DTIL PROJECT REPORT

ON

RAIN WATER HARVESTING SYSTEM

Submitted by,

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F. Y. B-Tech CSE

Guide

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SANJIVANI UNIVERSITY

In the academic Year 2024-25

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CERTIFICATE

This is to certify that

1.	**Miss. Hon Pranjal Kisan**	**PRN 2124UCEF1087**
2.	**Miss. Turakane Sumita Sandip**	**PRN 2124UCEF1034**
3.	**Mr. Unde Kartik Vitthal**	**PRN 2124UCEM1057**
4.	**Mr. Kusmude vikas Sopan**	**PRN 2124UCEM1013**
5.	**Mr. More Sujit Ravindra**	**PRN 2124UCEM1078**
6.	**Mr. Nirhali Sarvesh Makarand**	**PRN 2124UCEM1125**

(F. Y. B-tech Computer)

Have successfully completed their DTIL Project report

On

RAIN WATER HARVESTING SYSTEM

Towards the Partial Fulfillment of Bachelor's Degree

In Computer Science Engineering

During the Academic year 2024 – 25

Prof. Pravin Chokakkar **Dr. Ajit Muzumdar**

Acknowledgement

We would like to express our sincere gratitude to our esteemed project guides, Dr. Ajit Muzumdar and Mr. Pravin Chokakkar, for their invaluable guidance and support throughout our DTIL Project on “Rain Water Harvesting”.

Through this project, our team gained a comprehensive understanding of the design thinking process, mind mapping, journey mapping, and prototype development. We developed essential skills in problem-solving, critical thinking, and collaboration. Their expertise and mentorship played a significant role in shaping our project and helping us to achieve our objectives. We are grateful for the time and effort they invested in our project.

We would also like to thank our group members for their active participation, cooperation, and contributions to the project. This project would not have been possible without the collaborative effort of our team.

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Report

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4. 5W1H activity
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6. Problem Statement
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8. Journey Map
9. Working of the App/Model
10. Discussion on the usability of the App/Model
11. Conclusion

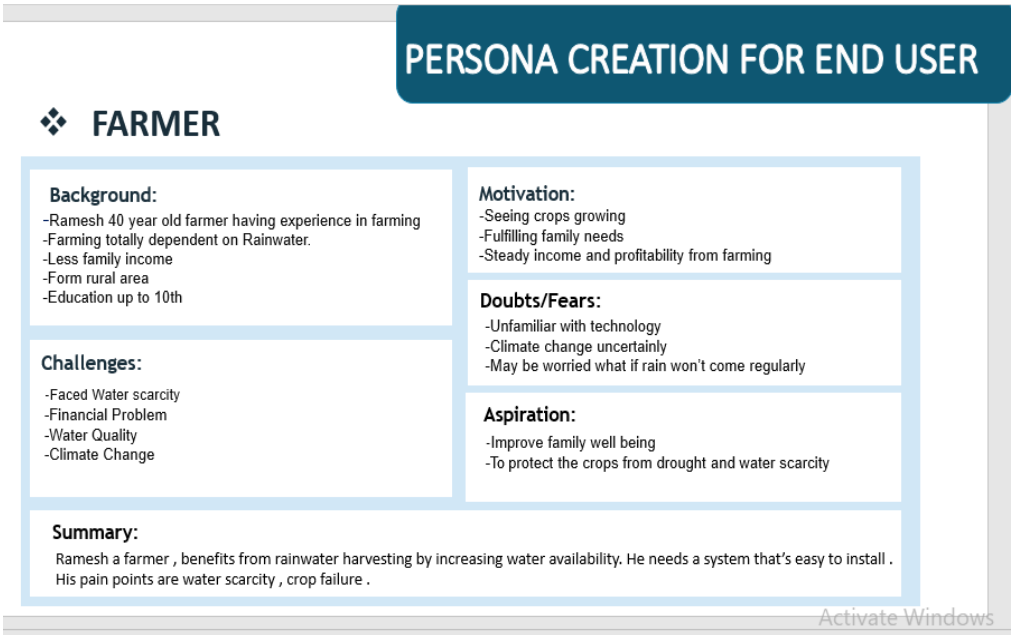
Topic Selection

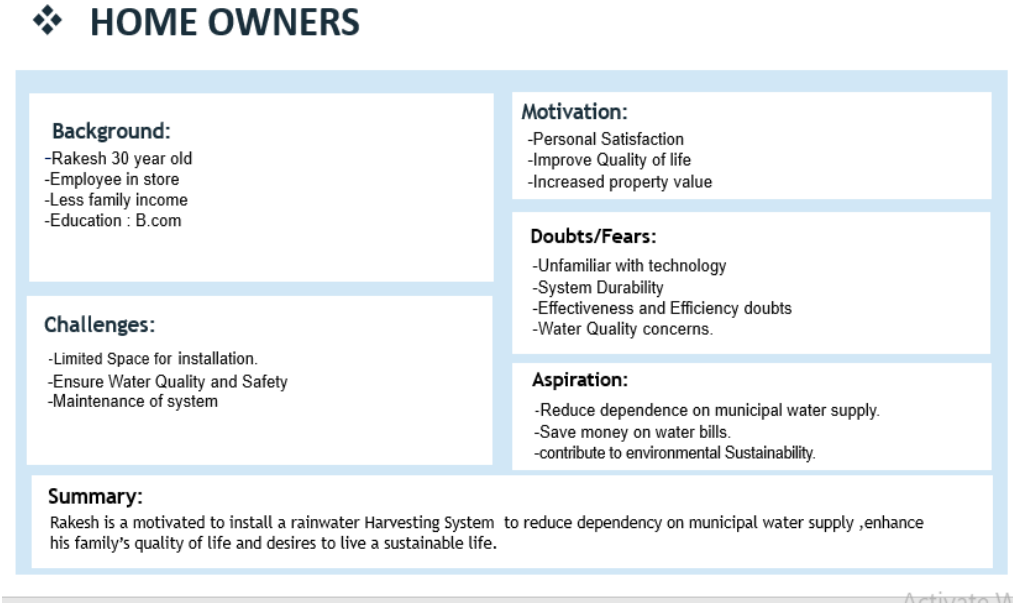
For our project, we selected the topic of Rain Water Harvesting under SDG 6 (Clean water and Sanitation) to enhance water conservation and management.

End User Persona

Persona contains a Background, Challenges faced, Motivation, Doubts and Fears, Aspiration and the summary of end users.

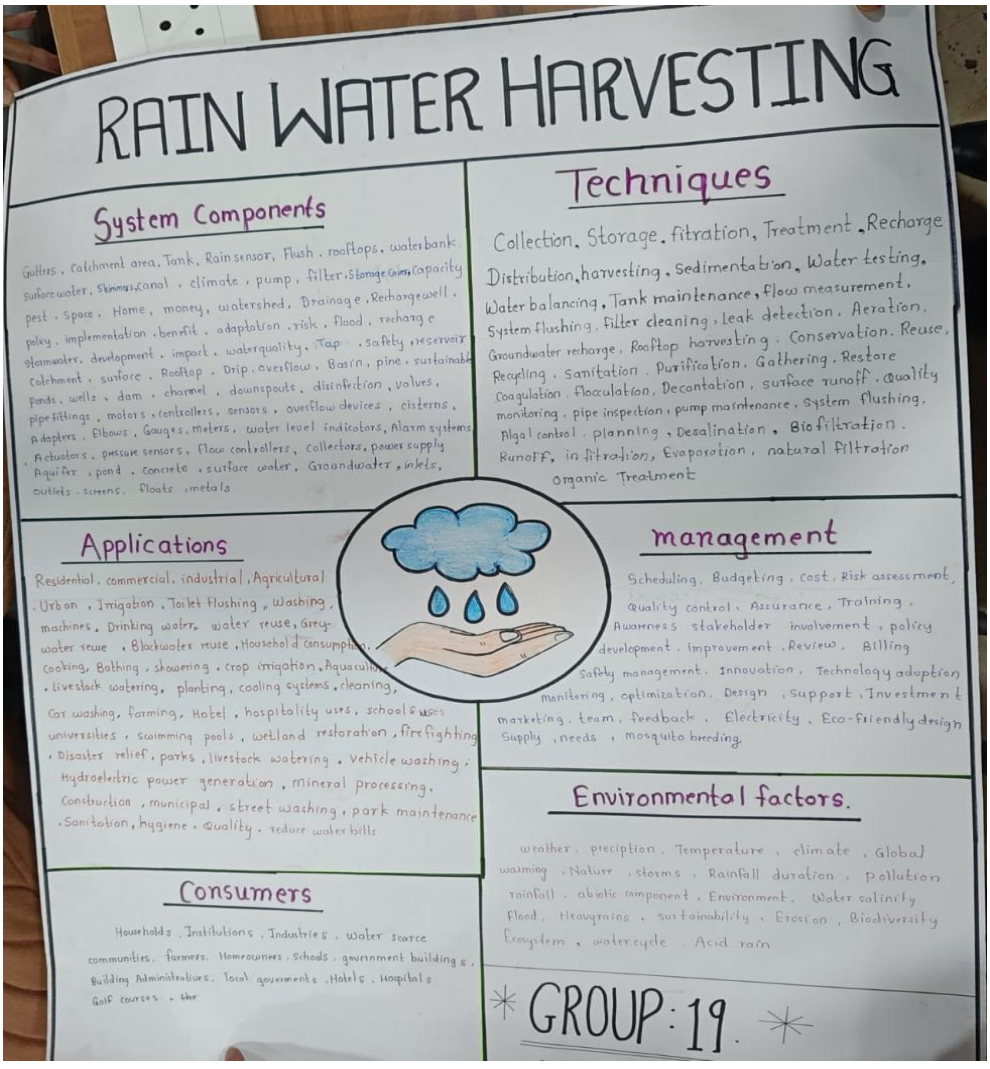
Our end users are Farmer, Homeowners .We created persona on this end users showing their background, their challenges and their pain points.





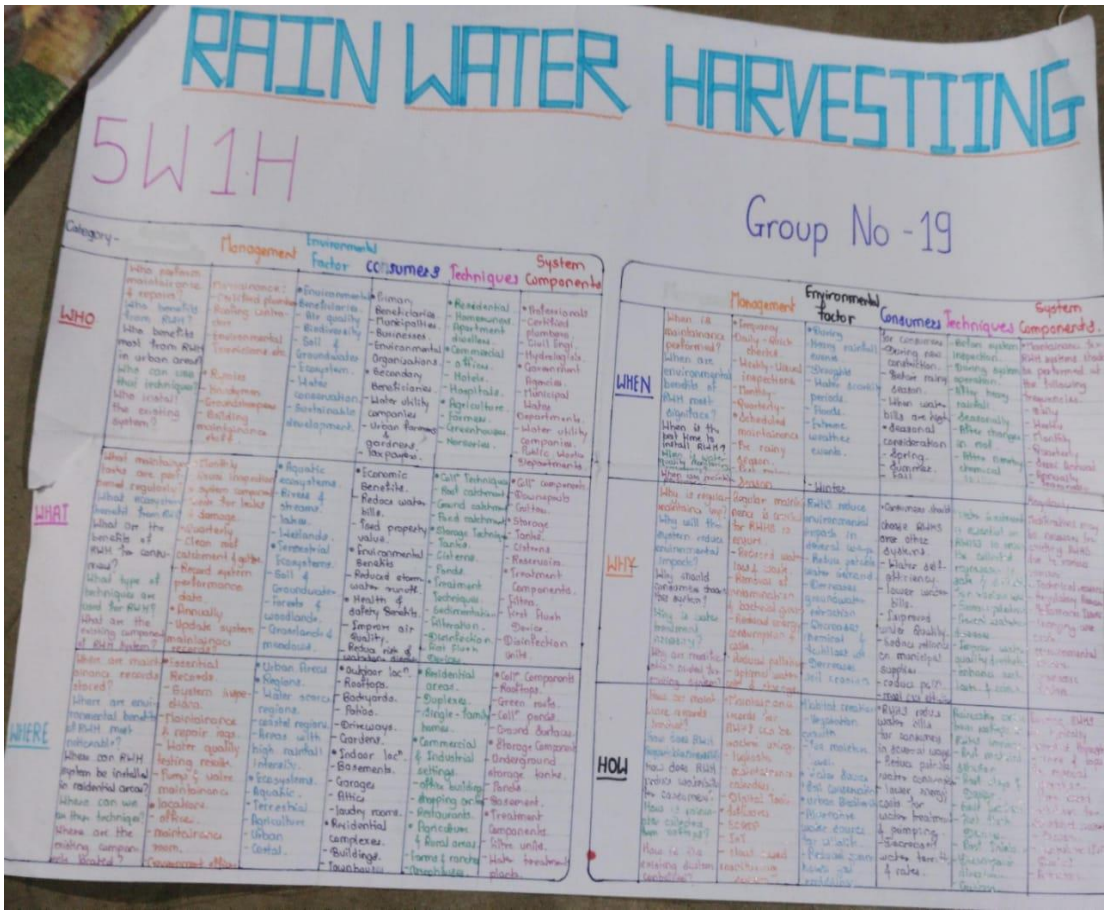
Mind Map Activity

Mind Map is Creative activity used to connect ideas. Mind Map visualizes your ideas and helps you to understand your topic. Through this Activity We found 210 words related to rainwater harvesting System then we categorized them into subtopics, which helped us to emphasize the topic in well mannered.



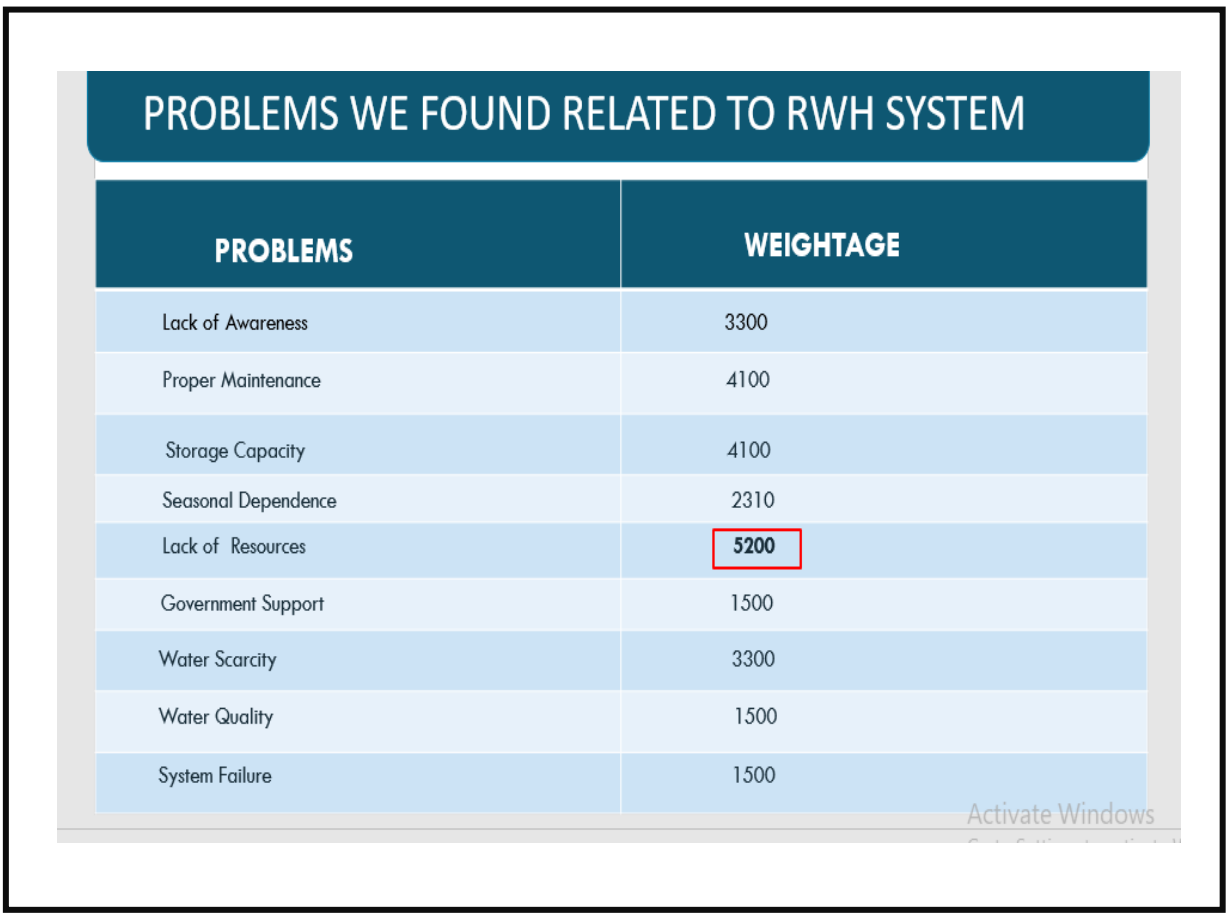
5W1H Activity

5W1H is a activity in which we have to find the questions related to our topic. We applied this to our topic then we found the questions related to rainwater harvesting system, which helped us in clarifying the problems and projects importance and necessity.



Theory of Prioritization

Theory of Prioritization is the process of finding the problems related to the topic and then assigning the weightage to each problem. As the problem which will having higher weightage will be most impactful and focusing point. We found the total nine problems and assigned weightage to each, and we got “Lack of Resources” with higher weightage of “5200”.



Problem Statement

The resources, which are needed for installation of rainwater harvesting system, are not easily available, particularly in rural or undeveloped areas. People's faces difficulty in Accessing Rainwater Harvesting Components, because of lack of local suppliers.

SCAMPER Activity

The SCAMPER Technique is a creative Problem-solving method. Its Acronym stands for:

S: Substitute	(Replace a component or process)
C: Combine	(Merge two or more Ideas)
A: Adapt	(Adjust an Existing Solution)
M: Modify	(Change a Component or Process)
P: Put to another use	(Repurpose an existing Solution)
E: Eliminate	(Remove unnecessary components)
R: Rearrange	(Reorganize existing elements)

WE USED “C- Combine “

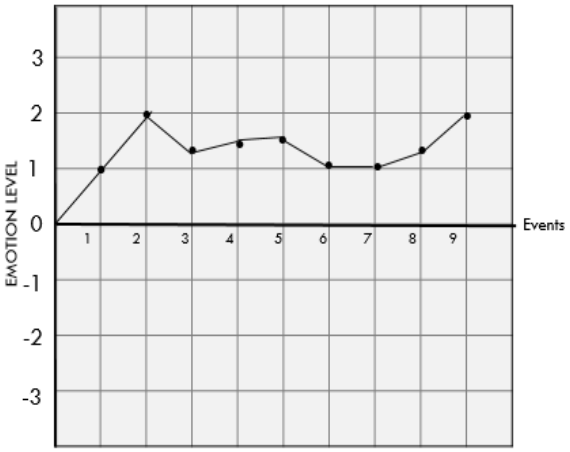
By applying **SCAMPER** technique to our problem statement, we identified that we can **combine** online platform for component purchasing with offline installation services and companies through which Peoples can buy components online. Easily Resources will be available. Will Increase efficiency.

Journey Map

Journey Map is the graphical representation of users experience with App. It is a powerful tool for understanding users need, identifying pain points and enhance user experience.

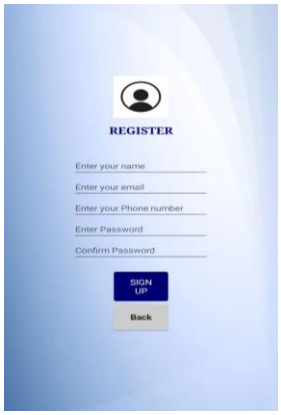
GRAPH AS PER THE EMOTIONAL JOURNEY OF USER

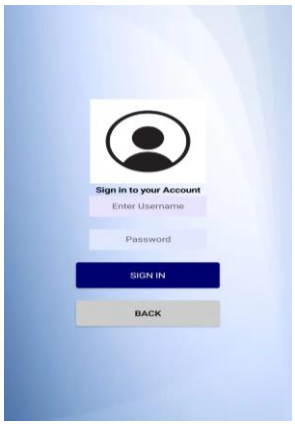
EVENTS	EMOTION
-Wants to install RWH system	motivated
-Start Searching About Setup	Confident
-Starts searching About the Components and resource	low confident
-Got to know about Rainwater Harvesting APP	Confident
-Hopefully Installs and sign in to the APP	Confident
-starts searching	low Confident
-Gets the content matching to his expectation	little Confident
-Gets some Content Helpful	confident
-Gets some helpful content and leaves the App	little confident

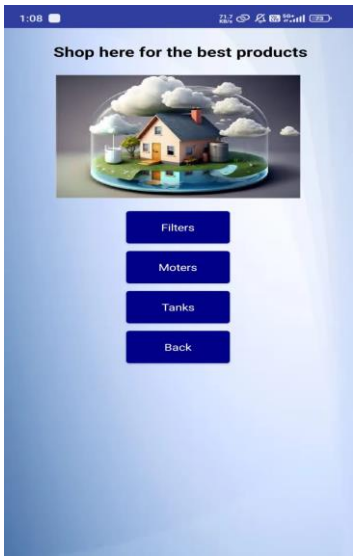


Activate Windows

Working of the App/Model



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System Installation
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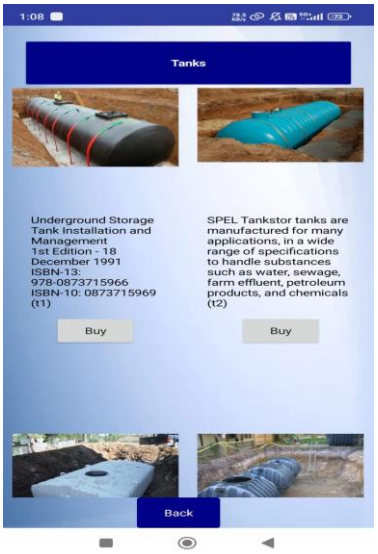
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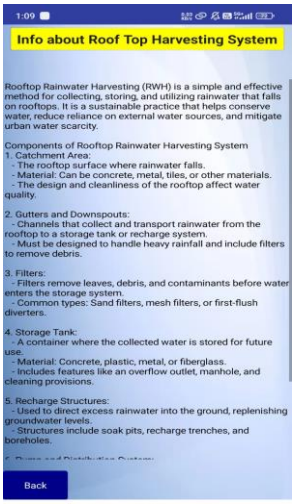
Info about Roof Top Harvesting System
Rooftop Rainwater Harvesting (RWH) is a simple and effective method for collecting, storing, and utilizing rainwater that falls on rooftops. It is a sustainable practice that helps conserve water, reduce reliance on external water sources, and mitigate urban water scarcity.
Components of Rooftop Rainwater Harvesting System
1. Catchment Area:
- The rooftop surface where rainwater falls.
- Material: Can be concrete, metal, tiles, or other materials.
- The design and cleanliness of the rooftop affect water quality.
2. Gutters and Downspouts:
- Channels that collect and transport rainwater from the rooftop to a storage tank or recharge system.
- Must be designed to handle heavy rainfall and include filters to remove debris.
3. Filters:
- Filters remove leaves, debris, and contaminants before water enters the storage system.
- Common types: Sand filters, mesh filters, or first-flush diverters.
4. Storage Tank:
- A container where the collected water is stored for future use.
- Material: Concrete, plastic, metal, or fiberglass.
- Includes features like an overflow outlet, manhole, and cleaning provisions.
5. Recharge Structures:
- Used to direct excess rainwater into the ground, replenishing groundwater levels.
- Structures include soak pits, recharge trenches, and boreholes.
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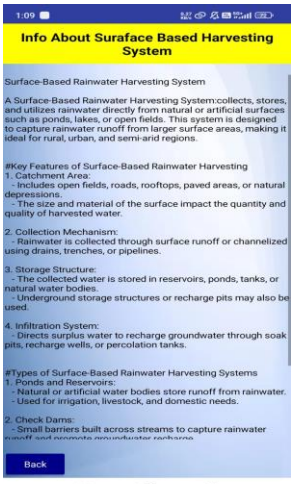
Info About Suraface Based Harvesting System
Surface-Based Rainwater Harvesting System
A Surface-Based Rainwater Harvesting System:collects, stores, and utilizes rainwater directly from natural or artificial surfaces such as ponds, lakes, or open fields. This system is designed to capture rainwater runoff from larger surface areas, making it ideal for rural, urban, and semi-arid regions.
#Key Features of Surface-Based Rainwater Harvesting
1. Catchment Area:
- Includes open fields, roads, rooftops, paved areas, or natural depressions.
- The size and material of the surface impact the quantity and quality of harvested water.
2. Collection Mechanism:
- Rainwater is collected through surface runoff or channelized using drains, trenches, or pipelines.
3. Storage Structure:
- The collected water is stored in reservoirs, ponds, tanks, or natural water bodies.
- Underground storage structures or recharge pits may also be used.
4. Infiltration System:
- Directs surplus water to recharge groundwater through soak pits, recharge wells, or percolation tanks.
#Types of Surface-Based Rainwater Harvesting Systems
1. Ponds and Reservoirs:
- Natural or artificial water bodies store runoff from rainwater.
- Used for irrigation, livestock, and domestic needs.
2. Check Dams:
- Small barriers built across streams to capture rainwater
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MOTORS
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Discussion on Usability of the App

The app process is seamless with minimal steps. Dashboard provides clear overview of content. It allows users to easily find information on rainwater harvesting system. We used clear and simple language.
The content we implemented in the app is user-friendly.

Conclusion

Overall, the Rainwater Harvesting App is strong, focusing on simplicity, efficiency, and user needs and satisfaction. It has been designed considering a wide range of users, providing clear and useful content.