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Eco-Driven Marketing Strategies for Resilient Growth in the Rubber Industry: A Pathway Toward Sustainability

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ABSTRACT

The paper discusses the idea of eco-driven marketing strategies as the means of sustainable and resilient growth in the rubber industry. The literature allows the study to identify issues of volatility in prices, deforestation, and the intention-behavior gap in eco-consumption intending to change the consumption behavior. The results of the findings indicate that the use of green marketing cannot be left behind without perfect matching it with the systemic innovations such as the use of replenishment regulations, bio-based fillers, and eco-designing frameworks. Findings indicate that successful approaches should not remain at the symbolic green image of their brands, instead they should be genuine and in the supply chains and consumption. Ecological balance can thus be achieved through this kind of integrated approach together with improvement of long-term competitiveness.

Keywords: Sustainability, Marketing, Rubber Industry, Eco-friendly.

1. Introduction

The rubber industry is a major contributor to the manufacturing, transport and consumer products industries the world over, but sustainability issues are building up along the rubber belt. Green issues, the depletion of biodiversity, and unstable pricing practices are also rising issues why the need of green transformation is urgent. Marketing approaches have become important instruments to bring the requirements of growth in the industry and conservation of the ecology in line with one another.

Eco driven marketing does not only deal with the consumer demand in green products; it also offers some promise of resilient supply chain. There is still a big disconnect between sustainability rhetoric and sustainability in practice. This paper explores how eco-based marketing and complimentary technological and systemic rearrangement holds the prospect of laying out a path towards sustainable resilience of rubber industry.

2. Methodology

The study implements a systematic literature review method to review concepts of the most important papers conducted on the bridge between sustainability and marketing in the rubber industry. Sources will be peer-reviewed journal articles, as well as industry centred research which will research ecological challenges, vendor behaviour, production methods, and policy solutions.

All of the studies were used to examine their contributions on thematic areas to eco-driven marketing, dividing it into sustainability challenges, consumer dynamics, technological innovations and global implications of the policy. Comparative frameworks and heatmaps and analytical charts were all employed to bring to light the connections between sustainability problems and strategic solutions. The approach serves the purpose of establishing a complete picture of the eco-driven strategies as multidimensional resilience measures in the rubber industry.

3. Related Works

Sustainability Challenges

The rubber sector exists at the synergy between economic development, the environment and social responsibility, which makes sustainability in the industry quite complicated. Kopp and Salecker (2018) (preprint) refer to the trading

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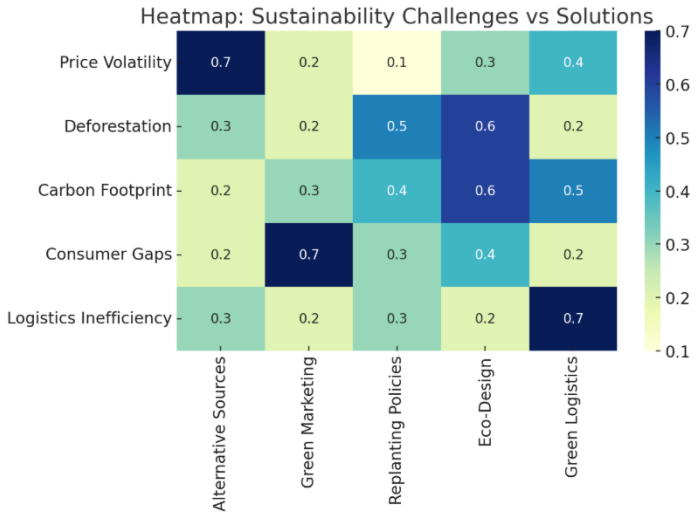
of rubber as a complex adaptive system (CAS), in which fishers and wholesalers settle on the channel, which is determined through recursive social influence, peers, and feedback loop-based decisions.

Their agent-based simulation of the Indonesian rubber trade shows how sellers chose to stand or stay based on their physical proximity, arcane debts and social connections. This view highlights the challenge of achieving sustainability in trading environments racked by network fragmentation where informal norms and peer developing forces tend to have stronger grip on activities than regulatory aspects of top-down controls.

The analysis on volatility of prices done by Kampan (2018) further complicates this because one thing that the land implies is that natural rubber prices are closely related to the Brent crude oil and GDP in the three largest consumers of rubber which include Japan, China, and the U.S. The results reinforce the idea that global macroeconomic dynamics combined with local sustainability issues multiply the challenge of resilience building to smallholder farmers in particular.

Negash et al. (2021) also further this discussion by illustrating the most important sustainability features when it comes to developing natural rubber. Their mixed-method analysis prioritises the importance of technical support as something that alleviates social and economic risks to smallholders. Nevertheless, when it comes to measuring sustainability, it is of a multidimensional nature economic and environmental sustainability, in this case, are found to be interdependent and cannot be achieved independently.

They highlight value addition and capital investment, marketing platforms and other sources of income as critical facilitators of resilience. In another study, Otten et al. (2020) show the discrepancies between the messages of sustainability and reality at the ground level by considering the Michelin-WWF partnership in Indonesia.



Whereas Michelin marketed their plantations as sustainable socially and environmentally, communities of such land lost their land as well as their environmental upheaval. This tendency in the political ecology doctrine implies that in many cases, eco-driven marketing is a convenient discursive instrument that conceals equity. Taken together, these articles demonstrate that the issues of sustainability in the rubber production industry are difficult to resolve by means of a symbolic or purely economic green branding processes, and involve a complex interplay of economic, ecological, and social shaping factors.

Eco-Driven Marketing Strategies

The inclusions of eco-driven marketing approaches in establishing green credentials of the rubber industry are core aspects of creating resilience within the industry, since market strategies that appeal to their consumer ethos, will be translated to eco-friendly contributions to the environment. The increasing popularity of the eco-friendly products among consumers puts pressure on the rubber industry to develop innovations in ladening, processing, and branding products and services.

To cite an example, the development of alternative rubber sources including guayule has avenues that will not only help in lowering impacts on the environment, but also give an economic boost. This shows that sustainability and marketing strategies can be amalgamated in order to not only cut carbon footprints, but also to boost the supply chain resilience.

On a higher theoretical plane, Peattie, and Crane (2005) critically examine the past of green marketing with warnings of the impending emerging bedfellows namely green spinning, green selling, and compliance marketing. Through their example, they explain why the much-hyped green revolution in marketing has not been successful in bringing about a systemic transformation to the industry since most firms practice shallow greening without institutionalizing sustainability in their business concept.

To add to this position, Groening et al. (2018) feature an in-depth review of the theory of consumer behavior focus on green marketing. The results highlight a constant difference between the green intentions of consumers and the reality of their behavior with regards to buying the green products with only a minority willing to spend extra and buy green goods. They present the theoretical model of this intention-behavior or the lamented intention-performance gap, including behavioral intentions, instantiaters that could assist the marketer know the leverage points between consumer goodwill and the real fee payment transform of consumer.

As Rex and Baumann (2007) reiterate, tools such as ecolabels are weak since they tend to appeal only to the already environmentally conscious consumers. Alternatively, they state that the rubber makers should not be concerned about ecolabeling but wider positioning contracts that are sufficient to accommodate certain mainstream consumers: price, place, and promotion.

As an example, durability, performance, and cost-saving in the long-run advantages of using eco-friendly rubber products could be made broader in its market value. Based on these studies, it appears that to come up with an effective eco-driven marketing in the rubber industry, it is important to do more than giving the company a symbolic gesture and labeling, as sustainability needs to be ingrained in the design of the product, the consumer facing behavior, and competitive differentiation strategies of the company**.**

Sustainable Production

The technological innovation and green manufacturing strategies are the other pillars on which the modernisation of the rubber industry is characterised by resilience and sensitivity to the environment. According to Sitepu et al. (2019), replacing rubber plantation policies are decisive and there are trade-offs affecting economic, environmental, and social terms.

Although replanting ultimately increases the long-term supply, the time it takes to grow trees (six years) shrinks the short-term supply of production, carbon storage, and work potential of the tapper. Their composite indicator approach that uses simulation to achieve this shows the way policy instruments can consider trade-offs to formulate replanting strategies that maximize sustainable outcomes in various dimensions.

Boonmahitthisud & Boonkerd (2021) point out the developments in green fillers and oil-based processing chemicals to deny toxic chemicals in NR composites. The use of biomass-based fillers like cellulose and chitin can take the industry out of fossil-based additives and match to the biobased circular economy.

Enganati et al. (2021) (preprint) also reveal the changes brought to the structural characteristics of rubber composites by thermal treatment. Although there is evidence of improved modulus of rubber composites with exposure to heat, there is also the drawback of the adhesion performance. This implies that both the performance, durability, and ecological aspects of material innovations should be considered with regards to attaining sustainability.

Rukmayadi et al. (2016) have developed a green logistics framework of rubber agro-industrial systems in Indonesia on a systemic level. With enhanced quality of raw materials and a better look on packaging, their model evinced considerable gains in efficiency: energy consumption decreased by 11%, water consumption by 25%, and productivity, by 54-67 percent.

Green logistics hence becomes a facilitating influence in terms of both sustainability and economic benefits as it has been revealed that supply chain optimization is inherent in eco-driven development. Subramaniam et al. (2021) apply

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this reasoning to the chemical sector as a whole that must move towards renewable raw materials and sustainable energy production systems. Their own take is relevant to the rubber industry, into which the overdependence of certain traditional input materials and production processes poses a threat to further contribute to ecological damage should sustainability transformations be postponed further on.

Global Consumption

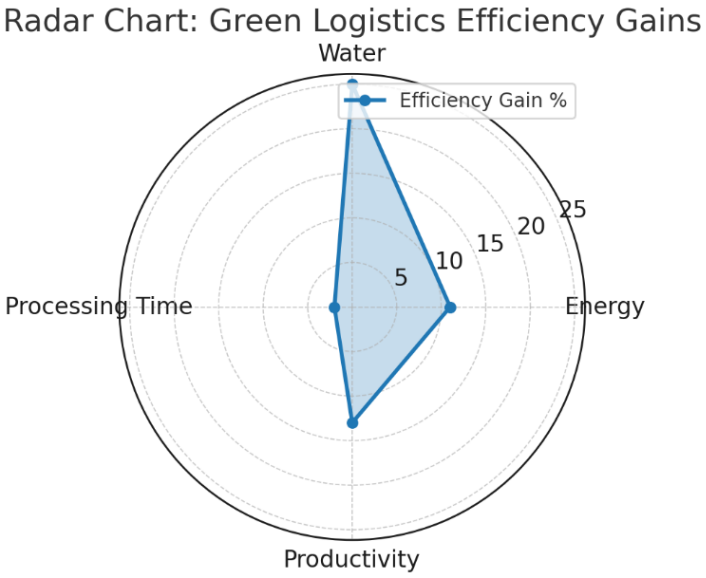
The theme of eco-driven marketing strategies in rubber industry cannot be isolated in the larger context of consumption and designs trends across the world that are influencing demand. Laroche et al. (2021) estimate the EU natural rubber footprint and reveal that up to 25 percent of plantation territory in natural rubber producing countries is utilised in EU tyres.

That 58 percent of this consumption is driven by car-dependent lifestyles pushes their claim to cross-cutting transport policies that are not only focused on fossil fuel curtailment but also car dependency to reduce the ecological footprint of rubber. What is evident in the work is that sustainability in rubber is not just a matter of supply side but equally a matter of governance on the demand side.

Simultaneously, Rio & Tyl (2021) (preprint) state that there is a need to take into consideration sustainability in design of items and services. They describe the work of Design for Sustainability (DfS), Socially Responsible Design and post-growth design as models of socially revamped design systems, with an aim at integrating ecological values into industry.

They point to the importance of grass roots activities in enriching these frameworks and indicate bottom-up activities of local populations can supplement top-down activities of industrial strategies. Such a view is especially applicable in the case of rubber, because smallholder farmers dominate supply and community-based programs have a direct bearing on ecological and social consequences.

Otten et al. (2020) demonstrate that it is impossible to have marketing in rubber based on eco-driving without alignment with policies and involvement of stakeholders. On the one hand, buyers are asking greener solutions, and this aspect opens the chance of alternative rubber sources, and sustainable branding.



On the one hand, sustainability claims perilously turn into the greenwashing claims, when they run counter to the facts on the ground that imply land appropriation and environmental degradation. It is this tension that implies the necessity of strong regulatory systems, democratic guiding, and monitoring to make sure that the results of eco-marketing strategies match to the true sustainable analysis results.

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The themes that are pointed out in the reviewed literature explain that eco-driven marketing strategies in the rubber industry should not only be limited to branding but structural, technological and systems-based reforms. Sustainability issues at the market level are highly intermeshed with external market factors namely global prices, trade network like peers-driven trading system, and social acumen-affecting producer choices.

On the consumer end, closing the green intention behavior gap will need to include the positioning strategy that is not limited to ecolabeling, and consideration of meeting the expectations of the mainstream markets. Material innovations, replanting policy and green logistics offer avenues that can help in shrinking ecological footprints and expanding resilience on the production and supply chain front.

4. Findings

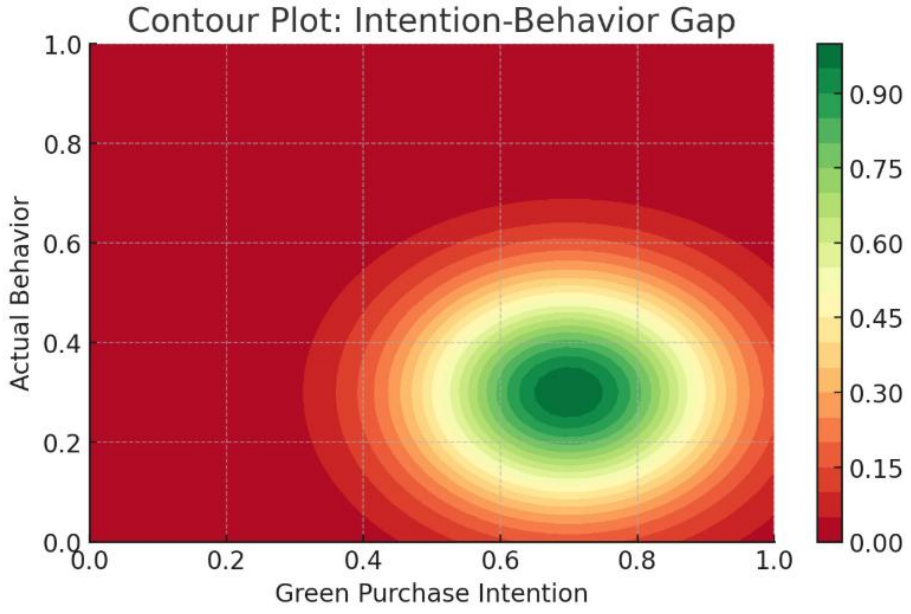
The results of the present study suggest that the implementation of eco-driven marketing practices in the rubber industry is feasible and necessary, yet, it may become efficient only in case of coinciding structural, technological, and policies changes.

In the literature reviewed, we identified three key streams of results that include (1) the comprehension of the sustainability issues in the current trading and production system, (2) the evaluation of consumer behavior and marketing processes and (3) the conceptualization of the potential ways ahead by the use of technologies, logistics and policy.

The rubber industry is characterized by sustainability sets by markets complexity, dependencies in the world and, socio-environmental trade-offs. Kopp & Salecker (2018) showed how the interactions between sellers (peer interaction use), presence of merchant debt and proximity were critical in determining the trading choice made by sellers, and that social networks were critical to guiding the actions in supply chains.

Negash et al. (2021) also indicated that alternative income (sources), value addition, and technical support play an important role in increasing the resilience of smallholders, and environmental and economical sustainability is bound together. Such results show that rubber resilience can neither be attained by individualized efforts nor through stand-alone action but with multipronged interventions on the economical, ecologic, and social fronts.

The findings have validated the existence of difference between green intention and real consumer purchasing conduct. The same points have been made by Groening et al. (2018), who stated that on the one hand, intentions to demand eco-friendly products are high, but on the other hand, few consumers are ready to pay extra on purchasing such goods, which constrains the market accessibility of eco-rubber innovations.



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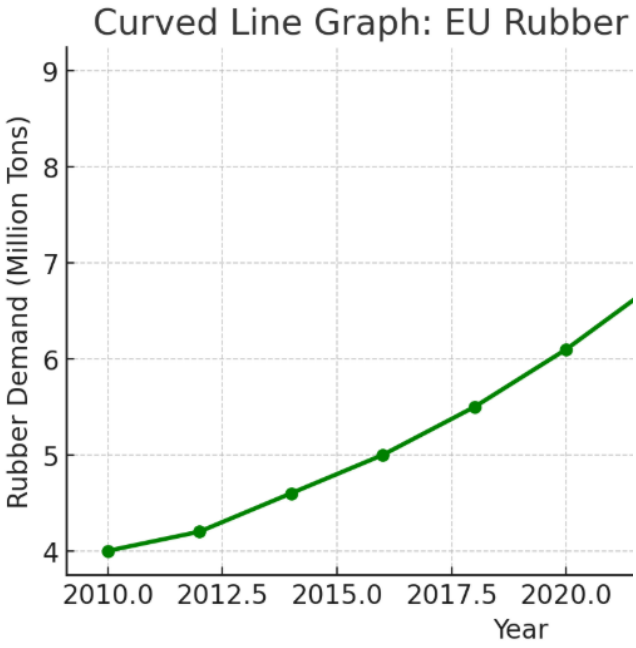
Ecolabels (Rex & Baumann, 2007) are tools that enhance awareness but are not so efficient when it comes to reaching the mainstream consumers. Sustainable eco marketing should therefore focus on value propositions that are holistic such as; durability, cost savings and social equity in addition to ecological goodness. The critique developed by Peattie & Crane (2005) of so-called false marketing promises necessitates the shift of the focus on the symbolic gestures to true sustainability brand assimilations.

Third, the findings point to technological innovation, as well as supply chain innovation, as the factors that make eco-marketing possible. Recyclable replanting plans (Sitepu et al., 2019), biobased fills and green processing oil (Boonmahitthisud & Boonkerd, 2021), and streamlined logistics (Rukmayadi et al., 2016) are all objectively demonstrated to be more efficient and environmentally less-harmful. These are in tandem with

Subramaniam et al. (2021) argue that the chemical industry in general has to switch to renewable sources of input and a circular economy. In addition, a study by Laroche et al. (2021) on global consumption showed that the European tyre demand alone uses 5 per cent of the world natural rubber indicating the necessity of demand side interventions in the form of reducing car dependency and implementing eco-design guiding principles (Rio & Tyl, 2021).



The findings show that only systemic sustainability in marketing could promote resilient growth of the rubber industry in the form of eco-driven marketing. The key to success is to do all three things at the same time i.e. to redesign production systems, deal with gaps in consumer behavior, and realign world consumption to remain within ecological bounds.

5. Conclusion

It can be concluded that eco-driven marketing has a huge potential of creating sustainable growth of the rubber industry based on authentic and systemic marketing. Results point out that consumer participation, green logistics, eco-design and sustainable replanting should be combined to overcome any ecological and social trade-offs.

Symbolic green branding is not enough, as marketing efforts have to focus on the real value propositions (eg. long-term savings, ecological benefits), even though the main idea behind it is related to marketing green brands on an ecological basis. Policy convergence is also needed in terms of global demand management, especially transport-based economies. Finally, eco-driven marketing may be of competitive advantage and a tool of strike-a-balance between the growth of the industry and the considerations of sustainability imperative.

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