1. Indicate in one or two sentences **in bold** the essence of the idea.

- A **real-time, decision support service software application** in form of a **chatbot** accessible via **Interactive Voice Response**, **SMS and Facebook Messenger in local languages** for maize smallholders to achieve quality crop production. We will implement **machine learning algorithms** on **satellite data**, **agronomic data** and **sensors data** to provide best answers to farmers' questions like best date for planting, input usage, water usage, plant disease management, crop pricing and market availability.

2. Why is the idea an unconventional or creative approach to the problem outlined in the topic?

Our idea is both unconventional and creative in its approach by the use of :

- accessible platforms like the Facebook Messenger and Interactive Voice Response in farmers' local languages to provide **real-time** data-driven decision support services for smallholders instead of just static .
- application of machine learning algorithms to curate the best answers from variant agronomic data sources to common and uncommon challenges faced by smallholder farmers.
- connected devices installable on farms to provide real-time data such soil moisture to inform decisions like how much water should be use at that a period for irrigation.
- artificial intelligence application, that is able to learn from data and uncover new patterns

3. Describe the hypothesis for the proposal and why it is expected to succeed.

A Farm Virtual Assistant platform that provides quality decision support services based on quality data for farm operations will help make smallholders climate smart and ensure increase in food production.

Smallholders, now more than ever, are facing a difficult time in their farming operations especially because of the uncertainty in weather patterns caused by climate change. Their old methods of farming are failing them as the weather systems changes and they are turning to technology for new answers.

The success of a nation wide E-Wallet scheme for Distribution of Seeds and Fertilizers Project run by the Federal Government of Nigeria where over 600,000 farmers were served through the scheme shows a growing adoption of mobile technology in Nigeria, a country where mobile phone penetration stands above 70% and internet penetration at above 50%.

Hence, an accessible platform with localization of contents for decision support service for farm operations will see a high rate of adoption. Our coalition of partnerships with all stakeholders (government, research institutions, farmers association and private organizations) will also ensure the success of this project.

**How will you pilot it?**

Use this section to briefly describe how the idea will be put into practice.

1. Describe the implementation plan, including any new technologies or tools that will be developed.

We have designed a product roadmap a 6 month period with core application development, testing and piloting. The pilot will involve about 5,000 farmers in Oke-Ogun Area, of Oyo State, Nigeria. The following new technologies will be developed:

i. proprietary algorithms for extracting meaningful insights and answers from our datasets combined with other open datasets from FAO, United Nations, World Bank .

ii. a public API for agricultural datasets generated on smallholders' land size, types of crops grown, income per period, soil types and characteristics, geospatial

iii. Facebook Messenger chatbot Interface that queries our own database for answers and other third party APIS such as weather services, agronomic data, geo-spatial datasets.

iv. an Interactive Voice Response and SMS interface for access to our application.

v. a language translation web service that converts local languages (Yoruba and Hausa) to English and Back connected to our Interactive Voice Response mobile service

2. Explain how the work will be performed within the budget (USD$100,000) and time (12 months) allowed?

We estimate that the core application development itself, beginning in December will take three months with a cost of $25,000. Cloud Hosting and access to third party services for the application will take about $15,000. After the three month period, another three month will the piloting, testing and beta-development of the application from March to June ending. Farmers sensitisation, logistics and operations of the pilot will cost about $30,000. General Administration expenses are budgeted for about $15,000 and the remaining $15,000 for other expenses that may arise.

3. What essential data will be generated during this pilot?

The pilot will essentially help generate geo-reference data on soil moisture, crop yield, input usage, water usage and gender-disaggregated data on farmers age, farm ownership, income level, literacy level, adoption of mobile technology and decision making.

4. If the pilot is successful, what are the next steps

We will integrate the learnings of the pilot into the application and then use that to prepare the platform for scaling across the whole country and regions with similar