Database Management System (IT615) Software Requirements Specification (SRS)

for

Sustainable Agriculture Resource Management

Group Number: 02
Aarushi Goel (202412002)
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Interview Plan

System: Sustainable Agriculture Resource Management

Project Reference: G2

Participants:
Aarushi Goel (202412002) (Interviewer)
Jayesh Chauhan (202412012) (Role play as Farmer/Researcher)

Date: 10/09/2024   **Time:** 10:00 AM

Duration: 45 minutes   **Place:** DA-IICT

Purpose of Interview:
The purpose of the interview is to understand the challenges farmers face in sustainable agricultural practices, gather insights on modern farming techniques, and evaluate potential solutions for improving resource management. Additionally, it aims to share practical experiences and explore how research can support farmers in adopting sustainable methods.

Agenda
   1. Farmer's Views on Sustainability:
      Gather insights on how farmers perceive sustainability, including their beliefs about its importance and impact on long-term agricultural practices.

   2. Current Resource Management Techniques:

Assess the methods farmers currently use for managing water, soil health, and crop rotation, identifying best practices and areas for improvement.

3. **Challenges in Adopting Sustainable Methods:**
   Identify the barriers farmers face in implementing sustainable practices, such as financial constraints, lack of training, and limited access to technology.

4. **Technology Integration in Farming:**
   Explore the extent to which farmers are incorporating modern technologies into their operations, including tools for precision farming, data analytics, and resource monitoring.

Questionnaire for Farmers:

1. How do you define sustainable agriculture?

2. Are you aware of new agricultural technologies? If yes, how did you learn about them? If no, do you want to learn?

3. Do you wish to pass down your agricultural knowledge to your children? Are they interested in continuing farming?

4. Are you familiar with crop rotation? If yes, how did you learn about it, and where are you practicing it?

5. How do you currently manage resources like water, land, and technology?

6. Would you benefit from more awareness about crop diseases and guidance on using technology for weather forecasting?

Questionnaire for Researcher:

1. How do you define sustainable agriculture?

2. Are there any emerging innovations with the potential to revolutionize sustainable agriculture management?

3. What are the pros and cons of genetically modified crops in the context of sustainable agriculture?

Interview Summary

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Summary of Key Points:
1. Farmers need increased awareness and training on sustainable practices and new agricultural technologies.
    - ➢ A table can store details on sustainable practices, including session records and completion status for each farmer.

2. Farmers seek better access to tools like weather forecasting, soil health monitoring, and disease management systems.

➢ Integrate real-time data for weather forecasting, soil health reports, and disease tracking into a table. These records would be regularly updated for decision-making.

3. Programs to encourage youth to continue farming and adopt sustainable methods.
    ➢ A table can track involvement in training programs and farming initiatives, monitoring their progress and interest in sustainable methods.

4. There is a need for improved water conservation techniques and irrigation systems.
    ➢ A table can store irrigation schedules, water usage statistics, and recommended conservation techniques based on local conditions.

5. Education on crop rotation and diversified farming for better productivity and sustainability.
    ➢ A table would record crops, timing, and fields used, optimizing yield and sustainability. It would link with the table for more effective recommendations.

6. Cost-effective technological solutions for small-scale farmers to integrate into their practices.
    ➢ A table can track which farmers have integrated affordable technologies, like smart irrigation systems or mobile apps, and how effectively they are using them.

7. Researchers stress the need for more clarity and education on sustainable farming, focusing on long-term resource conservation and ecosystem health.

> ➤ A table could monitor usage of natural resources, tracking trends in water, soil, and crop data over time, ensuring long-term sustainability.

8. Both farmers and researchers agree on the need for new technologies like precision farming and smart irrigation systems to enhance sustainability and productivity.
> ➤ A table would store sensor data and provide detailed recommendations for optimal water, fertilizer, and pesticide usage based on real-time metrics.

9. While crops can boost yields, careful management is required to avoid environmental risks.
> ➤ A table could track the use and performance of genetically modified seeds, recording pros/cons like yield improvement versus any environmental concerns.

10. Improved techniques for soil and water conservation are needed for more efficient farming.
> ➤ Separate tables for *Soil Conservation* and *Water Conservation* would log practices adopted by each farmer, linking them to the outcomes in the *Farmers_Info* table for evaluation.

11. Follow up
> ➤ Prepare a detailed survey to assess farmers' awareness and needs regarding sustainable agriculture resource management, focusing on their current practices, technology usage, and training requirements.

12. next step
> Prepare a detailed survey to collect data from the people about the awareness and need for sustainable agriculture resource management.

Questionnaire of Google form:

1. How familiar are you with the concept of sustainable agriculture?
A. Very familiar
B. Somewhat familiar
C. Not familiar

2. Do you currently use any modern agricultural technologies (e.g., weather forecasting, soil monitoring)?
A. Yes, frequently
B. Yes, occasionally
C. No, but I am interested
D. No, and not interested

3. What is your main source of learning about new farming techniques?
A. Online platforms
B. Government programs
C. Farmer communities
D. I don't use any

4. Do you practice crop rotation on your farm?
A. Yes, regularly
B. Yes, sometimes
C. No, but I'm interested
D. No, and not interested

5. How do you manage water resources on your farm?
A. Modern irrigation systems
B. Traditional methods
C. Rely on rainfall
D. Not sure

6. How well do you think young farmers are prepared to continue sustainable farming practices?
A. Very well prepared
B. Moderately prepared
C. Not prepared at all

7. Are you familiar with hybrid crops and their potential benefits/risks?
A. Yes, fully aware
B. Somewhat aware
C. Not aware, but interested to learn
D. Not aware and not interested

8. What is your biggest challenge in adopting sustainable practices?
A. Lack of awareness
B. Lack of resources
C. High cost of technology
D. No challenges

9. What type of support would help you most in adopting sustainable methods?
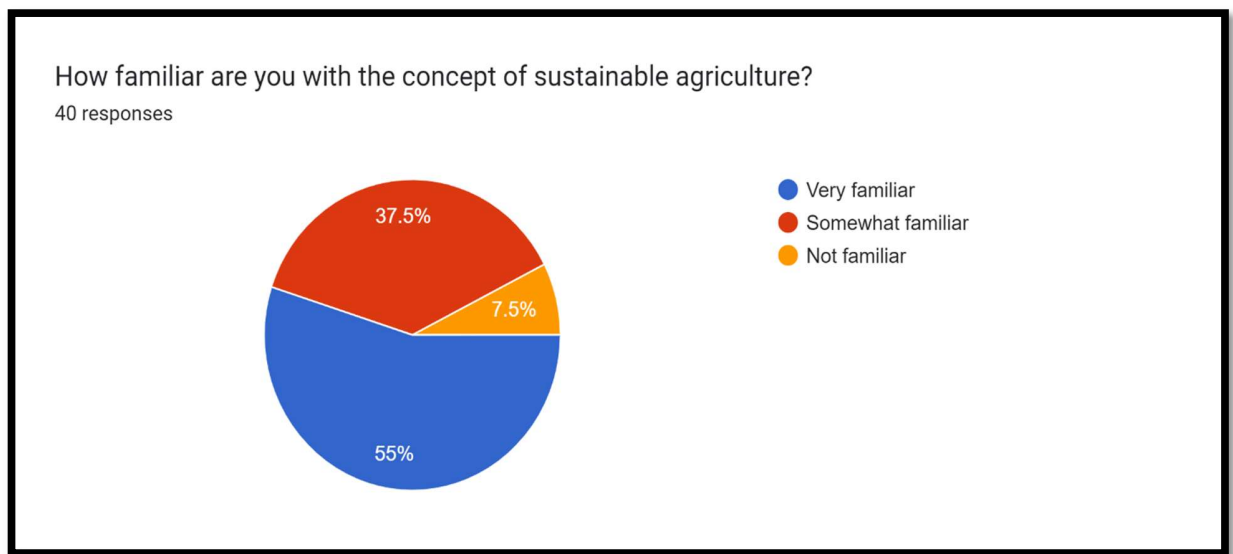A. Training programs
B. Access to technology
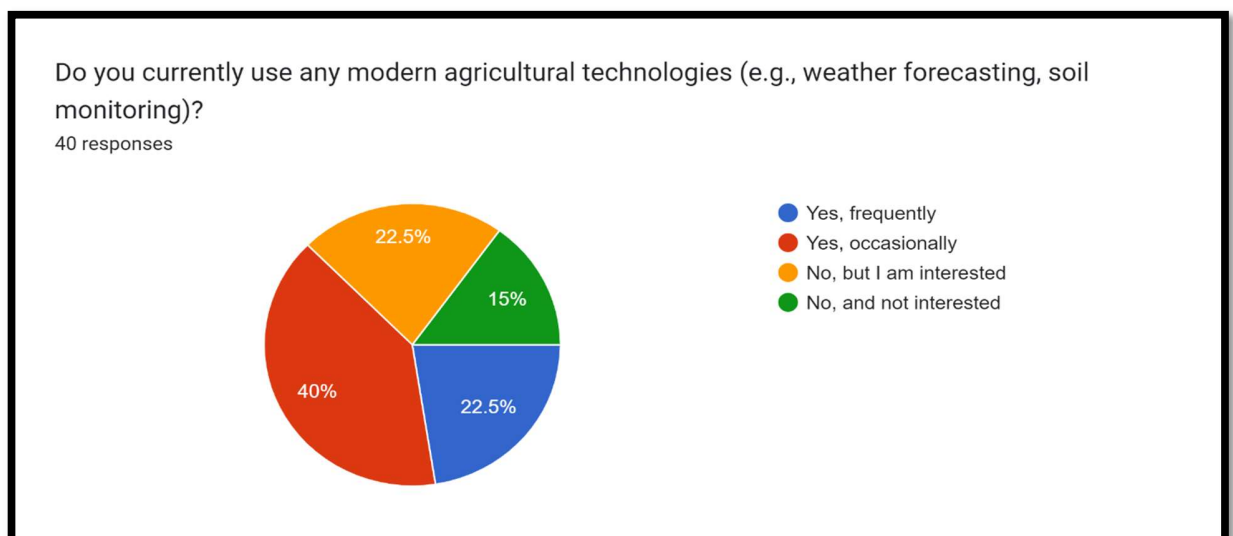C. Financial aid
D. Government policies

10. What additional challenges do you face in managing resources like water, soil, and crop health?

11. In your opinion, what would help most to promote sustainable agriculture in your region?
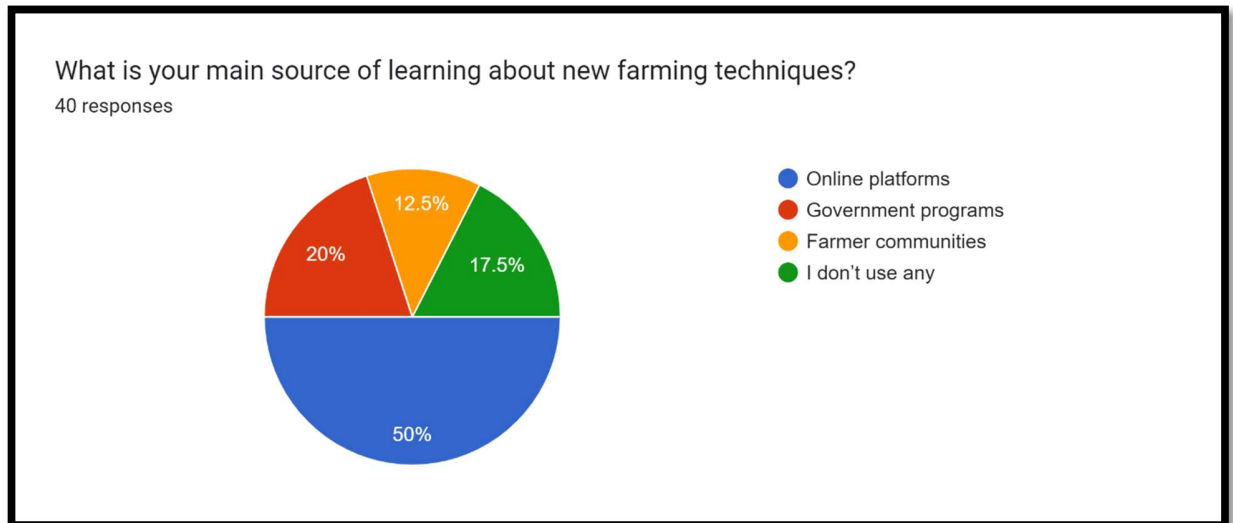
Summary

How familiar are you with the concept of sustainable agriculture?
40 responses

- Very familiar
- Somewhat familiar
- Not familiar

37.5%

7.5%

55%

1.

➢ Most respondents are very familiar with sustainable agriculture, which indicates a good foundational knowledge among the surveyed group.

Do you currently use any modern agricultural technologies (e.g., weather forecasting, soil monitoring)?
40 responses

- Yes, frequently
- Yes, occasionally
- No, but I am interested
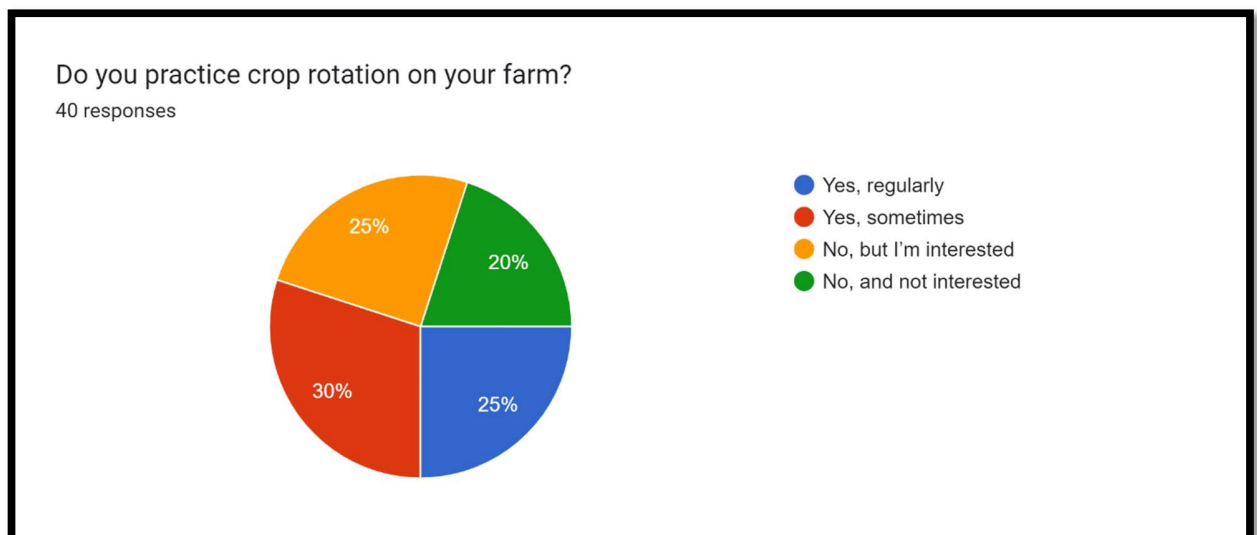- No, and not interested

22.5%

15%

40%

22.5%

2.

➢ A significant portion of respondents uses modern technologies occasionally and expresses interest in adopting them more. This suggests a gap in frequent usage but an openness to technology.

3.

What is your main source of learning about new farming techniques?
40 responses

- Online platforms
- Government programs
- Farmer communities
- I don't use any

12.5%
20%
17.5%
50%

➢ Online platforms are the primary source of learning for most respondents, indicating that digital resources are key to their knowledge acquisition.

4.

Do you practice crop rotation on your farm?
40 responses

- Yes, regularly
- Yes, sometimes
- No, but I'm interested
- No, and not interested

25%
20%
30%
25%

➢ While a quarter of respondents practice crop rotation regularly, there's notable interest from those who do not yet practice it, suggesting a potential area for education and adoption.

How do you manage water resources on your farm?
40 responses

- Modern irrigation systems
- Traditional methods
- Rely on rainfall
- Not sure
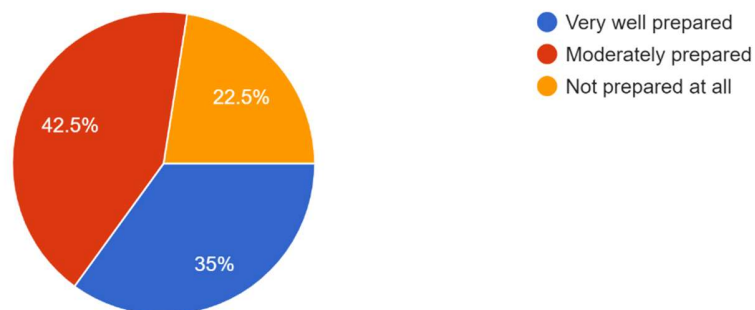
32.5%
10%
30%
27.5%
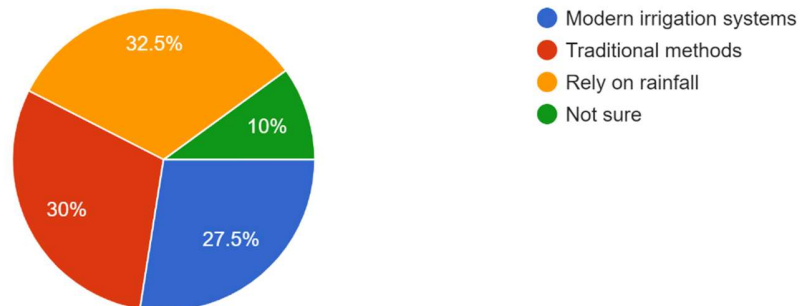
5.
  ➢ Many respondents rely on rainfall or traditional methods, indicating a need for more modern water management solutions.

How well do you think young farmers are prepared to continue sustainable farming practices?
40 responses

- Very well prepared
- Moderately prepared
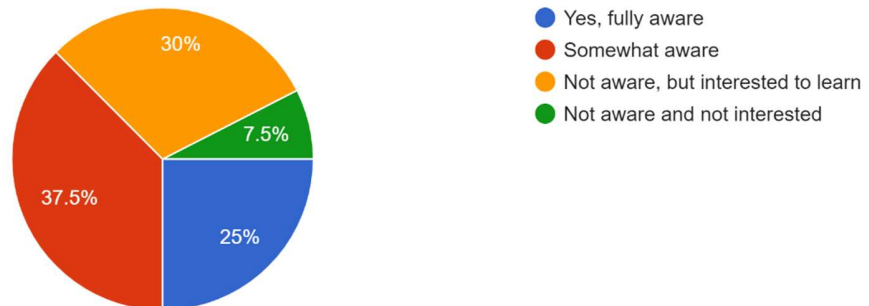- Not prepared at all

42.5%
22.5%
35%

6.
  ➢ There's a mixed view on the preparedness of young farmers, with a moderate level of confidence and some concerns about their readiness.

Are you familiar with hybrid crops and their potential benefits/risks?
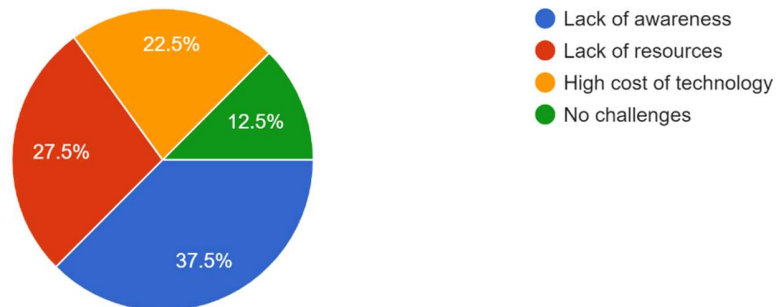40 responses

- Yes, fully aware
- Somewhat aware
- Not aware, but interested to learn
- Not aware and not interested

30%
7.5%
37.5%
25%

7.
➢ There is a strong interest in learning about hybrid crops, suggesting that education on this topic could be valuable.

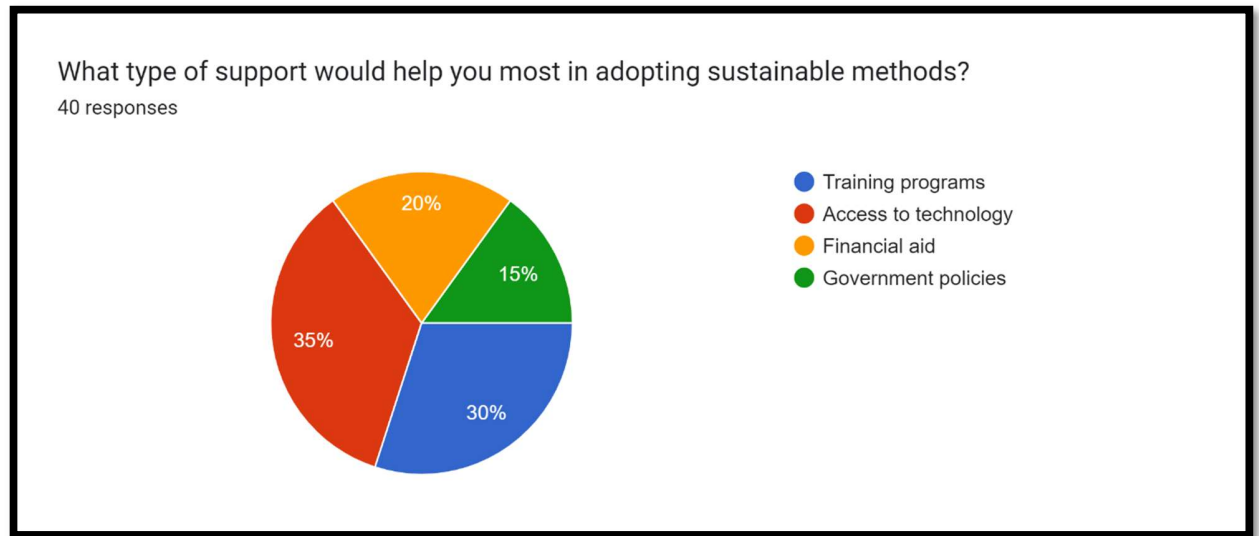What is your biggest challenge in adopting sustainable practices?
40 responses

- Lack of awareness
- Lack of resources
- High cost of technology
- No challenges

22.5%
12.5%
27.5%
37.5%

8.
➢ The major challenges are lack of awareness and resources, with a notable concern about the cost of technology.

9.

> Access to technology and training programs are seen as the most critical supports needed, with financial aid and government policies also being relevant.

List the combined Requirements gathered from Responses:

1. Increased awareness and education on sustainable practices:
> Create a centralized database system that stores and organizes educational resources, including articles, tutorials, case studies, and best practices related to sustainable agriculture and hybrid crops. Users can access and search this repository to enhance their knowledge.

2. Enhanced access to modern agricultural technologies:
> Develop a database to catalog available modern technologies, such as irrigation systems, soil sensors, and weather forecasting tools. This database can include details on technology providers, costs, benefits, and user reviews to help farmers make informed decisions.

3. Support for technology adoption and addressing the high cost of technology:

➢ Implement a database system to manage and track financial aid, grants, and subsidies available for sustainable agriculture technologies. The system can also include information on resource availability and application processes for financial assistance.

4. Training programs and support for young farmers:

➢ Create a database to manage training programs, workshops, and support initiatives. This system can track participant registration, program content, and feedback. It can also help in scheduling and promoting these programs to ensure wide participation.

5. Encouragement of crop rotation and modern water management practices:

➢ Develop a database to track and analyze crop rotation practices and water management strategies. This system can provide recommendations based on historical data, user inputs, and best practices, helping farmers optimize their crop rotation and water usage.

6. Water Resource Management:

➢ Create a database to manage information on water resource management practices, including modern irrigation systems, traditional methods, and reliance on rainfall. This can help identify trends and provide recommendations for improving water resource management

7. Preparation of Young Farmers:

➢ Develop a database to assess and track the preparedness of young farmers for sustainable practices. This system can help in identifying areas where additional support or training is needed.

Observation/s

Observations summary (list of observations).

1. Strong Foundational Knowledge:
➢ Most respondents have a solid understanding of sustainable agriculture.

2. Interest in Technology Adoption:
➢ Many respondents occasionally use modern technologies and express interest in adopting them more frequently.

3. Dependence on Digital Resources:
➢ Online platforms are the primary source of learning for most respondents, highlighting the need for accessible educational resources.

4. Crop Rotation and Water Management Practices:
➢ About 25% regularly practice crop rotation, with others showing interest in adopting it.
➢ Many respondents rely on rainfall or traditional water management methods, indicating a need for modern solutions.

5. Preparedness of Young Farmers:
➢ Mixed opinions on the readiness of young farmers for sustainable practices suggest a need for targeted training and support.

6. Challenges in Technology Access and Financial Constraints:
➢ Key challenges include lack of awareness and high costs of modern agricultural technologies.
➢ Respondents see financial aid, subsidies, and better resource access as critical for overcoming these barriers.

7. Interest in Hybrid Crops:

➤ Strong interest in learning about hybrid crops indicates potential for valuable educational efforts in this area.

8. Importance of Training and Financial Aid:

➤ Increased access to training programs and financial aid is essential for promoting the adoption of sustainable practices.

List the combined Requirements gathered from Observation/s.

➤ In conclusion, while young farmers are knowledgeable about sustainable agriculture, they encounter significant barriers related to technology access, financial constraints, and a lack of training opportunities. To empower this demographic, it is essential to enhance access to affordable sustainable technologies, increase funding for training programs and low-interest loans, and foster mentorship connections with experienced farmers. By addressing these challenges, we can support young farmers in successfully adopting sustainable practices, ultimately leading to a more resilient and sustainable agricultural community.

➤ From a database perspective, key entities and relationships that could be modelled:
  - Young Farmers (entity with attributes like name, location, experience level)
  - Sustainable Farming Practices (entity with attributes like irrigation, pest management, crop rotation)
  - Funding Programs (entity with attributes like loan type, interest rate, eligibility criteria)
  - Training Programs (entity with attributes like program type, location, curriculum)

- Mentorship Relationships (relationship between young farmers and experienced farmers)

➢ Modelling these entities and their relationships in a database could help analyse the challenges young farmers face and optimize the allocation of resources to support them.
➢ For example, queries could identify geographic areas with high young farmer populations but low access to funding and training programs. Relationships between young farmers and their mentors could be tracked to measure the impact of mentorship on adoption of sustainable practices. By using data to understand the barriers and target support, we can create more opportunities for young farmers to thrive in sustainable agriculture

Fact Finding Chart

Objective	Technique	Subject(s)	Time Commitment
Analyse farmers' knowledge of sustainable agriculture	Background Reading	Doubling Farmers' Income Report	30 minutes
		Sustainable Agriculture in India	30 minutes
		What is Sustainable Agriculture?	15 minutes
Assess current resource management practices	Interview	Farmer's practices & Researcher's insights on resource management	45 minutes (10/09/2024)
Identify challenges in adopting sustainable methods	Observation	Farmers' adoption of sustainable methods	1 hours
Evaluate integration of modern technologies	Document Sampling	Technologies used in farming	1.5 hours

Explore impact of new technologies on sustainability	Interview and Observation	Farmers' and researchers' perspectives on new technologies	1.5 hours
Prepare for follow-up and detailed survey	Google form	Survey design and analysis	2 hours