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Adoption Of Green Innovation Practices by Young Entrepreneurs: Evidence from Madurai District

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Abstract: Green innovation has become an important component of sustainable entrepreneurial development in recent years. It focuses on the adoption of environmentally friendly practices, technologies, and processes that reduce environmental impact while improving business efficiency. Young entrepreneurs play a crucial role in integrating such sustainable practices into their ventures, especially in developing regions. The present study examines the level of adoption of green innovation practices among young entrepreneurs in Madurai District. It also aims to identify the major factors influencing adoption and the key barriers faced in implementing such practices. The study is based on primary data collected from young entrepreneurs engaged in micro, small, and medium enterprises in the region. A structured questionnaire was used for data collection, and simple statistical tools such as percentage analysis and mean score analysis were applied for interpretation. The findings indicate that the adoption of green innovation practices among young entrepreneurs is at a moderate level. Awareness of environmental issues and government support are found to be significant motivating factors, while high implementation cost and lack of technical knowledge act as major constraints. The study suggests that proper training, financial assistance, and policy support are essential to encourage wider adoption of green practices among young entrepreneurs.

Key Words: Green Innovation, Young Entrepreneurs, Adoption of Green Practices Barriers to Innovation, Sustainable Practices.

I. INTRODUCTION

In recent years, sustainability has become an important concern in business and economic development. With increasing environmental issues such as pollution, waste generation, and depletion of natural resources, businesses are expected to adopt practices that are environmentally responsible. In this context, green innovation has emerged as an important concept that combines business growth with environmental protection. Green innovation refers to the adoption of eco-friendly technologies, processes, and business practices that reduce negative environmental impact while improving efficiency and productivity. It includes practices such as energy conservation, waste management, use of renewable resources, and sustainable production methods. These practices not only help in protecting the environment but also improve the long-term competitiveness of businesses.

Young entrepreneurs play a significant role in driving innovation and economic development. They are more open to new ideas and technologies compared to traditional business owners. Therefore, they are considered important contributors to the adoption of sustainable and green practices in business activities.

Madurai District, located in Tamil Nadu, is witnessing growth in entrepreneurial activities, especially among young individuals in small and medium enterprises. However, the extent to which these entrepreneurs adopt green innovation practices and the challenges they face in doing so remain less explored. Factors such as awareness, financial constraints, and access to technology may influence their adoption behaviour.

II. STATEMENT OF THE PROBLEM

Environmental problems are increasing, so businesses are expected to follow eco-friendly and sustainable practices. In this situation, green innovation is important for protecting the environment while improving business performance. Young entrepreneurs are important for introducing new and innovative ideas in business. However, many of them do not fully adopt green innovation practices due to problems like lack of awareness, high cost, and limited technical knowledge. In Madurai District, the level of adoption of green innovation practices among young entrepreneurs is not clearly known. There is also limited information about the factors that influence their adoption and the challenges they face.

III. REVIEW OF LITERATURE

Chiewattanakul et al. (2021) in Southeast Asia, which is one of the fastest-growing regions in the world, points out how entrepreneurship will play an important role in finding solutions to the problems pertaining to climate change. The document also assesses the existing support ecosystem for environmental related entrepreneurs in southeast Asian countries of Myanmar, Indonesia, Vietnam and Cambodia. This narrowed and thus focus shifted towards environmental entrepreneurship initiatives. The green entrepreneurs try to exceed in developing their business by having a greener and sustainable environment. The report also covers details about the organizations that offer support to green entrepreneurs that address issues pertaining to climate change, mitigation, adaptation, environmental protection and challenges.

Pavithra and Kanimozhi (2019) in their research paper on "Green Entrepreneurship: Strengthening Indian Economy by Innovating the Future" revealed that humans are now increasingly becoming more conscious about the environment and related issues. Many individuals have shifted their preference in having environment friendly items. Green entrepreneurs started helping them provide ample opportunity for the start ups to identify and explore innovative ideas in helping find new products for the society. provides opportunity to the beginners who have identified and explored innovative ideas in serving Indian society.

Maryam, Akram and Soheil (2018) in their study on "The Effect of Emerging Green Market on Green Entrepreneurship and Sustainable Development in Knowledge-Based Companies" found that there is a positive and significant effect of the emerging green market on green entrepreneurship and sustainable development. The entrepreneurs were able to introduce many new Green products and deployed technologies.

IV. SCOPE OF THE STUDY

This study focuses on the adoption of green innovation practices among young entrepreneurs in Madurai District, Tamil Nadu. It covers entrepreneurs engaged in micro, small, and medium enterprises operating in various sectors such as trading, manufacturing, and services. The study examines the level of adoption of eco-friendly and sustainable business practices by young entrepreneurs. It also analyses the factors that influence their adoption and the barriers faced in implementing green innovation practices. The research is based on primary data collected from selected young entrepreneurs in Madurai District. It provides insights into their awareness, attitude, and usage of green innovation practices in business activities. The study is limited to young entrepreneurs within the age group defined for the research and does not include large-scale industries or entrepreneurs outside Madurai District. The findings are useful for understanding the current situation and improving sustainable entrepreneurial practices in the study area.

V. OBJECTIVES OF THE STUDY

1. To examine the level of adoption of green innovation practices among young entrepreneurs in Madurai District.

2. To identify the factors influencing the adoption of green innovation practices among young entrepreneurs.
3. To analyse the barriers faced by young entrepreneurs in implementing green innovation practices.

VI. RESEARCH DESIGN

The present study adopts a **descriptive and analytical research design** to examine the adoption of green innovation practices among young entrepreneurs in Madurai District.

VII. DATA COLLECTION METHODS

Primary Data is collected through a structured questionnaire distributed to young entrepreneurs**.**

Secondary Data is gathered from published research articles, government reports, and digital resources.

VIII. SAMPLING TECHNIQUE

The study adopts a **Simple Random Sampling technique** to select the respondents. Under this method, each young entrepreneur in Madurai District has an equal chance of being selected for the study, ensuring fairness and reducing bias.

Sample Size

The study is conducted with a sample of 150 respondents from Madurai District.

IX. LIMITATIONS

1. The study is limited to Madurai District, so the findings may not be applicable to other regions with different economic or environmental conditions.
2. The sample size is restricted to 150 respondents, which may not fully represent the entire population of young entrepreneurs.
3. The study focuses only on selected green innovation practices, and other important aspects of sustainability may not have been covered.
4. Changes in government policies and market conditions over time are not considered, which may influence the adoption of green practices.

X. DATA ANALYSIS AND DATA INTERPRETATIONS

X.I. DEMOGRAPHIC PROFILE OF THE YOUNG ENTREPRENEURS

Table.1 Age-wise Distribution

Age Group	No. of Respondents	Percentage
Below 25	32	21.3%
25–30	58	38.7%
31–35	36	24.0%
Above 35	24	16.0%
Total	**150**	**100%**

(Source: Primary Data)

The majority of respondents (38.7%) fall in the age group of 25–30 years, indicating that young entrepreneurs in this age category are more actively involved in green innovation practices.

Table.2 Gender-wise Distribution

Gender	No. of Respondents	Percentage
Male	95	63.3%
Female	55	36.7%
Total	**150**	**100%**

(Source: Primary Data)

Male respondents (60%) dominate the sample, showing higher participation of men in entrepreneurial activities, though female participation (36.7%) is also notable.

Table.3 Educational Qualification

Qualification	No. of Respondents	Percentage
School Level	20	13.3%
UG	65	43.3%
PG	48	32.0%
Professional	17	11.4%
Total	**150**	**100%**

(Source: Primary Data)

Most respondents (43.3%) are graduates, suggesting that higher education plays a role in awareness and adoption of green innovation practices.

Table.4 Nature of Business

Type of Business	No. of Respondents	Percentage
Manufacturing	40	26.7%
Service	55	36.7%
Trading	38	25.3%
Others	17	11.3%
Total	**150**	**100%**

(Source: Primary Data)

The service sector (36.7%) has the highest representation, indicating that green practices are increasingly adopted in service-oriented businesses.

Table.5 Years of Experience

Experience	No. of Respondents	Percentage
Below 1 year	28	18.7%
1–3 years	62	41.3%
4–6 years	35	23.3%
Above 6 years	25	16.7%
Total	**150**	**100%**

(Source: Primary Data)

A majority (41.3%) of entrepreneurs have 1–3 years of experience, showing that relatively new entrepreneurs are more inclined towards adopting green innovation practices.

X.II. LEVEL OF ADOPTION OF GREEN INNOVATION PRACTICES

Table.6 Level of Adoption of Green Innovation Practices

S.No	Statement	Mean	Std. Deviation
1	Use of eco-friendly raw materials	3.82	0.91
2	Waste reduction practices	3.95	0.88
3	Energy-saving methods	4.10	0.79
4	Recycling and reuse practices	3.76	0.93
5	Pollution control efforts	3.69	0.96
6	Use of digital tools to reduce paper	4.22	0.74

(Source: Primary Data)

The table 6 shows that the use of digital tools to reduce paper usage has the highest mean score (4.22), indicating strong adoption among respondents. Energy-saving methods (4.10) also rank high, showing awareness of cost and environmental benefits. Pollution control efforts (3.69) have the lowest mean, suggesting moderate adoption. The standard deviation values are relatively low, indicating consistency in responses.

X.III. FACTORS INFLUENCING ADOPTION

Table. 7 Factors Influencing Adoption

S.No	Statement	Mean	Std. Deviation
1	Government policies influence adoption	3.88	0.90
2	Customer demand for eco-friendly products	4.05	0.82
3	Long-term cost savings	4.18	0.77
4	Environmental awareness	4.12	0.80
5	Availability of technology	3.74	0.95
6	Training and education	4.20	0.76

(Source: Primary Data)

The table 7 shows that Training and education (Mean = 4.20) and long-term cost savings (Mean = 4.18) are the most influential factors encouraging green innovation. Customer demand (4.05) and environmental awareness (4.12) also play a significant role. Availability of technology has a comparatively lower mean (3.74), indicating some limitations in access. The low standard deviation values reflect similar opinions among respondents.

X.IV. BARRIERS IN IMPLEMENTING GREEN INNOVATION

Table.8 Barriers in Implementing Green Innovation

S.No	Statement	Mean	Std. Deviation
1	High initial cost	4.26	0.72
2	Lack of technical knowledge	4.08	0.81
3	Limited financial support	4.14	0.78

S.No	Statement	Mean	Std. Deviation
4	Lack of customer awareness	3.85	0.89
5	Difficulty in accessing technology	3.92	0.86
6	Poor infrastructure	3.80	0.91

(Source: Primary Data)

High initial cost (Mean = 4.26) is the most significant barrier faced by young entrepreneurs. Limited financial support (4.14) and lack of technical knowledge (4.08) are also major challenges. Poor infrastructure (3.80) shows comparatively lesser impact but still affects adoption. The consistency in responses is evident from moderate standard deviation values.

XI. FINDINGS

- The majority of respondents belong to the age group 25–30 years**,** showing that younger entrepreneurs are more active in adopting green practices.
- Male entrepreneurs form a higher proportion, though female participation is also significant.
- Most respondents are graduates**,** indicating that education plays an important role in understanding and adopting green innovation.
- The service sector has the highest representation, suggesting that green practices are more easily adopted in service-based businesses.
- A large number of entrepreneurs have 1–3 years of experience**,** showing that new entrants are more open to innovative and sustainable practices.
- The adoption level of green practices is moderately high, especially in the use of digital tools and energy-saving methods.
- Training and education and long-term cost savings are the most important factors influencing adoption.
- Customer awareness and demand also play a significant role in encouraging green practices.
- The major barriers identified are high initial cost**,** limited financial support**,** and lack of technical knowledge**.**
- Respondents show consistent opinions, as indicated by relatively low standard deviation values.

XII. SUGGESTIONS

- Government and financial institutions should offer subsidies, low-interest loans, and incentives to reduce the burden of high initial investment.
- Conduct regular training programs, workshops, and awareness campaigns to improve knowledge about green technologies and practices.
- Make eco-friendly technologies more affordable and accessible, especially for small and young entrepreneurs.
- Introduce supportive policies, tax benefits, and recognition programs to encourage green innovation adoption.

- Increase public awareness about eco-friendly products so that customer demand can motivate entrepreneurs further.
- Improve basic infrastructure such as electricity, waste management, and digital connectivity to support green business operations.
- Create platforms where entrepreneurs can share experiences, ideas, and best practices related to green innovation.

XIII. CONCLUSION

The study on the adoption of green innovation practices among young entrepreneurs in Madurai District reveals that there is a growing awareness and positive attitude towards sustainable business practices. The findings indicate that most young entrepreneurs, particularly those who are educated and in the early stages of their business, are moderately to highly adopting green practices such as energy conservation and digitalization. The analysis shows that factors like training and education, long-term cost benefits, and environmental awareness play a significant role in influencing the adoption of green innovation. At the same time, major challenges such as high initial investment, limited financial support, and lack of technical knowledge restrict the full-scale implementation of these practices. Overall, the study concludes that while the foundation for green innovation is strong among young entrepreneurs, there is a need for better financial assistance, improved access to technology, and continuous awareness and training programs. With the right support from government and institutions, green innovation can be widely adopted, leading to sustainable growth and long-term business success.

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