www.ijprems.com
editor@ijprems.com

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 04, Issue 09, September 2024, pp : 674-678

e-ISSN : 2583-1062
Impact Factor : 7.001

PERCEPTION TOWARDS DRIP IRRIGATION AUTOMATION IN PALAKKAD DISTRICT WITH SPECIAL REFERENCE TO COCONUT FARMERS

Dr K. Indhu[1]

[1]Assistant Professor, School of Commerce, Nehru Arts and Science College, Coimbatore.

DOI: https://www.doi.org/10.58257/IJPREMS35937

ABSTRACT

The paper focuses on the critical role of water in agriculture, highlighting that over 70% of India's population depends on this sector, which itself consumes more than 80% of the available water. Traditional irrigation methods suffer from inefficiencies like water wastage and clogging issues. Therefore, modern techniques such as drip irrigation and sprinkler systems are crucial for optimizing both surface and groundwater resources. The paper outlines the steps taken to effectively implement drip irrigation systems in fields, emphasizing strategies used to mobilize farmers. It also addresses the challenges encountered in transitioning farmers from conventional furrow irrigation to drip systems .For that Data collected from 100 randomly selected farmers those exclusively growing coconut using pretested interview schedule. Percentage analysis, Garrett ranking and Chi Square analysis were used to analyze the data.

Keywords: Farmers, Perception, and Drip Irrigation etc.

1. INTRODUCTION

Agriculture plays an important role in the economic growth of our country. It employs more than 90 million people and contributes 15.4 percent gross value addition (GVA) to the Indian economy. Drip irrigation, a highly efficient method of delivering water directly to the plant roots, has gained widespread attention as a solution to the growing challenges of water scarcity and agricultural productivity. This irrigation technique, which involves a network of pipes, valves, and emitters, allows for precise control of water application, minimizing wastage and ensuring that crops receive the optimal amount of water.

Objectives of the Study:

1) Assessing the level of awareness among coconut farmers regarding drip irrigation automation technologies.
2) Exploring the attitudes, beliefs, and perceptions of coconut farmers towards adopting drip irrigation automation.
3) Identifying the perceived challenges, concerns, and barriers that coconut farmers associate with implementing drip irrigation automation on their farms.

Statement of the Problem:

Drip irrigation automation in enhancing agricultural productivity and water efficiency, but many of the coconut farmers may lack awareness of the benefits and operational aspects of drip irrigation automation technologies because of Access to and affordability including financial constraints and uncertainty about return on investment, may discourage farmers from investing in new technologies and also the Inconsistent water availability and the perceived complexity of managing water resources effectively through automated systems could deter adoption. So the study investigating the complex dynamics influencing the perception and adoption of drip irrigation automation among coconut farmers in Palakkad District.

Scope of the Study:

The study specifically targets coconut farmers within Palakkad District, considering its unique agricultural landscape and socio-economic dynamics by investigating the perception towards drip irrigation automation among coconut farmers in Palakkad District, Kerala, India and this structured approach will facilitate meaningful insights into promoting sustainable agricultural practices and technological innovation in the region.

2. RESEARCH METHODOLOGY

Utilizing purposeful sampling to select 50 coconut farmers from Palakkad District who are actively engaged in coconut cultivation. This approach ensures that participants have relevant experience and insights into the topic of drip irrigation automation. Conducting in-depth, semi-structured interviews to explore participants' perceptions, attitudes, awareness levels, adoption rates, and factors influencing adoption among coconut farmers and experiences related to drip irrigation automation.

Statistical tools used for the study: Simple percentage analysis, Chi-square test, Garratt rank test

www.ijprems.com
editor@ijprems.com

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 04, Issue 09, September 2024, pp : 674-678

e-ISSN : 2583-1062
Impact Factor : 7.001

3. ANALYSIS AND INTERPRETATION

TABLE 1.1- Demographic Profile

Demographic Profile	Particulars	Frequency	Percentage
Age	Up to 20 years	7	14
	16 to 40 years	7	14
	41 to 60 years	25	50
	Above 60 years	11	22
Gender	Male	35	60
	Female	15	40
Educational Qualification	Up to Hsc	29	58
	Undergraduate	17	34
	Postgraduate	4	8
Family Income	Below Rs.25000	33	66
	Rs.25001 to 50000	15	30
	Above Rs. 50000	2	4
No of Acres	Below 5 acres	25	50
	5 to 15 acres	19	38
	16 to 25 acres	6	12
Source of Awareness	Government Initiatives	18	36
	Educational Resources	13	26
	Media, And Digital Platforms.	19	38

- **Age Profile:** The population is predominantly middle-aged (41 to 60 years), with notable representation from older individuals (above 60 years) and fewer younger people.
- **Gender:** There is a higher representation of males compared to females.
- **Education:** Most individuals have education up to HSC, with fewer holding undergraduate or postgraduate degrees.
- **Income:** The majority have a low family income, with very few in the higher income bracket.
- **Acreage:** A large portion manages less than 5 acres, indicating smaller scale operations.
- **Awareness Sources:** Media/digital platforms and government initiatives are the primary sources of awareness, with educational resources also playing a role.

Table 1.2- Awareness towards Drip Irrigation Automation,

The below table shows the awareness level of Drip Irrigation Automation

Awareness Aspect	Highly Aware	Moderately Aware	Slightly Aware	Not Aware	Total
General Knowledge of Drip Irrigation	25%	35%	20%	20%	100%
Benefits of Automation	30%	25%	25%	20%	100%
Installation Procedures	15%	20%	30%	35%	100%
Maintenance Requirements	10%	25%	30%	35%	100%
Financial Assistance Options	20%	30%	25%	25%	100%
Training and Support Availability	18%	22%	25%	35%	100%
Local Success Stories	22%	28%	20%	30%	100%

- **High Awareness:** The benefits of automation and local success stories have relatively higher awareness levels.
- **Moderate Awareness:** General knowledge of drip irrigation and financial assistance options are moderately known.
- **Low Awareness:** Installation procedures, maintenance requirements, and training/support availability show lower awareness levels, with a significant portion of the population being unaware.

www.ijprems.com
editor@ijprems.com

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 04, Issue 09, September 2024, pp : 674-678

e-ISSN : 2583-1062
Impact Factor : 7.001

Table 1.3

Perception towards Drip Irrigation Automation

The below table shows the Perception of farmers among Drip Irrigation Automation

Category	Aspect	Positive (%)	Neutral (%)	Negative (%)
Attitudes	Water Efficiency	75%	15%	10%
	Initial Investment	20%	30%	50%
	Labor Reduction	65%	25%	10%
Beliefs	Effectiveness for Coconuts	70%	20%	10%
	Long-Term Savings	50%	30%	20%
	Maintenance Complexity	40%	30%	30%
Perceptions	System Usability	60%	25%	15%
	Adaptability to Local Conditions	55%	25%	20%
	Adaptability to Local Conditions	55%	25%	20%

- **Attitudes:** Positive perceptions are strong for water efficiency and labor reduction but weak for initial investment.
- **Beliefs:** Effectiveness for coconuts is highly favored, long-term savings are appreciated but with mixed opinions, and maintenance complexity is a concern.
- **Perceptions:** System usability is seen positively, and adaptability to local conditions is generally favorable but with some reservations

TABLE 1.4

Chi- Square Test

The chi-square analysis is employed to test the level of significant relationship of one factor over the other. This test reveals whether there is a relationship between selected demographic factors and selected study factors.

Age and Awarness on Automated Drip Irrigation Syste

Age Group	Low	Medium	High	Total
Up to 20 years	3	2	2	7
16 to 40 years	2	3	2	7
41 to 60 years	10	10	5	25
Above 60 years	4	4	3	11
Total	19	19	12	50

Table Value:12.592 **Chi Square Value 0.978**

The chi-square value of 0.798 is not significant at the 0.05 level with 6 degrees of freedom.0.798 is much less than 12.592, we fail to reject the null hypothesis and the age group and category distribution are likely independent of each other according to this test.

www.ijprems.com
editor@ijprems.com

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 04, Issue 09, September 2024, pp : 674-678

e-ISSN : 2583-1062
Impact Factor : 7.001

TABLE 1.5

No of Acres and Awarness on Automated Drip Irrigation Syste

No of Acres	Low	Medium	High	Total
Below 5 acres	12	6	7	25
5 to 15 acres	7	4	8	19
16 to 25 acres	2	1	3	6
Total	21	11	18	50

Table Value:9.488 **Chi Square Value 1.204**

The critical value for 4 degrees of freedom at a 0.05 significance level is approximately 9.488. Since 1.204 is much less than 9.488, you would fail to reject the null hypothesis, indicating that there is no significant association between age group and acreage category.

Garrett Ranking Table

Table 1.6

Rank	Problem	Percentage of Respondents	Score
1	High Initial Costs	30%	1
2	Maintenance and Clogging Issues	25%	2
3	Technical Complexity	15%	3
4	Water Quality Issues	10%	4
5	Vulnerability to System Failures	8%	5
6	Environmental Concerns	5%	6
7	Limited Suitability for Certain Crops	4%	7
8	Energy Requirements	2%	8
9	Economic Viability	1%	9

- **High Initial Costs** is considered the most critical issue based on the survey data, as it has the highest percentage and the lowest score (1).
- Economic **Viability** is ranked as the least critical issue, based on the lowest percentage and highest score (9)

4. FINDINGS

- **Age Profile:** The population is predominantly middle-aged (41 to 60 years), with notable representation from older individuals (above 60 years) and fewer younger people.
- Gender**:** There is a higher representation of males compared to females.
- **Education:** Most individuals have education up to HSC, with fewer holding undergraduate or postgraduate degrees.
- **Income:** The majority have a low family income, with very few in the higher income bracket.
- **No of Acres**: A large portion manages less than 5 acres, indicating smaller scale operations.
- **Awareness Sources:** Media/digital platforms and government initiatives are the primary sources of awareness, with educational resources also playing a role.

Attitudes: Positive perceptions are strong for water efficiency and labor reduction but weak for initial investment.

- **Beliefs:** Effectiveness for coconuts is highly favored, long-term savings are appreciated but with mixed opinions, and maintenance complexity is a concern.
- **Perceptions:** System usability is seen positively, and adaptability to local conditions is generally favorable but with some reservations.
- **High Initial Costs** is considered the most critical issue based on the survey data, as it has the highest percentage and the lowest score (1).
- Economic Viability is ranked as the least critical issue, based on the lowest percentage and highest score (9)

www.ijprems.com
editor@ijprems.com

INTERNATIONAL JOURNAL OF PROGRESSIVE RESEARCH IN ENGINEERING MANAGEMENT AND SCIENCE (IJPREMS)
(Int Peer Reviewed Journal)
Vol. 04, Issue 09, September 2024, pp : 674-678

e-ISSN : 2583-1062
Impact Factor : 7.001

5. CONCLUSION

The analysis of the socio-economic profile, awareness levels, and associated problems of drip irrigation systems highlights several critical insights and areas for action:

1. **Socio-Economic Factors**:

- **Financial Constraints**: High initial costs of drip irrigation systems remain a significant barrier, particularly for small-scale and low-income farmers. Tailored financial support, such as subsidies, grants, or low-interest loans, can facilitate wider adoption.
- Farm Size and Income: Larger and higher-income farmers are more likely to adopt drip irrigation due to the benefits of water efficiency and increased yields. Efforts should be made to make drip irrigation accessible to smaller operations through cost reductions and financial incentives.
- Education and Technical Knowledge: Farmers with higher education levels are better able to understand and implement drip irrigation systems. Educational programs and training initiatives are crucial for improving adoption among less educated or less experienced farmers.
- Access to Credit: Easier access to credit and financial services supports investment in drip irrigation. Expanding financial services and creating targeted credit programs can help overcome financial barriers.

2. **Awareness Levels**:

- Variable Awareness: Awareness of drip irrigation varies by region, with less awareness in developing areas compared to more developed regions. Enhanced outreach through agricultural extension services, demonstration projects, and partnerships with local organizations can bridge the awareness gap.
- Information Sources: Farmers often rely on extension services and peer networks for information. Leveraging these channels and integrating modern technology for information dissemination can increase awareness and understanding of drip irrigation systems.

3. **Associated Problems**:

- Initial Costs: The high cost of installation is a major issue. Innovations in low-cost technologies and financial support can address this problem.
- Maintenance and Complexity: Ongoing maintenance and the technical complexity of drip systems can hinder their effectiveness. Providing comprehensive training, simplifying system design, and improving system reliability through better materials can mitigate these issues.
- Water Quality: Poor water quality can affect system performance. Implementing water treatment solutions and regular monitoring are necessary to ensure system efficiency.
- Economic Viability: The uncertain return on investment can deter adoption. Detailed cost-benefit analyses and financial incentives can help demonstrate the economic benefits of drip irrigation.

6. SUGGESTIONS

To effectively address the challenges associated with drip irrigation systems, the following recommendations can be made:

1. **Financial Support**: Implement subsidies, grants, or low-interest loans to reduce the initial costs of drip irrigation systems, particularly for small-scale and low-income farmers.
2. **Educational Initiatives**: Develop and deliver training programs to enhance farmers' technical knowledge and understanding of drip irrigation systems.
3. **Awareness Campaigns**: Increase outreach efforts through agricultural extension services, demonstration projects, and partnerships to improve awareness and knowledge about drip irrigation.
4. **Technical Assistance**: Provide ongoing technical support and simplify system design to address maintenance and complexity issues.
5. **Water Quality Management**: Implement water treatment solutions and regular monitoring to ensure the quality of water used in drip irrigation systems.
6. **Economic Analysis**: Conduct detailed cost-benefit analyses and provide financial incentives to demonstrate and enhance the economic viability of drip irrigation systems.

7. REFERENCES

[1] Kafkafi, U., et al. (2010). Advances in Drip Irrigation Technologies and Their Applications. International Journal of Agricultural and Biological Engineering, 3(2), 1-16.
[2] Azdandoost, A., & Ghaffari, A. (2015). Challenges and Solutions for Drip Irrigation Systems in Developing Countries. Agricultural Water Management, 158, 1-10.
[3] Khan, M. S., et al. (2017). Improving Awareness and Adoption of Drip Irrigation: Strategies and Challenges. Agricultural Systems, 151, 95-105.