our venture is valid. Source:<u>https://www.usaid.gov/div</u>
 - i. Stage 1: Proof of Concept (Up to \$200,000)
 - ii. Stage 2: Testing and Positioning for Scale (Up to \$1,500,000)
 - iii. Stage 3: Scaling (Up to \$5,000,000)
 - iv. Evidence Grants (Up to \$1,500,000)

Outline: (approved by Khanjan)

- GRO Mushrooms
 - **a. Project Manager:** Professor Khanjan Mehta and World Hope International in Sierra Leone.
 - **b.** Technical focus area: Innovative food production to provide increase food security in low resource countries.
 - c. Country for implementation: Sierra Leone
 - d. Stage applying to- Stage 3 Scaling
 - e. How much, if any, revenue has this innovation generated?
 - The business model projects a revenue of between \$10,800-\$12,000 in 4 to 5 years of the starting time.
 - f. What is your innovation? What is transformative or "game-changing" about it? Why is there an urgent need for your innovation? How does your innovation differ from existing products on the market?
 - GRO Mushrooms provides a nutritious, affordable and easy to integrate food source to families in low and middle income countries where malnutrition is prevalent. The goal is to provide local markets with a year round supply of mushrooms that are cheap for families to purchase.
 - Our process is game changing because we have developed an innovative way to extend the shelf life of the grain spawn which essentially allows us to use one batch of it to get multiple generations of mushrooms. Not only is this incredibly sustainable but it provides a unique solution to the lack of stable electricity/refrigeration that is often present in low resource

countries. Through our experiments over the summer we were able to determine that the second generation grain spawn can be successfully produced in temperatures as high as 86 °C. This will allow farmers to use our process to produce mushrooms all throughout the year since mushrooms can be grown in artificial environments unlike other crops. So, farmers would not have to rely on nature for a successful harvest.

- Our innovation differs from existing products in the market in that we do not need to buy grain spawn as frequently as other producers do. So, our process is more economically sustainable.
- g. What is/are the specific critical barrier(s) or problem(s) related to food security that your innovation addresses?
 - A central issue is that in low resource countries there is only one mode of food production and that is through traditional farming methods. When this works, it yields good profit for the farmers and produces food that people can consume. However, only relying on one farming approach is not reliable because if the traditional farming methods fail due to natural causes, then farmers and families struggle. This is especially the case during hunger months long periods of time where an area goes without precipitation- since crops die and famers are left with nothing but dry land. So, our innovation fills the gap of food shortage during the hunger months (and through the year) by providing affordable and nutritious food for families. It also provides farmers with additional avenues of income.
- h. Has this innovation been piloted (yes/no)? Where? What were the results of the pilot?
 - Yes, our innovation is currently being used in Makeni, Sierra Leone. Our team member in the country uses our innovation to produce mushrooms that he sells in local markets for a profit. He is able to sell out of all the mushrooms he has, which is not near steady state, but shows the demand for mushrooms in the local market.
 - Our parent venture was based in Cambodia where a self sustaining mushroom production system was established and is thriving to this day.
- i. What are the key, quantifiable metrics related to your innovation's performance or expected performance ?
 - The amount of mushrooms produced in each grow cycle helps us determine if we can still maximize our growing process, or if we have reach a maximum and now need to expand to a new MPS.
 - The amount of mushrooms sold shows the demand for our product, but also the impact we are having as the mushrooms will be eaten and provide nutrition to the families.

- j. How might this innovation engage or benefit (directly or indirectly) the stakeholders?
 - For the mushroom farmer, the more mushrooms they can grow, the more money they can make from the mushrooms they sell.
 - For our venture, more mushrooms means more profit to reinvest in ourselves, but it also means that we are helping more people. We are then able to build more MPSs and reach more families in need of a cheap and reliable food source.
 - For WHI, more mushrooms means they are funding a successful venture that is helping them raise the standard of living.
- k. Describe your expected end-users. Who are they and how might end users need to modify their existing practices or behaviors to use your product or service?
 - In families, we are targeting whoever buys food from the market, which is primarily the mothers. Mushrooms are not a commonplace food in Makeni, so the families will need to develop cooking methods that incorporate mushrooms into their food.
 - At steady state, we also plan to have an excess of mushrooms that we can sell in an international market for higher prices. We will need to adjust our own process to extend our mushrooms' shelf life to be able to sell in this market such as refrigeration.
- 1. Describe the social, environmental, institutional, legal and regulatory challenges your innovation faces that may prevent its scale-up. How do you propose to overcome those barriers?
 - A large business might attract government attention and therefore might be subject to taxation
 - We do not know if our mushrooms will be bought at a very large scale, making our venture pointless if it doesn't help the masses
- m. Who is/are your local partner(s)? Who are other potential partners (be specific about partners; e.g. provide names, not just categories)?
 - We are partnered with WHI in Sierra Leone
- n. Describe key elements of your go-to-market strategy in the country(ies) in which you propose to work. Where do you see as the biggest challenges and opportunities?
 - Selling mushrooms to market vendors, our worker is a community member and most likely has friends who would like to do business
 - For large scale, we have a ZECC that will expand the shelf life of our mushrooms
 - We will be looking into dehydration to preserve our mushrooms for longer as well

- o. If your innovation is a technology, provide technical specification on how your innovation works; if a business model, what is innovative about it?
 - Our innovation is a process. The process includes sterilizing grain spawn using a pressure cooker and then inoculating the sterilized grain with spawn and letting it sit under constant humidity until the spawn is fully colonized. (The specific numbers are on our second research paper and we will update this accordingly when the time arrives)
- p. Describe how you will measure and monitor success, including metrics/indicators and targets.
 - Mushrooms produced per cycle
 - Harvests might be weekly if not every few days
 - Mushrooms sold per day
- q. What is your timeframe for validating your technology solution?
 - Our methods were recently validated from our summer research. However, our scaling strategy needs to be implemented and validated within the next six months for this venture to survive.
- r. What are the social, economic, and environmental challenges your innovation faces that may prevent its scale-up and how you propose to overcome those challenges?
 - Seasonal changes might hurt crop but only in places where cold weather is possible so probably not Sierra Leone