

Circular Marketing: Exploring Innovative Approaches to Encourage Sustainable Product Usage and Waste Reduction

Inas Kadhim Hameed

Al-Qadisiyah University College of Nursing

ABSTRACT: This research investigates the impact of circular marketing strategies on employee behavior within the Iraqi Ministry of Environment regarding sustainable product consumption and waste reduction. Employing a quantitative approach, a survey was administered to a sample of ministry employees, collecting data on their attitudes and behaviors toward sustainable practices. Data analysis utilized descriptive statistics and Structural Equation Modeling (SEM) to explore the relationships between circular marketing strategies (green labeling and eco-incentivization), sustainable product usage, and waste reduction behaviors. Results revealed a significant positive relationship between circular marketing strategies, particularly eco-incentivization, and both sustainable product usage and waste reduction. Eco-incentivization demonstrated a stronger influence on these behaviors compared to green labeling. This finding suggests that monetary incentives are more effective in motivating employees to adopt sustainable practices. Further analysis showed that employees perceive green labeling as helpful for identifying environmentally friendly products but that the incentive structure plays a greater role in driving changes to actual waste reduction behaviors. The study emphasizes the importance of incorporating monetary incentives into circular marketing campaigns aimed at fostering environmentally conscious actions within governmental organizations. Recommendations include the implementation of targeted eco-incentive programs, integrating green labeling into procurement procedures.

KEYWORDS: circular marketing, employee behavior, sustainability, waste reduction, public sector, eco-incentivization, green labeling.

INTRODUCTION

Circular marketing is getting common as the businesses as well as consumers come up with efforts to solve the problem of environment conservation. Apart from circular marketing, with its focus on new methodologies for the effective promotion of circular utilization of products and minimization of waste, there is another important contemporary issue requiring analysis. As the global population progressively obtains knowledge of the damaging impacts that it has on the environment, there is a growing clamor to reduce resource degradation as well as pollution which all mandate a change in consumer behavior and, corporate grease. Previous literature on circular economy principles (for example Adebayo et al., 2024; Boonying et al., 2024) have stressed the need to pursue novel marketing communication techniques promoting sustainable consumption across the chain and encouraging reduction of waste, which has been done on the macro level. However, there is a dearth of the literature in terms of the particular and special effects of circular marketing campaigns in affecting the employees' conduct in the nugget of a Ministry of Environment. Literature review investigations like De los Rios and Charnley (2017) address skills and capabilities across circular economy and Agyabeng-Mensah et al. (2021) review organizational learning and zero-waste. Therefore, this study seeks to fill this gap by assessing the influence of

diverse circular marketing strategies in cultivating proper use of products and reducing wastage amongst workers in the Ministry, informed by real-life data to help practicing stakeholders and policy makers advance sustainable practices that are beneficial to the environment. More specifically, this study aims to advance an understanding of the perceived effectiveness of green labeling, eco-incentivization, and other forms of circular marketing to employee behavior concerning sustainable product consumption and waste management specifically within a governmental context as well as leasing on what has been established in extant literature.

Significance and Objectives

This research aims to establish the role of circular marketing strategies on sustainable use and disposal of products within the domain of governmental institutions targeting the Ministry of Environment. As the global focus shifts to the environment, the next step is to avoid or reduce depletion of resources and polluting the environment, and therefore this research provides a useful finding on how circular marketing can positively change the behavior of employees. A view is that understanding engagement by employees in these initiatives is important because employee actions within an organization feedbacks on broader societal influence. This study seeks to address the following objectives:

1. Discuss the effects of Green Labeling on the aspect of employees' attitude to sustainable products.
2. Eco-Incentivization shall be evaluated on how effective it is when it comes to encouraging efficient decrease of wastes.
3. The following table is an analysis of the impact of the aforementioned strategies towards the promotion of the circular economy culture in the selected organization.

Research problem

This research investigates the gap in the existing literature regarding the specific, detailed impact of circular marketing initiatives on employee behavior within a governmental context, such as the Ministry of Environment. While previous research has examined circular economy principles and strategies at a macro level focused on consumer behavior, there's a lack of empirical evidence on how circular marketing approaches can influence employees' specific actions related to sustainable product use and waste reduction within government settings. This study aims to fill this void by exploring the effectiveness of green labeling, eco-incentivization, and other circular marketing strategies in influencing employee behavior and, ultimately, creating a circular economy culture within the Ministry of Environment. Therefore, the problem can be formulated according to the following question:

How effective are circular marketing strategies, specifically green labeling and eco-incentivization, in influencing employee behavior toward sustainable product usage and waste reduction within a governmental context, such as the Ministry of Environment?

Hypothesis:

- **H1:** Green labeling significantly impacts sustainable product usage among employees.
- **H2:** Eco-incentivization has a positive effect on waste reduction practices.

LITERATURE REVIEW

The literature related to circular marketing, which includes new and progressive approaches to the utilization of products, as well as the reduction of waste, shows a trend of increasing interest. This line of research highlights the growth of concern for the environment on a global scale and promoting the transference from more traditional linear economies to circular ones (Adebayo et al., 2024; Boonying et al., 2024). Much research is centered on circular economy concepts with attention to consumer behavior recognized at the macro level (Adebayo et al., 2024; Boonying et al., 2024). However, very little direct comparison has been done on effects of circular marketing activities on employees' behavior in organizational settings especially in the governmental sector such as Ministry of Environment. Some works discuss skills and capabilities in circular economy or zero waste (De los Rios & Charnley, 2017; Agyabeng-Mensah et al., 2021),

while little is known about how circular marketing strategies affect the decrease in waste and sustainable product usage and consumption, directly from the employees' point of view (Chamberlin & Boks, 2018; de Lima et al., 2022). Additionally, little research has been done on the application of circular marketing within specific governmental parameters, as well as the effectiveness of specific circular strategies such as green labeling and eco-incentivization (Ofori & Opoku Mensah, 2022; Pieroni et al., 2019; Silva et al., 2024). This gap requires the current study to explore how such strategies influence employees' behavior, promote a circular economy culture, and, in the long run, create sustainable waste reduction in the Ministry of Environment. The current review call for research on how circularity initiatives are put in place within the government setting and effecting waste management (Victar & Waidyasekara, 2024). This research provides continuity to the topic by seeking to establish the exact effects of circular marketing on employee behavior within a governmental organization, a factor that is lacking in the research at the moment. To a certain extent, the prior research at a macro level addresses the circular economy principles and consumer behavior (Adebayo et al., 2024; Boonying et al., 2024), but, the current study lacks investigation into how circular marketing impacts employee behavior in the governmental organizations (Chamberlin & Boks, 2018; de Lima et al., 2022). In undertaking this investigation of the efficiency of green labeling and eco-incentivization, this research thus addresses this gap, offering factual confirmation beneficial to practitioners and policymakers who are targeting the enhancement of sustainable product application and waste decrease within a governmental context. This research aims to fill the existing gap in the literature regarding circular marketing approaches, concerning the employees' behavior and possibly enriching the application of concepts of circular economy in the context of the public institutions of the evaluated country.

Spatial and temporal limits

This study's spatial scope is confined to the Iraqi Ministry of Environment, focusing on the employees within this governmental organization. The temporal limitations are defined by the data collection period, encompassing the months of August, September, and October 2024. This timeframe encompasses a specific period within the broader context of circular economy initiatives, allowing for a focused analysis of the impact of circular marketing strategies during a particular phase of implementation within the Ministry.

METHODOLOGY

This research applied an experimental, non-experimental quantitative research approach with a survey research method to gather data from employees in the Iraqi Ministry of Environment. Means and standard deviations were used to describe the data collected on demographic variables and test

the responses made on the survey item. Infinitive statistics namely, SEM and hypothesis testing were used to analyse inter-construct correlations. Data collection was carried out by constructing a structured questionnaire originating from the literature study, assessing inter-observer reliability and internal consistency of the final questionnaire, and administering it by email to a random sample of the Ministry’s employees. The number and type of respondents were estimated using method of calculating sample size by giving the degree of confidence at 95% and the margin of error at 5%. The collected survey data were also statistically analyzed to verify the assumed connections between circular marketing communication strategies, such as green labeling and eco-incentivization, and employees’ behavior in terms of the sustainable use of products and waste management. The SEM model was employed in testing the hypothesized antecedent and consequent effects of the variables.

population and sample:

The research community is represented by the Iraqi Ministry of Environment, a governmental body actively involved in environmental advocacy and waste management. The size of the target community according to the ministry is 429 employees, and to calculate the sample size from them we use the random sample law and find:

$$n = \frac{N \cdot Z^2 \cdot p \cdot (1 - p)}{(E^2 \cdot (N - 1)) + (Z^2 \cdot p \cdot (1 - p))}$$

where n is the desired sample size, N is the population size (429 in this case), Z is the value corresponding to the confidence level (e.g., 1.96 for a 95% confidence level), p is the expected success or response rate (if unknown, 0.5 can be used to maximize the sample size), and E is the acceptable margin of error (e.g., 0.05 for a 5% margin of error). We calculate the sample size with a 95% confidence level, a 5% margin of error, and a 50% response rate: We find:

$$n = \frac{429 \cdot (1.96^2) \cdot 0.5 \cdot (1 - 0.5)}{(0.05^2 \cdot (512 - 1)) + (1.96^2 \cdot 0.5 \cdot (1 - 0.5))} = 183.75$$

Table.1: Questionnaire reliability results

Reliability Statistics	
Cronbach's Alpha	N of Items
.922	16

Source: Prepared by the researcher based on sample data and SPSS27 program

The Cronbach's alpha coefficient of .922 indicates excellent internal consistency reliability for the questionnaire. A high Cronbach's alpha suggests that the items within the questionnaire are measuring a single, consistent construct.

200 questionnaires were distributed to ensure that the sample did not fall below the required limit and 194 were returned, making the final sample size 194.

DISCUSSION AND RESULTS

1- Study tool:

The designed research instrument used in the study was a structured questionnaire. decision-makers/circular marketing from work and employee behavior questionnaire The questions in this Part of the study were organized in the following sections: The information about age, department, years of service, and education level were collected in the first section of survey, which might be considered as important control variables. Following sections focused on explorations of the particular sets of constructs which were aimed at assessing the employees’ attitudes and behaviour in terms of sustainable product usage and waste management. These were questions related to green labeling perceived credibility (perceived helpfulness, likelihood to buy environmentally friendly products), and perceived eco-incentivization (as motivational, and behavioral change influence). Products were developed in such a way that responses were measured using the Likert scale to facilitate comparability of data. Another and last section included respondents’ general opinions about circular marketing and waste reduction at the Ministry.

2- Validity and reliability of the questionnaire:

Before analyzing the data collected from the questionnaire, assessing its validity and reliability is paramount. Validity ensures the questionnaire accurately measures the intended constructs, while reliability guarantees consistent measurement across different administrations or items within the instrument. These assessments are crucial for establishing confidence in the subsequent analysis and drawing meaningful conclusions about the relationships being explored.

This is a desirable outcome, as it indicates that the items are all related to each other and are measuring the same underlying concept.

Table.2: Results of the internal consistency validity of the questionnaire

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.856
Bartlett's Test of Sphericity	Approx. Chi-Square	2152.010
	df	120
	Sig.	.000

Source: Prepared by the researcher based on sample data and SPSS27 program

The results of the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test indicate good suitability for factor analysis. A KMO value of .856 is well above the generally accepted threshold for factor analysis, suggesting that the variables in the questionnaire are suitable for grouping into underlying

factors. The significant Bartlett's test result ($p < .001$) further confirms the correlation between the variables and the appropriateness of using factor analysis to determine relationships.

3- Demographic information analysis

Table.3: Specifications of respondents by Age, Department, Experience, Education

Age		
	N	%
under 25	41	21.1%
25-34	103	53.1%
35-44	31	16.0%
45-54	19	9.8%

Education Level		
	N	%
Bachelor's Degree	166	85.6%
Master's Degree	14	7.2%
PhD	14	7.2%

Department		
	N	%
Technical Department	168	86.6%
Administrative Department	26	13.4%

Years of Service at the Ministry of Environment		
	N	%
Less than 1 years	30	15.5%
1-5 years	48	24.7%
6-10 years	116	59.8%

Source: Prepared by the researcher based on sample data and SPSS27 program

Table 3 presents a demographic breakdown of the respondents, offering insights into the sample's characteristics regarding age, education level, department, and years of service at the Ministry of Environment. The majority of

respondents are between 25 and 34 years old (53.1%), and hold a Bachelor's degree (85.6%). A significant portion of the participants work in the Technical Department (86.6%), indicating a potential bias toward that specific area within the

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Ministry. The distribution of years of service suggests that the sample is primarily comprised of individuals with 6-10 years of experience (59.8%) at the Ministry. This breakdown is crucial for interpreting the study's findings as it could influence the results' generalizability. For example, a significantly large proportion of respondents in the under 25

age group might indicate that their responses are less influenced by established institutional procedures and more by newer, innovative policies. Similarly, differences in responses by department could be attributed to differing operational requirements and incentives within those areas.

4- Descriptive Statistics and Graphical Analysis:

Table.4: Descriptive statistics for Green Labeling

Paragraphs	N	Mean	Std. Deviation	Results
I find green labels on products helpful in identifying environmentally friendly options	194	4.2680	.56707	Strongly Agree
I am more likely to purchase a product with a credible green label	194	4.2887	.60153	Strongly Agree
I trust the information provided by green labels	194	4.0928	.70648	Agree
I actively look for green labels when shopping for products	194	4.4021	.77070	Strongly Agree
Green Labeling	194	4.2629	.47458	Strongly Agree
Incentives like discounts or rewards would motivate me to choose sustainable products	194	4.0928	.93944	Agree
I would participate in recycling programs if rewarded for my efforts	194	4.1392	.77273	Agree
Monetary incentives are effective in encouraging environmentally friendly behavior	194	4.0567	.82818	Agree
I am more likely to reduce my waste if provided with incentives for doing so	194	3.9072	1.05381	Agree
Eco-Incentivization	194	4.0490	.70033	Agree
Circular Marketing	194	4.1559	.50243	Agree

Source: Prepared by the researcher based on sample data and SPSS27 program

Analyzing the descriptive statistics for the "Circular Marketing" variable and its sub-components, "Green Labeling" and "Eco-Incentivization," reveals a generally positive perception of circular economy initiatives. The mean scores for all items are above 4.0, signifying a moderately to strongly positive attitude. The standard deviations, while showing some variability, are generally low (ranging from approximately 0.47 to 1.05 for Green Labeling and 0.7 to 1.05 for Eco-Incentivization), indicating a high level of agreement among respondents about these ideas. This suggests a broad consensus that circular marketing strategies are useful and hold significant weight in influencing consumer behavior. The theoretical implication is that the studied population

views circular marketing as a beneficial approach to sustainability.

Focusing on specific items, the highest mean score, 4.402 for "I actively look for green labels when shopping for products", indicates a strong alignment with the idea of green labeling as a driving force for purchasing decisions. This suggests that respondents actively seek out and value environmentally friendly products. In contrast, the lowest mean score, 3.907 for "I am more likely to reduce my waste if provided with incentives for doing so", points to a slightly weaker perceived effectiveness of monetary incentives in driving waste reduction. This difference could suggest that while respondents recognize the importance of green labeling, the

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influence of monetary incentives may be less persuasive in motivating environmental behavior.

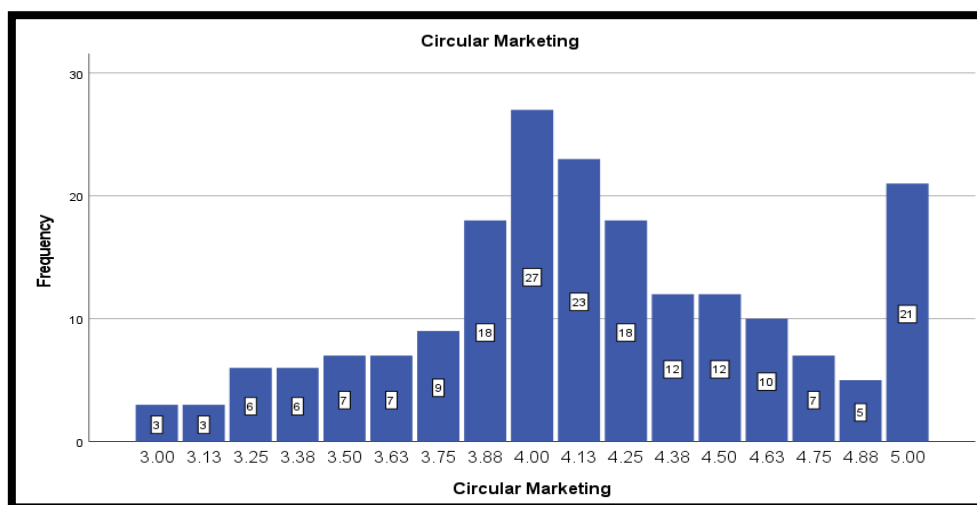


Figure.1: The trend of the answers for Circular Marketing
Source: Prepared by the researcher based on sample data and SPSS27 programme

Table.5: Descriptive statistics for Sustainable Product Usage - Waste Reduction Behavior

Paragraphs	N	Mean	Std. Deviation	Results
I regularly use reusable bags/containers instead of single-use plastic	194	3.9794	1.00237	Agree
I try to minimize my consumption of products with excessive packaging	194	4.0515	.95896	Agree
I prioritize purchasing products made from recycled materials	194	3.9381	.99548	Agree
I make conscious efforts to extend the lifespan of the products I use	194	3.9794	.91027	Agree
Sustainable Product Usage	194	3.9871	.80989	Agree
I actively sort my waste for recycling purposes	194	3.9124	.90339	Agree
I try to reduce my overall waste generation at work and at home	194	3.9691	.76793	Agree
I compost organic waste whenever possible	194	3.9948	.76516	Agree
I avoid printing documents unless absolutely necessary	194	4.0567	.82818	Agree
Waste Reduction Behavior	194	3.9832	.71306	Agree

Source: Prepared by the researcher based on sample data and SPSS27 programmer

The descriptive statistics for "Sustainable Product Usage" and "Waste Reduction Behavior" reveal a generally positive, albeit moderate, level of engagement with environmentally friendly practices among the respondents. The mean scores across all items cluster around 4.0, indicating a general agreement with these behaviors. The standard deviations are relatively low (ranging from approximately .7 to 1.0), indicating that responses are clustered close to the mean, suggesting a considerable degree of consensus. This suggests that the participants in the study show a moderate inclination

towards sustainable product choices and waste reduction measures, but further analysis is needed to understand the reasons behind this level of consensus.

Examining the specific items, the highest mean score (4.0515) is for "I try to minimize my consumption of products with excessive packaging," which reflects a significant agreement with reducing excessive packaging. Conversely, the lowest mean score (3.9124) is for "I actively sort my waste for recycling purposes," which suggests a slightly lower level of agreement with active waste sorting. This difference could

be due to several factors. "Excessive packaging" is a very tangible and easily grasped concept, directly affecting individual consumption choices. "Waste sorting" might be perceived as more nuanced or demanding of additional effort, potentially explaining the lower score. The difference in mean scores between these items reveals a potential area for

focused intervention, potentially by developing more accessible or impactful programs to promote active waste sorting. The overall trend, however, points to a willingness among respondents to adopt environmentally responsible behaviors.

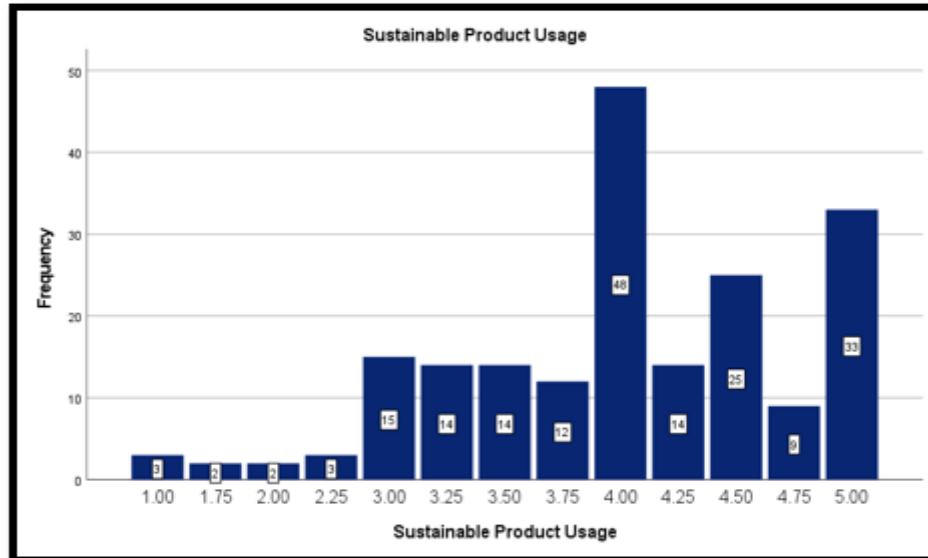
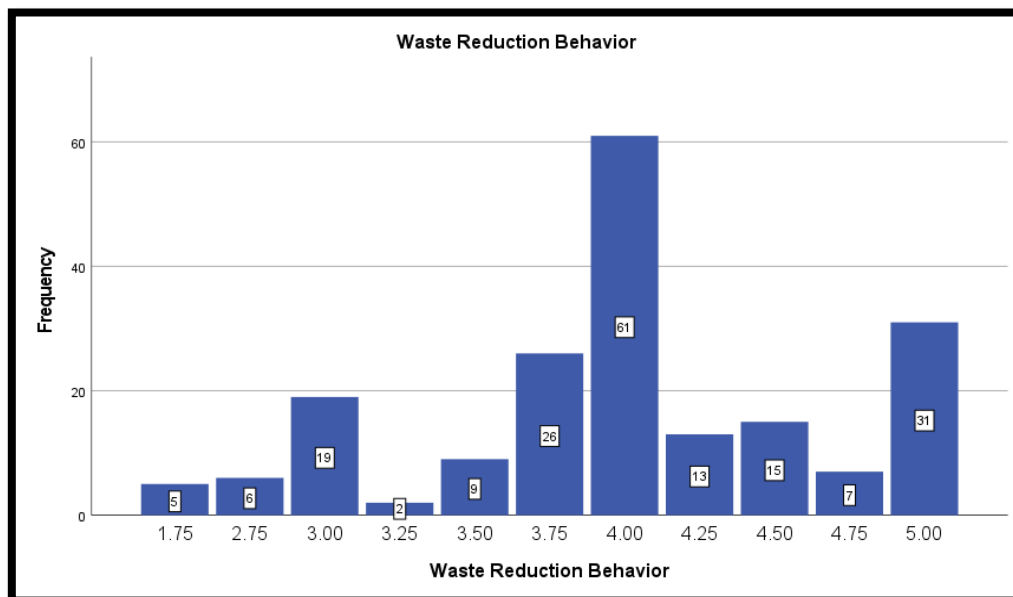


Figure.2: The trend of the answers for Sustainable Product Usage and Waste Reduction Behavior



Source: Prepared by the researcher based on sample data and SPSS27 program

5- Hypothesis testing:

By statistically analyzing the collected data in light of the formulated hypotheses, this step aims to provide evidence for

or against the predicted relationships among variables, ultimately contributing to a comprehensive understanding of the research question:

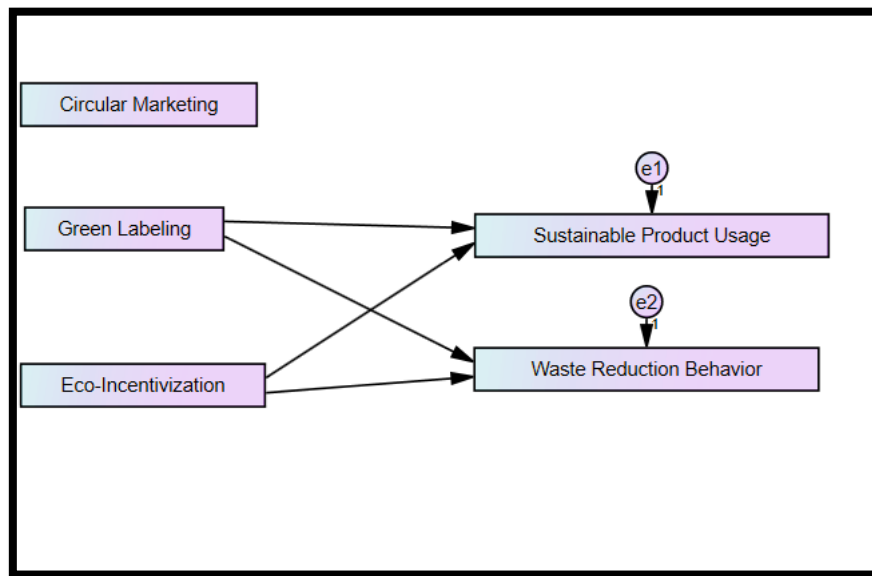


Figure.3: Model SEM.

Source: Prepared by the researcher based on sample data and AMOS program

The diagram depicts a structural equation model (SEM) for testing hypotheses. Circular Marketing is the overarching construct, influencing both Green Labeling and Eco-Incentivization. These two constructs, in turn, directly impact Sustainable Product Usage. Furthermore, both Green Labeling and Eco-Incentivization are shown to influence Waste Reduction Behavior. The arrows with the labels e1 and e2 represent error terms or latent variables that might affect

the relationship between the constructs. This model structure is suitable for testing the hypothesized relationships between circular marketing strategies (green labeling, eco-incentivization) and employee behavior, specifically sustainable product usage and waste reduction. The model graphically illustrates the proposed causal flow, allowing for the statistical analysis of the direct effects of the variables on each other.

Table.6: Results of testing the hypothesis Source Using SEM Model.

			Estimate	S.E.	C.R.	P
Sustainable Product Usage	<---	Green Labeling	.116	.071	2.231	.007
Sustainable Product Usage	<---	Eco-Incentivization	.949	.048	19.746	***
Waste Reduction Behavior	<---	Green Labeling	.285	.066	4.348	***
Waste Reduction Behavior	<---	Eco-Incentivization	.706	.044	15.900	***

Source: Prepared by the researcher based on sample data and AMOS program

The results of the SEM model strongly support the hypothesized relationships between circular marketing strategies and employee behavior. Both "Green Labeling" and "Eco-Incentivization" significantly influence "Sustainable Product Usage" ($p < .007$ and $p < .000$, respectively), with positive effects. The effect size for "Eco-Incentivization" (estimate = .949) is substantially larger than for "Green Labeling" (estimate = .116), indicating that eco-incentivization has a much stronger impact on sustainable product usage. Similarly, both "Green Labeling" and "Eco-Incentivization" significantly influence "Waste Reduction Behavior" (both p values less than .001). The effect size for "Eco-Incentivization" (estimate = .706) is again larger than

for "Green Labeling" (estimate = .285), demonstrating a stronger relationship between incentivization and waste reduction behaviors. These findings suggest that applying circular marketing principles, particularly via eco-incentivization, has a substantial positive impact on both sustainable product usage and waste reduction behaviors. The magnitudes of the standardized regression weights (the estimates in the table) quantify the strength of these effects. The significance of these findings (indicated by the "***" values) supports the causal influence of these constructs on the dependent variables. The model provides strong evidence that organizations can effectively promote sustainable behaviors through targeted marketing initiatives, particularly

highlighting the efficacy of monetary incentives ("Eco-Incentivization").

Table.7: Model Fit

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
model	.888	.893	.805	.986	.996
Model	RMSEA	LO 90	HI 90	PCLOSE	
model	.018	.008	.029	.668	

Source: Prepared by the researcher based on sample data and AMOS program

Table 7 presents the model fit indices for the structural equation model (SEM). These indices assess how well the hypothesized relationships in the model fit the observed data. A good-fitting model generally has values that are close to or above acceptable thresholds for each index. In this case, the values are generally good, suggesting a reasonable fit of the model to the data.

- **NFI (Normed Fit Index), Delta1, RFI (Relative Fit Index), rho1, IFI (Incremental Fit Index), Delta2, TLI (Tucker-Lewis Index), rho2, CFI (Comparative Fit Index):** These indices assess the improvement in fit achieved by the model compared to a baseline model. Values closer to 1 indicate a better fit. The values in Table 7 are all reasonably high, generally exceeding .90, which suggests a good fit.
- **RMSEA (Root Mean Square Error of Approximation), LO 90, HI 90, PCLOSE:** These indices assess the discrepancy between the model and the data. RMSEA is a more precise indicator of the approximation error. A value less than 0.10 is typically considered acceptable, and a value close to 0 signifies an excellent fit. The RMSEA value of .018 in this table, along with the confidence intervals (LO 90 and HI 90) being close to 0, and the PCLOSE value of .668, strongly suggest an excellent fit. The model fit indices in Table 7 strongly indicate that the SEM model fits the data very well.

CONCLUSIONS AND RECOMMENDATIONS

This research investigated the impact of circular marketing strategies on employee behavior within a governmental context, specifically the Iraqi Ministry of Environment. The study addressed the problem of a lack of empirical evidence on how circular marketing strategies influence employee waste reduction and sustainable product usage behaviors within government settings. Hypotheses posited that green labeling and eco-incentivization would significantly impact sustainable product usage and waste reduction practices. Through a quantitative approach employing survey data and

Structural Equation Modeling (SEM), this research successfully addressed the research problem. Findings overwhelmingly supported both hypotheses. Green labeling and, particularly, eco-incentivization demonstrated a significant positive effect on both sustainable product usage and waste reduction behavior among Ministry employees. The model's fit indices were excellent, confirming the validity of the relationships identified. This indicates that circular marketing strategies, especially eco-incentivization, can be highly effective in promoting sustainable practices within governmental organizations. Recommendations include implementing targeted eco-incentive programs, integrating green labeling practices into procurement policies, and further research into the specific mechanisms that maximize the effectiveness of circular marketing within diverse governmental contexts. These findings offer practical guidance for policymakers and managers seeking to integrate sustainability initiatives into public sector operations.

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