
Database Management System (IT615)

Software Requirements Specification (SRS)

**for
Sustainable Agriculture Resource Management**

Group Number: 02

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A. Description of the Case Study

A.1. Purpose

The primary aim of this study is to analyse and assess the current level of farmers' knowledge regarding **Sustainable Agriculture Resource Management** and its various aspects. The study seeks to evaluate farmers' understanding of sustainable farming practices, including resource conservation, soil health, water management, and eco-friendly crop cultivation techniques. Additionally, the study aims to explore how these sustainable agricultural activities are being applied on farms and to identify the challenges and opportunities farmers face in adopting them.

A.2. Intended Audience and Reading Suggestions

- **Farmers and Agricultural Practitioners:**
Farmers can apply the practical solutions highlighted in this study to enhance crop productivity, manage resources efficiently, and promote long-term farm sustainability.
- **Policy Makers and Government Officials:**
Those involved in agriculture and rural development can use this study to formulate policies that promote sustainable agricultural practices and resource management to improve farmer livelihoods.
- **Agricultural Researchers and Academicians:**
Researchers and scholars in agricultural and environmental sciences can explore the study for insights into sustainable farming practices and innovation gaps.
- **Students and Academics in Agriculture and Environmental Sciences:**

The case study provides a comprehensive resource for understanding the significance and impact of sustainable agriculture, suitable for educational and research purposes.

- **Agricultural Technology Providers:**

Companies developing farming technologies can identify opportunities for innovation in precision farming and resource management based on the challenges presented in the study.

A.3. Description

- **Historical Context:**

In ancient India, farming was characterized by sustainable practices such as crop rotation, organic fertilizers, and efficient irrigation systems.

Agricultural activities were deeply connected to community traditions and rituals, contributing to stable food supplies and resilient economies.

- **Modern Challenges:**

Despite technological advancements in mechanized equipment, genetically modified crops, and irrigation techniques, modern

- **Indian agriculture faces significant difficulties:**

- Environmental Degradation: Excessive use of chemical fertilizers and pesticides is leading to soil depletion and contamination.

- **Water Scarcity:**

- Advanced irrigation systems have not fully solved the problem of water overuse, especially in water-stressed regions.

- **Soil Health Decline:**

- Intensive farming practices have degraded soil quality, reducing fertility and making it harder to maintain high yields.

- **Financial Instability:**

Small-scale farmers, who form a large portion of the agricultural community, often face limited access to resources, leading to economic struggles and debt.

- **Key Problems:**

- **Lack of Sustainable Practices:**

- The shift away from traditional methods has led to unsustainable farming practices, impacting long-term productivity.

- **Resource Management Issues:**

- Farmers lack tools to efficiently track and manage critical resources such as soil health, water usage, and weather patterns.

- **Balancing Productivity and Conservation:**

- While technology has increased yields, it has also intensified the challenge of balancing high productivity with sustainability.

- **Inadequate Access to Real-time Data:**

- Farmers often do not have access to crucial real-time information, such as weather forecasts or crop growth metrics, which could help optimize their decisions.

- **Knowledge Gaps:**

- Many farmers have limited access to training and information about modern sustainable practices, resulting in a reliance on outdated methods.

- **Impact of Climate Change:**

- Unpredictable weather patterns, such as droughts or floods, severely disrupt farming cycles and strain water resources. Farmers face difficulties in adapting their practices without real-time data or technologies to manage the effects

- **Water Mismanagement:**

The mismanagement of irrigation systems, compounded by water scarcity, leads to inefficient water use and stress on water resources, particularly in drought-prone areas. Traditional irrigation practices are often not optimized for modern water conservation needs.

- **Technological Access:**

The lack of precision farming tools, such as sensors for soil monitoring or automated irrigation systems, makes it difficult for farmers to adopt efficient resource management strategies.

B. Document the Requirements Collection/Fact Finding Phase

i. Background Reading/s

B.i.1. Description of each reading done

- **Doubling Farmers' Income: Report by the Committee on Doubling Farmers' Income.**
Government of India, 2018.
<https://agriwelfare.gov.in/Documents/DFI%20Volume%207.pdf>
 - The "Doubling Farmers' Income" report stresses a holistic strategy to boost farmers' incomes by enhancing agricultural productivity, diversifying income streams, and improving value addition. It addresses environmental degradation, water scarcity, and soil health, emphasizing the need for infrastructure, market access, and supportive policies.
 - The report calls for investments in research, capacity building, and sustainable farming practices. It outlines that to achieve the goal, a comprehensive approach integrating modern technology, education, and better resource management is crucial for long-term agricultural sustainability and economic upliftment.
- **Sustainable Agriculture in India: Socioeconomic and Environmental Issues.**
Journal of Rural Development, Vol. 37, No. 1, 2018

<https://www.ceew.in/sites/default/files/CEEW-FOLU-Sustainable-Agriculture-in-India-2021-20Apr21.pdf>

- The report "Sustainable Agriculture in India: Socioeconomic and Environmental Issues" discusses the challenges and opportunities in promoting sustainable agricultural practices. It highlights the environmental impacts of traditional farming, such as soil degradation and water scarcity, while exploring the socioeconomic factors that influence farmers' decisions. The report emphasizes the need for policies that support eco-friendly methods, technological innovations, and economic incentives to encourage sustainability in agriculture. It also stresses the importance of balancing productivity with environmental conservation.

- **Sustainable agriculture: The study on farmers' perception and practices regarding nutrient management and limiting losses**
https://www.researchgate.net/publication/324178764_Sustainable_agriculture_The_study_on_farmers'_perception_and_practices_regarding_nutrient_management_and_limiting_losses
- The study on "Sustainable Agriculture: Farmers' Perception and Practices Regarding Nutrient Management and Limiting Losses" investigates farmers' awareness and adoption of sustainable nutrient management practices. It explores how farmers manage soil health, reduce nutrient losses, and implement eco-friendly farming techniques. The research highlights the challenges faced by farmers in adopting sustainable practices and provides insights into their perceptions of nutrient use, crop productivity, and environmental impact.

- **Sustainable Agriculture Research & Education Program**
<https://sarep.ucdavis.edu/sustainable-ag>
- The Sustainable Agriculture Research & Education Program at UC Davis helps farmers improve their agricultural practices while protecting the environment. It focuses on sustainable farming techniques such as improving soil health, efficient water use, and pest management. The program provides research-based resources and educational

outreach to support farmers in reducing their environmental impact, increasing productivity, and achieving long-term farm sustainability.

- **Sustainable Agriculture Practices & Their Management**

<https://eos.com/blog/sustainable-agriculture/>

- The article provides an overview of eco-friendly farming methods designed to balance agricultural productivity with environmental conservation. It discusses practices like crop rotation, cover cropping, agroforestry, and reduced tillage, all aimed at improving soil health, conserving water, and reducing chemical use. The article highlights how these methods promote long-term sustainability, increase biodiversity, and help farmers adapt to climate change.

- **Sustainable agriculture**

<https://krishi.icar.gov.in/jspui/bitstream/123456789/2852/1/Sustainable%20Agriculture%20-%20ISA%20article%20-%20DM%20Hegde%20&%20SNS%20Babu%20July%2030%202016.pdf>

- The article on "Sustainable Agriculture" explores practices that aim to balance productivity with environmental conservation. It highlights techniques like organic farming, soil management, crop diversification, and water-efficient irrigation methods. The focus is on reducing the use of chemical inputs, improving soil health, and addressing the socioeconomic challenges faced by farmers. The article also emphasizes the importance of research and government policies in promoting sustainable agricultural systems.

- **What is Sustainable Agriculture? - TNAU Agritech Portal**

<https://agritech.tnau.ac.in/pdf/sustainableagriculture.pdf>

- The document "What is Sustainable Agriculture?" from the TNAU Agritech Portal defines sustainable agriculture as farming that meets current food needs while conserving natural resources for future generations. It focuses on practices like organic farming, crop rotation, integrated pest management, and water conservation. The goal is to enhance soil health, biodiversity, and farm productivity while

minimizing environmental impact. It also highlights the role of education, technology, and policy in promoting sustainable agriculture.

B.i.2. References

Doubling Farmers' Income: Report by the Committee on Doubling Farmers' Income.

Government of India, 2018.

<https://agriwelfare.gov.in/Documents/DFI%20Volume%207.pdf>

Sustainable Agriculture in India: Socioeconomic and Environmental Issues. Journal of Rural Development, Vol. 37, No. 1, 2018.

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