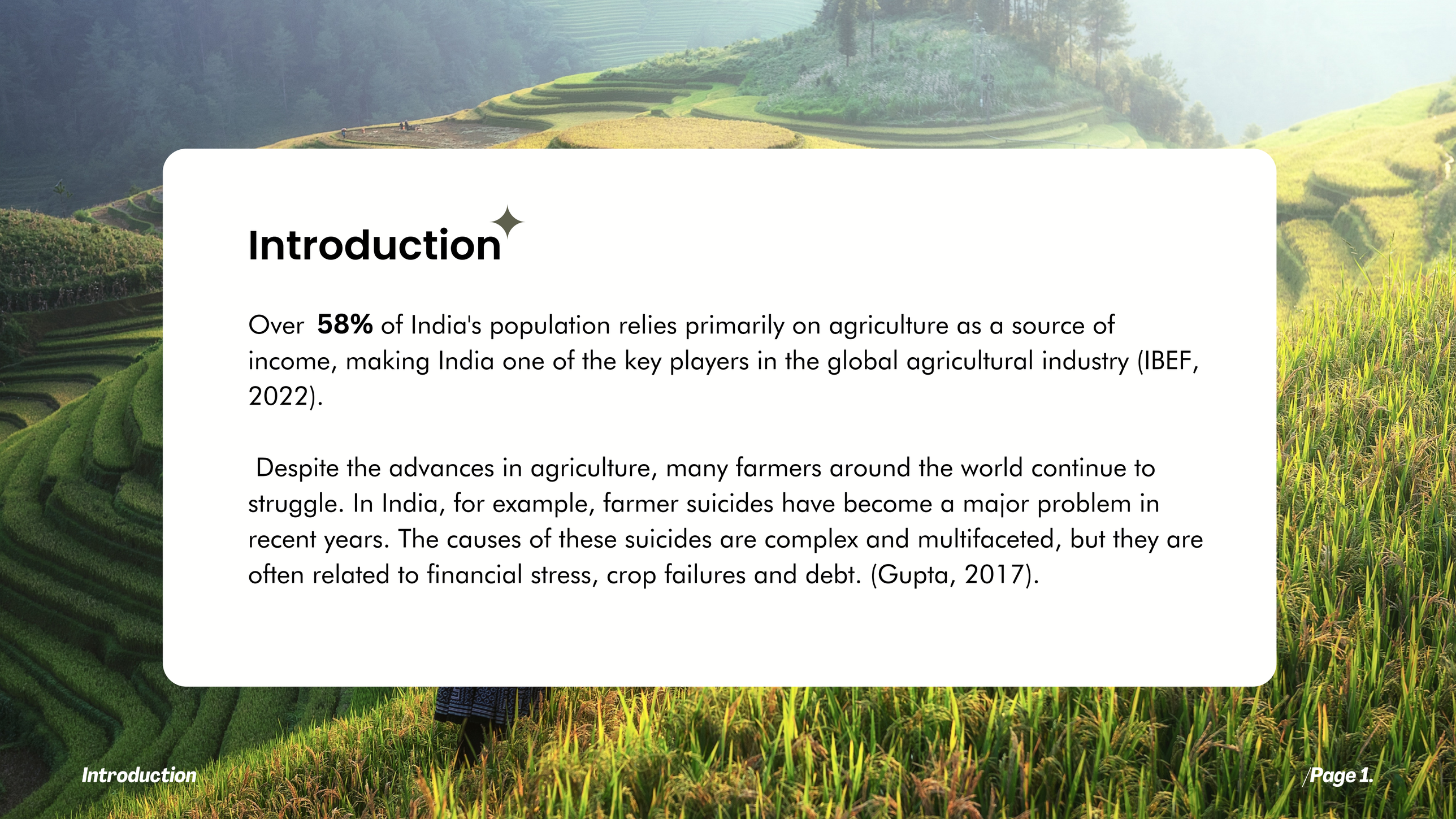
Modern technology
For not so modern Farmers

Application for the NEXT HALF BILLION



Introduction

Over **58%** of India's population relies primarily on agriculture as a source of income, making India one of the key players in the global agricultural industry (IBEF, 2022).

Despite the advances in agriculture, many farmers around the world continue to struggle. In India, for example, farmer suicides have become a major problem in recent years. The causes of these suicides are complex and multifaceted, but they are often related to financial stress, crop failures and debt. (Gupta, 2017).

Do you know how many farmers resort to drastic measures every year?

Not 50. Not 100. Not even 500.

But thousands.

5500 farmer suicides in 2020 alone.

Now, why do they resort to such drastic measures?

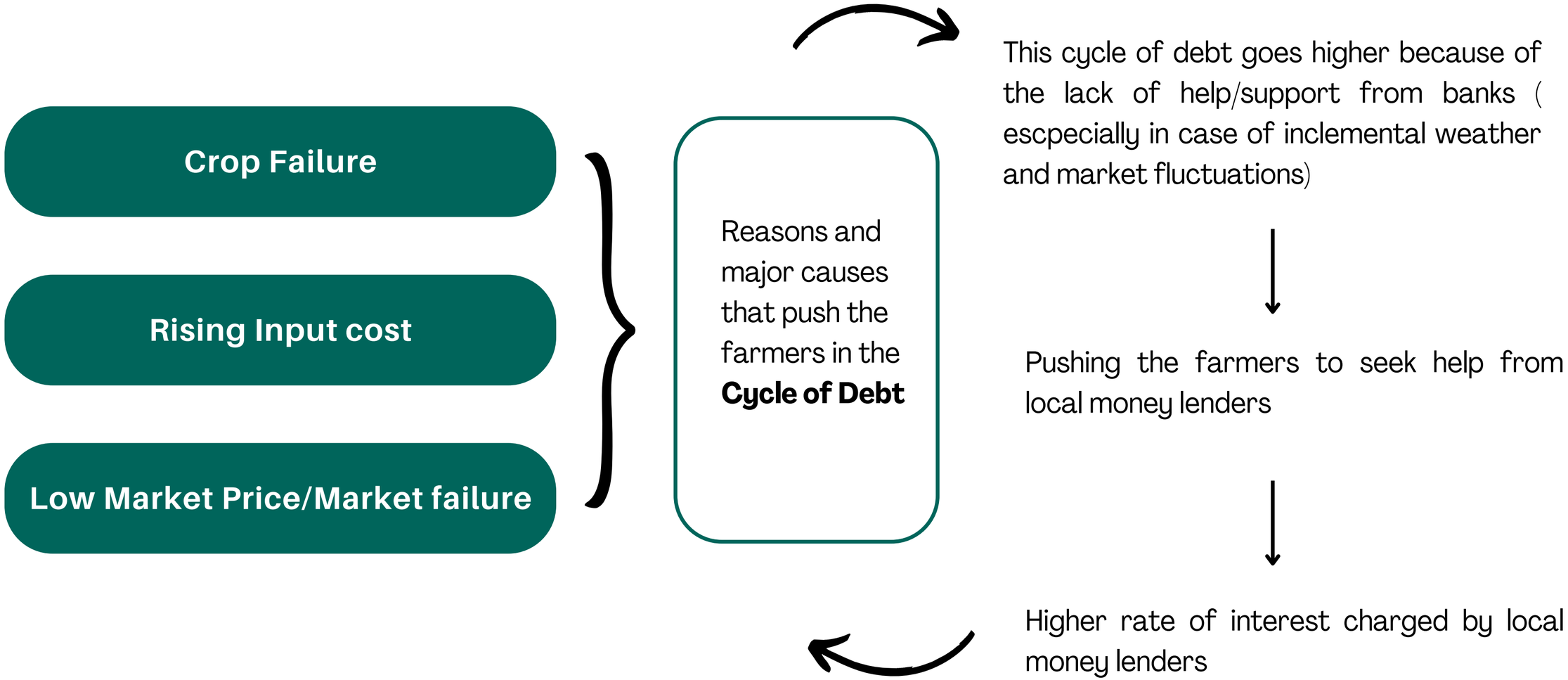
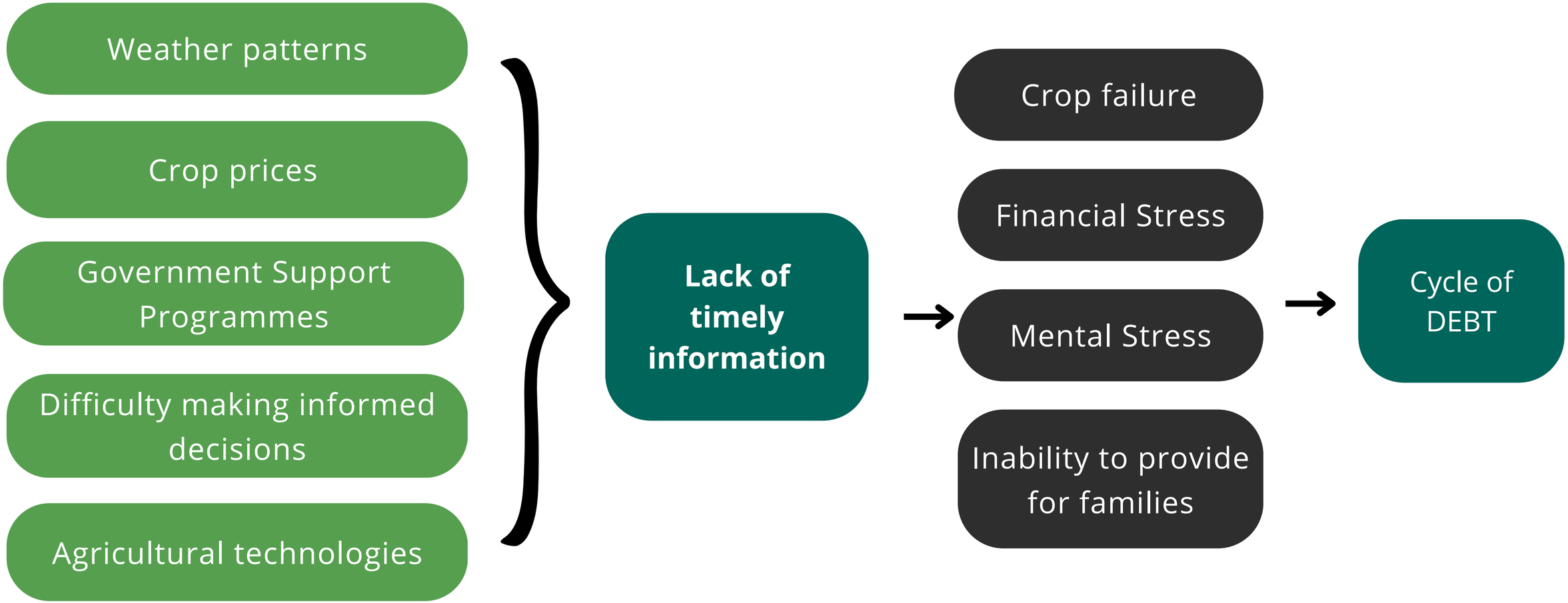


fig. how farmers fall into this cycle of debt

These kind of problems do not see the light of the day and all this is merely caused because of the **lack of timely information**



There are a lot of other problems also that increase the intensity of the situation:

- Shortfall in Government measures, **focusing mainly on boosting crop productivity and production** without considering the impact of higher output on prices in a surplus situation. Secondly there are no proper warehouses or storage units therefore the harvest can perish.

- PMFBY gives protection against crop failures but farmers also face **market failures**

- Technological interventions are not user friendly

- MSP is only restricted to major crops like paddy, rice and wheat

Source: IAS express, Accessed on 20 April at 5:40 pm

Furthermore

Agriculture sector is a segment that caters to the whole world, but when it comes to designing something Technologically advanced for the farmers, there are a lot of challenges.

Source: Times of India, Accessed on 17 Jan 2023, at 1:00 pm

Most farmers today fall under the "Next Half Billion," first-time internet users coming online via their mobile phones in the five years till the end of 2022. (Financialexpress, 2022)

Source: Financial Express, Accessed on 20 Jan 2023 at 2:20 pm

Next Half Billion (NHB)

The NHB have lower education levels, different language skills (comfort with local languages over English), and different social and cultural milieus. NHB Users are not like our regular app users. Therefore understanding these users further can help in making better and impactful products

Source: Financial Express, Accessed on 20 Jan at 2:20 pm

It is important to understand them and how they interact with Technology, their lifestyle, their mobile usage patterns, value systems for NHB users, etc., to be able to develop a product that has a good retention rate and benefits the Target Audience/Customer (Farmers in this case).

Source: NextHalfBillion , Accessed on 22 Jan at 5:10 pm

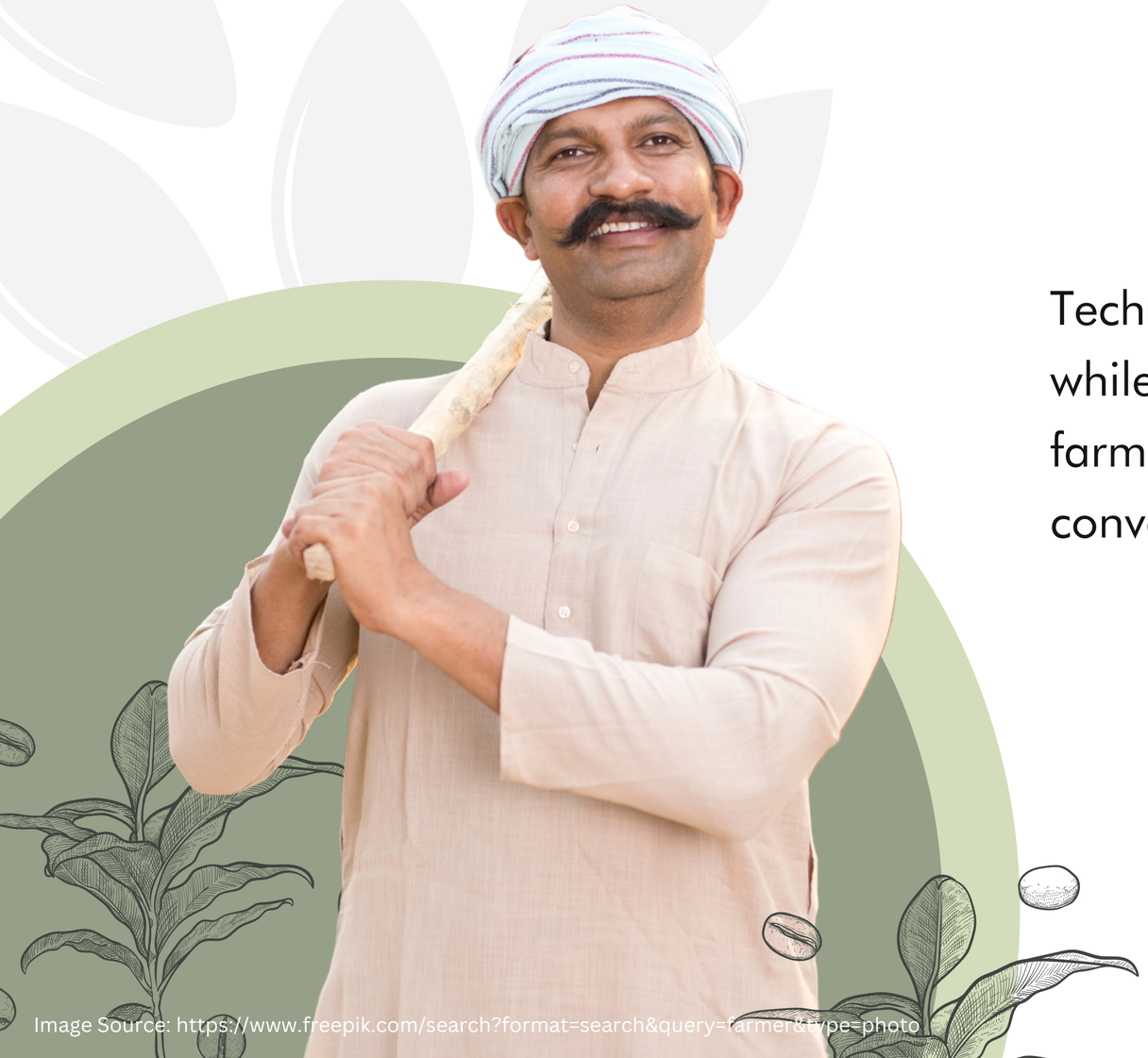


Image Source: https://www.freepik.com/search?format=search&query=farmer&type=photo

Technology is something that is new for a lot of farmers, while it can benefit them significantly it is important that farmers understand that and are able to use it conveniently.

Keywords: Next Half Billion, Value Systems, Usage patterns

Objectives

- To study the agricultural problems faced by Indian farmers
- To identify the problems faced by farmers while interacting with Technology and different types of applications
- To design an application that caters to the day-to-day farming needs of the farmers
- To test the application with the user base of Absolute company.

Image Source: Self clicked

Review of Literature

1

Farmers' Suicides in India – Reasons, Initiatives, Challenges & Solutions

- Indian agriculture heavily depend on monsoon, limiting crop diversification to a great extent.(IAS express)

- Fragmented land holdings result in low productivity and hinder infusion of technology and new farming techniques.

According to the National Crime Records Bureau (NCRB) report, the number of agricultural labourers who died by suicide in 2020 was 18% higher than the preceding year. But suicides among landowning farmers decreased slightly during the pandemic year.

Image Source: Self clicked

2

Determinants of farmers' interestin and readiness to adopt applications

With the development of the internet and increased worldwide connectivity, there is now a significant opportunity to improve farmers' means of subsistence through technological advancements like mobile applications. Sadly, many farmers have not properly utilized these advantages. Issues including inadequate knowledge and abilities for using mobile devices and applications. (Diaz, 2021)

3

Understanding mobile usage patterns of Rural India

instead of engaging with the UI of the phone they engage with the physical aspects of it, memorize where to tap to perform an action, use their spatial memory, gestures, patterns and colors to use the phone
(Milind Kaduskar, 2019)

Image Source: Self clicked

4

Understanding mobile usage patterns of farmers

In order to understand the mobile usage patterns we need to understand the user.

The farming community can broadly be categorized into three personas :

Traditional farmer

Rely on the traditional methods of farming and cultivation.
These farmers are the major ones who now fall into the NHB category.

Progressive farmer

Farmers who use current/modern technology or a different non-conventional farming method to harvest/produce crops

Newbie farmer

People who just recently started or will start farming in the near future to sustain themselves or as a career option

Image Source: Self clicked

5

Understanding Value systemsfor NHB users

For the product to be a success and for it to have a high retention rate it is also imperative to know and understand the people, culture, beliefs, literacylevel of the regions for which the digital product is being made.

Key points to keep in mind"

- Language barriers (Nikam, 2020)
- Literary rate (Tali, 2015)
- Comfort level with applications
- Understanding level of a smartphones UI
- Understanding of choice
- Mental model of applications used by hem like Whatsapp, Facebook,Youtube, etc ((Nikam, 2020)
- Voice based navigation

- **Understanding Value systems for NHB users**

For the product to be a success and for it to have a high retention rate it is also imperative to know and understand the people, culture, beliefs, literacy level of the regions for which the digital product is being made (Diaz, 2021) Accessed on 17.1.23 at 3:00 pm

- **Mobile app usage patterns of rural India and farmers**

They engage with the physical aspects of it, memorise where to tap to perform an action, use their spatial memory, gestures, patterns and colours to use the phone (Milind Kaduskar, 2019) Accessed on 17.1.23 at 3:00 pm

Key insights from Review of Literature

Lower eduation levels
(Diaz, 2021) (Nikam V. ,2020)

NHB and New smart phone users

109 million Smartphone users in rural india
(Sharma, 2017)

Phone usage via spatial memory

No/ very less interaction with the UI
(Nikam, V. (2020)

Mental model as per WhatsApp, Facebook, YouTube usage is high

Color contrast

Low data based requirements

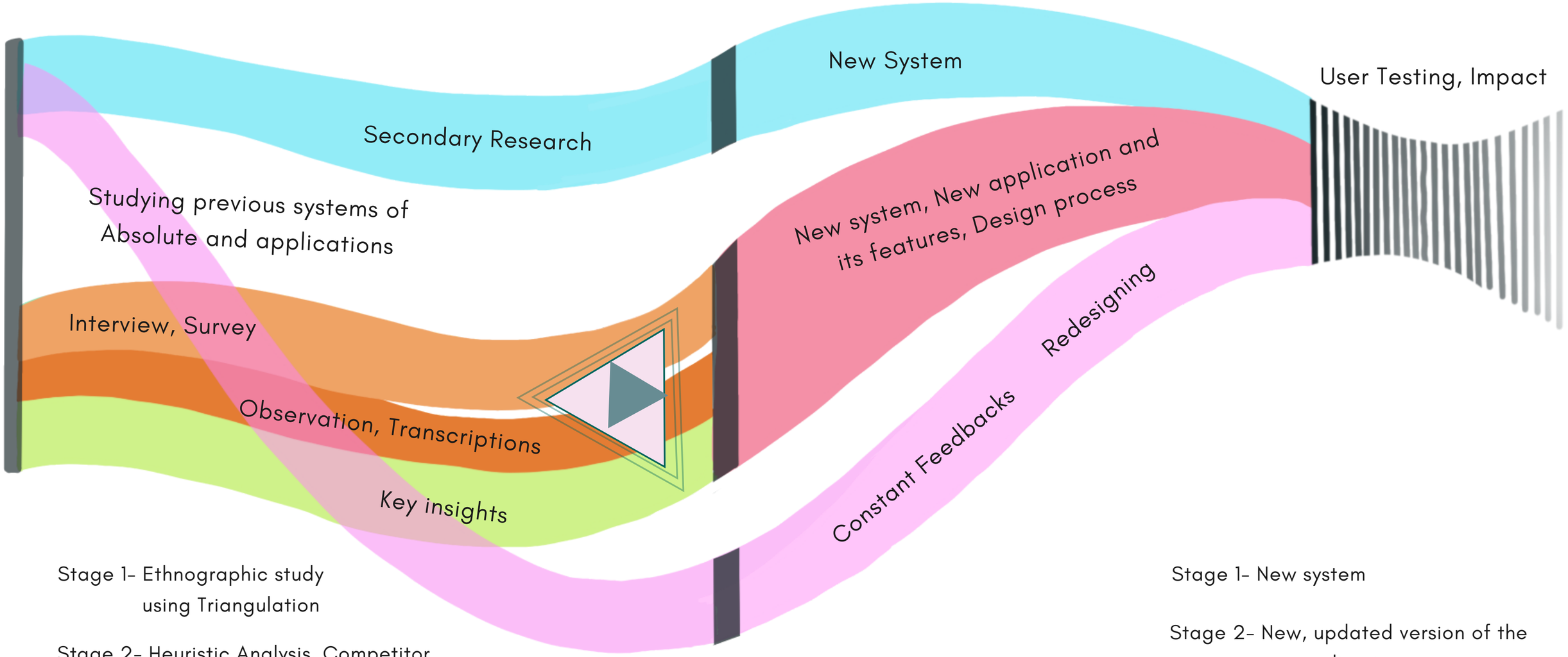
Understanding of choice

Problem in understanding CTAs

Language barriers

Farm school

Methodology



Stage 1- Ethnographic study
using Triangulation

Stage 2- Heuristic Analysis, Competitor
analysis of the existing application

▲ -Triangulation method

Solution Framework

Stage 1- New system

Stage 2- New, updated version of the
application

Stage 3- User Testing and Impact

Primary research was majorly divided into two stages:

- Triangulation method
- Observation study
- Pain areas

Ethnographic study

15 farmers

↓

Understanding overall problems

Telephonic survey

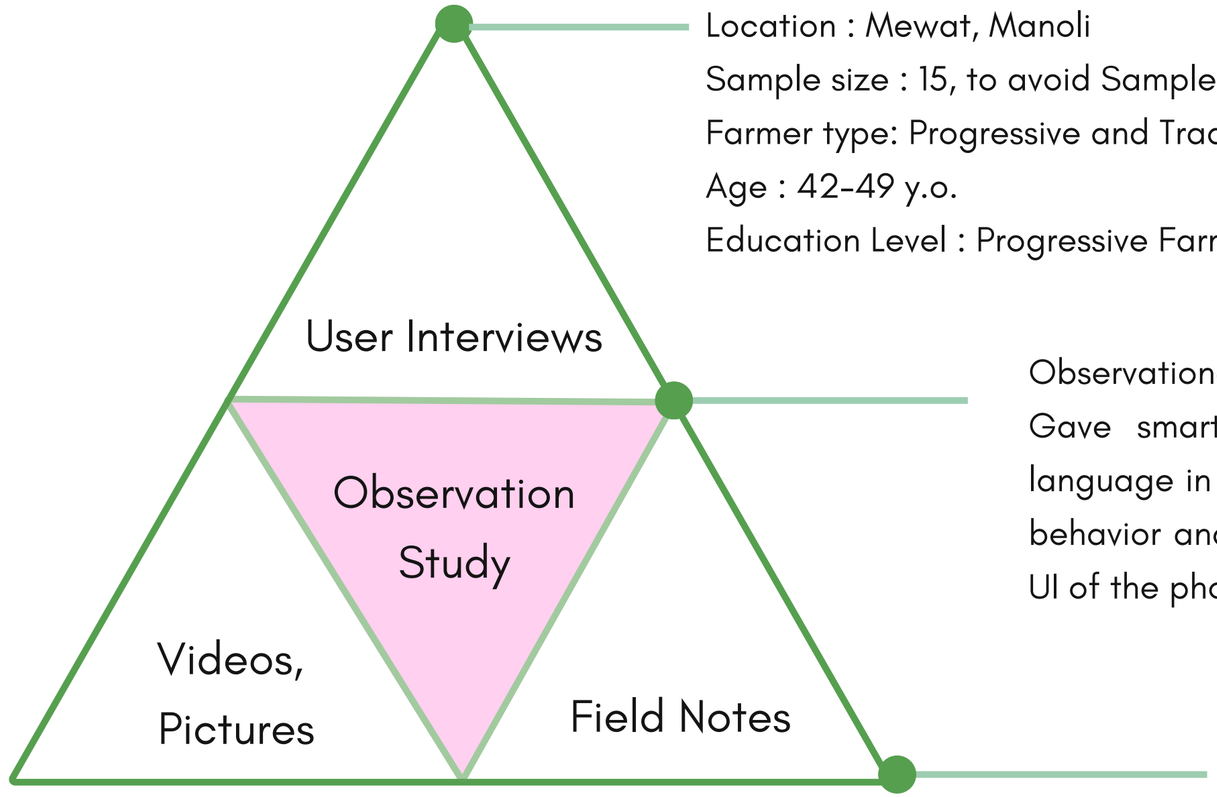
500 farmers

↓

Problems in terms of usability (app)

- Usability
- App features
- Services

Stage 1- Primary Research



Qualitative interview of Farmers in Haryana
Location : Mewat, Manoli
Sample size : 15, to avoid Sample Data Saturation
Farmer type: Progressive and Traditional
Age : 42-49 y.o.
Education Level : Progressive Farmers - Diploma, Bachelors. Traditional Farmers - 10th std.

Observational study:
Gave smartphones, assigned certain tasks like how to change the language in an application, how to click pictures, etc. to observe the user behavior and understand the user journey in terms of interaction with the UI of the phone

On the basis of general conversation and observation while on field study

Ethnographic Study (Method Triangulation)

Semi structured user interviews → Transcriptions → Codes → Themes → Key Insights

Ethnographic Study

Some pictures from the Ethnographic study

Key insights

Crop Diversity and Experimentatio1

- Farmers can grow non-native crops by creating the right environment through **experimentation and smart farming practices**
- Farmers regularly **seek help from doctors** to ensure the **health of their crops**
- Farmers tend to stick to crops they're familiar with and **switch to new crops only when they see success in their network**
- Ways to intercrop

Learning and community building

- WhatsApp can be a valuable tool for **sharing information** about the spread of diseases in farming areas and **creating relevant content**
- Farmers regularly **seek help from doctors** to ensure the **health of their crops**
- Farmers tend to stick to crops they're familiar with and **switch to new crops only when they see success in their network**

Key insights

- **Farmers believe pests and diseases can only be cured post facto** (done/ made/ formulated), but they can prevent fungus caused by light rains
- **Progressive farmers** often grow multiple crops simultaneously, even in the same field (**Inter cropping**)
- Operational issues with polyhouses can lead to crop destruction, making it essential to **maintain a controlled environment**
- **Soil tests are often unreliable** and fail to provide relevant insights and advisory because the sample is incorrectly collected
- **Struggle to mark their farms accurately** and often make cross lines while marking maps.

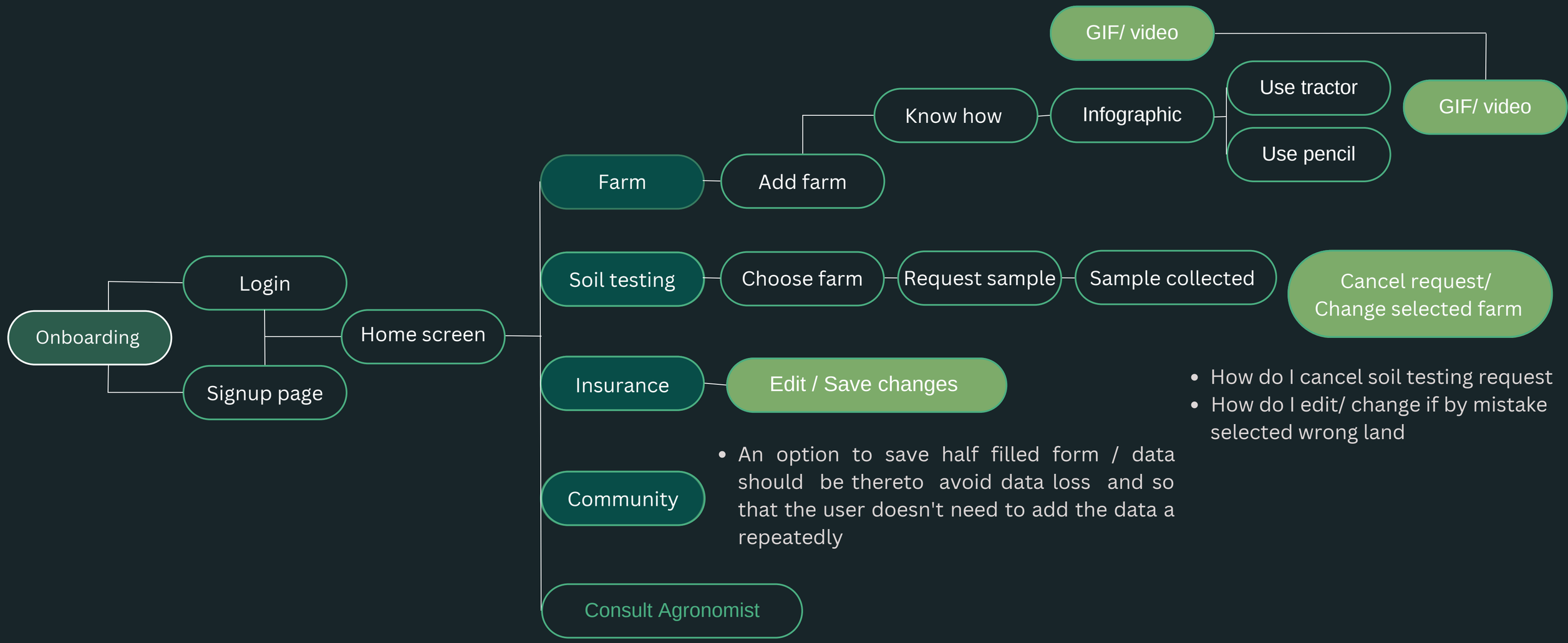
Stage 2

- Understanding the existing Upaj applications and the pain areas.

- **Quantitative telephonic Survey of 500** funneling it down to **300 and furthermore 50** farmers in the firm's database (Absolute company's) was conducted in order to understand Farmer pain points and the user drops in the Upaj 2.0 application.

upaj

Information Architecture of the application along with suggested additions,
OLD app



- How do I cancel soil testing request
- How do I edit/ change if by mistake selected wrong land

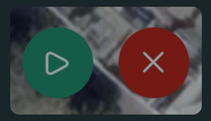
- An option to save half filled form / data should be thereto avoid data loss and so that the user doesn't need to add the data a repeatedly

○ -- Regular app flow ● -- Changes/additions

upaj

After adding farm the farm details should be editable

- In case the farmer added a mistake while adding farm
- In case the farmer purchased a new piece of land or sold some part of the land

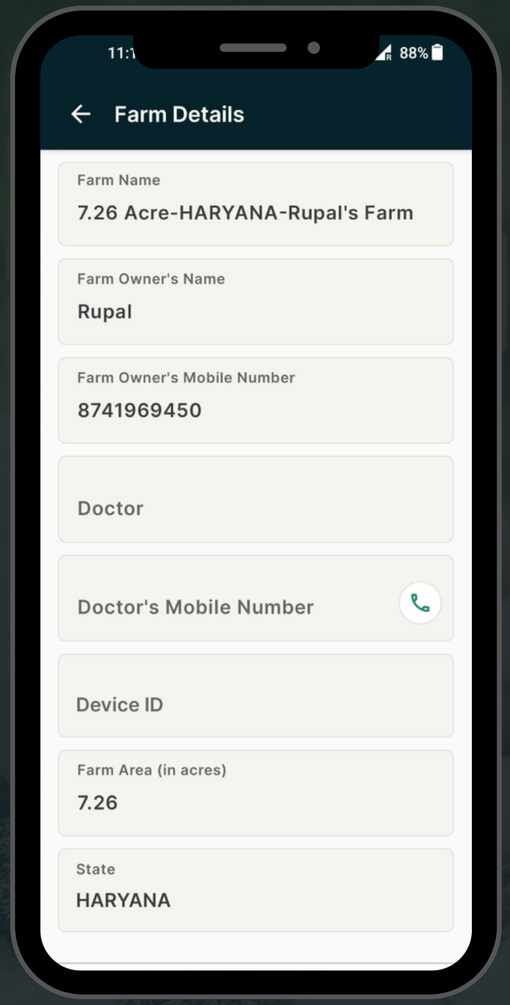


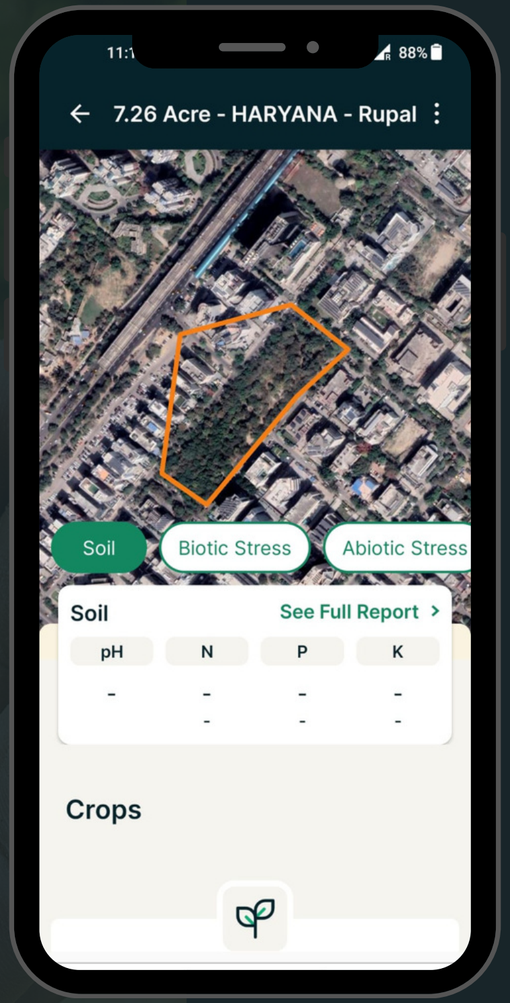
- While farm selection using tractor there should also be a pause button/ Re-start recording, incase the farmer stops, or would like to pause recording and go somewhere in between, etc.

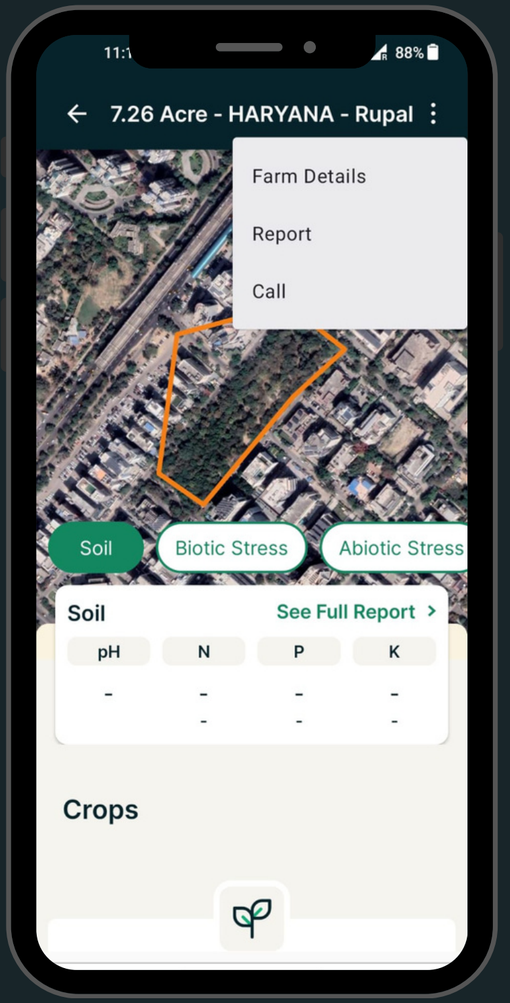
Farm
Add farm
Know how
Infographic
GIF/ video
Use tractor
Use pencil
GIF/ video
Choose farm type
Farm added
Edit farm details
Delete farm
Choose crop/ type of crop

- Choosing farm type before selecting farm would be beneficial to avoid wrong selection/ unintentional selection of residential area
- In case someone is mapping a residential area. There should be a pop up/ modal stating that they're mapping a residential area and if they'd like to go ahead or relocate/change.
- Incase it's a residential area the user can choose the type of farm, say- terrace farm , etc.

○ -- Regular app flow ● -- Changes/additions







No option to edit farm details

There should be an option to edit farm details, incase details were entered wrongly, incase the farmer purchased another piece of land and wants to add it to the existing farm land, or sold a part of his/her land and wishes to decrease the farm size, etc.

Problems with the old applications

- The application was too complex to understand
- The application was not designed keeping in mind the NHB population
- There was no trust building or guidance in the old application
- Could not understand the Soil test report
- The signup while Onboarding was a deal breaker because the farmer did not have the scope to know more or explore the application without signing up and traditional farmers are generally very sceptical about sharing information.

Note: Based on the Primary Research and Competitor analysis

How can we solve those problems?

- By **ensuring that Institutional Financing** and insurance is easily available and accesible and that farmers get insurance claims, when required.

- Long chain of intermediaries need to be reduced therefore a **proper system** should be in place that can keep the farmers informed about the Mandi rates

- Grouping farmers into **FPOs**. That could improve farmers access to the market and therefore better bargaining capacity.

- The focus needs to be **shifted from Farms income to farmers income**, boosting farmers earning through expansion of job opportunities, in and around rural areas.

The system

The village → Grouping farmers into FPO's →

VLEs per village

Educate the farmers and train and teach them , how to use the application

Upaj Centers in the village

Provide Agronomist support, Correct products, Soil tests and again, teach how to use the application

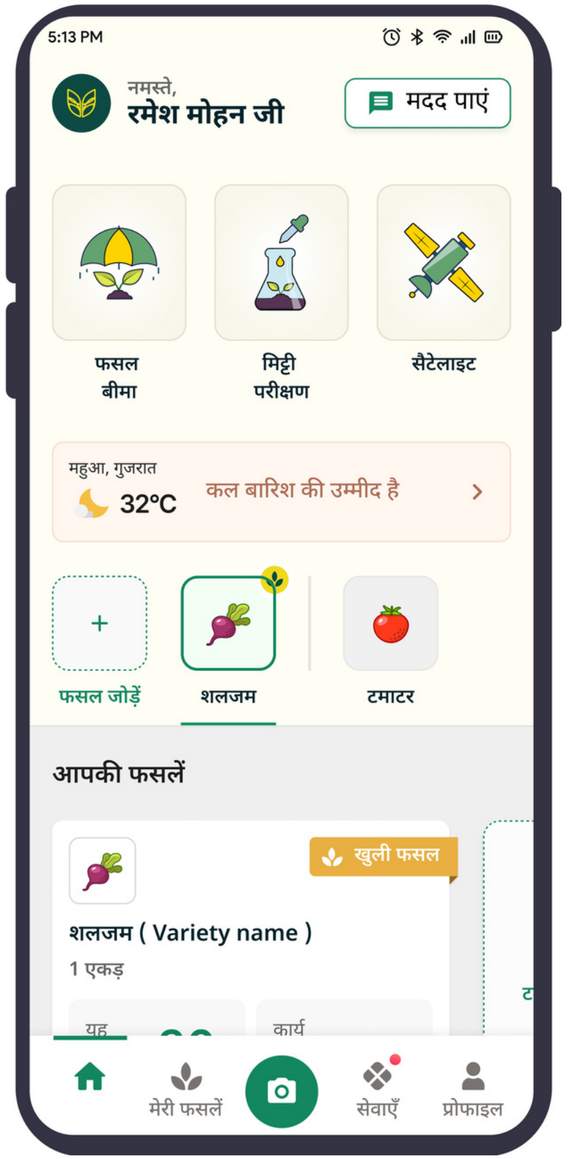
FPO- Farmer Producer Organization
VLE- Village Level Entrepreneur

How can Upaj Centers help

Putting a face to the application would help in building trust amongst the farmer community. It will also help farmers with access to timely and correct information.

- Soil testing at nominal rates
- Agronomist help
- Providing the correct products for a specific problem
- Agronomist can conduct workshops for farmers
- Help farmers with insurance filing etc.

Major features



1. No signup required
2. A lot of visuals
3. Tutorial/ videos
4. Audio based navigations
5. Multilingual
6. Agronomist help anytime
7. Color based search

Major features

1. No signup required
2. A lot of visuals
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Onboarding

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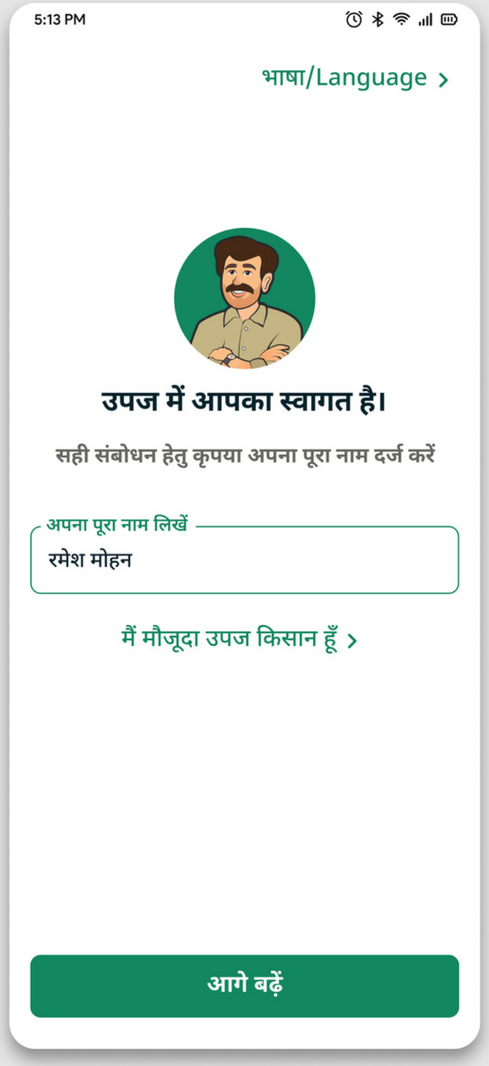
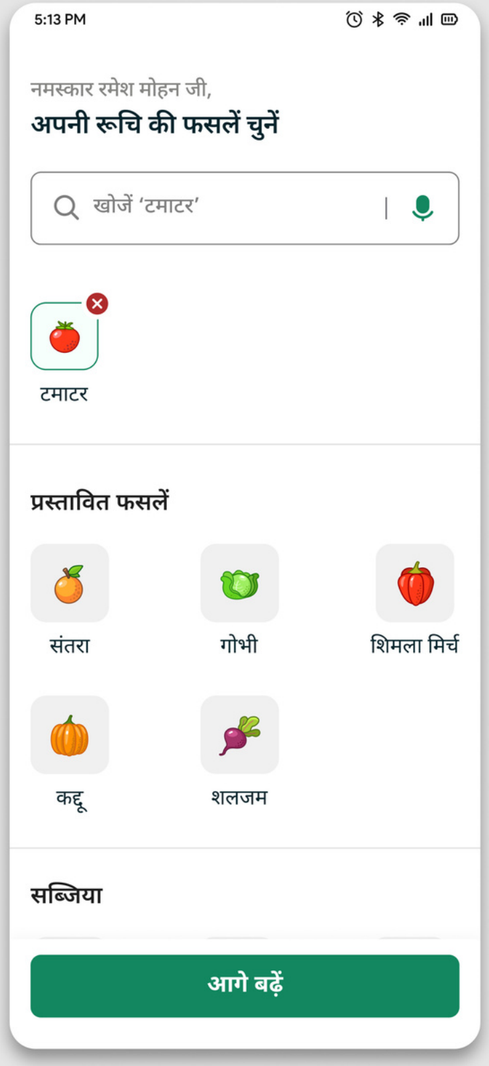




- No signup required
- Crop Addition for services and SOPs
- Voice based search

The application

Notification bar

It will notify about important updates, news super deals, discount coupon and orders.

Weather information

Current weather information and upon clicking the full weather information for the upcoming daysis available here.

About your crop

Information related to which crop the farmer is growing and SOPs are available upon clicking on the crop detail card.

Agronomist help

The user can seek Agronomists help from here

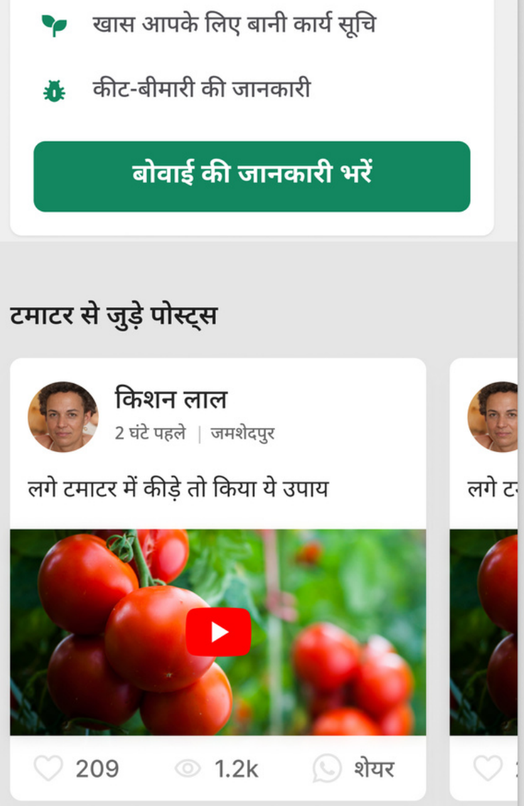
Services

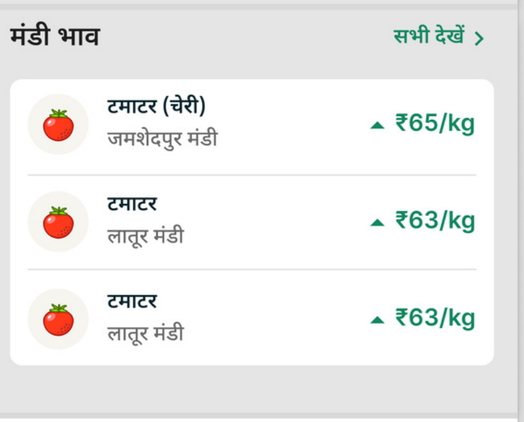
Three Primary services are mentioned here, from where the service flow starts

Navigation Bar

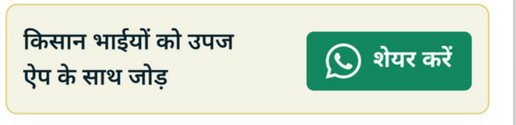
User can access Home page, their crops, services and their profile from here.

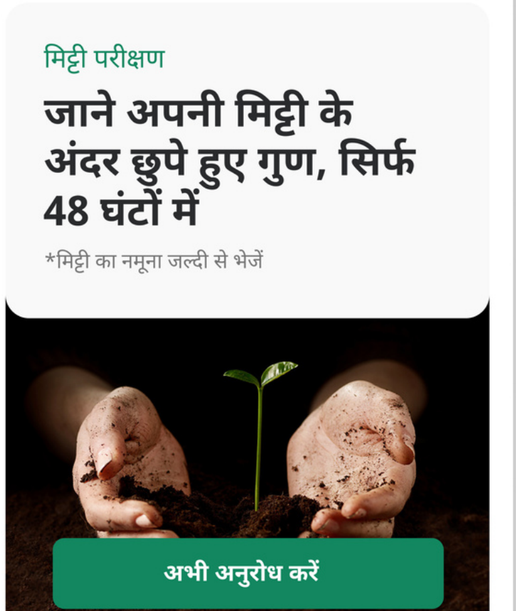
- Satellite based farm imaging



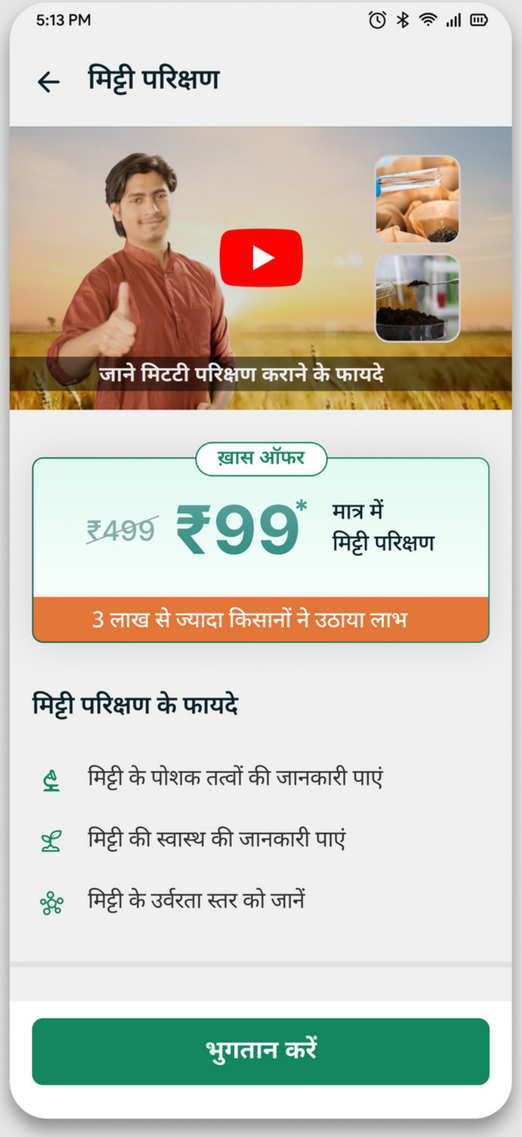


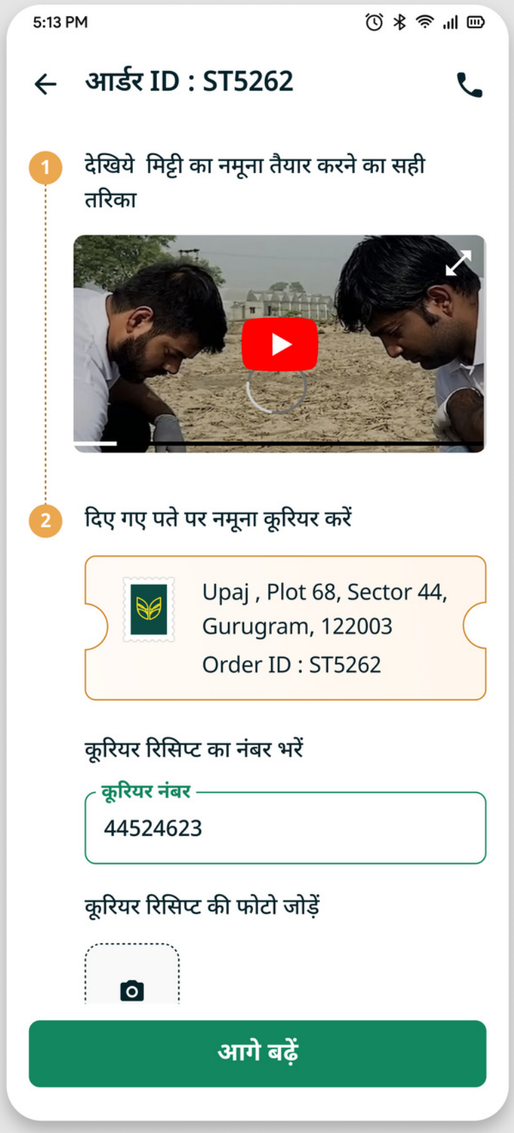
- Mandi





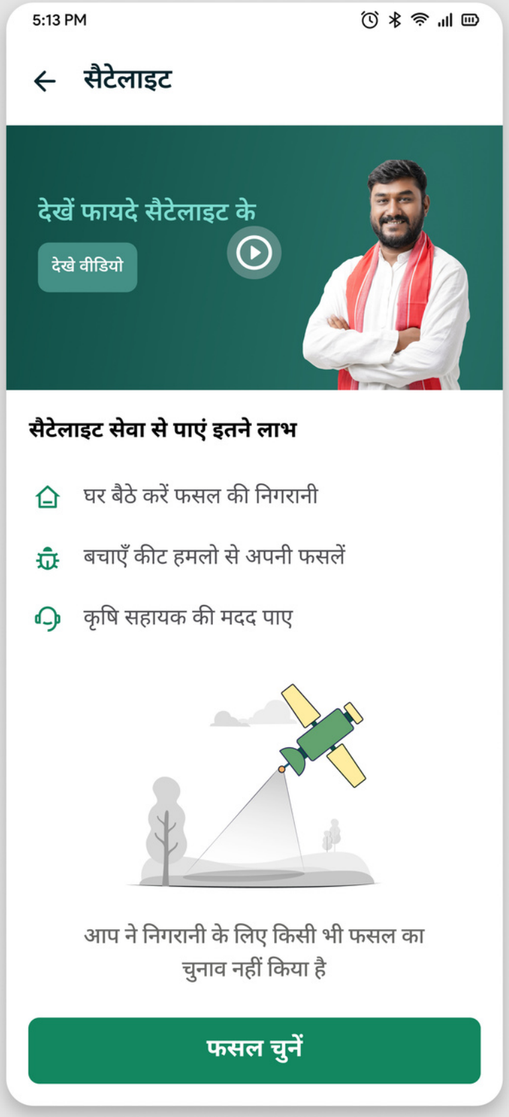
Soil Testing

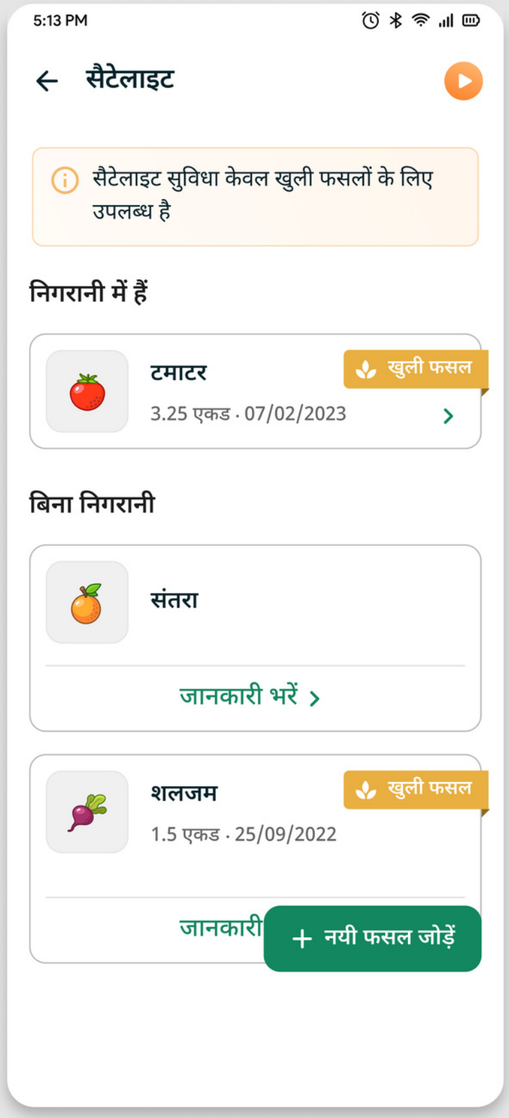


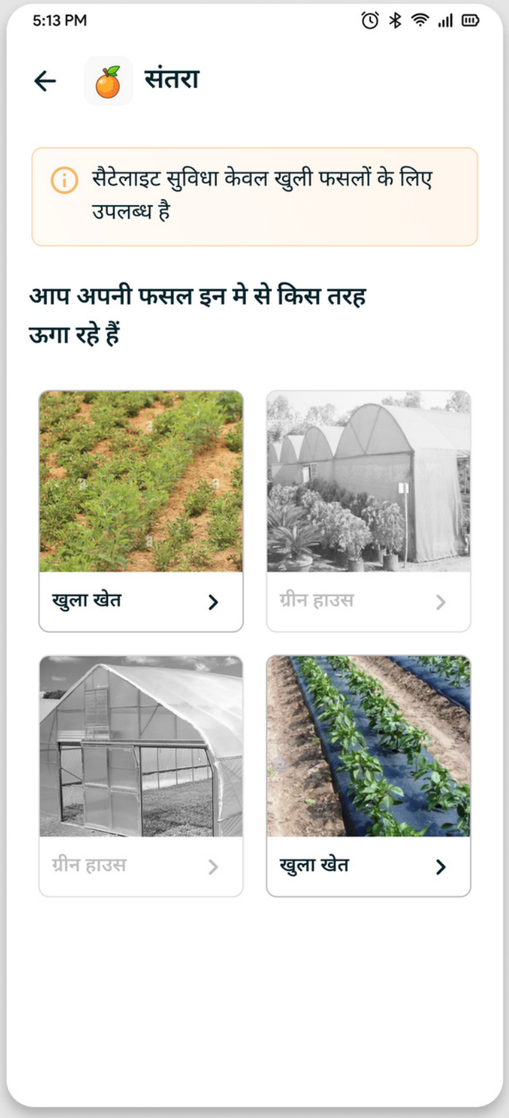


- Accurate reports
- Sample preparation tutorial
- Someone to explain the reports
- Real time tracking and updates

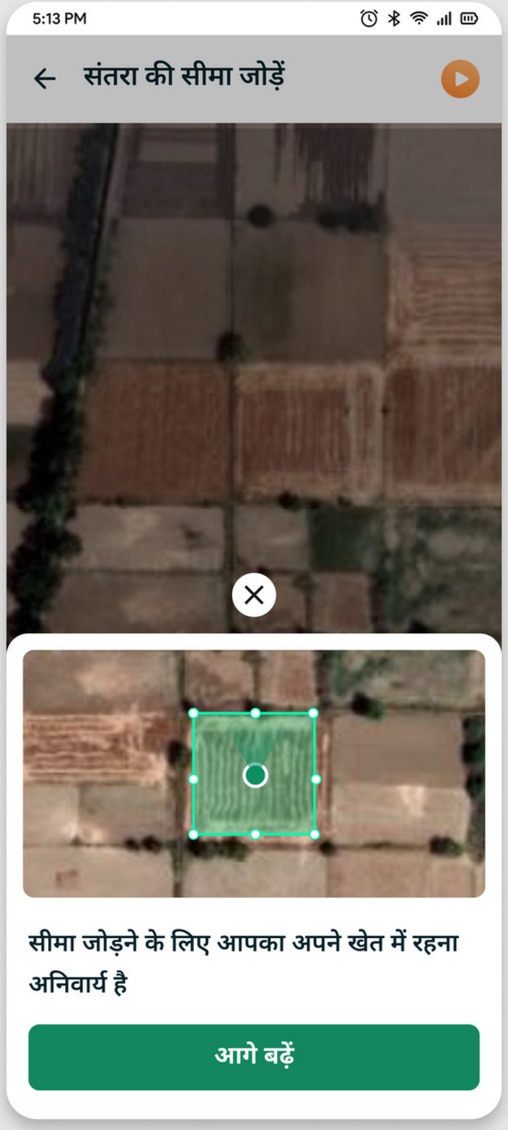
Farm Monitoring

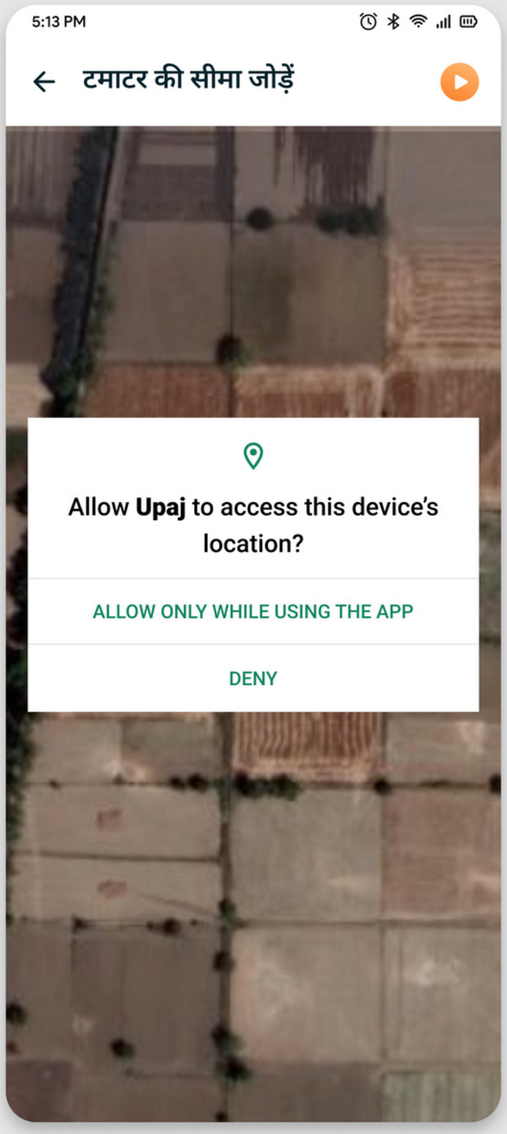






- Pest Management
- Real time data
- Agronomist to help navigate
- Farm monitoring from any place


5:13 PM
संतरा की सीमा जोड़ें
सीमा जोड़ने के लिए आपका अपने खेत में रहना अनिवार्य है
आगे बढ़ें


5:13 PM
टमाटर की सीमा जोड़ें
Allow Upaj to access this device's location?
ALLOW ONLY WHILE USING THE APP
DENY


5:13 PM
टमाटर की सीमा जोड़ें
लातूर, महाराष्ट्र
बिंदुओं की मदद से अपनी टमाटर की फसल की सीमा बनाएं
आपका स्थान
कुल क्षेत्र : 3.25 एकड़
आगे बढ़ें


5:13 PM
टमाटर की सीमा जोड़ें
लातूर, महाराष्ट्र
बिंदुओं की मदद से अपनी टमाटर की फसल की सीमा बनाएं
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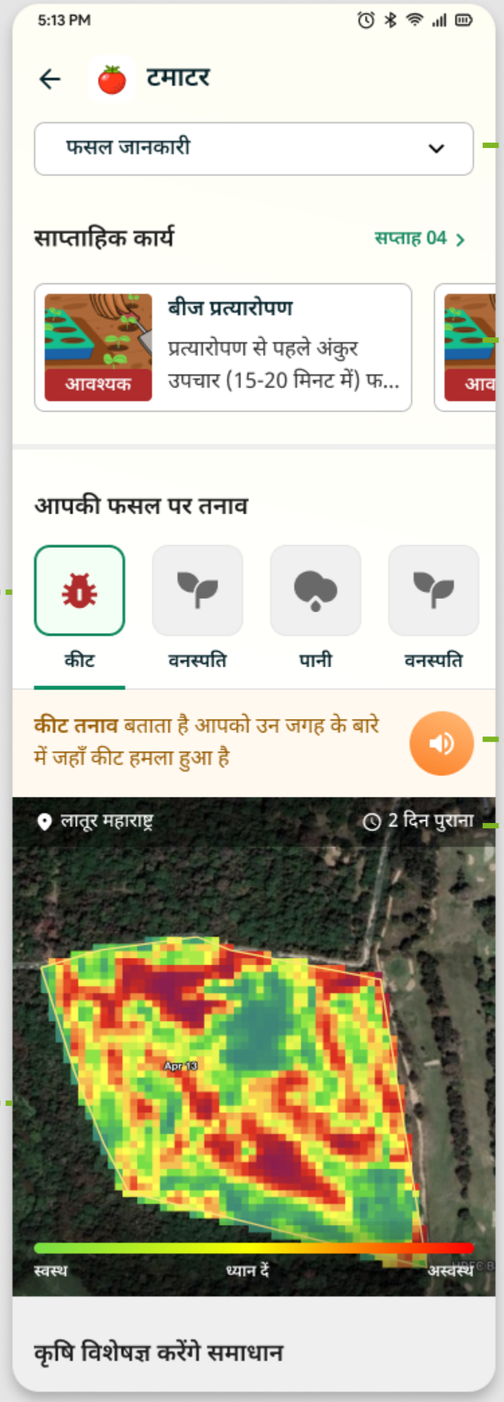


Crop information

SOPs

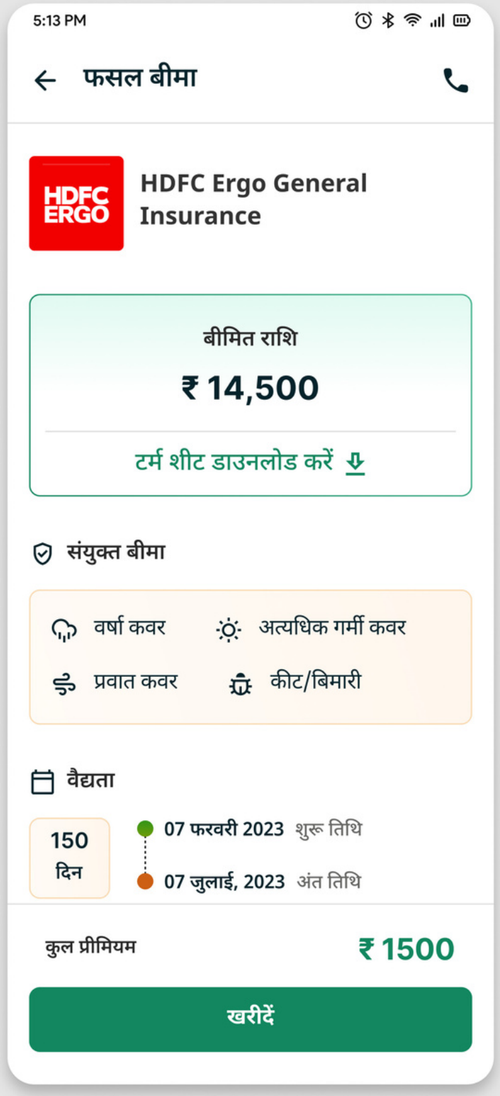
Kinds of problems

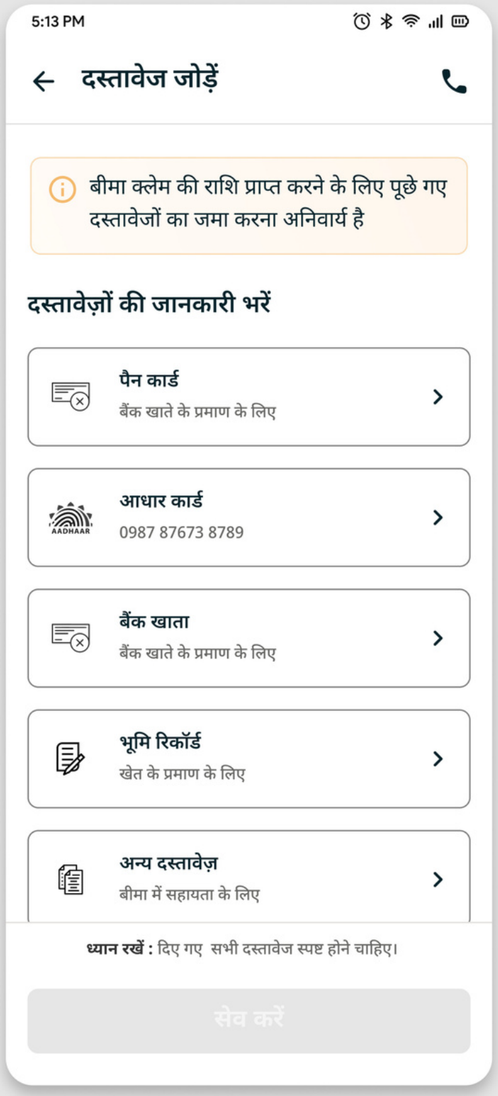
Voice based command

Real time satellite data along with two day old data

Satellite imaging of stress points in the crop farm

Insurance





- Insurance status tracking
- One time document upload
- Insurance options/ customized plans
- Easy claims

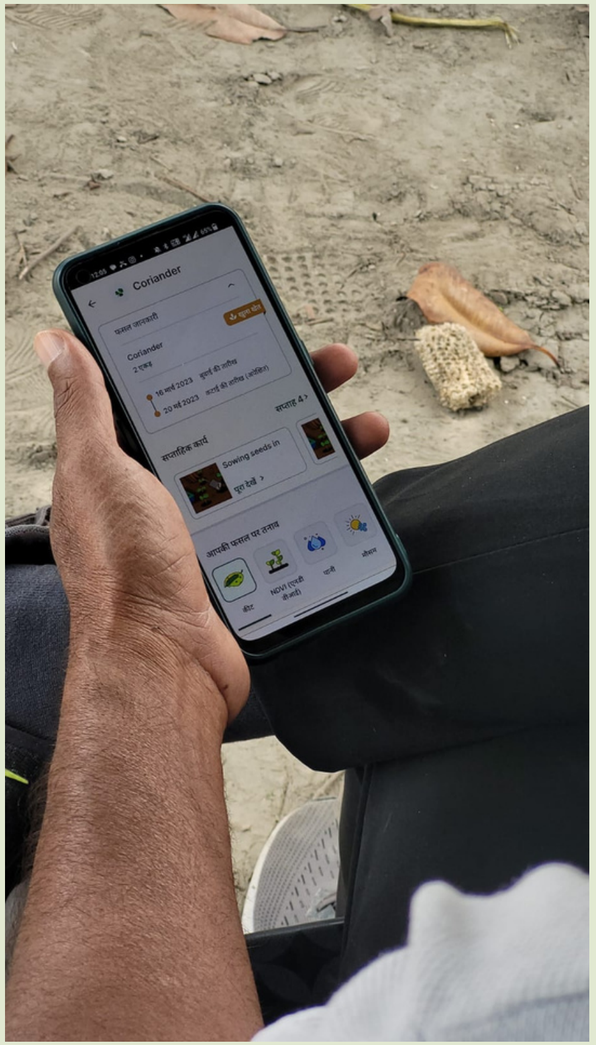
How is the new Upaj application better?

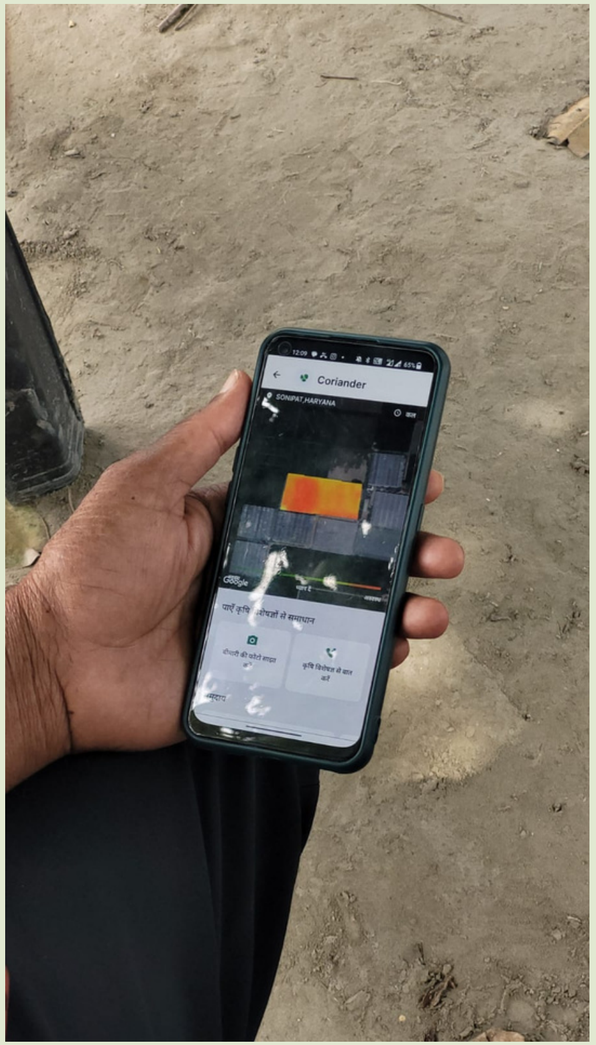
- Fairly simple ux flow

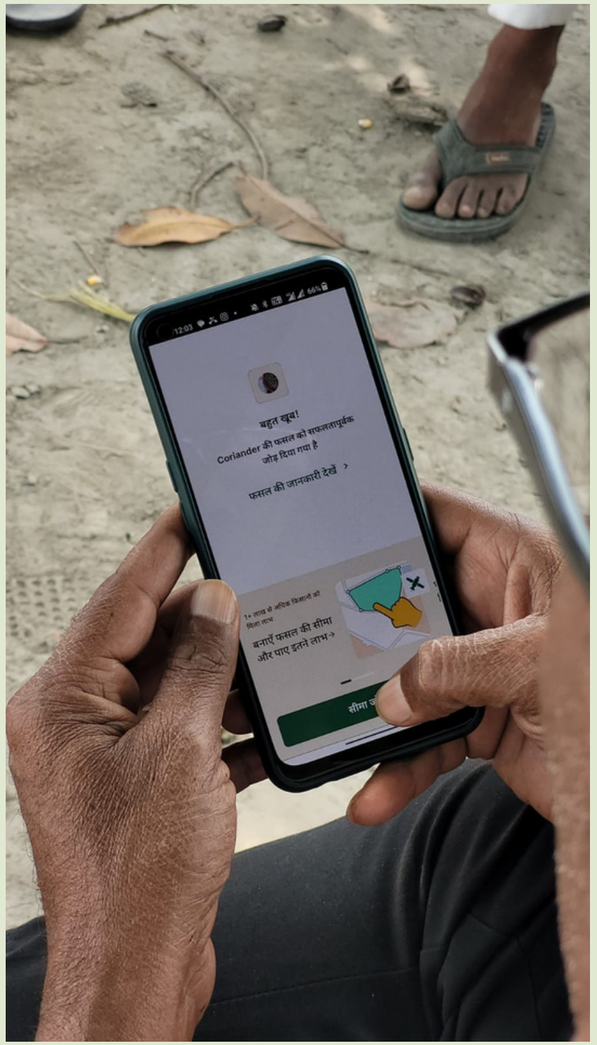
- More visually represented data

- The application has been designed keeping in mind the NHB users:

1. Voice based search command
2. Agronomist calling available
3. The color contrast is good for broad daylight
4. Multilingual
5. Provides suggestions for the crops in a particular area and after a particular harvest
6. SOP's are available
7. Color based crop segregation


Coriander
फसल जानकारी
Coriander
2 एकड़
16 मार्च 2023 बुवाई की तारीख
20 मई 2023 कटाई की तारीख (अनुमित)
सप्ताह 4 ›
साप्ताहिक कार्य
Sowing seeds in
पूरा देखें ›
आपकी फसल पर तनाव
मौसम
पानी


Coriander
SONIPAT, HARYANA
Google


बहुत खूब!
Coriander की फसल को सफलतापूर्वक जोड़ दिया गया है
फसल की जानकारी देखें ›
बनाएँ फसल की सीमा और पाएं इतने लाभ ?

Factors that brought about the change and reduced user drops

- No login mandatory
- Add only the interest crops to see content related to them
- Add crops that you're growing in two parts - Add information & Add boundary
- Farm addition by farmers not required
- Visibility of key services & Chat to users on Home

60%

Users reaching Home after first session

From 3% to 17%

Crop addition

From 50% to 72%

Registration rate

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