



## BGIF - FEASIBILITY STUDY

Commercializing 'KRISHE' E-Agriculture Services in  
Blue Gold Polder Areas

**TITLE**

**BGIF Feasibility Study: Commercializing 'KRISHE' E-Agriculture Services in Blue Gold polder areas**

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## PROLOGUE

Dear reader,

In front of you lies the feasibility report that will give you insights on how e-agricultural services can benefit the socio-economic development of rural farmers in Bangladesh. In partnership with technology provider Grameen-Intel Social Business and the Blue Gold Innovation Program, ProPortion as lead the first steps of a human-centered design (HCD) process.

Rather than conducting a traditional feasibility study, we embrace a designers mentality to create deep empathy with the farmers that we aim to impact positively. Through this deep understanding of farmers' desires, needs and constraints, we learnt about their context. And also about the stakeholders that are part of a whole system around farmers and agricultural production.

The insights from field research and desk research has led into high potential design directions for a systemic change leading to more yield, better socio-economic development of farmers and a better functioning value chain. These most risky assumptions of these design directions have been validated in a first validation round with the partners.

A special thanks to the research team and all the research participants in the field who shared their thoughts and ideas. Thank you for your time, effort and enthusiasm to be part of creating agri-service solutions benefiting low-income farmers in Bangladesh. As a next phase, we propose to prototype and pilot the proposed design direction to continue the validation and continuous improvement of a service that truly can impact lives at scale.

Warm regards,

**Thomas Schuurmans**

Director ProPortion

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# 1. INTRODUCTION

Majority of the population in Bangladesh live in rural areas where agriculture is the main source of livelihood. As of 2016, the rural population (% of total population) in Bangladesh was reported at 64.96 %, while agriculture was reported to be the largest employment sector in Bangladesh providing employment to more than 47% of the total labour force in the country. The agriculture, value added (% of GDP) in Bangladesh was reported at 14.77 % in 2016.

Agriculture sector in Bangladesh has high potential to create overwhelming impact on major macroeconomic objectives like employment generation, poverty alleviation, human resources development and food security. However, the southern delta region of Bangladesh is highly exposed to climatic factors and natural disasters such as floods, droughts, cyclones, storm surges, salinity intrusion, and river siltation which makes it much harder for the coastal farming communities to improve their farm productivity and profitability. Hence, the farm productivity and agriculture income for smallholding farmers in southern delta regions is seeing a steady decline over the past few years. Nearly 38% of the population in the coastal regions of Bangladesh lives below the poverty line and many smallholder farmers are opting out of agriculture and migrating to cities for better income opportunities.

Despite of these challenges, the coastal areas of Bangladesh offer ample opportunities to harness its rich resources for creating a sustainable environment that can not only lift the population from its poverty but also provide them with better quality and secured lifestyle. Upon identifying the development potential of the southern delta and coastal regions of Bangladesh, the Governments of The Netherlands and Bangladesh have agreed to join hands under '**Blue Gold program**' to support the development of the region through participatory water management and agricultural production with business-orientation. The main objective of Blue Gold Program is to reduce poverty of the people living in the selected coastal polder areas of Patuakhali, Khulna and Satkhira districts by creating a healthy living environment through sustainable socio-economic development. The program aims to establish strong community organizations and empower them with appropriate skills and tools to sustainably manage their resources and to make these resources more productive. Apart from participatory water resources management, the program is also implementing several interventions aimed at improving agricultural productivity and income potential through improved processing techniques for value addition, effective marketing of agricultural products and strengthening of existing market value chain to ensure better selling price for the agricultural produces.

The Blue Gold Program has a dedicated 'Innovation Fund' to explore and promote new innovations within the project. This fund is available for conducting research, feasibility studies and piloting of new innovative technologies and approaches that contribute to the outcome and results of the Blue Gold Program. Blue Gold identified Grameen Intel's E-Agriculture Platform (**KRISHE**) as a high potential innovative technology that could help improve agricultural practices and create new agri-business and income opportunities for the smallholder farmers in its project areas. Hence, a feasibility study was funded for this technology through the Blue Gold Innovation Fund in **September 2017**. The feasibility study was lead by **ProPortion**, in partnership with **Grameen Intel Social Business Pvt. Ltd.** to explore opportunities and identify strategies for commercially deploying the E-Agriculture Platform (**KRISHE**) in the Blue Gold Project areas.

## 2. PROBLEM DESCRIPTION

The main reasons why farm productivity and overall agriculture income remains low and unstable for the smallholder farmers of coastal regions of Bangladesh includes;

### DECLINING SOIL FERTILITY

Soil fertility in Bangladesh is declining due to overexploitation of soil nutrients, and imbalanced use of fertilizers (Rashid, 2011). Both overuse and underuse of fertilizers have harmful effects on short-term yields and long-term sustainability, but farmers often do not know how much fertilizer to apply to their crops. Small land holding farmers find it extremely difficult to assess the proper type and quantity of fertilizer to match their specific 'Soil & Crop' combination. Efficient use of fertilizers is a major factor not only in reducing input costs but also in bringing about an economic increase in agricultural production. It is a common perception among farmers that they have to increase the fertilizer inputs to achieve higher yield levels. However the amounts and kinds of fertilizers required for the same crop vary from soil to soil, even field to field on the same soil. Currently the fertilizer input recommendations available to these farmers are often based on regional (not plot-specific) soil and climate conditions, and therefore their usefulness is limited. In the case of South West coastal areas, where soil has salinity is high and often fluctuating, there is additional need for plot-specific customized recommendations to understand how to improve its fertility.

### IMPROPER USE OF PESTICIDES

Loss of yield due to increased instances of crop mortality from pest infestation has lead to widespread use of pesticides across Bangladesh for every crop as a precautionary measure, even when it is not essential. The use of toxic pesticides by farmers has increased by 328% over the past 10 years, posing serious health hazards due to its long-term residual effect (BRR). This overuse of pesticides is causing pesticide poisoning of water bodies through water runoffs from irrigation, leading to irreversible catastrophic ecological damage in Bangladesh. Farmers lack knowledge on the proper use of pesticides, which is compounded by the increasing variety of pesticides sold in the market. This is not just increasing the input costs for the farmers but also has a much wider impact on the delicate ecology and overall wellbeing of Bangladesh citizens.

### LIMITED CASH FLOW

Smallholder farmers usually do not have multiple sources of income and are dependent only on their limited agricultural income. Hence they often face cash flow crisis due to lack of sufficient disposable income (buffer) to seek any support from external experts or to invest on new technologies to improve their agricultural productivity. The cash flow crisis due to unstable and limited agricultural income forces the smallholder farmers to rely on sub-optimal generic regional agricultural practices that are commonly followed by other farmers (peers) in the region. Most of these farmers are either not aware of or cannot afford to seek customized plot-specific agronomic recommendations and customized solutions to improve their crop productivity and reduce overall input costs.

### LIMITED ACCESS TO REAL-TIME MARKET INFORMATION

Farmers in southern delta regions of Bangladesh are mainly concentrated in areas with limited accessibility and that are classified as hard to reach (HTR) areas. These farmers from hard to reach areas lack direct access to both various markets/market actors and real-time market price information, which puts them in disadvantaged position with respect to their bargaining power. According to a study by Katalyst in 2010, nearly 57% of farmers seek real-time information on market price. Thus, lack of accurate information and high transaction costs to access various markets and market price information happens to be one of the major impediments for the agricultural marketing processes in southern delta regions of Bangladesh.

### LIMITED ACCESS TO AGRI EXPERTS AND EXTENSION SERVICES

One of the primary challenges of the smallholder farmers in the southern delta areas of Bangladesh (Blue Gold target areas) has been the **limited access to** expert consultation and extension services. Without a reliable extension and expert advisory service, farmers find it difficult to access not only relevant and timely agronomic and market information, but also to access equitable markets for

purchasing quality inputs and selling their agricultural produces. The Department of Agricultural Extension (DAE) has deployed several extension agents (SAAO) across the country to support farmers by providing agro advisory services. Each DAE extension agent (SAAO) is expected to support an average of 1000-1200 farm families in his/her working area. It is a daunting task for a DAE extension agent to provide adequate and on-time advisory support services for all the 1000+ farm families under his/her working area. Considering the limited resources and working hours available for the extension agent (SAAO), it becomes difficult for many smallholding farmers located in remote areas to access their advisory and support services on time. Thus, many farmers tend to rely on their past experiences or seek advice from their family and friends who are not the domain experts. Hence, they become even more vulnerable to loss of productivity and income due to suboptimal practices and are also exposed to exploitation from various market actors with vested interests. Hence, there is a need to build a robust and scalable 'Agricultural Extension Service' that not only educates and advises the farmers on appropriate agricultural products and practices but also helps in creating market linkages for maximizing farm productivity and agricultural income of the rural communities in Bangladesh.

### **3. POTENTIAL OF E-AGRICULTURE SERVICES**

Bangladesh can be considered as a market in many ways ahead of its time. The total number of mobile subscriptions has crossed the 130 million mark, while we believe that unique mobile subscriber penetration is around 42%. Interestingly, the mobile penetration in rural areas is around 50% and Bangladesh boasts about largest mobile infrastructure coverage across the country, something not seen in most other emerging markets. Such rapid proliferation of mobile phones and Internet usage in the rural areas of Bangladesh is creating opportunities for agriculture sector to quickly adopt mobile-based digital platforms as an effective and efficient tool to help farmers get better access to information, finance and market systems. Hence, it is not surprising that today there are many project and business driven initiatives run by NGOs and private sectors that are betting on Information Communication Technology (ICT) to effectively disseminate knowledge and information based agricultural services to the farmers in the remotest parts of rural Bangladesh.

Bangladesh has stepped into new era of Digital World with a vision of 'Digital Bangladesh'. This has created conducive environment for ICT driven agriculture services (E-Agriculture) to grow more rapidly than ever. Food and Agriculture Organization (FAO) defines "E-Agriculture" as an emerging field involving multidisciplinary initiatives like agricultural informatics, agriculture development and entrepreneurship. The concept of 'E-Agriculture' is currently being tried and tested in Bangladesh through various initiatives taken by both government and private organizations. However, most of the E-Agriculture services that are active in Bangladesh are mainly focused on dissemination of information to the farmers through Internet and related technologies. Of these, the most common and familiar services are the provision of information's, agriculture advisory and helpline services through mobile phone using IVR / Call / SMS based technologies. E-Agriculture services are evolving rapidly from what started as simple telephone helplines and SMS based services, today it has transformed into software applications that can provides accurate agriculture information on multiple devices like PC, tablets and mobile phones even without stable internet connectivity.

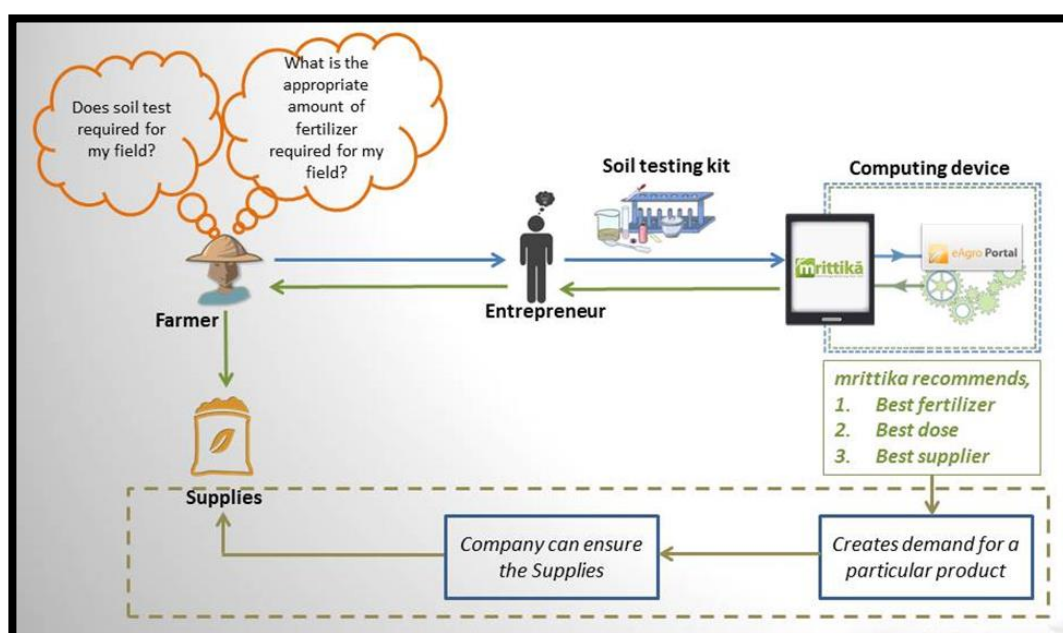
Earlier, it was only the government and NGOs who took on the initiative to promote ICT based services to serve the needs of the farmers. Today, we see many private sector agriculture input companies in Bangladesh that are extending various ICT based services aimed at providing product specific and general agriculture information to farmers. The agriculture input sector has begun to acknowledge the fact that E-Agriculture based services are much faster and more economically than their traditional communication channels to reach out to their network of farmers (end customers) across the country. This is because; E-Agriculture services allow the agro input companies to have frequent and more direct interaction with their farmers to provide them with relevant and timely information to help improve their yield. These ICT driven customer care and marketing initiatives are helping the agro input companies to position themselves as more empathetic and farmer centric companies, which in turn helps them to gain the trust and loyalty of the farmers.

### 3.1. 'KRISHE' BY GRAMEEN-INTEL SOCIAL BUSINESS

Government, NGOs and Private sector actors are implementing many new and innovative E-Agriculture initiatives as a part of research and development projects and some of them are already demonstrating their potential for full-scale commercial deployment. **KRISHE** digital platform is one such innovative E-Agriculture initiative that has been developed by **Grameen intel Social Business (GISB)** through dedicated research and consultations with over 50 experts and leaders in the agricultural and environmental arena. A conscious effort was made to ensure that their product development process recognized the wide diversity of agriculture, climates, and unique local conditions in Bangladesh.

**Grameen Intel Social Business Pvt. Ltd. (GISB)**, strongly believes that effective and timely dissemination of relevant information to agricultural and rural communities is a potent tool in fighting poverty and deprivation. Thus in response to the above stated problems, GISB has developed an innovative technology platform called '**KRISHE**', specifically designed to help the farmers improve their productivity and overall agriculture income. **KRISHE** platform hosts three specialized digital tools (**Mrittikā, Protikār & Vistār**) which can deliver information-based services to the farmers via mobile devices such as smartphones, tablets and other handheld communication or computing devices. These specialized digital tools are described in detail below;

**1. Mrittikā** is a soil nutrient analysis and recommendation software that offers knowledge and customized information to the farmers on required nutrients based on specific crops and current state of the soil of their cultivable land; specific fertilizer types, quantity, dosage and application procedure and local sources of fertilizers offering competitive prices. The software brings expert advisory services of crop and soil based nutrient selection to the doorstep of the farmers, thus maximizing yield and improving the quality of the harvest and simplifying the selection and sourcing of the fertilizers. This in turn enables farmers to save money by reducing wastage and harmful effects of using excess fertilizer. Mrittikā is an application, which can work both online, and offline. Sync requires connectivity, other than that, these applications works offline. This is done to overcome situations where there might be no mobile Internet coverage in rural areas.



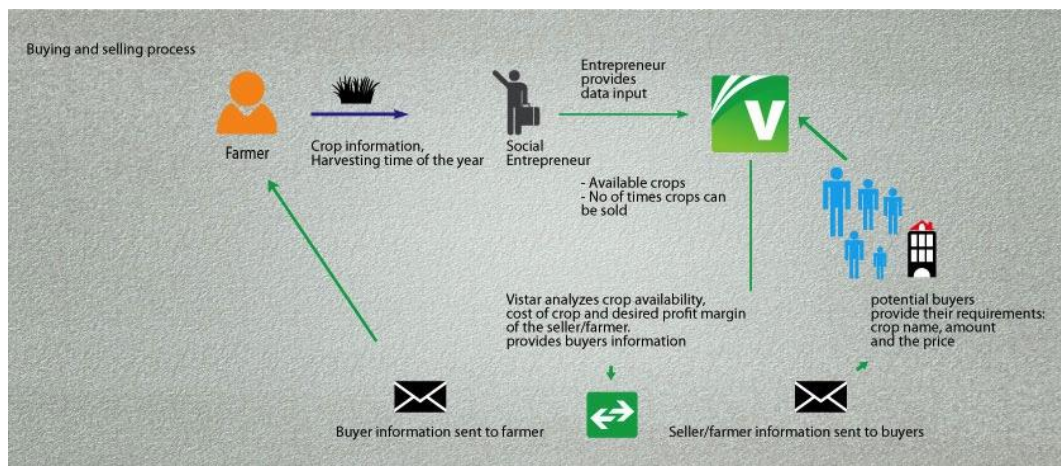
**Digital Soil Testing & Fertiliser Recommendation Tool**

**2. Protikār** is a software application for managing plant diseases, weeds and pest organisms that damage agricultural crops.



The software offers knowledge based and customized information to the farmers on: preventive measures to avoid plant diseases, specific pesticides recommendations, quantities, dosage and application procedure and pesticides available at reliable local sources. These in turn enable farmers to produce better crops and reduce the harmful effects of using excess pesticides. Protikār is an application, which can work both online, and offline. Sync requires connectivity, other than that, these applications works offline. This is done to overcome situations where there might be no mobile Internet coverage in rural areas.

**3. Vistār** is a software application that helps farmers to get direct access to market or buyer information so that they can sell their crops at an optimum price. This application provides considerable business opportunity due to its enormous potential to connect buyers and sellers. It offers market information to the farmers on: - improving buying and selling service by offering crops to potential buyers at the beginning of the season - centralizing bids and offers - it reduces costs and improves margins for farmers The application ensures ease of selection of crops from multiple reliable farmers or sellers - Farmers can sell perishable crops at fixed interval and avoid crop damages - Farmers can contact buyers directly through SMS or email.



### **'Vistar': Forward Market Linkage Tool**

To a large extent, the efficiency and effectiveness of any E-Agriculture services depends upon the care and effort put forward by the extension service agents to provide follow-through support to the farmers, which goes beyond disseminating information and recommendations. Hence, GISB continues to field test its E-Agriculture software services with actual farmers under different contexts and at various locations across Bangladesh.

### **3.2. CHALLENGES IN COMMERCIALIZING 'KRISHE'**

GISB has been active in commercialising KRISHE. They conducted own commercialisation activities as well as through partners. During those activities, GISB faced various challenges in the commercialisation of KRISHE.

#### **FARMERS HAVE LOW PURCHASING POWER**

Smallholder farmers linked to short crop or livestock cycles often have low purchasing power. Hence, it is challenging to identify early adopters among these small farmers who will be willing to invest on new technologies and services. GISB has always had to rely on projects to subsidise the cost of products and services being delivered to these smallholder farmers.

#### **THERE IS NO 'ONE SIZE FITS ALL' SOLUTION**

The advantages conferred by agricultural innovations are highly dependent on ecological conditions. GISB's E-Agriculture tools needed to be customised and calibrated to suit each of the local context in which it was being piloted. The overall performance of E-Agriculture tools depends on multiple

factors including ecological conditions, local culture, local cropping pattern and farming practice, market system, etc. Hence, it requires considerable time and effort to understand the impact of ecological and market conditions on business performance of E-Agriculture services.

#### **DIVERSE ECOLOGY & MARKET ECOSYSTEM**

GISB has experienced that even after adapting their E-Agriculture tool/service to a particular context, it was equally challenging for GISB to replicate and scale the technical and commercial pilot in adjoining areas. GISB identified some of the main barriers for replicating and scaling the pilot interventions as;

- Varying levels of infrastructure in rural areas
- Varying agriculture practices across the country
- Geo-political, social, cultural and climate factors that influence the Market Dynamics

#### **NO PROVEN BUSINESS MODELS**

GISB is yet to make a breakthrough in mobilizing large lead firms to get involved in their ambitious plans of selling E-agriculture services directly to small farmers. Meanwhile, their attempts to work with local/regional market actors has been equally challenging due to the informal nature these unorganised local markets. The local market actors are often beyond the purview and control of government policies making them highly susceptible to market volatility and thus a very high-risk stakeholder to engage with.

## **4. OBJECTIVE & GOAL OF THE STUDY**

The '**KRISHE**' digital platform hosts multiple E-Agriculture tools/services, specifically designed to improve the food security situation in Bangladesh, through increased agricultural-productivity of farmers and overall socioeconomic development of both farmers and other agriculture value chain actors. GISB aims to achieve this impact by establishing a robust network of financially sustainable field agents, powered by '**KRISHE**' digital platform, to support the farmers in;

1. Improving the soil nutrient balance of their cultivable lands.
2. Purchasing best quality agricultural inputs for the best price.
3. Reducing crop mortality through improved crop health management.
4. Getting the best market price for their crop harvests.

The study thus aims to identify the most relevant E-Agriculture tool/service to be commercialized, based on its potential to impact the overall **socio-economic development** of both farmers and other local stakeholders in the agriculture value chain. Hence, the main objective of the proposed feasibility study under Blue Gold Innovation Fund is to uncover the market potential for commercializing GISB's '**KRISHE**' digital platform to effectively deliver relevant E-Agriculture services to the farmers in selected Blue Gold project areas.

The ultimate goal is to generate ideas and recommendations for developing a **scalable service delivery model** and a **sustainable business model** for '**KRISHE**' digital platform that enables the small holding farmers in southern polder areas of Bangladesh to access the benefits of E-Agriculture services at an affordable price.

## **5. SCOPE OF THE STUDY**

The scope of this feasibility study is mainly focused on understanding the major drivers and barriers for technology commercialization in the selected polders under Blue Gold project. Technology commercialization in a given market/context is primarily influenced the willingness of the target customer segments to adopt new technologies. The willingness of the farmer communities to adopt new technologies will depend on 4 factors, generally known as 4A's of technology adoption;

1. **Awareness**
2. **Advantage**

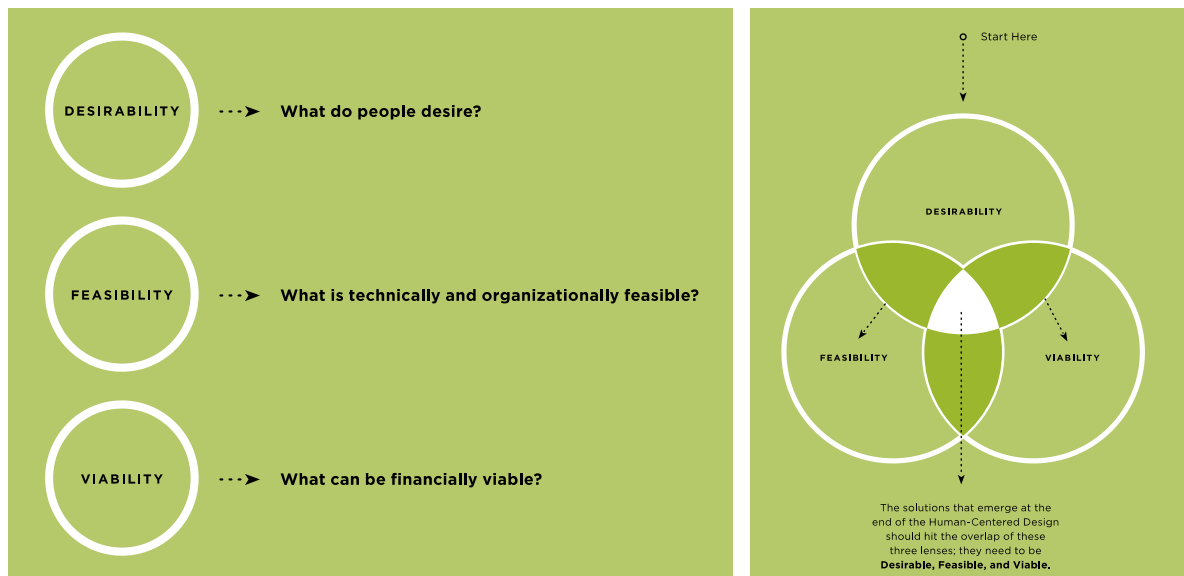
3. **Affordability**
4. **Accessibility**

To uncover and understand the peculiarities of 4A's of technology adoption for the given context, the research team has developed a set of **Research Questions** to clearly scope and guide this feasibility research study.

1. **What is the unique value that KRISHE digital platform can offer to farmers in polder areas?**
2. **Which of the GISB E-Agriculture services are the most relevant and effective carriers of the unique value for the farmers?**
3. **Who are the early adopters? What needs to be done to get the early adopters in the polder regions to try/adopt the E-Agriculture tools & services?**
4. **What could be the most suitable service delivery business model for the E-Agriculture services?**

Apart from 'researching' the above set of question, the proposed feasibility study has also tested for qualitative indicators like:

- **Service Desirability:** Demand from farmers, as well as other agriculture value chain actors for 'KRISHE' E-Agriculture services
- **Service Feasibility:** To deliver E-Agriculture services through a network of field agents equipped with technology and support ecosystem.
- **Service Viability:** Potential revenue streams that can cover the cost structure of the service delivery model for a sustainable business growth in future.



### **Designing a Desirable, Feasible & Viable Solution**

At the end of the feasibility study, we will have an improved concept idea for 'KRISHE' E-Agriculture service delivery that is validated by farmers, agri entrepreneurs and other actors in the value chain (market-lead). If the study provides sufficient insights that guide us to overcome technology adoption barriers and leverage the market drivers for designing a service deliver business model that is desirable, feasible and financially viable on the long run, a proposal will be made to proceed further with a pilot project.

#### **5.1. RESEARCH AREAS & ACTIVITIES**

The feasibility study was carried out in **polder no. 29** and **polder no. 30** under **Dumuria** and

**Botiaghata upazillas** in Khulna districts. The research team engaged with at least **145 field stakeholders** and **30 experts respondents** during the course of this feasibility study. Research activities carried out during the entire feasibility study were;

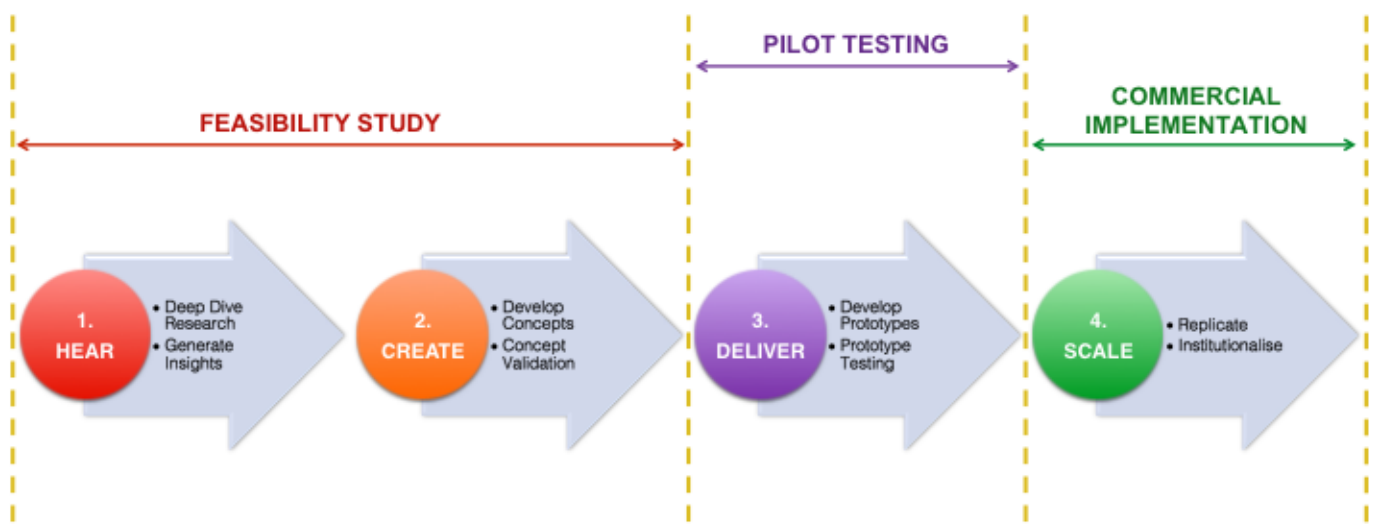
- **3 Consultation workshops** with Blue Gold and experts
- **4 consultation meetings** with NGOs & MFIs
- **8 expert interviews** with Govt. institutions & authorities (*DAE, DAM, SRDI, UDC*)
- **4 expert interviews** with input supply firms (*Metal, ACI, AR Malik, AIRN*)
- **15 individual interviews** with market actors (*Dealers, Service Providers & Buyers*)
- **8 individual interviews** with smallholder farmers
- **2 Focus Group Discussions** with market actors (*Dealers, Service Providers & Buyers*)
- **2 Idea Validation workshops** with market actors (*Dealers, Service Providers & Buyers*)
- **5 Focus Group Discussions** with Farmer Groups (*WMG-FFS & MFS*)
- **4 Idea Validation workshops** with Farmer Groups (*WMG-FFS & MFS*)

## 6. RESEARCH METHODOLOGY:

ProPortion has been applying Human Centered Design (HCD) methods in Base-of-Pyramid context since 2009, with the purpose to create impact at scale that lasts. ProPortion always applies a tailor made process with the best elements of Human-Centered Design, Service Design and Business Model Generation.

### HCD APPROACH

**Human-Centered Design integrates design and measurement methods in a continuous learning cycle.** For conducting this feasibility study, the research team has embraced Human-Centered Design (HCD) approach. The HCD approach puts the emphasis primarily on farmers, field agents and other stakeholders in agriculture value chain and not the product ('KRISHE' digital Platform) under consideration, because a technology/product is only an enabler for the proposed service to the farmers, and it is not a goal in itself to push this technology to farmers. The main focus of HCD based research is on studying people's experiences of "using the product/service" and a host of activities that surround the context in which it is being used. By focusing on 'what people say' and 'what people actually do', we unlock the possibilities of getting unexpected insights and hence developing a deeper understanding of people. The entire HCD based research, design, testing and implementation process is segmented into **3 stages** and **4 phases** as described below.



*Human Centered Design Process with 3 Stages & 4 Phases*



### **STAGE-1: FEASIBILITY STUDY:**

The proposed feasibility study using HCD approach comprises of the first two phases (HEAR & CREATE) of a typical HCD process.

#### **PHASE-1: 'HEAR'**

We begin the feasibility study by scoping for the problem or challenge to be solved? We carry out a rapid market analysis to get an overview of the key stakeholders in the system. We then prepare for a deep dive in the community. We put our key stakeholders at the center, and research their desires, aspirations and needs holistically. We have different techniques varying from ethnographic observations, Interview techniques, focus group workshops, surveys, etc. Based on that we generate user insights. We cluster and prioritize the user insights to bring us to the next step of concept development.

#### **PHASE-2: 'CREATE'**

Once we have acquired a deep understanding of the context, the key stakeholders and the system from HEAR phase, we can now (re-) formulate our design challenge. We create hypotheses and facilitate various creative techniques to develop solution ideas, and list all the assumptions behind those ideas. The most promising ideas are then selected for developing detailed solution concepts in form of storyboard illustrations and/or service mockups (Minimum Viable Product-MVP). These concept MVPs (storyboards and/or mockups) are used to validate the riskiest assumptions through concept validation workshops involving potential customers/users, experts and other relevant stakeholders. Based on the feedback received during concept validation workshops, the concept MVPs will go through multiple rounds of design iterations and improvements before an optimized concept is ready for full scale prototyping and field testing.

### **STAGE-2: PILOT TESTING**

#### **PHASE-3: 'DELIVER'**

The validated MVP from the CREATE phase of the feasibility study is further developed into a full fledged product or service prototype and subjected to a real life testing through a small-scale controlled pilot under DELIVER phase. In case you need people for the actual service delivery, we are strict in defining the desired profile and incentive model for service delivery. We then recruit candidates, using traditional channels or social media if effective. We design the various trainings (can be technical, on social marketing, on after care), and train the service providers. Our hands-on and experienced field staffs will coach the service providers on the job. This gives us direct feedback to further improve the full end-to-end service delivery model / customer journey.

### **STAGE-3: COMMERCIAL IMPLEMENTATION**

#### **PHASE-4: 'SCALE-UP'**

The strongest driver for scale is often an economic driver, but not every intervention is suitable for a social business strategy. However, there needs to be a clear view on the value at scale and the customers/financiers who wish to pay for that value, beyond the project budget. We use business model generation and validation techniques (starting already in create & delivery phase) to develop a business plan and business case to attract financiers for further scale-up. Embedding the product/service in the system can be very powerful, like engaging with the government, local corporates and NGOs.

## 7. HEAR PHASE

The key step of the Hear phase of the HCD process is a “Deep Dive” research, which employs ethnographic consumer research methodologies to systematically analyse the marketplace by developing a deep understanding of the needs and constraints of all relevant actors/stakeholders along the agriculture market value chain. During the HEAR phase, we began with rapid market analysis, which provided us with an overview of the key stakeholders in the system. We then prepared for a deep dive in the community by placing each of the key stakeholders at the center, and research their desires, aspirations and needs holistically. We applied different qualitative research techniques/tools like,

1. Contextual observations
2. Contextual Interviews
3. Expert Interviews
4. Focus group workshops
5. Insight generation workshops



**Blue Gold Consultation Workshop**



**Expert Interviews**



**Focus Group Workshops**



**Contextual Interviews**



**Contextual Observations**



**Insight Generation Workshop**



**Contextual Interviews**



**Contextual Observations**



**Insight Generation Workshop**

The learning from these real life observations, interviews and discussions were distilled and

synthesized into ‘Key Research Insights’ per stakeholder groups to illustrate the potential opportunities and directions for deploying GISBs ‘KRISHE’ E-Agriculture service offering in the target areas of Blue Gold Program.

## 7.1. KEY RESEARCH INSIGHTS: ‘FARMERS & FARMER GROUPS’

### INSIGHT-1

#### INCREASED PRODUCTIVITY DOESN’T MEAN IMPROVED INCOME/PROFIT FOR FARMERS

“Increasing farm productivity and optimising input costs does not translate into increased income for many smallholder farmers, unless they are provided access to profitable and equitable markets to sell their farm produce.”

#### OBSERVATIONS

The market is flooded with several technologies, products and service interventions (including advisory services) to help farmers to improve productivity and land utilisation. However, the research revealed that many small farmers were unable to convert their increased farm productivity into improved income/profit mainly because;

1. To achieve increased farm productivity, farmers have to invest more to procure quality agri inputs, thus increasing their overall input costs.
2. Without strong forward market linkages, farmers with bumper crop produce are unable to find good buyers and hence are forced to sell their crops at lower prices thus incurring huge losses.



**High Price for Agri Input**



**Low market Price for Agri Produce**

KRISHE hosts multiple E-Agriculture services like ‘digital soil testing’ service that aims at **reducing or optimising the input costs** especially for fertilizers. Most of the Farmers were of the opinion that KRISHE’s ‘digital soil testing’ service and other E-Agriculture advisory services (**Mritika, Protikar & Ankur**), are only a partial solution to address their pain point related to low income/profitability. They believe that the overall income/profit level of farmers cannot be improved on a long run by only reducing or optimising the input costs. Instead, the focus should be on creating or improving access to equitable markets that offers fair price for the farmers produce considering all the costs and risks incurred by them.



## INSIGHT-2

### **LOW BARGAINING POWER OF SMALLHOLDER FARMERS DUE TO CASH FLOW CONSTRAINTS**

*“The cash flow constraint of the small farmers reduces their purchasing power and limits their risk taking and decision making capacity. This positions them as one of the highly vulnerable stakeholder with very low bargaining power in the entire market value chain.”*

#### **OBSERVATIONS**

*Smallholder farmers have limited and seasonal sources of income. This leaves them with very little or no disposable income to try/adopt new farming techniques and technologies to enhance their productivity. The cash constrained small farmers who cannot access affordable credit/loan facilities to purchase high quality inputs from large dealers, usually end up buying low quality agri inputs that are available with their local agri input retailers who offer short term purchase credits. However, these small farmers fail to notice that they end up paying higher price for low quality inputs, further risking their productivity and profitability due to their dependency on low quality inputs from local retailers in the quest to overcome their cash flow crisis.*



**Lack of 'Cash Flow' reduces the purchasing power and bargaining power of Smallholder Farmers**

*Thus, lack of sufficient cash flow and unavailability of farmer friendly credit facility options forces the small farmers to either compromise into buying low quality agri inputs using their available funds or further increase their financial burden/risk by taking high interest loans to procure expensive but high quality inputs from their local retailers or dealers.*

### INSIGHT-3

#### **HIGH TRANSACTION COSTS FOR SMALLHOLDER FARMERS**

“Farmers with limited market options and low bargaining power are exposed to several market oriented risks that often results in increasing their ‘transaction costs’ along the agriculture value chain.”

#### **OBSERVATIONS**

*Smallholder farmers who are dependent only on local agri input retailers are often not assured of timely access or availability of their desired quality and quantity of input supplies. Also, the inability of these smallholder farmers to assess the quality of inputs and identify ‘value for money’ deals in the market, further reduces their bargaining power in the market.*

*Usually, small farmers living in remote polder areas usually have limited access to wide network of input suppliers and updated market information. Hence, they are at higher risk of incurring losses to their investments if any of the agri inputs are not available for purchase at their local dealer/retailers on time, in line with their cultivation calendar. To overcome any supply chain related risks, individual farmers often have to scout for alternate sources that can supply the desired agri inputs on time and at an affordable price or payment options.*



**Limited access to market and limited market options increases the transaction cost of Small Farmers who want to buy high quality products at affordable price**

*Apart from limited physical access to wide network of input suppliers, these small farmers also face difficulty in getting direct access with the large end buyers in these markets. Due to the inherent complexity and lack of transparency in market dynamics, small farmers with low bargaining power are forced to sell their produces to the market agents (middle men) who exploit them by purchasing their produce at a much lower price than the actual market price.*

*Due to lack of access to appropriate and timely market information; limited physical access to various markets and inherent barriers to directly access/communicate with large market actors (both suppliers and buyers), many smallholder farmers end up spending considerable amount of money and time to build their network of suppliers and buyers and to negotiate a good deal to increase their profitability and to protect themselves from market exploitation.*

#### INSIGHT-4

#### **UNLOCKING THE POWER OF COLLECTIVE ACTION THROUGH 'MFS'**

“ The ‘Collective Action’ approach is helping the MFS farmer groups to augment their overall bargaining power in the value chain by improving their cash flow, purchasing power and market access.”

#### **OBSERVATIONS:**

*The Business Development component of Blue Gold program along with Food Security and Agricultural Production has jointly designed a new and innovative system of Farmer/Producer groups called the **Market Oriented Farmer Field School (MFS)**. The main purpose of MFS is to bring about a change in the approach and attitude of the participating farmers by enabling them to look beyond farm productivity and start taking necessary actions to increase their overall profitability by effectively tackling all the potential market risks. MFS aims to enhance the market orientation of farmers and by facilitating efficient market linkages to expand of their network of market actors for accessing appropriate inputs, technology, market information and finance facilities.*



#### **Market Oriented Farmer Field Schools (MFS) under Blue Gold Project**

Further more, many MFS groups have also initiated collective actions in areas of input purchase and produce selling to counter the issues of high transaction costs and low bargaining power faced by individual small holding farmers. A **Resource Farmer (RF)** is nominated from each MFS to lead any transactions and negotiations with market actors on behalf of the producer group. RFs are compensated by their respective MFS group for their time and effort invested for leading the transactions and successfully closing beneficial deals for the group.



**MFS have higher bargaining power when they practice ‘Collective Selling’ and thus fetch higher market price for their agriculture produce in the**

The member farmers of MFS are experiencing several benefits like;

**1. Increased purchasing power and bargaining power in the market**

- Individual small farmers claimed that they felt more confident, secure and self-sufficient after becoming active member of MFS producer group.
- Collective action initiated by the MFS had effectively increased the bargaining power of the farmers during both procurement of agri input and selling of agri produces.
- Market actors had lower risk perception about small farmers who were part of a MFS producer group, practicing collective action for market transactions.
- Member farmers of groups with own/internal income generating activities command higher purchasing power and easier access to markets.
- Market actors treat the member farmers of MFS with respect and trust due to the higher purchasing capacity of the MFS producer group.

**2. Improved Access to Information, trainings and institutional market support**

- The MFS producer groups can effectively lobby and negotiate for institutional support from DAE, NGOs and even private sector actors like AIRN.
- The MFS producer group provides equal opportunity for all member farmers to access information and training on best practices and relevant agri technologies / techniques.
- MFS producer groups act as a potent platform for knowledge sharing and peer-to-peer learning opportunity amongst the member farmers.

**3. Improved cash flow situation and reduced risks for new technology adoption**

- MFS producer groups that practice monthly groups savings and have other income generating activities are able to offer internal credit facility to meet small cash flow requirements of their member farmers.
- Progressive MFS producer groups own farm machineries as a shared asset. This enables the MFS to offer their member farmers with easy and affordable access to modern farming technologies without the burden of ownership or associated risks.

## INSIGHT-5

### **BALANCING INDIVIDUAL NEEDS WITH GROUP BENEFITS**

*“There is a growing demand from member farmers for MFS initiatives to be more versatile and flexible enough to address specific needs, problems and aspirations of each individual member farmer.”*

### OBSERVATIONS

*The market oriented farmer/producer groups (MFS) activated by Blue Gold Program, is empowering the smallholder farmer with increased bargaining power and easy access to information and institutional support through its innovative collective action approach. In some cases these groups are also assisting the smallholder farmers to access easy internal credit facilities (within the groups) to meet their cash flow needs.*



### **Group Interest often overrides personal preferences for small farmers**

*During Focus group discussions with MFS members, few potential challenges regarding the future prospects of MFS groups beyond project period were highlighted during the discussions. Some of these priority issues were;*

- 1. The collective actions and decisions of the MFS groups might not always be in the favour of some individual farmers. The individual decisions and preferences of member farmers might be highly influenced or overridden by the MFS group decisions.*
- 2. As the group size grows and when the Blue Gold Project withdraws its support, arriving at group consensus with regards to any new collective action initiatives might become tricky and tedious affair.*
- 3. Collective approach of MFS groups may not always be able to address the agronomic needs and operational problems of all its member farmers on case-by-case basis. However, many member farmers will need personalised support to enable them to comply with their MFS group objectives and ambitions.*
- 4. Collective actions based MFS groups are currently active only for few selected crop value chain. Member Farmers may not be able to access few of the key group benefits (like bargaining power and institutional support) as an individual, if he/she chooses to grow crops that are not approved by their MFS for collective action. . In other words, the farmers would like to enjoy some of the key benefits that come with MFS membership even when they act as an individual farmer beyond the MFS mandated crop value chain.*

## INSIGHT-6

### **SUSTENANCE AND GROWTH OF 'MFS' GROUPS BEYOND PROJECT PERIOD**

“There is a strong sense of fear and uncertainty by many MFS groups about their ability to survive and sustain their growth in the face of rapidly changing market situation in the absence of alternate intuitional support structure after the BLUE GOLD project has concluded.”

#### **OBSERVATIONS**

Currently, Blue Gold program is supporting the MFS producer groups by facilitating the establishment of new market linkages to expand their network of both market actors and market enablers for accessing appropriate inputs, technologies, market information and finance facilities. However, there is a growing concern that once the Blue Gold Program has concluded, it might leave a huge void of institutional support structure for these high performing MFS in the polder areas.



**MFS have market credibility due to technical, business and institutional support offered by Blue Gold Project**

Many MFS producer groups might risk losing credibility and trust with the market actors and enablers if they cease to have formal association and support from recognised institution / project. Even though many MFS are performing well under the supervision of Blue Gold Program, they have limited capacity to independently create new market linkages and pursue new business development activities for sustaining and growing their operations without an institutional support. The market linkages established by Blue Gold program can only support the growth of these MFS to certain extent, beyond which they might face challenges of stagnating growth. Not all MFS groups are capable quickly adapting to the ever-changing market system by constantly innovating and diversifying their market approach strategy.

## 7.2. KEY RESEARCH INSIGHTS: 'MARKET ACTORS' (Input Suppliers, Service Providers & Output Buyers)

### INSIGHT-1

#### **CUSTOMER RELATIONSHIP MANAGEMENT (ACQUIRE, MANAGE & RETAIN)**

“The local market actors (input suppliers, LSPs and Output buyers) would highly benefit if they had access to an innovative and affordable tool to effectively acquire, manage and retain their customer base in a cost/time efficient manner possible.”

#### **OBSERVATIONS**

Agri value chain market actors invest a lot of time and effort to build and maintain close relationship with their customers (farmers) to understand their requirement and expectations and accordingly stock their supply with necessary agri input products or design their service delivery system. They often base their business decisions on the customer preference and purchase behaviour information gathered through their local network and relations within the local farming communities. As the customer base of the market actor grows with wide variety of customers (size and type), the process of building relationships and managing the expectations of individual customers (farmers) becomes complicated and expensive.

However, most farmers have the tendency to frequently shift their loyalties. It is challenging and



**Local market actors have to invest considerable time and effort to manage the needs and expectations of each of their individual customers (small farmers)**

expensive to understand the reasons for shifting loyalties of each individual customer and to take action towards mitigating this behaviour among customers. Hence, most of the market actors interviewed believed that it is easier and cost/time efficient to acquire, retain the loyalty of farmer groups than that of many individual farmers.

## INSIGHT-2

### **CASH FLOW MANAGEMENT & CREDIT RECOVERY**

“The local market actors (input suppliers, LSPs and Output buyers) believe that they will be able to serve their smallholder farmers (customers) more effectively and efficiently, if their cash flow management process is simplified and all their credit-based transactions are de-risked.”

### OBSERVATIONS

*Smallholder farmers with cash flow constraints seek credit facility to purchase inputs and services from their local market actors (retailers and service providers). In the absence of farmer friendly credit facilities in the market, farmers tend to expect short-term purchase credits from their local market actors.*



**Local dealers prefer upfront cash payments**



**Retailers have to regularly track the purchase credits and credit recovery status**



*Short-term purchase credits are offered by many local market actors as potent tool to retain the loyalty of their regular customers who can be trusted with timely repayment. However, due to limited financial capacity of the local market actors, they are unable to offer such credit benefits to each and every customer (smallholder farmers). Also, any delay in credit recovery can cause cash-flow crisis for the local market actors who in turn have to pay their vendors/distributors to replenish their inventory/stocks for next season. Thus, many local input suppliers and service providers refuse to offer credit based purchase options to many smallholder farmers, especially for unfamiliar farmers who often make infrequent, small-ticket purchases.*

*It was not surprising that most of the market actors expressed their desire to do frequent business transactions with large farmers or well-organized farmer groups who often make big-ticket size purchases with full cash payment, upfront. Interestingly, these market actors were also willing to offer credit based purchase options against big-ticket size purchases made by farmer groups with credible institutional support or endorsements from NGO projects, Govt. authorities and/or reputed private entities.*



### **INSIGHT-3**

#### **HIGH TRANSACTION COSTS & LOW PROFIT MARGINS**

“The large suppliers and buyers are willing to directly deal with small farmers only if there is an alternate value chain system that keeps their transaction costs per farmer at the bare minimum. While the farmers are willing to adopt an alternate value chain system only if it assures to maximize their profit margin by reducing their risk and cost of transacting directly with large market actors.”

#### **OBSERVATIONS**

*The time invested and cost incurred for every transaction has a direct implication on the profit margin of the market actors. Hence, large suppliers and buyers want to achieve their business turnover targets by engaging in few large size transactions instead of having to deal with many small sized transactions this reducing their overall transaction cost and maximizing their profits. This approach towards transaction and dealings is stopping the large suppliers, service providers and buyers from directly engaging with individual smallholder farmers whose transaction ticket size is usually very small. This has in turn created a market space for retailers/agents who transact with many small farmers and aggregate the business for the large suppliers/buyers.*



#### **Market actors incur a lot of capital and operational expenditures per transaction**

*This arrangement has however reduced the overall earnings of the farmers as their profit margin gets distributed among the retailers/agents for their effort and time invested in bridging the gap between the farmers and the larger market actors. Also, the local suppliers/buyers with limited capacity (time, resource and money) find it challenging to efficiently serve their customer base and further grow their business beyond certain scale due to high transaction costs involved in directly engaging with small holder farmers.*

#### **INSIGHT-4**

##### **INVENTORY MANAGEMENT (DEMAND & SUPPLY)**

“The local suppliers and buyers will be able to offer better price and high quality products and services to smallholder farmers, if they are empowered with accurate market intelligence to efficiently plan their inventory and manage their investment risks.”

##### **OBSERVATIONS**

*Local market actors who have to deal with many small-ticket sized transactions with farmers find it challenging to make accurate demand and supply projections needed to improve their stock and inventory management. Unlike large suppliers and buyers, the local market actors lack both financial capacity and access to accurate market/customer information to make informed business decisions. They are mainly dependent on their local network and contacts to gather necessary market intelligence to plan their investments. Hence, in order to reduce their investment burden and risk, local retailers tend to stock less quantity and variety of products. This makes it challenging for the local market actors to ensure time supply as per demand, without having to keep any customer waiting for their product/service. This further increases the risk of customer dissatisfaction or losing a valuable customer, if they are unable to immediately supply as per the customer demand.*



**Retailers have take stock of their inventory on daily basis to ensure uninterrupted supply of products to their customers**

## 8. CREATE PHASE

The HEAR phase of HCD process was followed by CREATE phase in which, the key research insights were used as an inspiration to conceptualise appropriate solutions to address the major pain points of the farmers and other agriculture value chain actors/stakeholders.

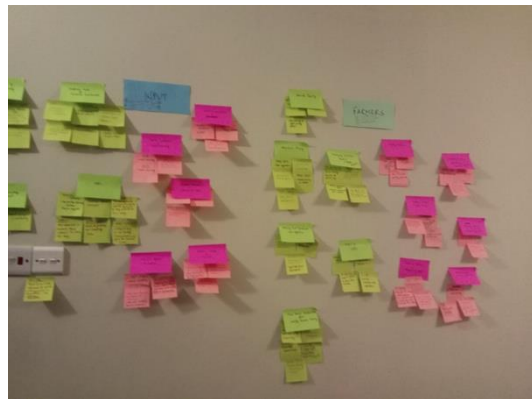
During the CREATE phase, the research team conducted multiple rounds of brainstorming to generate ideas for service delivery. Some of the ideas were developed into concept storyboards and low-fidelity mock-ups (*Minimum Viable Products-MVP*). Concept validation workshops were facilitated by the research team to test the concept MVPs with the stakeholders to see what works best in reality and explore ideas to further optimize the features of the product and service offerings (*'KRISHE' E-Agriculture Service*) from GISB.

At the end of the CREATE Phase of this feasibility study, the research team had an improved concept for commercially delivering the E-Agriculture services via KRISHE digital platform to the farmers that was actually validated/approved by the farmers themselves along with the potential field agents and other market actors and enablers in the agriculture value chain.

### 8.1. 'DESIGN DIRECTIONS' AS A RESPONSE TO 'RESEARCH QUESTIONS'

Unlike a traditional feasibility study in which a proposed solution is assessed to be feasible or not for a given context, the HCD approach goes beyond the scope and explores new ideas for an appropriate solution that is desirable by key stakeholders, feasible to implement and potentially viable to scale up.

During the CREATE Phase, the research team developed a conceptual design direction / strategy for commercialising KRISHE' E-Agriculture services in the Blue Gold polder areas through a series of idea brainstorming sessions based on the key research insights. These preliminary ideas from the brainstorming sessions were refined through multiple design iteration cycles based on feedback from the farmers and other market stakeholders during idea validation workshops.



***Insight Generation & Idea Brainstorming workshop at GISB office***

The research team had developed a set of 4 Research Questions to scope and guide the feasibility study for commercialising KRISHE' E-Agriculture services. The design direction and strategy outcome from CREATE Phase has been synthesised and presented in form of an elaborate response for each of the 4 research questions in the following section below.

**RESEARCH QUESTION-1**

What is the unique value that KRISHE digital platform can offer to farmers in polder areas?

**DESIGN DIRECTION-1**

**'KRISHE' DIGITAL PLATFORM AND ITS VALUE PROPOSITIONS**

On closely analysing the research observations and insights, we have identified few opportunities within the scope of Blue Gold project that can be complemented with 'KRISHE' digital platform based E-Agriculture services to further strengthen the agri market value chains in the polder areas. We believe there is a huge scope for KRISHE digital platform based E-Agriculture services to act as key support system to augment the power of collective action by increasing market transparency and creating equitable market opportunities for both farmers and other market stakeholders.



**Idea Validation Workshop using 'Concept Storyboards' with farmers and market actors**

Through several focus group discussions and validation interviews with various stakeholders, the research team has identified key value propositions (benefits) of KRISHE digital platform and its associated tools for each of the stakeholder segments as listed below;

**KRISHE Value Proposition for Smallholder Farmers**

- Increase their bargaining power as an individual
- Facilitate easy and quick market transactions
- Reduce market risks by increasing transparency in market system
- Reduce overall transaction cost (time, money & effort) by increasing market accessibility

**KRISHE: VALUE PROPOSITION**



**SMALL FARMERS**

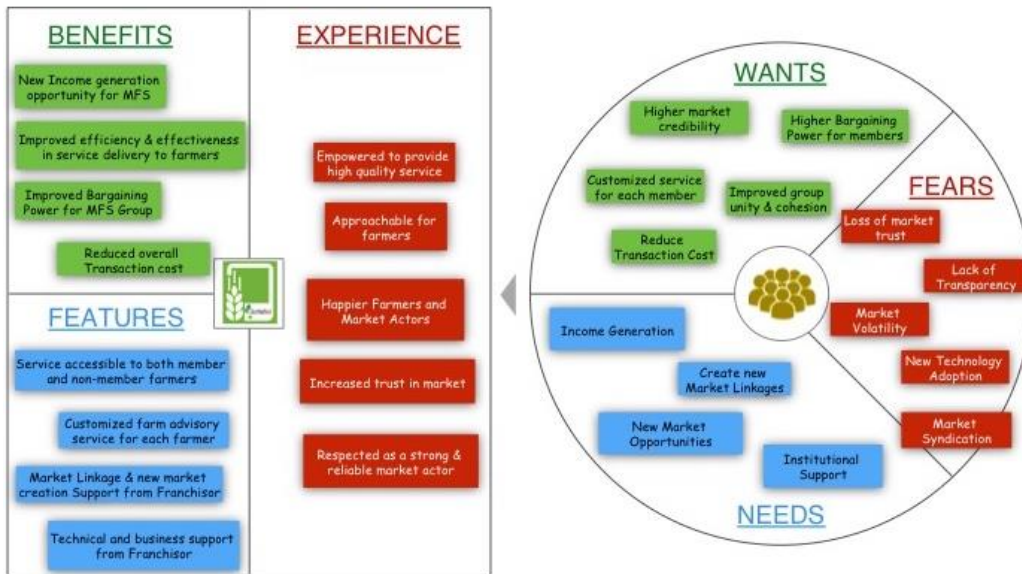


**KRISHE Value Proposition for Market Oriented Farmer Field School (MFS) & Resource Farmers (RF)**

- Improve efficiency and effectiveness of service delivery by RFs
- Empower MFS and RFs with appropriate tools for offering agronomic/technical and market oriented services to farmers (members and non-members) for an affordable fees
- Generate new income generation opportunities for MFS groups to become self sustainable

**KRISHE: VALUE PROPOSITION**

**FARMER GROUPS**

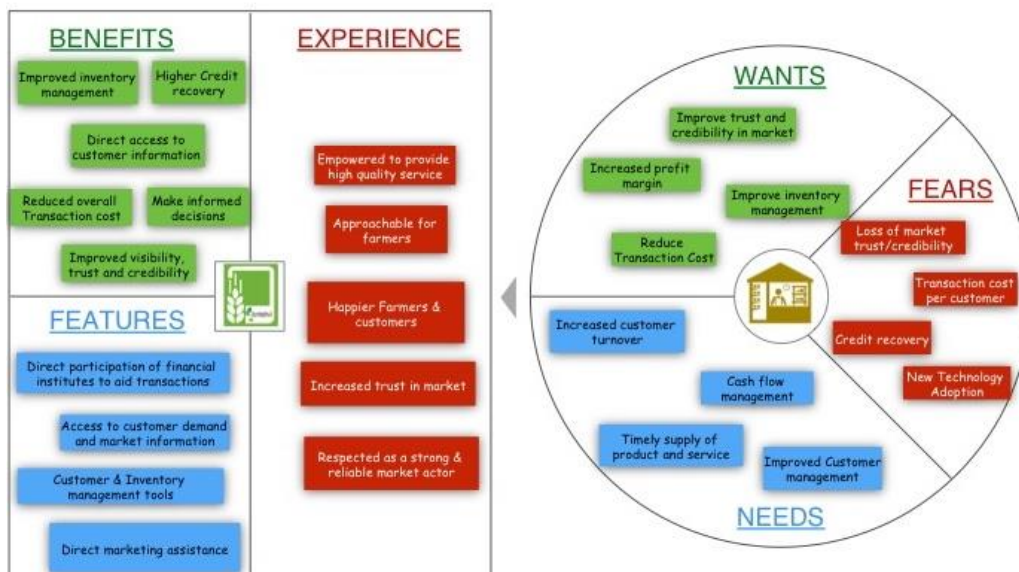


**KRISHE Value Proposition for Market Actors (Local Suppliers, Service Providers & Buyers)**

- Acquire, retain and manage their customer base more efficiently
- Acquire real-time customer related information and market demand
- Improve visibility, trust and credibility in market
- Reduce transaction cost per farmer/stakeholder by aggregating demands and supplies.
- Facilitate direct participation of financial institutes in market transactions

**KRISHE: VALUE PROPOSITION**

**MARKET ACTORS**



## **RESEARCH QUESTION-2**

*Which of the GISB E-Agriculture services are the most relevant and effective carriers of the unique value for the farmers?*

## **DESIGN DIRECTION-2**

### **'KRISHE' DIGITAL TOOLS FOR COMMERCIALISATION**

The research findings suggest that not all E-Agriculture tools under KRISHE digital platform hold equal importance for immediate commercialisation in the researched polder areas. To commercialise a product/service in the market there has to be clear evidence of customer willingness to adopt and pay for that product/service.

KRISHE platform hosts multiple digital tools to deliver a wide range of E-Agriculture services to the farming communities. The deep dive and validation research revealed that some of the E-Agriculture advisory services like; **Digital Soil testing**; Fertilizer recommendation (**Mritika**); Seed recommendation (**Ankur**); and Pest management (**Protikar**) services are mainly perceived as a 'good-to-have' service and not an 'essential' or a 'must-have' service by both farmers and the service providers. The local markets currently have their own formal and informal mechanism/system in place to offer such input advisory services to the farmers for free or at an affordable price. Even though the existing market solutions may not be as effective and efficient in comparison to the E-Agriculture services offered through KRISHE digital platform, they are adequately addressing the needs of the stakeholders without any serious concerns yet.



### **Idea Validation Workshop using 'Service Mock-up (MVP)' with farmers and market actors**

During the validation research, many farmers and other market stakeholders recognised the benefits of using KRISHE digital tools (*Digital Soil Testing, Mritika, Ankur & Protikar*) to access accurate and timely advisory services. The Agri Extension Workers (SAAO) and Agri Entrepreneurs (LSPs & Resource Farmers) believe that these KRISHE digital tools will improve the quality of their services delivery but were not convinced about charging an extra premium from the farmers for using these digital tools. Without a strong consumer demand or policy push for a digital tool aided agri services as an alternative for the existing agri services, there is very little incentive for the extension workers and the agri entrepreneurs to self-invest on these digital tools. Similarly, most farmers appreciated the idea of equipping the Agri Extension Workers (SAAO) and Agri Entrepreneurs (Resource Farmers) with KRISHE digital tools (*Digital Soil Testing, Mritika, Ankur & Protikar*) to disburse advisory services more

effectively and efficiently. Despite of all the enthusiasm and positive response, many respondents preferred to opt for existing market options of free advisory services available through traditional channels rather than paying a small fee to access KRISHE digital tool based advisory services. To convert the customer interest in to customer purchase, GISB and Blue Gold program will have to invest considerable amount of time and effort to demonstrate the actual value addition and long-term commercial benefits that come from adopting KRISHE digital tool based E-Agriculture advisory services. Hence, before commercialising any **E-agriculture advisory services** using of the above-mentioned KRISHE digital tools (**Digital Soil Testing, Mritika, Ankur & Protikar**), GISB should first launch a **technical demonstration pilot** in the polder areas to gain the much-needed trust to overcome the technology adoption barriers amongst all stakeholders.

While, this research does not indicate immediate prospect for commercialising any of the E-Agriculture advisory tools available on KRISHE digital platform, there was an overwhelming response for the idea of commercialising 'Vistar' a market linkage tool, which is also available on KRISHE digital platform. 'Vistar' is a high potential and versatile market linkage tool that can help farmers get improved access to both input suppliers and forward market actors. Getting access to profitable and equitable markets is the biggest pain point that has been highlighted by almost all the farmers and farmer groups that were interviewed during the research.

Blue Gold program is helping small farmers get better market access through innovative interventions like 'Market Oriented Farmer Field School' (MFS), and promoting 'collective action' as an effective strategy to improve their bargaining power in the markets. Currently, MFS groups with collective action approach have been successfully established for few selected crop value chains like Sesame and Mung beans. These MFS groups are expected to sustain their growth even after the Blue Gold project has concluded in 2019. MFS groups will have to continuously innovate and diversify their crop value chain to remain relevant in the market and achieve sustained growth. Without a strong institutional support system like Blue Gold project, many MFS groups will struggle to create and sustain strong market linkages and make informed decisions in response to the changing market scenarios. This is where KRISHE digital platform can play a vital role in the sustenance of MFS groups by offering updated market/technical information and support services across wide range of crop value chains. We believe that by commercialising the market linkage tool (Vistar) on KRISHE digital platform, the demonstrated impact of collective action/market aggregation by Blue Gold project can be effectively sustained and further scaled up to other farmer groups/MFS and individual small farmers.

Hence we recommend GISB to launch a **commercial pilot project** in selected polder areas to introduce their **market linkage tool (Vistar)** on KRISHE digital platform as a '**paid service**' for farmers and farmer groups under Blue Gold project. This can be followed by a gradual and phased introduction of **KRISHE advisory service (Mritika, Ankur & Protikar)** and **Digital Soil Testing service** as either an **additional value added service** or an **optional paid service** to the willing farmers from the established customer base for Vistar service.

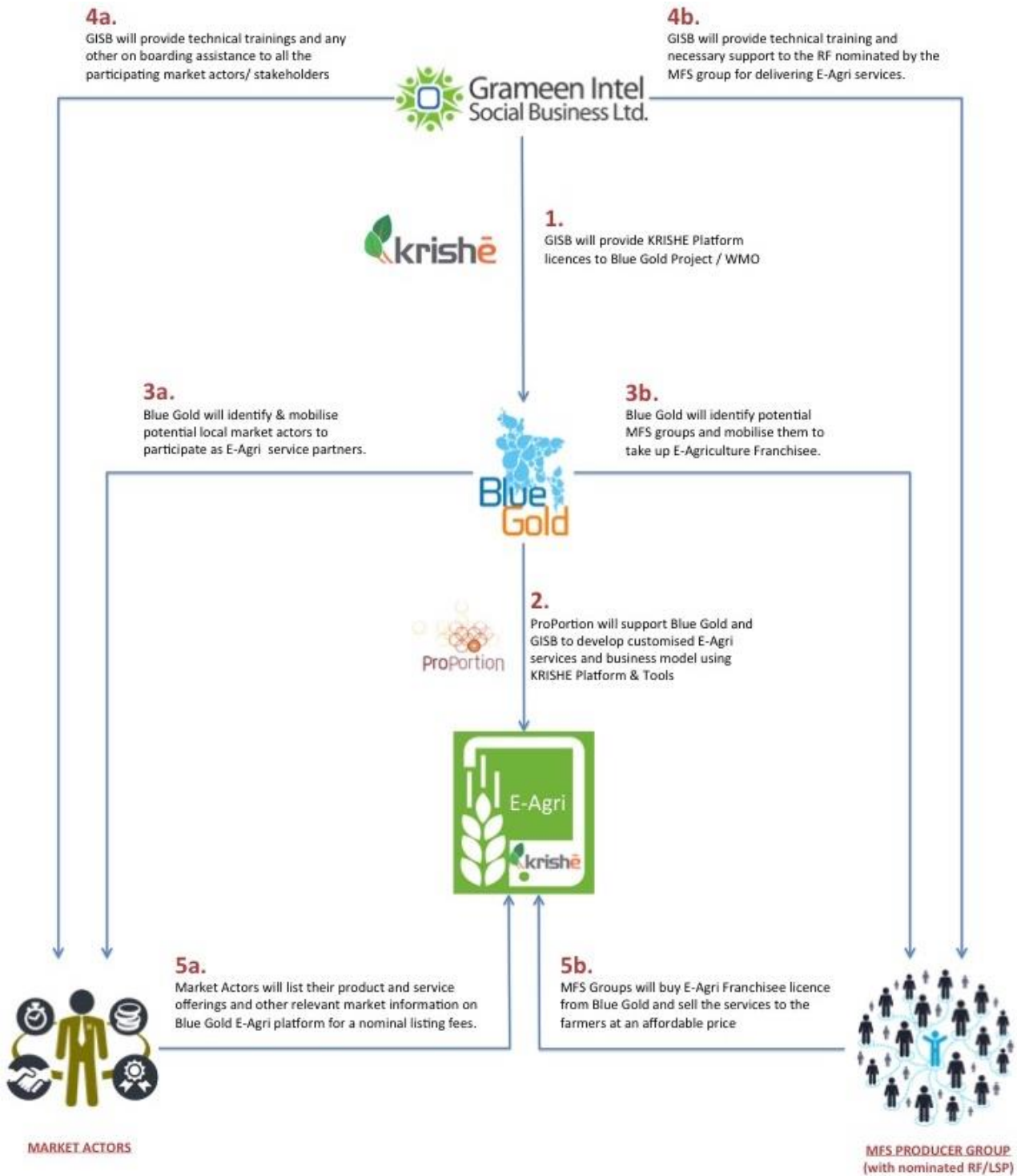
### **RESEARCH QUESTION-3**

*Who are the early adopters? What needs to be done to get the early adopters in the polder regions to try/adopt the E-Agriculture tools & services?*

### **DESIGN DIRECTION-3**

#### **SERVICE ECOSYSTEM FOR COMMERCIALISING 'KRISHE' E-AGRICULTURE PLATFORM & VISTAR TOOL**

The biggest challenge to successfully commercialise an E-Agriculture services is to acquire critical mass of paying customers (early adopters). This challenge becomes more critical if the E-Agriculture service being commercialised is targeting to define a new service category or a new business stream and has very little existing references and competitors. We have tried taking on this challenge by defining a simple 'service ecosystem' specifically for Blue Gold project context. To create an ideal service ecosystem in which KRISHE digital platform will be commercially piloted as an E-Agriculture service, we have identified some of the key stakeholders and their roles for the proposed service model.



*Proposed 'Service Ecosystem' concept for commercialising the KRISHE E-Agriculture services in Blue Gold polder areas.*



### KRISHE' TECHNOLOGY PROVIDER

**Grameen Intel Social Business Pvt. Ltd. (GISB)** will be providing **Blue Gold project** (*primary customer*) with commercial user licences for KRISHE digital platform along with necessary technical training and after sales customer support.

GISB will first consult with Blue Gold project, Department of Agriculture Extension (DAE), Market Oriented Farmer Field School (MFS) and other market actors (Suppliers and buyers) to develop a highly customised KRISHE platform with market linkage tool (Vistar) activated as the core service tool. Vistar tool will be custom built as per the local context to ensure that it can include/host all the relevant local agri value chain actors on the platform to enable smooth service delivery and transaction experience for the farmers. GISB will provide all necessary technical support to Blue Gold project to ensure that KRISHE platform and its associated tools will perform flawlessly as per the stakeholders' service delivery expectations.

### SERVICE FRANCHISOR

To successfully demonstrate the commercial viability a service-business model for KRISHE digital platform; the pilot project will need a strong '**Service Franchisor**' to develop and manage customised E-Agriculture services using KRISHE digital platform. We believe, **Blue Gold project** is well positioned to act as a '**Service Franchisor**' during the pilot project due to its strong influence on MFS Farmer groups, extensive field presence and strong working relationships with various market actors and market enablers. As a **Service Franchisor**, Blue Gold will first **purchase commercial user licenses** of KRISHE digital platform from GISB.

To monetise the investment made on the purchase of KRISHE user licences, Blue Gold project will develop customised **E-Agriculture services** to facilitate **market linkage creation** using **Vistar** tool on KRISHE platform. GISB will provide necessary technical training and assistance to use KRISHE platform and its associated tools for developing customised E-Agriculture services. Blue Gold will offer its E-Agriculture service for market linkage creation to farmers against a small service fee through its network of **service franchisees** in the polder areas.

We envision, a private firm or a social enterprise to take up the role of 'Service Franchisor' from Blue Gold project if the commercial pilot successfully demonstrates market viability for the KRISHE platform based E-Agriculture service for market linkage creation.

### SERVICE FRANCHISEE HOLDER

Blue Gold can capitalise on its rich experience and expertise in facilitating market linkages for MFS to develop customised E-Agriculture based market linkage services using KRISHE platform. However, it will have to rely on a **strong network of franchisees** to effectively deliver its E-Agriculture services to the farmers.

Blue Gold project has established several **Market Oriented Farmer Field School (MFS) groups** in its polder areas. These MFS groups are well trained by Blue Gold project to enhance the market orientation of farmers by facilitating market linkages with wide network of market actors for inputs, technology, market information and finance facilities. Hence, MFS groups are most suitable stakeholders to take up the role of **E-Agriculture Service Franchisees** to deliver the E-Agriculture market linkage services to farmers for a small service fee. Blue Gold project will develop the service and business framework/protocols for the MFS to act as service franchisee holder. The **franchisee holders (MFS)** will receive business development and marketing support from Blue Gold project and its partners.

### LOCAL SERVICE PROVIDERS

MFS groups are business entities that hold franchisee licence from Blue Gold to distribute its E-Agriculture services in its polder area. The **Resource Farmer (RF)** nominated by these Franchisee Holding MFS groups will be trained as the **E-Agriculture local service provider** to deliver E-Agriculture based market linkage services to farmers on behalf of the MFS (Franchise holder) group.

GISB will offer the E-Agriculture local service provider (RF) with relevant technical trainings and support to use KRISHE digital platform to deliver Blue Gold's E-Agriculture market linkage services to the farmers as a paid service. E-Agriculture service providers (RF) will receive trainings on service delivery and customer support from Blue Gold project and its partners.

#### **SERVICE PARTNERS**

The E-agriculture market linkage service developed by Blue Gold using KRISHE digital platform is of not any value to the farmers (paying customers) unless the KRISHE E-Agriculture platform has on boarded all the relevant market actors and market enablers with whom the farmers (paying customers) would want to transact and interact with.

The service franchisor will have to actively engage with relevant market actors (input suppliers, service providers and agri produce buyers) and market enablers (DAE, BADC, BARI, NGOs, etc.) to develop a service partnership for the E-Agriculture service. The service partnership agreement will allow the market actors and enablers to actively participate on the KRISHE platform to directly interact and transact with farmers.

#### **SERVICE CUSTOMERS/CONSUMERS**

The member farmers of MFS groups will be the early adopter customers for Blue Gold's E-Agriculture based market linkage service, delivered through Local Service Provider (Resource Farmer) nominated by the MFS group. The non-member farmers will also be able to access E-Agriculture service from the nominated Local Service Provider of the MFS group by paying a slightly higher service fee than the member farmers.

The individual farmers paying for the Blue Gold's E-Agriculture service will have access to wide range of market actors and enablers participating on the KRISHE platform. KRISHE platform will also provide a safe and transparent environment for the farmers to directly interact, negotiate and transact with the market actors of their choice. Local service providers will facilitate any interactions and business transaction between the farmers and the market stakeholders with an intention to safeguard the interest and safety of the farmers.

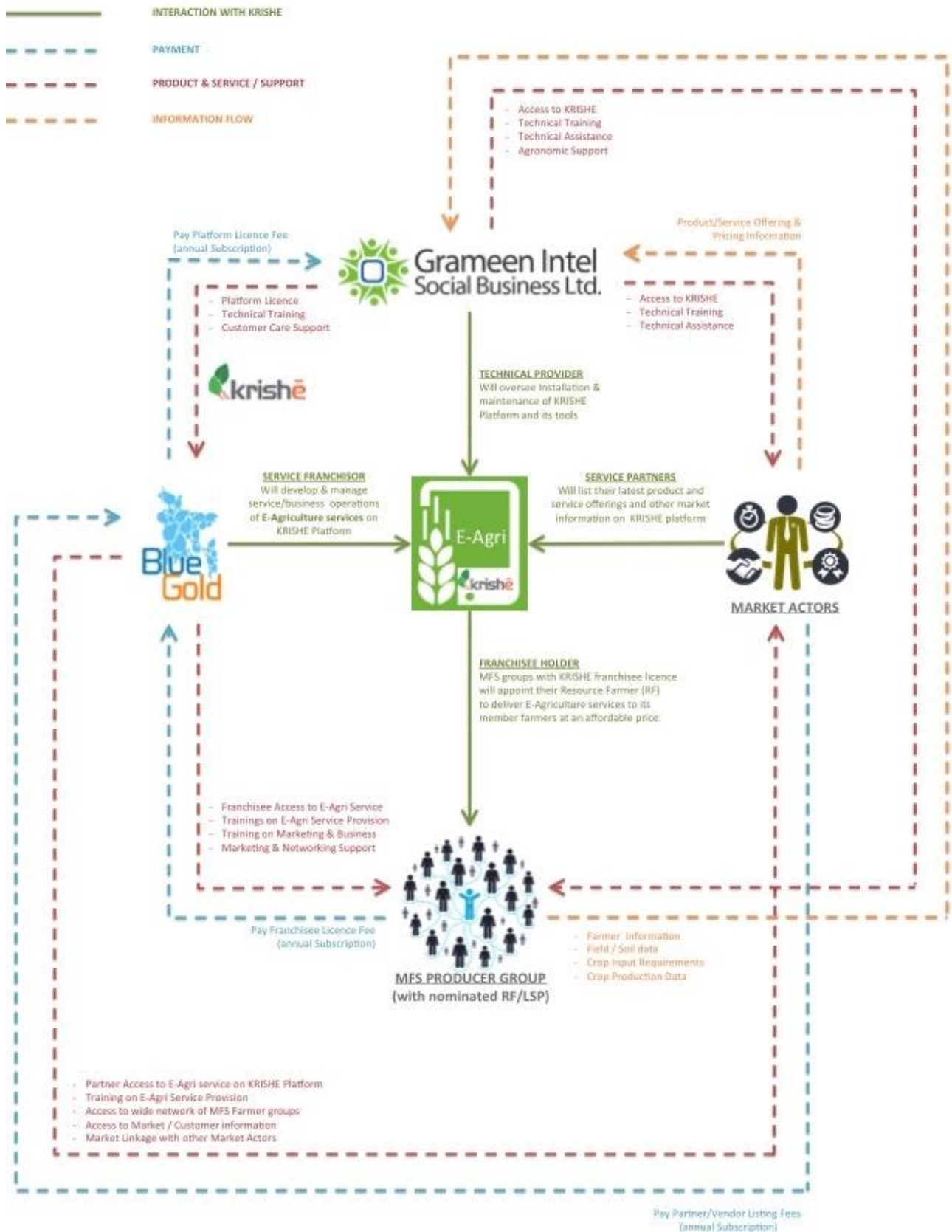
#### **RESEARCH QUESTION-4**

What could be the most suitable service delivery model and service business model for commercialising the 'KRISHE' E-Agriculture services?

#### **DESIGN DIRECTION-4**

##### **SERVICE DELIVERY & BUSINESS MODEL FOR 'KRISHE' E-AGRICULTURE SERVICES**

A detailed service delivery and business model for 'KRISHE' E-Agriculture services is illustrated below with description about stakeholder interactions/relations, information flow, revenue flow and support structure.



**Proposed 'Service Delivery-Business Model' concept for commercialising the KRISHE E-Agriculture services in Blue Gold polder areas.**

## 8.2. RISKIEST ASSUMPTIONS OF DESIGN CONCEPT

The feasibility study concluded with design concept proposal for both service delivery and business model for KRISHE E-Agriculture services. The proposed concepts were validated through low fidelity prototype testing workshops with the potential customers and other market stakeholders. Low-fidelity prototype testing workshops can only pre-empt some of the basic assumptions related to customer desirability, market feasibility and commercial viability of the proposed concept solution. These validation workshops cannot test and validate the concepts for real life scenario. Hence, we acknowledge that the proposed design concepts are still in their primal stage and far from ready to be commercially deployed in the market. The proposed concept is assumed to work flawlessly in ideal conditions and the real life conditions are far from ideal. Thus, to reduce the probability of failure during commercial deployment, the research team has further scrutinised the design concepts and identified some of the riskiest assumptions that needs be tested and validated in a real life setting.

### TECHNICAL ASSUMPTIONS

- GISB will develop customised E-Agriculture Suite on KRISHE platform with VISTAR as the core tool to offer forward market linkage service to the farmers.
- The customised KRISHE E-Agriculture suite developed by GISB will act as virtual market platform to facilitate seamless interactions and safe transactions between farmers and all types of market actors and market enablers at both local and national level.

### VALUE ASSUMPTIONS

- KRISHE will provide farmers with better access to a large number of Agri produce buyers and input suppliers at both local and national level.
- Farmers will be able to sell their agri produce at higher price and buy agri inputs at lower price via KRISHE platform.
- KRISHE will further improve the bargaining power and market influence of MFS groups.
- Market actors will have better access to customer (farmer) demand information and gain increased visibility among farmers via KRISHE platform

### CUSTOMER ASSUMPTIONS

- Farmers are willing to adopt 'KRISHE' E-Agriculture service as a platform to access and transact with the agriculture value chain market actors
- MFS groups are capable of being franchisee holders for 'KRISHE' E-Agriculture service
- MFS groups are willing to offer 'KRISHE' E-Agriculture services to individual farmers (both members and non members) as a paid service.
- Local and national level market actors are willing to participate on 'KRISHE' platform as service partners

### BUSINESS ASSUMPTIONS

- Farmers see value for money in subscribing to 'KRISHE' E-agriculture services to directly access and transact with relevant market actors.
- MFS groups are voluntarily willing to buy 'KRISHE' franchisee license from the franchisor (Blue Gold)
- MFS groups with 'KRISHE' Franchisee license can easily earn back their investments by selling E-Agriculture services to farmers.
- Market actors are willing to pay subscription fees to list their products and services on the 'KRISHE' E-Agriculture platform.
- Private entities or social enterprises are willing to buy commercial licenses of 'KRISHE' platform from GISB to become the Franchisor for E-Agriculture services.



#### **4. KRISHE: PRODUCT DEVELOPMENT (12 WEEKS)**

GISB will develop customised version of KRISHE platform with contextualised market information built in to the backend of the platform. GISB will work closely with all the local market actors to gather all relevant market, product and pricing information that needs to be incorporated in to the KRISHE platform.

#### **5. MOBILISE AND ACTIVATE MARKET STAKEHOLDERS (6-8 WEEKS)**

The product development phase will be followed by stakeholder activation and mobilisation process. As a part of this process, GISB will conduct orientation workshops and technical trainings to on-board major stakeholders like Blue Gold (Service Franchisor), MFS groups (Service Franchisees) and selected market stakeholders (Service partners). Stakeholder activation process will be followed by technical trainings for all the local service providers who are nominated or appointed by the participating MFS groups (Service Franchisee).

#### **6. MOBILISE CUSTOMERS / FARMERS (6-8 WEEKS)**

Before the commercial launch of KRISHE: E-Agriculture service, the target customer segment (member farmers) have to be mobilised through awareness creation sessions and service demonstrations to gain their trust and address any technology adoption concerns before official launch of the commercial pilot.

#### **7. LAUNCH COMMERCIAL PILOT (16 - 20 WEEKS)**

KRISHE: E-Agriculture Service is commercially launched in the selected polder areas after successfully activating all the service stakeholders and mobilizing the customers. KRISHE service will be piloted as paid service over a period of at least 16 to 20 weeks for evaluating the;

- Market feasibility and commercial viability of the proposed business model
- Impact and benefit of the proposed service model to the paying customers (farmers).

#### **8. EVALUATE AND IMPROVEMENT CYCLE (8-12 WEEKS)**

At mid term of the pilot, we will have an evaluation and improvement cycle. We will conduct various qualitative interviews and focus groups to harvest the experiences of the agents and farmers in delivering and accessing the 'KRISHE' E-Agriculture services. Based on the service experience, we can further fine-tune the design of the service and the service delivery model.

#### **9. CONTINUATION OF PILOT**

The agents will update their service and service delivery based on step 9, and continue the pilot.

#### **10. DEVELOPMENT OF BUSINESS PLAN FOR SCALE UP**

Based on the performance of the agents and the feedback of the farmers and other stakeholders engaged, we are able to fine tune the business case of a single agent, as well as the business case for a sustainable system (e.g. franchise organisation) to support the agents in the field. We will further optimise the scale-up strategy and the design of that support system, to enable scale-up within the initial regions as well as the replication of the model to other regions. The relevant partners for scale-up will be engaged in this process that leads to a business plan and financial need to enable scale.

## EPILOGUE

The feasibility study has been a very interesting opportunity to actually design concept directions that can have huge impact on farmers. The ProPortion team members enjoyed the collaboration with BGIF and GISB being part of this human-centered design process. Since we see potential in further deploying the recommended model, ProPortion would desire to further take lead in the next phases of the human-centered design methodology.

For that to happen, we desire to continue with the current partners. This would require willingness and ability to prototype a contextualised agri-service portfolio and service delivery model by GISB. We also desire an even more intense collaboration and ownership from BGIF to prototype and pilot the franchise support system, and jointly design the mechanics of such a franchise system, that can be later transferred into a dedicated entity or to an organisation that is interested to adopt and operate this franchise model as part of their business portfolio.

We therefore would like to invite GISB team and BGIF team to co-write a pilot proposal during March and April 2018, with the intention to submit this to BGIF and potential other financiers if needed.

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