

“CONTAINER FARMING AND ITS ROLE IN SUSTAINABLE AGRICULTURE: BRIDGING ENVIRONMENTAL MANAGEMENT IN URBAN AND RURAL AREAS”

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College: A J Institute Of Management, Mangaluru

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Guide(S): Prof. Deeksha Rao

Prof. Prashanth Shetty

Student (S): Ms. Payal

Ms. Sneha Shetty

Mr. Ashiq M A

Mr. Ganesha

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Introduction:

Container farming is an innovative agricultural practice that addresses critical challenges such as limited arable land, resource scarcity, and climate change. This project explores its potential to bridge environmental management gaps in urban and rural areas promoting sustainability. Container farming is a modern agricultural system that enables controlled environment agriculture, often using hydroponics or aeroponics. This method supports year-round crop production regardless of external climate conditions. It requires less water, land, and chemical input compared to traditional farming. Container farming are ideal for urban settings where space is limited. They can also supplement rural areas facing poor soil. This technology enhances food security by bringing production closer to consumers. It helps reduce transportation emissions and dependency on imported produce. Container farming supports circular economy principles through resource efficiency. Waste management and water recycling are integral parts of its operation. This system can serve as a education and training hubs for sustainable farming. They provide a model for scalable, replicable food systems in various regions. Urban areas benefit through greening efforts and access to fresh produce. It empowers local communities and stimulates agritech entrepreneurship. Container farming helps to mitigate climate risks

and environmental degradation. Overall, container farming is a strategic solution to sustainable agriculture challenges. By evaluating public awareness and adoption barriers, the study aims to develop strategies for integrating container farming into mainstream agricultural practices.

Objectives:

1. To evaluate public awareness of container farming as a sustainable agricultural practice in addressing environmental challenges in urban and rural areas.
2. To assess the impact of awareness campaign and programs promoting container farming as a solution for resource efficient agriculture
3. To examine the role of container farming in enhancing environmental management including resource conservation and waste reduction.
4. To analyse factors influencing the adoption of container farming both in urban and rural context
5. To propose strategies for increasing awareness and integrating container farming into sustainable agricultural practices in diverse settings.

Methodology:

This study adopts a mixed-methods approach to evaluate the role of container farming in sustainable agriculture, focusing on bridging urban and rural environmental management. Primary data will be collected through structured surveys targeting urban and rural populations, including aspiring farmers, agricultural students and sustainability stakeholders. Secondary data sources will include academic research, government reports, case studies, and agricultural databases. Descriptive analysis will summarize key findings, while correlation, regression and comparative analyses will examine relationships between awareness, perceived benefits and adoption intentions across different contexts. Path analysis using Structured Equation Modeling (SEM) will explore factors influencing adoption, with tools like IBM SPSS and SMART PLS ensuring robust analysis. This methodology aims to identify awareness levels, motivators and barriers, providing actionable recommendations to enhance container farming as a sustainable agricultural practice. Structured Equation Modeling (SEM) using IBM SPSS and SMART PLS.

Relevance to Industry/Society:

The project on container farming is highly relevant to agriculture industry, environmental management institutions and society at large. It addresses the growing demand for sustainable agricultural practices, offering solutions to urban and rural communities facing challenges like limited arable land, resource constraints, and climate change. In the industry, container farming aligns with the trends of agri-tech innovation, precision farming, and green employment, supporting the development of sustainable food production systems. For society, it promotes food security, resource efficiency, and eco-friendly practices, directly benefiting urban and rural populations. Institutions focused on environmental sustainability and agricultural research can leverage the findings to enhance programs and policies, ensuring better integration of container farming into sustainable development goals.

Results & Conclusions (Expected)

This project aims to provide a comprehensive understanding of public awareness regarding container farming to inform the development of effective educational and promotional strategies. It offers valuable insights into how container farming can address environmental challenges and support sustainable agriculture in both urban and rural contexts. The study analyzes key motivators and barriers influencing the adoption of container farming, facilitating its broader application. Additionally, it evaluates existing campaigns and programs, offering recommendations to improve their effectiveness and outreach. By proposing practical approaches to integrate container farming into sustainable and resource-efficient agricultural systems, the project highlights its benefits to diverse communities. Furthermore, it presents actionable guidance for policymakers, agricultural organizations, and communities to promote container farming as a viable solution for environmental management and food security.

Working Model vs. Simulation/Study

This project is based on both primary and secondary research to evaluate the potential of container farming as a sustainable agricultural practice. Primary data was gathered from the respondents who are pursuing or interested to take up farming, capturing

their perspectives, awareness levels, and willingness to adopt this method. This data was collected through structured surveys and interactions with aspiring farmers and students. In addition, secondary research involved analyzing existing literature, government reports, case studies, and relevant datasets to support and validate the findings. The combination of these two research approaches provides a comprehensive understanding of the current landscape, challenges, and opportunities related to container farming.

Project Outcomes and Learnings

The project is expected to yield a well-rounded understanding of the current awareness, perceptions, and adoption readiness of container farming, particularly among youth. By combining primary insights with established secondary research, the study will identify key motivators and barriers influencing adoption in both urban and rural settings. It will also evaluate the effectiveness of current awareness campaigns and suggest improvements to enhance their impact. The research aims to propose actionable strategies for integrating container farming into mainstream sustainable agriculture practices, contributing to resource efficiency and environmental management. Through this project, the team gained valuable skills in data collection, critical analysis, and sustainable development planning. Moreover, it strengthened interdisciplinary knowledge by blending concepts from agriculture, environmental science, and urban planning, while emphasizing the role of innovation and technology in modern farming systems.

Future Scope

Container farming holds immense potential for expansion and innovation in the coming years. One promising direction is the integration of AI and machine learning to optimize nutrient delivery, monitor plant health, and automate climate control. This could significantly improve crop yield and reduce human labor, making the system even more efficient. There is also scope to explore solar-powered container farms, especially for rural or remote regions where electricity supply is limited. These off-grid systems can make container farming more accessible and environmentally sustainable. Future research can focus on diversifying crop options beyond leafy greens, incorporating fruiting plants and medicinal herbs using advanced hydroponic

or aeroponic techniques. Additionally, modular designs could allow for scalable solutions from small residential units to large commercial farms. Another critical area is community-driven farming models, where schools, housing societies, or local entrepreneurs adopt container farming as a means of generating income, reducing food dependency, and promoting local sustainability. Environmental studies could further assess the long-term impacts on carbon footprint, waste reduction, and soil conservation, helping to build stronger cases for urban policy support and agricultural grants.