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GreenLoop and the E-Waste Challenge: A Circular Solution for Bengaluru

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1. Abstract:

Purpose:

This study dives into the role of consumer awareness in shaping sustainable habits, willingness to engage, and trust in circular economy (CE) models — all within the urban landscape of Bengaluru. GreenLoop, a digital platform focused on upcycling and product exchanges, serves as the case study. The goal? To find out if just knowing about CE is enough to drive change or if other factors play a bigger role.

Research Methodology:

A mixed-method approach was used, blending primary data **from 84 respondents** via a structured questionnaire with secondary data from literature and industry reports. Four key variables were examined: consumer awareness of CE practices, adoption of sustainable behaviours , willingness to participate, and trust in CE models. Data analysis involved regression and correlation techniques using Microsoft Excel to uncover patterns and relationships.

Research Findings:

The results painted an interesting picture. Awareness showed a modest but significant positive impact on sustainable consumption behaviours ($p = 0.0075$). However, when it came to influencing willingness to participate ($p = 0.1542$) or trust in CE models ($p = 0.7679$), awareness barely moved the needle. This suggests that while awareness plays a role, other factors like convenience, financial incentives, and social influence matter much more.

Conclusion:

Just spreading awareness isn't enough. Trust needs to be earned through transparency and credibility, while participation thrives on accessibility and incentives. For platforms like Green-Loop, success lies in making upcycling easy, rewarding, and woven into daily life.

Future Study:

There's still a lot to uncover. Future research should dig deeper into the motivational drivers behind CE adoption and explore how regional and cultural factors influence consumer behavior. Understanding these dynamics could help build more effective strategies for scaling circular practices.

Keywords:

- **Circular Economy**:

An economic model that focuses on minimizing waste and maximizing the reuse, repair, recycling, and regeneration of materials and products.

- **Sustainable Consumption**:

Using resources in a way that meets present needs without compromising the ability of future generations to meet theirs—emphasizing eco-friendly and mindful choices.

- **Consumer Awareness**:

The knowledge and understanding consumers have about products, services, rights, and the environmental or ethical impact of their choices.

- **Upcycling**:

The process of creatively reusing waste or old materials to make new, often better-quality or more valuable, products.

- **GreenLoop**:

Likely refers to a company, project, or initiative promoting sustainability—could involve circular practices like upcycling, recycling, or community sharing. (You might be referring to a specific org in Bengaluru.)

- **Bengaluru**:

A major city in southern India, known for its tech industry and growing sustainability and green living movements.

- **Digital Platforms**:

Online tools or websites (like apps or social networks) that connect people, provide information, or offer services—used to promote sustainable habits or sell upcycled products, for example.

- **Behavioral Change**:

Shifting people's habits and attitudes, often through education or incentives, to adopt more sustainable and eco- friendly lifestyles.

2. Introduction:

The transition from a linear economic model to a circular economy (CE) has gained significant momentum as a response to increasing environmental concerns and resources subjected to a number of constraints. (Geissdoerfer, 2017) define the circular economy as a sustainability paradigm that integrates environmental, economic, and social dimensions. Unlike the “take-make-dispose” model, CE promotes waste minimization, closed-loop resource systems, and consumer participation. (Kirchherr, 2017) further bolsters this perspective by analyzing 114 definitions of CE, identifying key principles associated, such as designing out waste, keeping materials in circulation, and regenerating natural systems.

Consumer behavior plays a critical role in the adoption of CE practices. (Bocken, 2016) highlights how business model strategies, such as modular product design and recyclability, enhance consumer willingness to participate in CE initiatives. (Hobson, 2016) argue that social influence, particularly peer norms and societal expectations, significantly influences the sustainable purchasing decisions. In addition, (Gao, 2013) focuses on the importance of consumer trust in sustainable strategies and practices by the corporate sector, understanding that companies integrating circular economy principles with ethical and transparent communication foster higher adoption rates. (Foundation, 2019) further supports this view by illustrating the role of upcycling in transforming waste into valuable products, thereby increasing consumer engagement in circular practices.

Mediating factors, including government policies, technological advancements, and financial incentives, influences the adoption of circular economy.

(Ghisellini, 2016) identify regulatory frameworks as a primary driver of corporate sustainability efforts, while on the other hand (Lacy, 2015) argue that technological innovations- such as digital tracking systems- enhance consumer confidence in circular business models. (Tura, 2019) and (Rizos, 2016) examines how government influence and economic incentives encourage both business and consumer to adopt circular practices, particularly within SMEs. Despite these drivers, (Korhonen, 2018) warns that institutional barriers and inefficiencies in the market can obstruct the widespread implementation of CE models, calling for stronger policy mechanisms and economy incentives.

Digital platforms have emerged as a key enabler of circular economy practices. (Kirchherr J. R., 2017) focuses on the point that digital tools enhance accessibility, transparency, and operational efficiency, thereby facilitating sustainable consumption behaviors.

The integration of digital solutions has also enabled circular startups to explore innovative revenue models, including service fees, subscription and commissions on upcycled goods (Sundararajan, 2016). The case of GreenLoop, a circular economy startup in Bengaluru, exemplifies how digital platforms can be leveraged to

upcycle, repurpose, and facilitate the exchange of unwanted household items, promoting local artisan engagement while reducing waste. The alignment of such initiatives with Bengaluru's sustainability policies, as highlighted by the Smart Cities Mission, further bolsters the potential for scaling CE practices within urban ecosystems.

3. Review Of Literature:

3.1. Conceptual Foundations of Circular Economy

Geissdoerfer et al. (2017) provide a foundational understanding of CE, defining it as a sustainability paradigm that integrates environmental, economic, and social dimensions. The study highlights the shift from linear to circular economic models and emphasizes how consumer awareness influences sustainable consumption behaviors. Similarly, Kirchherr, Reike, and Hekkert (2017) analyze 114 definitions of CE, identifying common elements such as closed-loop resource systems, waste minimization, and consumer participation.

Stahel (2016) discusses the economic benefits of CE, arguing that consumer trust in circular models is crucial for adoption. The paper provides a long-term perspective on waste reduction and the creation of new business opportunities, reinforcing the importance of economic incentives and government policies as mediating factors.

3.2 Consumer Behavior and Sustainable Consumption

- Bocken et al. (2016) explore business model strategies that facilitate consumer adoption of sustainable behaviors. The study underscores how product design innovations, such as modularity and recyclability, enhance consumer willingness to participate in CE initiatives. Hobson and Lynch (2016) further investigate the role of social influence, arguing that peer norms and societal expectations significantly impact consumer choices regarding sustainable products.
- A study by Gao and Bansal (2013) examines the relationship between consumer trust and business sustainability strategies. The findings indicate that firms integrating circular economy principles with ethical and transparent communication foster greater consumer trust, leading to increased adoption rates. Similarly, Ellen MacArthur Foundation (2019) emphasizes upcycling and transforming waste into value, reinforcing how consumer awareness and education shape participation in circular initiatives.
- Tura et al. (2019) identify barriers and drivers influencing circular economy adoption. They emphasize that regulatory policies, economic incentives, and consumer trust serve as key enablers of sustainable consumption. Similarly, Rizos et al. (2016) analyze small and medium-sized enterprises (SMEs) and highlight the impact of government interventions and financial incentives in shaping consumer behaviors towards sustainability.

3.3. Mediating Factors Influencing Circular Economy Adoption

- Ghisellini, Cialani, and Ulgiati (2016) present a systematic review of circular economy transitions, identifying key mediating factors such as government policies, technological advancements, and

economic incentives. Their findings highlight that regulatory frameworks play a critical role in influencing consumer decisions and corporate sustainability efforts.

- Lacy and Rutqvist (2015) discuss corporate strategies that leverage circular principles to achieve competitive advantages. They highlight the role of technological advancements in driving circular business models, particularly in manufacturing and retail sectors. The study suggests that companies investing in eco-innovation and digital tracking technologies enhance consumer confidence and trust in sustainable products.

- Masi et al. (2017) review supply chain configurations in the circular economy, illustrating how technological innovations, social influence, and government policies influence consumer behavior. The study provides insights into how supply chain transparency enhances consumer trust and willingness to adopt circular practices.
- Korhonen, Honkasalo, and Seppälä (2018) provide a critical perspective on the limitations of CE models, arguing that institutional barriers and market inefficiencies hinder widespread adoption. The study calls for stronger policy interventions and economic mechanisms to address gaps in consumer participation and trust.

3.4. The Circular Economy Paradigm

- The circular economy represents a transformative shift away from the traditional linear "take- make-dispose" model, toward a system where resource efficiency and sustainability are embedded in every stage of a product's lifecycle. This paradigm is not only qualitative in its intent but also opens avenues for quantitative measurement of its benefits.

Core Principles and Quantitative Insights

According to Geissdoerfer et al. (2017), the circular economy is built on three foundational principles:

3.5 Keeping Products and Materials in Use:

This principle emphasizes extending the lifecycle of products through reuse, remanufacturing, and upcycling. Geissdoerfer et al. (2017) highlight that studies have shown the potential for significant material savings. In some sectors, circular practices have been estimated to reduce raw material usage by up to 30–40%. These figures underscore the economic and environmental benefits of keeping products in circulation rather than disposing of them after a single use.

3.6 Framework and Methodological Contributions:

In their comprehensive review, Geissdoerfer et al. (2017) not only synthesized over 100 definitions and interpretations of the circular economy but also proposed an analytical framework that categorizes circular practices into design, consumption, and end-of-life management. This framework serves as a basis for both qualitative and quantitative assessments. For example:

Material Flow Analysis (MFA): Quantitative studies often use MFA to trace the movement of materials through the economy. This method helps identify bottlenecks and quantify the potential reductions in resource extraction when circular strategies are implemented.

Lifecycle Assessment (LCA): LCAs are critical in providing data on energy savings and emissions reductions. By comparing products designed under circular principles with conventional products, researchers can quantify improvements in sustainability.

Circularity Indicators: These indicators, now being refined in various sectors, provide a numerical score reflecting how "circular" a product or system is. They help policymakers and businesses set targets and monitor progress over time.

3.7 Community Building and Collaborative Consumption:

Digital platforms foster a sense of community among users, promoting collaborative consumption. They connect like-minded individuals, allowing them to share resources and knowledge. This network effect can lead to a significant multiplier effect, where increased participation by one group encourages broader community involvement. Kirchherr et al. (2017) emphasize that such collaborative environments are integral to the success of the circular economy, as they help spread sustainable practices through social and economic networks.

3.8 Upcycling and Repurposing: Transforming Waste into Value

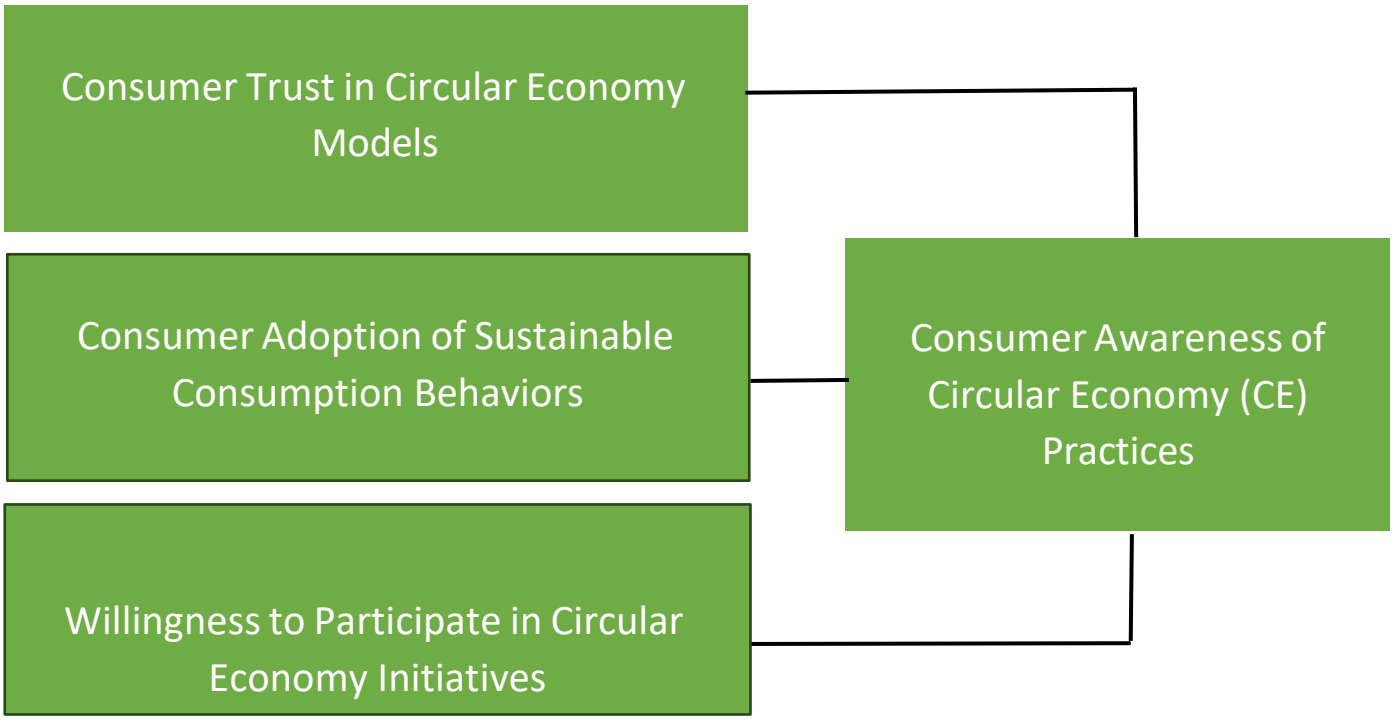
Upcycling involves creatively reusing materials to produce products of higher quality or value than the original. Unlike recycling, which typically breaks materials down to form new, sometimes lower-quality products, upcycling emphasizes innovation and design excellence. Repurposing, a closely related practice, involves adapting items for new uses without extensive modification. These strategies collectively help reduce the amount of waste sent to landfills, conserve resources, and lower carbon footprints.

Quantitatively, studies such as **"Upcycling: Transforming Waste into Value"** (Ellen MacArthur Foundation, 2019) highlight significant potential benefits. For example, metrics can be developed to track the reduction in

waste volume and the amount of raw material saved by diverting items from traditional waste streams. Some estimates suggest that effective upcycling initiatives could reduce waste streams by up to 20–30% in targeted sectors, depending on the material and local context.

4. Research Model

Consumer Awareness-Behavioral Response Model for Circular Economy (CABR-CE):
Research Gap:



Limited research exists on how consumer awareness of circular economy (CE) practices directly influences sustainable consumption adoption, willingness to participate, and trust in CE models, especially in rapidly growing urban centers like Bengaluru, India.

4.1 Research Question:

How does consumer awareness of circular economy (CE) practices influence the adoption of sustainable consumption behaviors, willingness to participate in CE initiatives, and trust in CE models within Bengaluru's urban sustainability landscape?

5. Research Objectives:

1. To examine the impact of consumer awareness of circular economy (CE) practices on the adoption of sustainable consumption behaviors in Bengaluru.

2. To analyze the relationship between consumer awareness and willingness to participate in circular economy initiatives.
3. To assess how consumer awareness influences trust in circular economy models within Bengaluru's urban sustainability context.

6. Research Methodology:

A mixed-method approach is used in this study, incorporating both primary and secondary data to analyze the impact of consumer awareness on sustainable consumption behaviors, willingness to participate, and trust in circular economy (CE) models.

Primary data will be collected through a structured questionnaire focused on four key variables: Consumer Awareness of CE Practices (Independent), Adoption of Sustainable Consumption Behaviors (Dependent), Willingness to Participate in CE Initiatives (Dependent), and Trust in CE Models (Dependent). The questionnaire will utilize Likert-scale questions to quantify respondents' perceptions of each variable. The sample will consist of 84 respondents, including environmentally conscious consumers and individuals engaged in sustainability initiatives in Bengaluru.

The collected data will be analyzed using Microsoft Excel, employing descriptive statistics, regression, and correlation analyses to identify relationships between consumer awareness and the dependent variables. Secondary data from industry reports, government policies, and peer-reviewed journals will be included to provide theoretical validation and comparative analysis.

This comprehensive approach will ensure the reliability of findings and offer actionable insights into how consumer awareness drives circular economy adoption in urban settings like Bengaluru.

7. Research Hypothesis:

H_1: Adoption of sustainable consumption behaviors is positively influenced by consumer awareness of circular economy (CE) practices.

H_2: Willingness to participate in circular economy initiatives is positively influenced by consumer awareness of CE practices.

H_3: Consumer trust in circular economy models is positively influenced by consumer awareness of CE practices.

Hypothesis Table:

Variables	**P Values**	**Accepted/Rejected**
Trust in Circular Economy Models	**0.7679**	**Rejected**
Adoption of Sustainabl Consumption Behaviors	**0.0075**	**Accepted**
Willingness to Participate in CI Initiatives	**0.1542**	**Rejected**

Interpretation:

The hypothesis table breaks down the relationship between consumer awareness and three key factors: trust in circular economy (CE) models, adoption of sustainable consumption behaviors, and willingness to participate in CE initiatives. The only hypothesis that holds up is the link between awareness and adopting sustainable habits (p = 0.0075), meaning awareness does push people towards greener choices. But when it comes to building trust (p = 0.7679) or getting people to actively participate (p = 0.1542), awareness alone doesn't cut it. Trust needs more- like transparency and credibility- while participation likely depends on things like convenience, incentives, and social influence. So, boosting awareness is a start, but it's not the magic solution for driving full engagement in CE practices.

8. Data Analysis:

8.1 Correlations:

Variables	Independent Variable (Awareness of CE)	Trust in CE Models)	Willingness to Participate	Adoption of Sustainable Behavior
Independent Variable (Awareness of CE)	1			
Trust in CE Models)	-0.032890214	1		
Willingness to Participate	-0.157811558	0.254907875	1	
Adoption of Sustainable Behavior	0.291411797	0.381208704	0.192214892	1

Interpretation:

1) Awareness of CE & Trust in CE Models (-0.0329)

- A very weak negative correlation suggests that Awareness of CE does not strongly influence Trust in CE Models.
- This indicates that even if people are aware of circular economy concepts, it does not necessarily mean they trust these models.

2) Awareness of CE & Willingness to Participate (-0.1578)

- A weak negative correlation suggests that Awareness of CE has a slight inverse relationship with people's Willingness to Participate in CE initiatives.
- This could imply disbelief or barriers despite awareness, indicating that awareness alone is not sufficient to be the driving force behind participation in CE activities.

3) Awareness of CE & Adoption of Sustainable Behavior (0.2914)

- A positive correlation shows that as Awareness of CE increases, Adoption of Sustainable Behavior tends to increase, but the relationship is not very strong.
- This suggests that raising awareness can have some impact on sustainable behaviors but it may require additional factors.

4) Trust in CE Models & Willingness to Participate (0.2549)

- A positive correlation indicates that Trust in CE Models influences people's willingness to participate in CE activities to a certain degree.
- This highlights that people are more likely to engage in CE activities if they trust the underlying models.

5) Trust in CE Models & Adoption of Sustainable Behavior (0.3812)

- A moderate positive correlation suggests that Trust in CE models positively affects Sustainable Behavior.
- This implies that trust plays a crucial role in encouraging people to make sustainable choices.

6) Willingness to Participate & Adoption of Sustainable Behavior (0.1921)

- A weak positively correlation indicates that Willingness to Participate in CE initiatives has some influence on Adoption of Sustainable Behavior.
- While participation helps, it may not be the only key driver of behavior change.

8.2 Regression/ANOVA/Coefficients Analysis

H3: Consumer trust (dependent variable) is influenced by consumer awareness of CE practices (independent variable).

Regression Statistics	
Multiple R	0.032890214
R Square	0.001081766
Adjusted R Square	-0.011250558
Standard Error	0.944189225
Observations	83

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.078199963	0.078199963	0.087718	0.767856629
Residual	81	72.21095666	0.891493292		
Total	82	72.28915663			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.90678659	0.313117221	6.089689304	3.61E-08	1.283781539	2.529791642	1.283781539	2.529791642
Independent Variable (Awareness of CE)	-0.051512674	0.173928143	-0.29617216	0.767857	-0.397575121	0.294549773	-0.397575121	0.294549773

Interpretation:

Regression

- **Multiple R (0.0329):**

A very low correlation between Awareness of CE and Trust.

- **Adjusted R Square (-0.0113)**: A negative value suggests that adding the independent variable did not improve the model.
- **R Square (0.0011)**: The independent variable (Awareness of CE) explains only 0.11% of the variation in Trust, indicating a very weak explanatory power.

ANOVA

- **F-statistic (0.0877) and Significance F (0.7679)**:

The model is not statistically significant ($p > 0.05$), meaning Awareness of CE does not significantly impact Trust.

Coefficients

- Intercept (1.91, $p < 0.0001$): The base level of Trust is statistically significant.
- **Awareness of CE (-0.0515, p = 0.7679)**:

The coefficient is negative, suggesting a very weak negative relationship, but it is not statistically significant ($p > 0.05$), meaning Awareness of CE has no real impact on Trust.

H_2: Willingness to participate (dependent variable) is influenced by consumer awareness of CE practices (independent variable)

Regression Statistics	
Multiple R	0.157811558
R Square	0.024904488
Adjusted R Square	0.012866272
Standard Error	0.646530491
Observations	83

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.864755834	0.864755834	2.068785569	0.154193849
Residual	81	33.85813573	0.418001676		
Total	82	34.72289157			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	1.809076043	0.214405995	8.437618734	1.02844E-12	1.382475366	2.235676719	1.382475366	2.235676719
Independent Variable (Awareness of CE)	-0.171300082	0.119096728	-1.438327351	0.154193849	-0.408265213	0.06566505	-0.408265213	0.06566505

Interpretation:

Regression

- **Multiple R (0.1578):**

A weak positive correlation exists.

- **R Square (0.0249)**:

Awareness of CE explains only 2.49% of the variation in Willingness to Participate, indicating a very weak relationship.

- **Adjusted R Square (0.0129)**:

The model's explanatory power remains low.

ANOVA

- **F-statistic (2.07), Significance F (0.1542):**

The model is not statistically significant ($p > 0.05$). This means that Awareness of CE does not significantly predict Willingness to Participate.

Coefficients

- **Intercept (1.809, p < 0.0001):**

The base level of Willingness to Participate is statistically significant.

- **Awareness of CE (-0.1713, p = 0.1542)**:

The coefficient is negative, meaning that an increase in Awareness of CE is associated with a slight decrease in Willingness to Participate. However, the p-value is greater than 0.05, making this effect statistically insignificant.

H_1: Adoption of sustainable consumption behaviors (dependent variable) is influenced by consumer awareness of CE practices (independent variable)

Regression Statistics	
Multiple R	0.291411797
R Square	0.084920836
Adjusted R Square	0.073623562
Standard Error	0.547216417
Observations	83

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	2.250913712	2.250913712	7.516931805	0.007519784
Residual	81	24.25511038	0.299445807		
Total	82	26.5060241			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.976287817	0.181470916	5.379858311	7.06229E-07	0.615217617	1.337358017	0.615217617	1.337358017
Independent Variable (Awareness of CE)	0.276369583	0.100802183	2.741702355	0.007519784	0.075804858	0.476934308	0.075804858	0.476934308

Interpretation:

Regression

- **Multiple R (0.2914):**

A weak positive correlation exists between Awareness of CE and Adoption of Sustainable Consumption.

- **R Square (0.0849)**:

Awareness of CE explains 8.49% of the variation in Adoption of Sustainable Consumption, which is still a weak relationship, but stronger than the previous analysis.

- **Adjusted R Square (0.0736)**:

The explanatory power remains low but slightly adjusted for the sample size.

ANOVA

- **F-statistic (7.5169), Significance F (0.0075):**

The model is statistically significant (p < 0.05), meaning that Awareness of CE has a significant impact on Adoption of Sustainable Consumption.

Coefficients

- **Intercept (0.9763, p < 0.0001):**

The base level of Adoption of Sustainable Consumption is statistically significant.

- **Awareness of CE (0.2764, p = 0.0075)**:

The coefficient is positive, meaning that an increase in Awareness of CE is associated with a higher likelihood of adopting sustainable consumption. The p-value is significant ($p < 0.05$), confirming that Awareness of CE has a meaningful impact.

9. Findings

9.1 Consumer Awareness Has No Significant Impact on Trust

- Minimal correlation (Multiple R = 0.0329) suggests an almost negligible relationship between awareness and trust.
- $R^2 = 0.0011$, Adjusted $R^2 = -0.0113$, indicating that awareness explains only 0.11% of the variation in trust levels.
- p-value = 0.7679 (above the 0.05 threshold), confirming that the relationship is not statistically significant.
- The negative coefficient (-0.0515) suggests a slight inverse relationship, though it lacks statistical relevance.

Implications for GreenLoop:

- Awareness alone does not build trust. Other factors, such as brand reputation, transparency, and demonstrated impact, likely play a more critical role.
- GreenLoop should prioritize trust-building strategies, such as third-party sustainability certifications, transparent reporting, and customer testimonials.

9.2 Consumer Awareness Does Not Directly Drive Willingness to Participate

- Weak positive correlation (Multiple R = 0.1578) suggests a slight link between awareness and willingness to participate.
- $R^2 = 0.0249$, indicating that awareness accounts for only 2.49% of the variation in willingness to participate.
- p-value = 0.1542, F-statistic = 2.07, confirming statistical insignificance.
- Negative coefficient (-0.1713) suggests that, in some cases, higher awareness may reduce willingness to participate, though this effect is not strong enough to draw conclusions.

Implications for GreenLoop:

- Awareness alone is insufficient to encourage participation; barriers such as convenience, financial incentives, and behavioral habits likely play a more significant role.
- GreenLoop should focus on removing friction points and creating incentives, such as discounts for product returns, cashback rewards, and an intuitive digital experience.

9.3 Consumer Awareness Positively Influences Sustainable Consumption, But Modestly

- Weak but positive correlation (Multiple R = 0.2914) suggests that awareness plays a role in influencing

sustainable behavior.

- $R^2 = 0.0849$, indicating that awareness explains 8.49% of the variation in sustainable consumption behaviors.
- Statistically significant p-value (0.0075, F-statistic = 7.5169) confirms the validity of this relationship.
- Positive coefficient (0.2764, p = 0.0075) indicates that higher awareness is associated with a greater likelihood of sustainable consumption behaviors.

Implications for GreenLoop:

- While awareness contributes to sustainable behavior, it is not the sole determining factor.
- To maximize impact, GreenLoop should integrate educational marketing strategies with action- oriented initiatives:
  - Engaging, interactive content that informs and encourages participation.
  - Influencer partnerships to normalize and promote sustainable behaviors.
  - Gamification and reward-based systems to encourage continued engagement.

10. Conclusion

This study, based on 84 responses, makes one thing clear-just knowing about the circular economy (CE) isn't enough to get people to trust it or actively participate. The numbers back it up as awareness has almost no impact on trust (Multiple R = 0.0329, $R^2 = 0.0011$, p-value = 0.7679). That means the hypothesis that awareness builds trust got rejected. People don't just believe in CE models because they know about them-things like brand reputation, transparency, and actual impact matter way more. For GreenLoop, this means focusing on things that actually build credibility, like sustainability certifications, transparent reporting, and strong customer testimonials, instead of just spreading awareness.

The same goes for participation. Awareness alone doesn't really push people to take action (Multiple R = 0.1578, $R^2 = 0.0249$, p-value = 0.1542). The hypothesis that awareness drives willingness to participate was also rejected. This suggests that just educating people about CE isn't enough—real participation depends on convenience, financial perks, and behavioral habits. GreenLoop can't just expect people to engage because they understand CE; it needs to make participation easier and more rewarding. Things like discounts on product returns, cashback offers, and a seamless app experience would do a better job of getting people involved.

That said, awareness does have some influence on sustainable consumption behaviors, though it's not a game- changer (Multiple R = 0.2914, $R^2 = 0.0849$, p-value = 0.0075). The hypothesis that awareness leads to sustainable behavior was accepted, but with an important caveat- it's not the only factor at play. This means GreenLoop needs to go beyond just informing people and make sustainable behavior engaging. Strategies like educational marketing, influencer collaborations to normalize CE practices, and gamification to keep users involved would make a bigger impact.

The bottom line? Just spreading awareness isn't enough. Trust needs to be earned through credibility, participation has to be made easy and rewarding, and behavior change needs more than just knowledge- it needs engagement. For GreenLoop, that means a well-rounded strategy that goes beyond just talking about CE and actually makes it accessible, beneficial, and part of people's everyday choices.

11. Future Study

Future studies need to go beyond just awareness and figure out what actually makes people trust and engage with circular economy (CE) models. With only 84 responses, this study showed that awareness barely made a difference in trust ($R^2 = 0.0011$, p = 0.7679) or willingness to participate ($R^2 = 0.0249$, p = 0.1542). That means future research should focus on what really drives action—things like convenience, financial perks, social influence, and habit formation. Just knowing

about CE isn't enough; people need reasons to care and incentives to stay involved. Looking into how different regions and cultures adopt CE could also bring out new challenges and opportunities, helping businesses and policymakers create strategies that actually work for different consumer groups.

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13. Annexture:

Demographic Information

1. Age: (Mark only one oval)

- Under 18
- 18-24
- 25-34
- 35-44
- 45 and above

2. Gender: (Mark only one oval)

- Male
- Female
- Prefer not to answer

3. Occupation: (Mark only one oval)

- Student
- Professional
- Other: _____

4. Location (within Bengaluru): (Mark only one oval)

- South Bengaluru
- North Bengaluru
- East Bengaluru

- West Bengaluru
- Central Bengaluru

5. Household Size: (Mark only one oval)

- 1
- 2-3
- 4-5
- 6 or more

Awareness of Circular Economy and GreenLoop

6. How familiar are you with the concept of the circular economy? (Mark only one oval)

- Very familiar
- Somewhat familiar
- Not familiar at all

7. Have you ever heard of GreenLoop before? (Mark only one oval)

- Yes
- No

8. If yes, how did you hear about GreenLoop? (Mark only one oval)

- Social Media
- Word of Mouth
- Online Search
- Ads (Online/Offline)
- Other: _____

9. Which of the following circular economy concepts do you find most interesting? (Select all that apply)

- Upcycling
- Recycling
- Product exchanges
- Repairing and reusing
- None of the above

Consumer Behavior and Participation in Upcycling

10. How often do you dispose of household items that are no longer needed? (Mark only one oval)

- Frequently (once a month or more)
- Occasionally (every few months)
- Rarely
- Never

11. Would you consider using a service like GreenLoop to exchange or upcycle your household items? (Mark only one oval)

- Yes, definitely
- Maybe, depends on the convenience
- No, I prefer to dispose of items myself
- No, I don't believe in upcycling

12. What would encourage you to participate in a circular economy platform like GreenLoop? (Select all that apply)

- Financial incentives (discounts, credits, etc.)
- Convenience (pickup service, easy-to-use platform)
- Environmental impact (contribution to sustainability)
- Trust in the quality of upcycled goods
- Social influence (family/friends using the service)

- Other: _____

Barriers to Adoption

13. How likely are you to use GreenLoop's services if the following were offered? (Mark only one oval per row)

- Free collection and delivery service for upcycled items
- A digital platform with a user-friendly interface for exchanging goods
- Incentives like discounts on upcycled items or services
- Clear information about the environmental impact of upcycling Options for each:
- Not Likely
- Unlikely
- Neutral
- Likely
- Very Likely

14. Would you be willing to pay for upcycling services through GreenLoop? (Mark only one oval)

- Yes
- No
- Maybe, depending on the price

15. What do you think would stop you from using GreenLoop's services? (Select all that apply)

- Lack of awareness about how it works
- Inconvenient service (pickup, drop-off, etc.)
- No financial incentives
- Lack of trust in the quality of upcycled goods

- Concerns about hygiene or condition of repurposed items
- Limited variety of items available for exchange
- Other: _____

16. How do you feel about the idea of repurposing household items for others to use? (Mark only one oval)

- Positive: I see the environmental benefit
- Neutral: I don't have strong opinions either way
- Negative: I prefer new products only

17. In your opinion, what are the biggest challenges to adopting sustainable consumption behaviors in Bengaluru? (Mark only one oval)

- Lack of awareness and education
- Inconvenience or time-consuming processes
- Limited availability of sustainable alternatives
- Higher cost of sustainable products/services
- Other: _____

Technological Integration and Future Participation

18. How comfortable are you with using digital platforms to exchange or upcycle goods? (Mark only one oval)

- Very comfortable
- Somewhat comfortable
- Not comfortable at all

19. If GreenLoop offered an AI-powered recommendation system to suggest upcycling options for your items, would you use it? (Mark only one oval)

- Yes, definitely
- Maybe, if it's easy to use

- No, I don't trust AI recommendations
- No, I don't think I need it

20. Would you recommend GreenLoop to others in your community if it met your expectations for convenience and sustainability? (Mark only one oval)

- Yes, definitely
- Maybe, depending on the experience
- No