

DETERMINANTS OF ECO-PACKAGING: PATHWAYS TO RESPONSIBLE PRODUCTION AND CONSUMPTION

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ABSTRACT

Global concern for environmental protection has led to the United Nations movement for Sustainability by setting up an agenda for achieving Sustainable Development Goals. There is a growing awareness and sensitivity among consumers and corporations to contribute to the larger cause of Sustainability. Plastic has been one of the major contributors to Packaging as well environmental pollution. Technological advancements, government regulations, consumer awareness, corporate initiatives etc. are playing a key role in devising measure minimize environmental damage by ensuring availability of products in Eco-Packaging. Inspired by Circular Economy, Cradle to Cradle, Tiple Bottom Line, Green Marketing, and Attitude towards Behaviour theoretical frameworks, Eco-Packaging is a pathbreaking initiative, contributing to minimizing waste and environmental pollution. The present study explores the determinants of Eco-Packaging, based on a survey of customers. The factor analysis reveals that key determinants and their constituents related to Environmental Concern, Ethical choice for responsible consumption and credibility and trust, contribute to Eco-packaging. The study brings important findings and implications for professionals and scholars.

KEYWORDS: *Eco-Packaging, Sustainability, Sustainable Packaging, Green Packaging, Green Marketing.*

INTRODUCTION

The world is witnessing devastating effects of growing environmental degradation causing threats to the living planet. Climate change, global warming, natural disasters, soil erosion etc. are some of the reflections of the damages caused by mankind to the environment. Production, distribution and consumption of products involves multiple types of packaging for storage, safety, convenience, communication, aesthetics of the products. Packaging plays much more than functional role in terms of its marketing or supply chain, as a means of communication, design and salesmanship. In modern marketing, packaging is also considered as a silent salesman as it informs and attracts the customers through attractive design, material, colours, strength etc. Packaging, as an essential element of any product, plays a key role in impacting the environment. It is found that packages made from hazardous, non-recyclable, non-treatable materials with long

disposal time, create litter and damage the environment. Such materials are primarily responsible for air, water and soil pollution, posing a serious threat to all living beings. The production, use, and disposal of packaging not only generate large volumes of waste but also deplete raw materials, water, and energy, resulting in greenhouse gas emissions that exacerbate climate change (Herbes et al., 2018). Realizing the harmful effects of such packaging materials, growing concern of people, government and international agencies, and regulatory compliances, the corporations are innovating and using alternative materials which are eco-friendly and minimize the damage to the environment. Emergence of environment friendly packaging, known as Eco-Packaging or Sustainable-Packaging or Green-Packaging, which minimizes waste, easily decomposes, recyclable and reusable, have emerged as a potential solution for reducing harmful effects to the environment. The real impact will depend upon its widespread awareness, compliance and use of Eco-Packaging by both the producers as well as consumers. The present study is aimed at studying the important determinants of Eco-Packaging. Based upon consumer responses, the study provides valuable insights for understanding the dimensions of Eco-Packaging and makes significant contributions for academics as well professionals.

Review of Literature

The present study mainly relies on the five important theoretical frameworks related to - Circular Economy (Ellen MacArthur Foundation, 2013 and Kristianto&Nadapdap, 2021); Cradle-to-Cradle (C2C) framework developed by McDonough and Braungart (2002); Tripple Bottom Line for Sustainable Development (Elkington, 1997); Green Marketing (Polonsky, 1994), and Theory of Planned Behaviour (Ajzen, 1991).

Recent focus on sustainability has enhanced the efforts by everyone towards contributing to environmental protection. **Circular Economy** framework is an attempt to balance production and consumption by ensuring relevant measures for sustainability. It is described as “an industrial system that is restorative by intention and design, replacing the end-of-life concept with restoration and using renewable energy” (Ellen MacArthur Foundation, 2013). It encourages manufacturers to design the products to minimize waste, keep materials in circulation along with regenerating natural systems. The principles of eco-packaging align closely with the tenets of the Circular Economy (CE), particularly the "Reduce, Reuse, Recycle" (3R) framework, sometimes expanded to include "Recovery" and "Repair" (Kristianto&Nadapdap, 2021). It has been observed that use of different types of material for packaging purposes has a varying effect on the percentage of climate change (Bassani et al., 2024). Circular economy aligns with Eco-packaging by promoting use of recyclable, reusable, biodegradable, or compostable materials for packaging of products.

The **Cradle-to-Cradle (C2C)** framework developed by McDonough and Braungart (2002) focuses on regenerative materials which are easily decomposable or recycled. It significantly contributes to eco-packaging by distinguishing between biological and technical nutrient cycles. It suggests that packaging should either: biodegrade safely into ecosystems, or circulate indefinitely through high-value recycling. Their conceptualization suggests that eco-packaging should be based on regenerative resource system including packaging material and energy used for production.

The “**Triple Bottom Line**” framework proposed by Elkington (1997) describes sustainability in terms of three critical elements, also known as 3P’s – People (Social), Planet (Nature/Environment), and Profits (Economic). “It captures the whole set of values, issues, and processes organizations must address to minimize environmental impacts and meet broader

social responsibilities” (Elkington, 1997). This framework is very relevant for Eco-Packaging as it highlights that manufacturer should give emphasize on society (health & safety), environmental impact (waste reduction & recyclability), and business value (cost-effectiveness, brand enhancement), while designing and using packaging for their products for various purposes.

Green Marketing framework emphasizes upon use of environmentally friendly marketing practices from product design and development, distribution, and promotion to disposal of products. It highlights the importance of leaving a better planet for the future generations. According to Polansky (1994), green marketing refers to “marketing activities designed to generate and facilitate exchanges intended to satisfy human needs or wants, with minimal detrimental impact on the natural environment”. It provides significant rationale for use of Eco-packaging so as to minimize environmental pollution. Early studies indicated rising demand for environmentally friendly products and packaging, as consumers associated sustainability with responsibility, ethical consumption, and brand trust (Dangelico & Vocalelli, 2017; Ottman, 1998).

Theory of Planned Behaviour (TPB) helps in predicting the purchase intention and recycling/return behaviours by accounting for attitudes, subjective norms, and perceived behavioural control. According to Ajzen (1991), human behavioural intention is predicted by “attitudes toward the behaviour, subjective norms, and perceived behavioural control”. This is very relevant in understanding the adoption of Eco-packaging in terms of Attitudes (or beliefs about environmental benefits), Subjective norms (social pressure) and perceived behavioural control (ease of disposal, recycling). This theory explains that how the consumers’ attitude towards environmental concern and perceived environmental knowledge provides an understanding of the decision-making process in sustainable packaging (Popovic et al., 2019; Nguyen et al., 2022).

The above theoretical frameworks provide the basic foundations for adoption for Eco-packaging as integral to social, environmental and economic development. One of the earliest work of Boulding’s (1966) seminal essay “The Economics of the Coming Spaceship Earth,” argued on emergence of ecological economics and systems thinking and provides the foundation for eco-packaging. It emphasizes that traditional linear models of production and consumption were incompatible with ecological limits. Boulding’s vision of a closed-loop “spaceship” economy highlighted minimizing waste and maximizing resource circulation which serve as the basis for Eco-Packaging.

Eco-packaging which is also referred as Sustainable Packaging or Green Packaging or Environmentally Friendly Packaging is gaining importance as a potential element for marketing strategy. Eco-packaging also serves as a powerful communication and product-cue system that shapes expectations, trust, perceived quality, and ultimately purchase decisions (Magnier & Schoormans, 2015; Pinto et al., 2021, Steenis et al., 2017).

Eco-packaging or sustainable packaging has been defined and described by a large number of authors in terms of its constituents, design, material, benefits to the environment, individual users and other aspects related to sustainability. Siracusa et al. (2008) describes eco-packaging as a packaging that reduces environmental impacts through the use of recyclable, reusable, compostable, or biodegradable materials, and through design approaches that minimize material use, lower carbon emissions, and improve end-of-life recovery. It refers to “packaging that has a reduced environmental impact through the use of sustainable, recyclable, or biodegradable

materials and minimized resource consumption” (Pinto et al., 2021).Packaging material plays a key role in determining its environmental impact.

Eco-packaging is “packaging designed to minimize waste generation and promote circularity through reuse, recycling, or compostability” (Magnier & Schoormans, 2015). It is “perceived by consumers as environmentally benign because of its materials, recyclability, biodegradability, or reduced resource intensity” (Steenis et al., 2017).Sustainable packaging is the result of a process approach in which certain attributes are added to a standard product that increase the economic, social and environmental value throughout its entire life cycle (Kozik, N., 2020). It has also been reported that demographic factors and cultural context also has an influence on the preference and choices for eco-packaging (Prakash and Pathak, 2017).

Research Methodology:

With a view to obtain opinions of consumers about Eco-Packaging, Exploratory Research approach was adopted. The data was collected through Survey of Consumers. Based on the review of literature and consultation with the subject experts, a Questionnaire – Scale consisting of 15 Likert type items was developed. The respondents included any consumer who has used products in Eco-Packaging. The data was collected from 84 respondents using Online survey. The data was analysed using Exploratory Factor Analysis to understand the determinants of Eco-Packaging. SPSS software was used to analyse the data.

Results and Discussion

The scale was tested for reliability. The KMO score of .883 reflect a high level of reliability. As all the items of the scale were based on the review of relevant literature and consultation of the experts, the scale has high content validity.

Table - 1

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.883
Bartlett's Test of Sphericity	Approx. Chi-Square	887.881
	df	105
	Sig.	.000

Exploratory Factor Analysis using Principal Component Method with Varimax Rotation was used to deduce factors/determinants from the scale. The data converged into three factors or determinants contributing to 70.65% of the total variance.

Table – 2

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	7.917	52.782	52.782	7.917	52.782	52.782	3.908	26.053	26.053
2	1.402	9.346	62.128	1.402	9.346	62.128	3.367	22.446	48.498
3	1.279	8.527	70.656	1.279	8.527	70.656	3.324	22.157	70.656

Extraction Method: Principal Component Analysis.

Rotated Component Matrix^a			
FACTORS (Determinants)	Factor Loadings		
	1	2	3
ENVIRONMENTAL CONCERN			
1. Eco-packaging contributes towards environment.	.828		
2. Eco- packaging promotes recycling of the packaging.	.745		
3. Eco-packaging reduces environment degradation.	.733		
4. Eco-packaging makes disposing packaging waste easier.	.689		
5. Eco-packaging reduces waste.	.645		
6. Eco-packaging attracts environmentally conscious customers.	.566		
ETHICAL CHOICES FOR RESPONSIBLE CONSUMPTION			
1. Eco-packaging reflects customer commitment to greener lifestyle		.839	
2. Eco-packaging empowers customers to make ethical choices.		.807	
3. Eco-packaging supports responsible consumer behaviour.		.807	
4. Eco-packaging provides customer with environmentally responsible choices.		.471	
CREDIBILITY AND TRUST			
1. Eco-packaging choices reflect brand integrity.			.808
2. Eco-packaging choices gives peace of mind to the customers.			.760
3. Eco-packaging builds customer trust.			.723
4. Eco-packaging creates a responsible brand image.			.716
5. Eco-packaging helps business in improving sustainability.			.612
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. ^a			
a. Rotation converged in 9 iterations.			

Considering the constituents of the factors, the First factor was named as Environmental Concern, Second factor as Ethical Choices for Responsible Consumption and Third as Credibility and Trust.

The **First Determinant –Environmental Concern**, contributing about 26.5% variance, consisted of six items namely Eco-Packaging - Contributes towards environment (.828); Promotes recycling of the packaging (.745); Reduces environment degradation (.733); Makes disposing packaging waste easier (.689); Reduces waste (.645) and Attracts environmentally

conscious customers (.566). This determinant describes the first and foremost step towards adoption of Eco-Packaging. Consumers having higher level of concern for the environment are aware of the core benefits of eco-packaging and accordingly develop their attitude towards the acceptance and usage of products in eco-packaging. The realization of waste reduction, reflecting in their expectation from eco-packaging is significant reflection of concern for environment.

The **Second Determinant – Ethical Choices for Responsible Consumption**, contributing about 22.44% variance, consisted of four items namely Eco-Packaging - Reflects customer commitment to greener lifestyle (.839); Empowers customers to make ethical choices (.807); Supports responsible consumer behaviour (.807); and Provides customer with environmentally responsible choices (.471). This determinant builds on the attitude towards eco-packaging as described by the earlier determinant. It helps in reinforcing the primary benefits of eco-packaging and encourages ethical and responsible decision making and consumption with regard to packaging. An aware and educated consumer reflects a higher possibility of making choices in favour of buying and using products in eco-packaging. It has been reported in a study by Dwivedi et al. (2018) that the young, educated consumers with higher disposable incomes are willing to pay extra money or premium for eco-packaging.

The **Third Determinant – Credibility and Trust**, contributing about 22.15% variance, consisted of five items namely Eco-Packaging - Reflect brand integrity (.808); Gives peace of mind to the customers (.760); Builds customer trust (.723); Creates a responsible brand image (.716); and Helps business in improving sustainability (.612). Eco-Packaging plays an important role in the brand building and winning customers' trust for any product. They influence company's image and identity by contributing to a larger cause of sustainability. Such initiatives help the company in developing positive perceptions of the buyers towards company and product in terms of a responsible producer and marketer of sustainable products. This generates goodwill from the buyers enhances their credibility and trust for the company.

The findings are in line with the earlier studies on Eco-packaging which found a positive relationship between the perceptions, attitude, decision making, trust, values, and purchase intentions of Indian consumers toward products with eco-friendly packaging (Angelovska, et al., 2012; Steenis et al., 2017; Prakash et al., 2019; Pinto et al., 2021). Growing interest and consumption of products with Eco-packaging can be largely contributed to these determinants related to Environmental Concern, Ethical Choices for responsible consumption and Credibility and Trust of the buyers. Meena Rani et al. (2025) found that attitudes toward sustainability, personal norms, and perceived environmental awareness are some of the key factors that drive the consumer purchase intentions towards eco-packaging.

CONCLUSION

The world of innovation is not only bringing new products, but also different material and design for creating eco-packaging for addressing the global concern for the environment. Growing consumer awareness, technological innovations, corporate initiatives, regulatory compliances and many other drivers are popularizing and facilitating the adoption of Eco-packaging by increasing number of consumers. The present study analyses the key determinants of Eco-packaging shaping up consumer preferences, perceptions, attitudes, and decision making. The study brings out that various elements contributing to environmental concern, ethical decision making and consumer attitude towards the brand, shaping its credibility and building trust, are the primary determinants shaping Eco-packaging. Mass level awareness and adoption of eco-packaging as a buying habit will bring a major transformation in environment protection. The

study is not only useful for the practitioners, it also provides important insights to the policymakers and scholars for advancing the work towards sustainable production and consumption.

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