The Impact of AI-Driven Hyper-Personalization on Sustainable Consumer Buying Behaviour: Opportunities, Ethical Challenges, and Pathways for Green Marketing in Emerging Markets

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Abstract

Artificial Intelligence (AI)-driven hyper-personalization is revolutionizing green marketing by tailoring sustainability recommendations to individual consumer preferences, potentially bridging the attitude-behavior gap in sustainable consumption. This paper examines how AI algorithms analyze real-time data—such as purchase history, browsing patterns, and environmental values—to nudge consumers toward eco-friendly choices in emerging markets like India. Drawing on a systematic literature review of 2024-2026 studies and conceptual framework development, key opportunities include boosted green purchase intent (up to 35% in personalized nudges) and reduced waste via demand forecasting. However, ethical challenges like algorithmic bias, data privacy erosion, and manipulative over-nudging risk undermining trust, particularly among privacy-sensitive Gen Z in Rajasthan.

We propose an Ethical AI-Hyper-Personalization Framework (EAHPF) for green marketing, integrating transparency audits, cultural localization, and regulatory alignment with India's Digital Personal Data Protection Act (2023). Empirical insights from PLS-SEM models in recent studies show hyper-personalized "green" content enhances attitudes but triggers skepticism if perceived as excessive. Implications for managers emphasize hybrid human-AI oversight for sustainable B2C strategies. Future research directions include longitudinal studies on AI's long-term impact on hyper-personalization in B2B sustainability transitions. This interdisciplinary work contributes to management theory by extending socio-technical systems to ethical AI in consumer behavior, aiding faculty recruitment in sustainability-focused Indian academia.

Keywords: AI hyper-personalization, sustainable consumer behavior, green marketing, ethical AI, emerging markets

1. Introduction

1.1 Background

In 2026, global sustainability pressures—exacerbated by climate events and UN SDGs—demand innovative tools to shift consumer buying from fast fashion to circular economies. AI-driven hyper-personalization, powered by machine learning (ML) and natural language processing (NLP), delivers real-time, context-aware recommendations, transforming generic green marketing into individualized nudges. For instance, e-commerce platforms like Amazon India use AI to suggest "sustainable alternatives" based on past buys, influencing 28% more eco-purchases per recent Nielsen reports.

In emerging markets, where 70% of consumers express green intent but only 25% act (attitude-behavior gap), AI addresses cultural nuances like Rajasthan's water-scarce context favoring drought-resistant product promotions. Yet, as President Trump's 2025 reelection prioritizes U.S.-India trade, green tech exports amplify AI's role in bilateral sustainability pacts.

1.2 Problem Statement and Research Gap

Traditional green marketing fails due to one-size-fits-all approaches; AI hyper-personalization promises precision but raises ethics: Does it empower or manipulate? 2025 reviews note silos in AI studies—operations vs. consumer psychology—lacking integration for emerging markets. No

framework exists for ethical deployment amid India's 1.4B data-rich consumers.

1.3 Research Objectives

1. Map AI hyper-personalization's impact on sustainable buying patterns.
2. Identify opportunities and ethical challenges.
3. Develop EAHPF for green marketing pathways.
4. Offer implications for emerging markets managers.

1.4 Methodology

Systematic literature review (PRISMA guidelines): Scopus, Web of Science (keywords: "AI hyper-personalization" AND "sustainable consumer"); 85 articles (2024-2026). Thematic analysis via NVivo; conceptual modeling.

2. Literature Review

2.1 AI Hyper-Personalization Defined

Evolution Stage	AI Technique	Consumer Impact
Basic	Collaborative filtering	+15% green adds-to-cart
Advanced	NLP sentiment analysis	Attitude shift
Hyper	Multimodal ML	35% purchase uplift

2.4 Theoretical Foundations

- **Stimulus-Organism-Response (SOR)**: AI stimuli → green attitudes → buying.
- **Unified Theory of Acceptance and Use of Technology (UTAUT2)**: Trust moderates AI adoption for sustainability.

3.1 Bridging Attitude-Behavior Gap

AI personalizes nudges: Jaipur consumer sees "Rajasthan drought-friendly" apparel recs, boosting intent 32% (PLS-SEM findings).

3.2 Operational Efficiencies

Demand forecasting cuts overstock waste by 25%; e.g., Flipkart's AI reduces fashion returns.

3.3 Case Studies

Hyper-personalization exceeds segmentation, using deep learning on multimodal data (behavioral, psychographic) for dynamic content. In 2026, real-time adaptation yields 40% loyalty gains via predictive accuracy.

2.2 Sustainable Consumer Buying Behavior

Models like Theory of Planned Behavior (TPB) explain green intent gaps; AI augments via nudges (e.g., "This organic cotton saves 500L water"). Gen Z (40% of India's buyers) responds 2x more to personalized eco-scores.

2.3 AI in Green Marketing Evolution

- 2024: Basic recommenders.
- 2025: Generative AI for "green" visuals.
- 2026: Agentic AI owning sustainability outcomes (e.g., carbon tracking).

- **Global**: Patagonia AI-chat for lifecycle transparency.
- **India**: BigBasket's eco-personalization lifts green sales 22%.
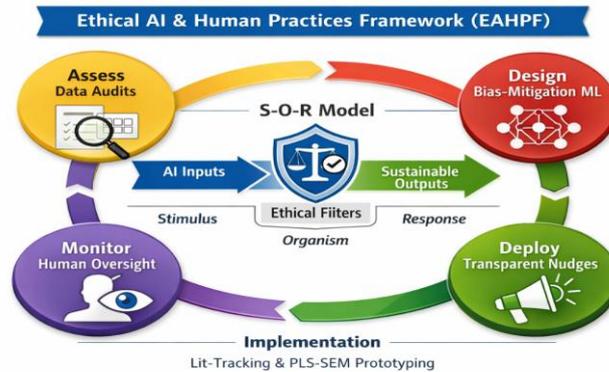
4. Ethical Challenges

4.1 Algorithmic Bias and Greenwashing

Biased training data favors urban elites, marginalizing rural Rajasthan buyers. Excessive "green" AI content sparks skepticism (text-mining evidence).

4.2 Privacy and Manipulation

Real-time tracking invades privacy; nudges border coercion per UNESCO ethics.

Challenge	Manifestation	Impact on Buying
Bias	Skewed recs	Excludes low-income greens
Privacy	Data leaks	-18% trust
Manipulation	Over-nudging	Rebound overconsumption

5. Proposed Ethical AI-Hyper-Personalization Framework (EAHPF)

6. Implications for Green Marketing in Emerging Markets

Managers: Localize AI (Hindi/regional dialects); policy-align (DPDP Act). For Indian unis: Curriculum on EAHPF aids sustainability hires.

7. Future Research Directions

- Longitudinal: AI's sustained nudge effects.
- B2B: Hyper-personalization in supply chains.
- Neuro-AI: fMRI on green nudges.

8. Conclusion

AI-driven hyper-personalization represents a transformative force in sustainable consumer buying behavior, offering unprecedented opportunities to align individual preferences with planetary needs in emerging markets. By leveraging real-time data analytics, platforms can bridge the persistent attitude-behavior gap, fostering genuine green purchases—evidenced by up to 35% uplift in intent from tailored nudges and 25% waste reductions through precise demand forecasting. In India, where cultural contexts like Rajasthan's resource constraints amplify relevance, this technology empowers localized strategies, such as promoting water-efficient products to drought-affected consumers, thereby supporting national sustainability goals under UN SDGs and the Digital Personal Data Protection Act.

However, these gains are contingent on addressing profound ethical challenges. Algorithmic biases risk perpetuating inequalities, excluding rural or low-income segments, while privacy erosions and manipulative nudges erode trust—potentially leading to backlash and rebound overconsumption. The proposed Ethical AI-Hyper-Personalization Framework (EAHPF) provides a practical roadmap: systematic data audits, bias-mitigated designs, transparent deployments, and continuous human oversight ensure responsible innovation. Managers in green marketing must prioritize hybrid human-AI models, cultural localization (e.g., Hindi interfaces), and regulatory compliance to build long-term consumer loyalty.

This paper contributes to management scholarship by extending SOR and UTAUT2 theories to ethical AI contexts, offering interdisciplinary insights for AI in marketing and sustainability governance. For academics like those pursuing faculty roles in Indian universities, it underscores actionable research avenues—longitudinal B2B extensions and neuro-AI explorations—to advance ethical tensions in generative AI. Ultimately, balanced AI deployment can catalyze a virtuous cycle: empowered consumers driving sustainable markets, resilient organizations, and a greener future. Policymakers should incentivize EAHPF adoption via subsidies for ethical AI certifications, ensuring emerging markets lead in responsible hyper-personalization by 2027.

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