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MARKETING AND ADVERTISING STRATEGIES FOR THE LAUNCH OF AN ECO-FRIENDLY PAINT MADE FROM CRYSTAL PET: THE BIOPINT CASE

ESTRATÉGIAS MERCADOLÓGICAS E PUBLICITÁRIAS PARA O LANÇAMENTO DE UMA TINTA ECOLÓGICA À BASE DE PET CRISTAL: O CASO BIOPINT

ESTRATEGIAS MERCADOLÓGICAS Y PUBLICITARIAS PARA EL LANZAMIENTO DE UNA PINTURA ECOLÓGICA A BASE DE PET CRISTAL: CASO BIOPINT

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ABSTRACT

The present article analyzes the influence of an ecological advertising campaign on the acceptance of the sustainable paint BioPint, produced using crystal PET waste and recycled Styrofoam in the communities of Ixcaquixtla and Tepexi de Rodríguez, Puebla. The study was structured with a descriptive and mixed approach, using surveys and interviews conducted with residents of both municipalities. The results showed a high willingness to consume ecological products, growing interest in recycling, and a positive evaluation of the advertising message. The BioPint proposal was perceived as innovative, useful, and representative of the community effort. The analysis demonstrated that sustainable marketing can transform purchasing attitudes by linking environmental awareness with local development. The research concludes that combining environmental education, communicative transparency, and responsible production strengthens consumer trust and promotes the adoption of green alternatives in rural contexts.

Keywords: Marketing and Advertising Strategies. Ecological Paint. Crystal PET. Biopint. Sustainable Marketing.

RESUMO

O presente artigo analisa a influência de uma campanha publicitária ecológica na aceitação da pintura sustentável BioPint, elaborada com resíduos de PET cristal e isopor reciclado, dentro das comunidades de Ixcaquixtla e Tepexi de Rodríguez, Puebla. O estudo foi

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estruturado com abordagem descritiva e mista, por meio de questionários e entrevistas aplicados a habitantes de ambos os municípios. Os resultados mostraram alta disposição para o consumo de produtos ecológicos, interesse crescente pelo reciclagem e uma avaliação positiva da mensagem publicitária. A proposta da BioPint foi percebida como inovadora, útil e representativa do esforço comunitário. A análise permitiu demonstrar que o marketing sustentável pode transformar atitudes de compra ao vincular a conscientização ambiental ao desenvolvimento local. A pesquisa conclui que a combinação de educação ambiental, transparência comunicativa e produção responsável fortalece a confiança do consumidor e impulsiona a adoção de alternativas verdes em contextos rurais.

Palavras-chave: Estratégias Mercadológicas e Publicitárias. Pintura Ecológica. PET Cristal. Biopint. Marketing Sustentável.

RESUMEN

El presente artículo analiza la influencia de una campaña publicitaria ecológica en la aceptación de la pintura sustentable BioPint, elaborada con residuos de PET cristal y unicel reciclado dentro de las comunidades de Ixcaquixtla y Tepexi de Rodríguez, Puebla. El estudio se estructuró con enfoque descriptivo y mixto, mediante encuestas y entrevistas aplicadas a habitantes de ambos municipios. Los resultados mostraron alta disposición hacia el consumo de productos ecológicos, interés creciente por el reciclaje y valoración positiva del mensaje publicitario. La propuesta de BioPint fue percibida como innovadora, útil y representativa del esfuerzo comunitario. El análisis permitió demostrar que la mercadotecnia sustentable puede transformar actitudes de compra al vincular conciencia ambiental con desarrollo local. La investigación concluye que la combinación de educación ambiental, transparencia comunicativa y producción responsable fortalece la confianza del consumidor e impulsa la adopción de alternativas verdes en contextos rurales.

Palabras clave: Estrategias Mercadológicas y Publicitarias. Pintura Ecológica. PET Cristal. Biopint. Marketing Sostenible.

1 INTRODUCTION

In recent decades, humanity has experienced an unprecedented industrial expansion that has increased production, transformed consumption habits, and modified the relationship with the natural environment. Although economic progress was evident, the environmental cost proved unsustainable: pollution, accumulation of plastic waste, deforestation, resource depletion, loss of biodiversity.

The United Nations Environment Programme (UNEP, 2023) estimates that more than 400 million tonnes of plastic are generated per year, with recycling of less than 10%. Mexico contributes more than six million tons, ranking among the fifteen countries with the highest volume of waste. In Puebla, SEMARNAT (2024) reports that only three out of ten PET bottles are recycled; the rest remains in landfills or is incinerated, releasing toxic gases.

Against this backdrop, BioPint emerges, an ecological paint made from crushed glass PET waste along with recycled Styrofoam scraps. The project seeks to reduce the environmental impact generated by the use of plastics and offer a sustainable option within the domestic paint market. The initiative was born at the Higher Technological Institute of Tepexi de Rodríguez, where a group of young people identified the need to take advantage of recyclable materials to create useful products.

This article analyzes the BioPint case from a marketing approach, with the purpose of evaluating the effectiveness of its advertising strategies, considering the relationship between ecological communication, environmental education, and consumer behavior. The research aims to demonstrate that a sustainable strategy based on authentic messages can strengthen public trust, modify perceptions, and encourage responsible purchasing decisions.

1.1 PROJECT OVERVIEW

BioPint represents an entrepreneurial proposal focused on ecological innovation. It was created at the Higher Technological Institute of Tepexi de Rodríguez, in Puebla, with the purpose of transforming crushed crystal PET waste together with recycled Styrofoam into ecological white paint. The result combines quality, durability, low cost, composition free of toxic solvents.

The product is made through controlled recycling that reduces the use of petroleum-based compounds. Each liter of paint uses about 200 grams of PET, equivalent to ten plastic

bottles. With a monthly production of 10,000 liters, the positive environmental impact implies the reduction of more than 100,000 discarded containers.

BioPint is aimed at consumers aged 33 to 55 with an interest in improving their home, average purchasing power, willingness to try economical alternatives. The distribution areas include the municipal capitals of Tepexi de Rodríguez and Ixcaquixtla, where the market is dominated by traditional brands such as Comex, Pintumex and Sayer Lack. Its value proposition stands out for its ecological character, competitive cost, social commitment, and local origin.

The project is based on the circular economy. Each stage seeks to reduce waste, optimize resources, and strengthen the environmental education of the community. The process includes collection, cleaning, crushing, mixing, packaging, marketing. The entire cycle takes place in the region, which generates employment, promotes ecological awareness through practice.

1.2 STATEMENT OF THE PROBLEM

Plastic pollution is one of the greatest environmental challenges of the 21st century. According to the Organisation for Economic Co-operation and Development (OECD, 2023), only 9% of the world's plastic receives recycling treatment; the rest remains in landfills or contaminates rivers, lakes, coasts, agricultural soils, affecting flora, fauna, and human health.

In Mexico, the National Association of Plastic Industries (ANIPAC, 2024) estimates a production of more than eight million tons per year, with recovery of less than two million. In rural municipalities, the situation is aggravated by the absence of collection programs, environmental education, and specialized infrastructure. Waste accumulates in public spaces, ravines, neighborhood roads, deteriorating the urban image, affecting air quality.

Recycling represents a viable alternative to reduce environmental impact, although it faces sociocultural barriers. A part of consumers are wary of green products. The Kantar Worldpanel study (2024) indicates that only 38% of Mexicans consider sustainable brands trustworthy; Most associate "green" with high prices or less durability.

At BioPint, the difficulty encompasses production and recognition within the local market. The community of Tepexi de Rodríguez has little environmental information; Consumers prioritize immediate cost, without valuing ecological impact, which limits the adoption of sustainable alternatives.

2 OBJECTIVES

2.1 GENERAL OBJECTIVE

Design a sustainable marketing strategy with the purpose of positioning BioPint ecological paint within the local market through advertising actions that promote environmental education and strengthen the positive perception of the consumer.

2.2 SPECIFIC OBJECTIVES

1. Analyze the socioeconomic environment of the target communities to identify factors that influence the purchase decision.
2. To evaluate the consumer's perception of organic products within the regional market.
3. Design an advertising campaign based on the AIDA model to capture attention, arouse interest, generate desire, stimulate action.
4. Formulate sustainable communication strategies according to the cultural profile of the target audience.
5. Measure results through indicators of recall, credibility, and purchase preference.

2.3 HYPOTHESES AND ASSUMPTIONS

The research is based on the principle that ecological advertising has the capacity to transform perceptions and modify consumption habits when the message is authentically constructed.

2.4 NULL HYPOTHESIS (H_0)

The application of sustainable marketing strategies does not significantly influence consumer acceptance of BioPint ecological paint.

2.5 ALTERNATE HYPOTHESIS (H_1)

The application of sustainable marketing strategies significantly influences consumer acceptance of BioPint ecological paint.

2.6 ASSUMPTIONS

- Consumers place value on brands that demonstrate real environmental commitment.
- Emotional communication increases confidence in new products.
- Ecological knowledge has a direct influence on the willingness to buy.

- Community identity strengthens the credibility of local projects.

3 JUSTIFICATION

The study has environmental, economic, and social relevance. In the environmental field, BioPint reduces the accumulation of plastic waste by reusing PET glass. Each liter of paint uses about 200 grams of recycled plastic, equivalent to ten soda containers. With a monthly production of 10,000 liters, the positive impact exceeds 100,000 bottles recovered.

From an economic perspective, the Mexican paint market exceeds 2,500 million dollars per year, according to the National Chamber of the Paint and Ink Industry (2023). Less than 7% of national companies offer organic products. BioPint's proposal fills this gap through a sustainable, accessible option, aligned with the circular economy.

In the social aspect, the project promotes citizen participation, generates local employment, strengthens the culture of recycling. The process involves inhabitants of the region in tasks of collection, cleaning, crushing, formulation, packaging, which distributes benefits within the community.

The research is justified in the marketing field because it shows that sustainability can become a competitive advantage. According to Kotler (2022), brands with a purpose achieve greater loyalty, with an increase of approximately 35% compared to companies focused on functional attributes.

BioPint represents an example of responsible innovation, capable of combining profitability, positive environmental impact, social commitment. The research provides an academic perspective by integrating sustainable marketing, ecological advertising, circular economy within the Mexican rural context, in addition to serving as a model for future ventures.

4 THEORETICAL FRAMEWORK

4.1 HISTORICAL EVOLUTION OF PAINTINGS

The use of color as a protective and decorative element has accompanied humanity since ancient times. The first pigments applied to rock date back more than 30,000 years; Prehistoric groups mixed clays, charcoal, pulverized minerals, animal fat to fix the color in stone, wood, or bone. In ancient civilizations, the pigment acquired symbolic value. In Egypt, blue was related to aquatic divinities; red represented vital energy. The Romans used mixtures of lime with metal oxides to protect walls, an early form of waterproofing.

With the Renaissance, linseed oil was incorporated as a binder. Since the eighteenth century, industrial development transformed pigment production with petroleum-based chemical processes. This evolution increased the availability of the product, although it introduced toxic compounds.

The growth of modern construction intensified the consumption of coatings. According to the International Council on Paints and Inks (2024), global consumption exceeds 40 billion liters per year with a growth rate of close to 4%. However, traditional production generates emissions, hazardous waste, and high energy expenditure.

4.2 BACKGROUND OF ECOLOGICAL PAINTS

The first organic formulations emerged in Europe during the 1980s. Swedish research showed that replacing solvents with water reduced volatile organic compounds (VOCs) by up to 90%. Beckers Paints introduced a line certified by the NORDIC SWAN label, a symbol of environmental compliance.

In 1990, Benjamin Moore launched the Natura line in North America, free of aromatic solvents. In Mexico, interest appeared in the late 1990s, although the lack of tax incentives limited its development. The global market for eco-friendly paints exceeds $9 billion with a projected growth of 8% per year, according to Grand View Research (2024). These formulations employ vegetable oils, natural resins, mineral pigments, recycled plastics, biodegradable binders.

BioPint embraces this trend by integrating shredded PET with Styrofoam waste, partially replacing petrochemical polymers. The final blend has low VOC level, uniform texture, durable finish.

4.3 TECHNICAL CLASSIFICATION OF PAINTS

Paint is defined as a mixture of pigments, binders, solvents, additives. Its classification depends on the base, finish, use, chemical composition:

- Water-based paints: use water as a solvent, have low toxicity, fast drying.
- Oil paints: use vegetable or synthetic oils, generate a resistant protective layer, release polluting compounds.
- Synthetic paints: made with plastic resins derived from petroleum, they offer high durability and high environmental impact.

- Ecological paints: they use renewable or recycled materials, reduce emissions, facilitate cleaning, biodegradation.

BioPint's product belongs to the category of eco-friendly recycled base paint, with components derived from PET, glass and processed Styrofoam.

4.4 ENVIRONMENTAL STANDARDS AND REGULATIONS

The production of eco-friendly paints is governed by international standards. ISO 14001 establishes environmental management guidelines to reduce waste and control emissions. EPA sets VOC limits on coatings. In Mexico, NOM-123-SEMARNAT-1998 regulates VOC emissions during the manufacture of paints; NMX-AA-162-SCFI-2012 defines criteria for products with recycled content. Meeting these standards is an essential requirement for access to sustainable markets. BioPint applies equivalent principles through controlled artisanal processes that minimize the use of solvents.

4.5 FUNDAMENTALS OF GREEN MARKETING

Green marketing is a strategy aimed at satisfying consumer needs through environmentally responsible practices. According to Peattie (2001), this approach involves redesigning the entire business system. Production, distribution, communication and after-sales decisions must be aligned with environmental conservation.

Global interest in responsible consumption increased steadily. The Global Sustainability Barometer (2023) shows that seventy percent of consumers prefer brands with verifiable environmental commitments. However, only thirty percent fully trust sustainability-related advertising information. This credibility gap requires transparent communication strategies.

BioPint is inserted within this logic by promoting authenticity, social commitment and coherence between message and practice.

4.6 SUSTAINABLE ADVERTISING

Sustainable advertising is conceived as a responsible communication process that seeks to balance commercial benefit with environmental education. According to Uceda García (2008), the effective ecological message must generate collective awareness, not just the desire to buy.

Visual resources, language, emotional tone and media support must convey ethical coherence. A sustainable campaign informs, persuades, educates, without resorting to exaggeration or false promises.

BioPint uses visual communication strategies based on neutral colors, short messages and local testimonials. That combination strengthens trust and reinforces the emotional bond with the audience.

4.7 ECO-FRIENDLY CONSUMER BEHAVIOR

The organic consumer represents a central axis of today's marketing. Their behavior arises from a cultural change motivated by environmental crises, technological advances, and greater access to information. Ottman (2011) defines it as one that incorporates ethical values into its economic decisions to reduce its environmental impact and support collective causes.

This consumer combines environmental awareness, proactive attitude, and consistent behavior. The green gap persists, because although 78% of Mexicans prefer organic products, only 42% buy sustainably (NielsenIQ, 2023). Psychological, social, and cultural factors determine their decisions, with the perception of personal benefit predominating over collective concern.

PROFECO (2024) reports greater sustainable adoption in consumers with secondary education and urban areas. In rural areas, the lack of knowledge about terms such as biodegradable or recycled limits the acceptance of green proposals.

BioPint faces that challenge. Their strategy is based on simple communication, clear language, concrete examples. The idea of "giving new life to plastic" generates immediate emotional connection.

The VALS model places the buyer of BioPint between believers and compliers, with community attachment, practical orientation, and a disposition towards projects with social value.

4.8 CORPORATE SOCIAL RESPONSIBILITY

Corporate social responsibility (CSR) is a voluntary commitment that integrates ethics, sustainability and respect for stakeholders. Carroll (1999) described it through a pyramid composed of four levels: economic, legal, ethical, and philanthropic compliance.

Organizations that reach the top levels transcend profitability, consolidate reputation, strengthen legitimacy.

In the Latin American context, CSR has been linked to the search for social trust. ECLAC (2023) argues that companies with active sustainability programs manage to increase their brand value by up to forty-six percent. In addition, environmental commitment generates competitive advantages by reducing operating costs and improving the relationship with local authorities.

In Mexico, the Association of Socially Responsible Companies (2024) registers more than one thousand five hundred certified organizations, although most belong to industrial or financial sectors. Few initiatives come from rural micro-enterprises, which makes the BioPint project unique.

Social responsibility within BioPint is manifested in various practices: plastic waste collection within the community, training on recycling, female labor inclusion, partial reinvestment of profits in cleaning campaigns. The project promotes environmental co-responsibility through example. This coherence between discourse and action strengthens its market legitimacy.

From a marketing perspective, CSR translates into reputation. Kotler (2022) states that companies perceived as responsible achieve loyalty levels up to thirty-five percent higher than conventional ones. Trust becomes an intangible resource that increases brand value and amplifies word-of-mouth recommendation.

4.9 GREEN BRANDING AND ECOLOGICAL POSITIONING

Corporate social responsibility (CSR) represents a voluntary commitment based on ethics, sustainability, respect for stakeholders. Carroll (1999) structured it into a pyramid with four levels: economic, legal, ethical, philanthropic. Organizations that reach higher levels transcend profitability, consolidate reputation, strengthen legitimacy.

In Latin America, CSR is linked to social trust. According to ECLAC (2023), companies with sustainable programs increase their brand value by up to 46%. Environmental commitment provides competitive advantages by reducing operating costs, improving ties with local authorities.

In Mexico, the Association of Socially Responsible Companies (2024) registers more than one thousand five hundred certified organizations, concentrated in industrial or financial sectors. Few come from rural micro-enterprises, which makes BioPint a unique case.

BioPint demonstrates its CSR through plastic waste collection, community training, female labor inclusion, and reinvestment of profits in clean-up campaigns. This coherence between discourse and action reinforces its market legitimacy.

From a marketing perspective, CSR is reflected in reputation. Kotler (2022) states that responsible companies achieve up to 35% higher loyalty. Trust becomes an intangible resource that increases brand value, enhances word-of-mouth recommendation.

4.10 EMOTIONAL COMMUNICATION WITHIN SUSTAINABLE MARKETING

Sustainable marketing uses emotion as a vehicle of persuasion. Kotler (2019) highlights that emotionally charged messages achieve greater recall, generate empathy, and modify attitudes. Emotion acts as a bridge between rationality and action.

The human brain processes visual stimuli faster than logical arguments. For this reason, environmental communication requires symbolic images that awaken sensitivity. A photograph of clean oceans produces greater impact than a list of technical data.

BioPint implements emotional communication based on three axes: hope, community pride, shared responsibility. Each ad highlights tangible benefits of the product along with testimonials from neighbors who collaborate in the collection of plastic. This strategy generates collective identification and transforms the act of buying paint into an ecological contribution.

Batra and Ray (2020) point out that emotion increases willingness to pay up to twenty percent when the message conveys social purpose. In the case of BioPint, emotional connection becomes an essential tool to overcome cognitive barriers and achieve differentiation from industrial brands.

4.11 LATIN AMERICAN PERSPECTIVE ON RESPONSIBLE CONSUMPTION

Responsible consumption in Latin America presents an uneven development. Economic crises, educational levels and the structure of markets have a direct influence on the adoption of sustainable practices. ECLAC (2023) recognizes an average growth of seven percent per year in the demand for green products within the region, although mistrust of the authenticity of brands persists.

Brazil, Chile and Colombia lead the organic market with public policies focused on environmental certifications. Mexico is making progress through recycling programs

promoted by universities and civil associations, although the lack of tax incentives limits the expansion of green microenterprises.

The Latin American public values the social component as much as the ecological one. According to Latinobarómetro (2024), sixty-three percent of consumers prefer products that benefit local communities. This cultural characteristic favors projects such as BioPint, which integrate environmental benefits with direct social impact.

The phenomenon of conscious consumption acquires relevance in young generations. The so-called centennials show sensitivity to environmental causes, but demand digital transparency. For this reason, Latin American brands need to strengthen communication channels through social networks with verifiable information and real testimonials.

4.12 THEORETICAL APPLICATION TO THE BIOPINT CASE

The application of the theoretical foundations allows us to understand the marketing structure of BioPint. The project is based on three conceptual pillars: green marketing, social responsibility, emotional communication. His proposal coincides with the principle of sustainable development set out in the Brundtland Report (1987), aimed at satisfying present needs without compromising future resources.

The advertising campaign employs the AIDA model, which organizes the consumer's response into four stages. Attention is obtained through visual resources that highlight the recycled origin of the product. The interest arises when presenting data on plastic pollution. Desire is built through the emotional connection with the producing community. The action is driven by local promotions that incentivize the initial purchase.

Positioning is strengthened through proximity strategies. BioPint participates in school fairs, recycling workshops, community events. This direct interaction generates trust, a determining factor in rural contexts with limited digital penetration.

From a theoretical perspective, the case demonstrates that sustainable marketing can be applied in microenterprises with low budgets. Ecological purpose, ethical coherence, and social participation function as sources of authentic differentiation. BioPint exemplifies a replicable local innovation model, whose success depends on maintaining a balance between environmental message, product quality, and collective benefit.

5 CONCEPTUAL FRAMEWORK

5.1 PAINTING CONCEPT

Paint is one of the oldest materials created by humans. Its initial function was symbolic or ritual, as shown by the cave paintings of Lascaux. Over time, it served to protect surfaces, thermally insulate, improve aesthetics.

Technically, it is a mixture of pigments, binders, solvents that when applied form a protective film. Marrufo (2020) describes it as a colloidal system whose performance depends on the chemical interaction of its components.

The global market exceeds 170 billion dollars annually according to Statista (2024). This sector generates a high environmental impact due to volatile organic compounds and heavy metals. In Mexico, more than 850 thousand tons are produced each year according to the National Association of Paint and Ink Manufacturers (2024).

BioPint addresses this situation through ecological paint made with PET and recycled Styrofoam, reducing plastic pollution, petrochemical dependence and integrating technical innovation with environmental commitment.

5.2 ESSENTIAL COMPONENTS

The performance of a paint depends on four elements: pigments, binders, solvents, additives.

Pigments provide color, opacity, resistance. They are classified as natural or synthetic; metal waste is polluting. BioPint takes advantage of the white tone of PET glass, avoiding toxic pigments.

The binder binds particles together and forms an adherent film. Common resins come from petroleum. BioPint replaces them with recycled Styrofoam polymers, reducing environmental impact.

The solvent regulates viscosity and facilitates application. Instead of harmful organic solvents, BioPint uses purified water, ensuring safety and zero VOC emissions.

Additives improve shine, durability, drying, resistance. Natural compounds without heavy metals are used in organic formulas.

Grand View Research (2023) indicates that water-based paints account for 60% of global consumption. BioPint joins this trend with a biodegradable, harmless, local product.

5.3 TECHNICAL AND ENVIRONMENTAL CLASSIFICATION

Paints can be classified according to chemical composition, type of application or environmental impact. The technical classification distinguishes water, oil, epoxy, acrylic or vinyl formulations. Each type is adapted to specific surface and climate conditions.

The environmental criterion differentiates three main categories:

- Conventional paints, which contain aromatic solvents and metallic pigments.
- Low-VOC paints, with reduced emissions but still based on petroleum derivatives.
- Eco-friendly paints, completely free of toxins and made with biodegradable or recycled components.

According to Allied Market Research (2024), the market for ecological paints is growing at a rate of more than six percent per year, driven by emission reduction policies and environmental certification programs.

In Latin America, the consumption of sustainable paints still accounts for less than five percent of total coatings, although forecasts point to steady growth. Mexico participates with an approximate production of 120 thousand tons per year of water-based coatings.

BioPint is part of this emerging trend. Its product not only replaces polluting materials, but also incorporates the concept of circular economy. Each litre produced avoids the generation of approximately two hundred grams of plastic waste, thus contributing to national waste reduction targets.

5.4 ECO-FRIENDLY PAINT CONCEPT

Eco-friendly paint arises as a response to the need to reduce the environmental impact caused by petrochemical substances. Grand View Research (2024) defines it as a mixture free of heavy metals, with a water-based basis and biodegradable components.

Its purpose is to preserve the protective function of the coating, reduce risks to human health, reduce carbon footprint, and ensure indoor safety. The development began in Europe during the 1990s with standards such as ISO 14024, focused on eco-labeling. In Mexico, adoption is progressing slowly, although demand is growing steadily in schools, hospitals, and homes.

The INECC (2024) calculates that solvents in traditional coatings generate five hundred thousand tons of VOCs per year, an alarming figure in the face of urban pollution.

BioPint represents a sustainable local alternative. Its production uses low-energy consumption tools, manual recycling processes, community employment. Each package reflects green technology, environmental education, social entrepreneurship.

5.5 RECYCLING CONCEPT

Recycling is one of the pillars of sustainable development. SEMARNAT (2024) defines it as the process by which waste is transformed into useful inputs through collection, separation, cleaning, and revaluation.

Globally, the production of plastics exceeds 400 million tons per year, according to the UN Environment (2023), of which less than 10% is effectively recycled. In Mexico, about eight million tons are generated annually, equivalent to more than six hundred bottles per inhabitant.

PET accounts for around 40% of all recyclable plastics due to its strength and ease of processing. Its recovery avoids the emission of three kilograms of carbon dioxide for every kilogram recycled and reduces energy consumption by 60%.

On the other hand, Styrofoam (expanded polystyrene) presents a greater challenge due to its low density and light volume. In the country, barely 3% of this waste is recycled, which causes accumulation in landfills and visual pollution.

BioPint turns that problem into opportunity by combining both materials to create a stable polymer base. The shredding of the PET and the incorporation of the pulverized Styrofoam generate a matrix with a uniform texture, suitable for domestic coatings.

This process promotes the circular economy by reducing waste, generating employment and promoting environmental education. In this sense, recycling transcends its traditional function to become an engine of economic and social transformation within the communities of Ixcaquixtla and Tepexi de Rodríguez.

5.6 CONCEPT OF SUSTAINABILITY

Sustainability is defined as the ability to meet present needs without compromising the ability of future generations to meet theirs. The concept was established in the Brundtland Report (1987), a document that marked the basis of modern environmental thinking. Its essence lies in the harmonization of three dimensions: economic growth, social justice and ecological balance.

In the business sphere, sustainability translates into production models that minimise environmental impact, promote energy efficiency and strengthen collective well-being. ECLAC (2024) states that companies that apply sustainable practices achieve average increases of 18 percent in productivity due to the reduction of waste and the saving of resources.

Sustainability is expressed through innovation, environmental education and community participation. It is not limited to the adoption of clean technologies, but involves cultural transformation. In industrialized countries, public policies encourage the transition to the low-carbon economy. In Latin America, progress is uneven, although there are community projects that demonstrate their viability.

BioPint embodies the principle of sustainability by combining ecological innovation with social commitment. Its production model uses low-consumption machinery, recycled inputs and local distribution, which reduces emissions. In addition, it generates jobs within the community and promotes environmental awareness through informative workshops. Each liter of paint manufactured symbolizes the convergence between efficiency, equity and environmental respect.

5.7 MARKETING CONCEPT

Marketing is the set of activities aimed at identifying needs, creating value and establishing satisfactory exchanges between organization and consumer. According to Kotler (2022), its objective is to generate lasting relationships based on trust, purpose and satisfaction.

The concept has evolved from simple promotion to comprehensive experience management. Modern marketing analyzes preferences, values, and behaviors to deliver meaningful solutions. Within the global context, consumers are looking for products that reflect personal identity and ethical coherence.

In Mexico, the Mexican Institute of Competitiveness (IMCO, 2023) highlights that 70 percent of consumers consider environmental responsibility a determining factor when choosing a brand. This paradigm shift forces companies to design communication strategies based on transparency.

BioPint uses marketing as an educational and social tool. The strategy is not focused on consumption, but on cultural transformation. The main message communicates that each purchase contributes to reducing plastic waste. That narrative generates local pride and a

sense of belonging. The consumer does not only acquire paint, but also active participation in an environmental cause.

Marketing then becomes a vehicle for change, capable of modifying habits, stimulating reflection and consolidating ecological identity.

5.8 GREEN MARKETING CONCEPT

Green marketing is defined as the application of environmental principles within the marketing process. Peattie (2001) describes it as the incorporation of respect for the environment in every decision related to product, price, place and promotion. This approach seeks compatibility between commercial success and ecological responsibility.

The growth of green marketing reflects a profound cultural shift. NielsenIQ (2023) reports that 73 percent of Latin American consumers prefer sustainable brands, although only 32 percent fully trust their messages. This difference shows the need for authenticity.

In Europe, the European Union regulates ecological communication through guidelines against greenwashing, a practice that consists of exaggerating environmental attributes. In Mexico, the Federal Consumer Protection Agency (PROFECO) has initiated information campaigns to prevent misleading advertising in this area.

Green marketing demands consistency. It is not enough to offer a recycled product; it is essential to demonstrate real impact. BioPint applies this principle by openly displaying its PET collection, crushing and mixing process. Transparency in communication generates trust, a fundamental element to achieve customer loyalty.

The differential value of BioPint lies in turning waste into opportunity. The consumer perceives authenticity, which reinforces the reputation and consolidates the positioning within the regional organic segment.

5.9 ECO-FRIENDLY ADVERTISING CONCEPT

Ecological advertising represents a form of communication aimed at promoting responsible attitudes towards the environment. Uceda García (2008) defines it as a strategy that educates, informs, and inspires through messages based on truth and scientific evidence.

Its purpose goes beyond selling products, as it seeks to raise environmental awareness. To achieve this, it resorts to positive narratives, images of hope and verifiable

data. Authenticity becomes its guiding principle, as a brand loses credibility when its speech contradicts its actions.

Globally, green advertising is growing at the pace of international climate commitments. Global Advertising Review (2024) estimates that more than 40% of current advertising campaigns include some ecological component; however, only a part meets verifiable ethical criteria.

In the Mexican context, environmental communication still faces challenges related to ecological literacy. Many consumers are unfamiliar with terms such as "carbon neutral" or "biodegradable", which forces them to design clear, simple and visually forceful messages.

BioPint responds to this need for transparency through campaigns that show the process of collecting bottles, crushing and mixing PET. That visual clarity reinforces the credibility of the message and reflects real engagement.

CIRCULAR ECONOMY CONCEPT

The circular economy proposes a production model that replaces the linear logic of extracting, manufacturing, discarding with a system of continuous use. The Ellen MacArthur Foundation (2023) estimates that its global application would reduce waste by 50% and use of virgin materials by 40% by 2050.

It is based on prolonging the life cycle through repair, reuse, recycling, redesign, in order to minimize waste and maximize value.

In Mexico, the National Program for the Circular Economy (2024) promotes recycling and ecodesign in SMEs, seeking to raise the national recovery rate to 35% in the next decade.

BioPint exemplifies this model: it transforms collected PET into paint, distributes it locally, and reincorporates empty containers into the process. This dynamic converts waste into resources, strengthens regional self-sufficiency, promotes environmental education, improves family economy, reinforces local identity.

6 METHODOLOGY

6.1 TYPE OF STUDY

The methodological design adopted corresponds to a descriptive study with a mixed approach, which combines quantitative and qualitative analysis. The choice of this type of research responds to the need to understand both the patterns of behavior of the organic consumer and the symbolic perceptions associated with the BioPint product.

The descriptive approach allows detailing the characteristics, attitudes and purchasing habits within the target audience, without manipulating variables. According to Hernández Sampieri (2022), this type of research seeks to specify properties of observable phenomena, in this case, the acceptance of an ecological paint within rural markets.

The quantitative component makes it easier to measure frequency, trend and consumer preference through structured surveys. The qualitative dimension adds depth to the analysis by incorporating testimonies, perceptions and motivations expressed in semi-structured interviews. The integration of both approaches offers a complete vision of the market phenomenon.

6.2 POPULATION OR UNIVERSE

The population under study is made up of the inhabitants of the municipal capitals of Ixcaquixtla and Tepexi de Rodríguez, Puebla, where the initial distribution of BioPint ecological paint is concentrated.

According to data from the National Institute of Statistics and Geography (INEGI, 2024), Ixcaquixtla has 9,863 inhabitants, while Tepexi de Rodríguez has 10,877 residents. Collectively, the universe amounts to 20,740 people.

The study focuses on the adult segment between 33 and 55 years of age, the range that concentrates the greatest decision-making power in the household. Within this group, 52 percent are women and 48 percent men, according to local estimates. Most belong to socioeconomic levels D and D+, which coincides with BioPint's target audience.

Knowledge of the population allows us to define segmentation strategies and adjust the advertising message according to the cultural, educational and economic conditions of the environment.

6.3 SAMPLE

The sample was selected using non-probabilistic convenience sampling, a technique recommended for research with limited resources or in communities with restricted access.

The sample size was calculated based on the formula for finite population:

n=N×Z2×p×qE2(N−1)+Z2×p×qn = \frac{N \times Z^2 \times p \times q}{E^2 (N-1) + Z^2 \times p \times q}n=E2(N−1)+Z2×p×qN×Z2×p×q

where N represents the size of the population (20,740), Z equals 1.96 for a 95% confidence level, p and q are assumed to be 0.5, and E corresponds to the margin of error of 7%.

The result obtained was 183 people, a figure that guarantees sufficient representativeness. Of that total, 95 correspond to Ixcaquixtla and 88 to Tepexi de Rodríguez.

The selection was made within public spaces, local businesses and private homes, prioritizing occupational and school diversity.

6.4 INSTRUMENT DESCRIPTION

The main collection instrument was a structured questionnaire of 25 items, designed to measure level of knowledge, environmental perception, purchase intention and disposition towards sustainable products.

Each item was formulated on a five-level Likert scale, ranging from "strongly disagree" to "strongly agree." The structure of the instrument was divided into five sections:

1. Sociodemographic data, to identify age, gender, occupation and monthly income.
2. Consumption habits, with questions about the frequency of buying paint and the criteria for choice.
3. Ecological knowledge, focused on notions about recycling, pollution and biodegradable materials.
4. Perception of BioPint, aimed at evaluating trust in the brand, interest in its composition and the valuation of the advertising message.
5. Willingness to purchase, focused on the probability of acquiring ecological paint at a competitive price.

The questionnaire was validated by three specialists in sustainable marketing from the Tecnológico Nacional de México, Tepexi de Rodríguez Campus, who reviewed the clarity, relevance and congruence of the questions. A pilot test was applied with 20 participants to verify understanding and response time.

The instrument achieved a Cronbach's alpha reliability index of 0.89, a value that indicates high internal consistency.

6.5 DATA COLLECTION PROCEDURE

Data collection was carried out during the months of May and June 2024. The process was developed in three consecutive stages: planning, application and systematization.

During the planning stage, authorization was obtained from municipal authorities and support from local businesses to carry out the surveys. In addition, a group of five student volunteers were trained in interview techniques and ethical management of information.

In the application stage, the questionnaires were distributed in person. Each participant received a brief explanation about the purpose of the study, ensuring anonymity and confidentiality. The average application required fifteen minutes per person.

Subsequently, in the systematization phase, the data were coded in spreadsheets. Incomplete records were eliminated to ensure statistical validity. The quantitative results were processed using the IBM SPSS Statistics version 26 program, while the qualitative testimonies were organized with the Atlas.ti software, in order to identify patterns of opinion.

The statistical analysis included frequency distribution, averages, simple correlations and graphical representation. Open-ended responses were interpreted using thematic analysis to identify recurring perceptions about the product.

The methodological procedure allowed obtaining reliable information on the degree of acceptance of the BioPint product, the level of ecological awareness of the inhabitants and the opportunities for improvement within the advertising campaign.

6.6 RESEARCH QUESTION

How does the implementation of an ecological advertising campaign influence the perception, acceptance and willingness to purchase of adult consumers in Ixcaquixtla and Tepexi de Rodríguez compared to the sustainable paint produced by BioPint?

6.7 HYPOTHESIS

The implementation of an ecological advertising campaign, with an educational and emotional focus, significantly increases the acceptance and preference for BioPint sustainable paint in the local market, by strengthening the symbolic association between responsible consumption and community well-being.

6.8 SPECIFIC CASES

- The positive perception of recycled products is related to greater purchase intention.
- The consumer's prior environmental knowledge conditions the brand's valuation.
- Clear and transparent visual communication increases trust and recognition.

6.9 STATISTICAL INFORMATION MANAGEMENT PROCEDURE

The information collected through the questionnaires applied to consumers in the municipal capitals of Ixcaquixtla and Tepexi de Rodríguez was manually organized in tables prepared in spreadsheets. Subsequently, we reviewed the consistency of the responses and removed incomplete or inconsistent records to ensure the reliability of the data.

Once the information base was refined, simple counts were carried out to obtain frequencies and percentages that would allow the identification of general trends around the level of knowledge, perception and acceptance of BioPint ecological paint.

To analyze the results, basic measures of central tendency (mean and mode) were calculated in order to determine the average degree of acceptance towards the product. In addition, cross-comparisons were made between variables such as age, educational level, and willingness to purchase, in order to detect possible differences in response patterns according to the respondent's profile.

Finally, the data were represented by descriptive graphs and tables, which facilitated the visual interpretation of the results and allowed the quantitative information to be contrasted with the qualitative observations derived from the spontaneous comments of the participants.

7 RESULTS

The application of the ecological advertising campaign aimed at adult consumers in Ixcaquixtla and Tepexi de Rodríguez made it possible to identify relevant changes in the perception, interest and willingness to buy sustainable paint made by BioPint. From the review of the public's reactions, the comments obtained during the promotional activities and the direct observation of the behavior of the participants, various findings were obtained that strengthen the understanding of the impact generated by the implemented strategy.

First, it was observed that messages focused on PET recycling and local environmental benefits aroused a high level of curiosity among the inhabitants, especially in people who did not know sustainable paint alternatives. The clarity of the message allowed most participants to associate the product with an eco-friendly solution that is accessible and relevant to their community.

In addition, the in-person demonstrations and educational narrative used in the campaign made it easier for consumers to understand the process of making the painting, which increased confidence in its quality and usefulness. This understanding was key for

many people to express a favorable attitude towards trying the product in their homes or businesses.

Another relevant result was the identification that consumers prefer to start with simple options before venturing into specialized colors. In this sense, the introduction with a basic shade was perceived as an advantage, as it facilitates the initial acceptance of the product by adapting to different types of homes and projects, allowing the introduction of ecological paint without generating barriers to choice.

Finally, during the interactions, it was detected that the campaign generated a positive perception of the environmental commitment of the BioPint project. This aspect strengthened the emotional connection with the brand and motivated various consumers to consider the purchase not only out of aesthetic necessity, but also as a way to contribute to the care of the community environment.

Together, these results show that the advertising campaign managed to position BioPint as a viable, reliable and environmentally responsible option for families in both municipal capitals, laying the foundations for a sustained growth in its acceptance and interest within the local market.

8 DISCUSSION

The results obtained confirm that BioPint ecological paint was well received by the population of Ixcaquixtla and Tepexi de Rodríguez, which shows that consumers begin to value sustainable alternatives when they are presented with clear and accessible information. The high willingness to purchase the product, even without knowing it beforehand, reflects an openness towards responsible consumption and an opportunity to strengthen environmental education in both communities.

Most of the participants expressed interest in local products, which shows that regional identity directly influences the purchase decision. This suggests that communication strategies should continue to highlight the community-based nature of the project and its contribution to the local economy.

Likewise, the acceptance of the slogan and visual elements of the campaign indicates that the ecological message was understood and valued. However, the results also show that the level of technical knowledge about recycling is still limited, so future campaigns could incorporate clearer and more practical educational content.

The difference observed between municipalities reinforces the importance of adapting dissemination strategies to the social and educational context of each area. While in Ixcaquixtla environmental awareness is more linked to formal education, in Tepexi the interest is mainly related to health and risk reduction by solvents.

Taken together, the findings demonstrate that BioPint not only managed to position itself as a viable eco-friendly paint, but also promoted a positive perception about recycling and sustainable development. This confirms that communication with an environmental focus can generate social and commercial impact, as long as the message is consistent with the values and needs of the community.

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