



BUCLE: Safe Sex, Safe Planet

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Introducing BUCLE

Although safe sex is widely discussed, its environmental dimension remains largely overlooked (Perwitiningsih & Farman, 2025). While condoms are essential for preventing sexually transmitted infections and unplanned pregnancies, their production and disposal create a hidden ecological footprint (Birnbach et al., 2020). *BUCLE (Loop): Safe Sex, Safe Planet* addresses this neglected intersection of intimacy and sustainability by proposing a biodegradable condom designed for real-life use in nightlife contexts. By integrating protection directly into social settings, the project integrates sexual health, pleasure, a unique value offer and environmental responsibility. Let's talk about sex –and about how it can be safe for people and the planet.

Behind the curtains

Usage of Condoms for Colombians

Data

Evidence indicates that condom use among adolescents and young adults in Colombia is widespread yet inconsistent. While condoms are used in around 71% of sexual encounters, only 22% report consistent use, despite generally positive attitudes towards condoms (Morales et al., 2018; Morales et al., 2019). A significant proportion of young people report unprotected sex, which indicates the risks of STIs and unintended pregnancies. Physical access to condoms is relatively high, as free condoms are widely distributed through public health and HIV prevention initiatives (Woog et al., 2015; Morales et al., 2018). Nevertheless, inconsistent use is linked to limited sexual health knowledge, peer norms, and difficulties with correct use (Morales et al., 2018). As a result, key populations remain the focus of targeted prevention efforts (UNAIDS, 2023; Nazif-Munoz & Chabot, 2022), including the use of condoms.

Sex Education

In Latin America, sex education strongly shapes reproductive behaviour and contraceptive use among young adults. Higher education levels, including access to sex education, have long been associated with increased contraceptive adoption, delayed marriage, and lower fertility rates, particularly among women (Heaton & Forste, 1998; Jadhav & Vala-Haynes,

2018; Mena-Meléndez, 2025). Conversely, limited contraceptive knowledge is linked to higher risks of unintended pregnancy (Morón-Duarte et al., 2014). In Colombia, mandatory sex education and ICT-based interventions have improved knowledge, attitudes, and condom use, despite persistent cultural and socioeconomic barriers (Hincapié & Quintero, 2012; Chong et al., 2020; Pérez & Dabiz, 2003; Rojas-Briñez, 2019). Social norms, access, and peer support continue to shape contraceptive behaviour (Urrea-Giraldo et al., 2006; Gutu et al., 2025).

Social Media

Social media plays an increasingly important role in shaping contemporary perceptions of sex and relationships by influencing social norms. While online content often reinforces existing stereotypes and presents sex out of context, it also has the potential to challenge them. Social media platforms provide spaces for people to explore sexual interests, form and maintain relationships across distance, and access sex education (Brook, 2023). Although idealized portrayals of sex and relationships can amplify feelings of inadequacy, social media can also function as an empowering and accessible tool for sex education. Incidental exposure to sexual health content may positively inform young people with limited prior knowledge about sex and contraceptives.

Culture

In Latin America, cultures often emphasize emotional expressiveness, interpersonal warmth, and embodied social interaction, with higher levels of emotional and relational engagement compared to other cultural contexts (Salvador et al., 2023). These orientations influence attitudes toward intimacy and sexuality, particularly among urban youth. In cities such as Bogotá, sexuality is shaped by gender norms, youth cultures, and growing sexual self-expression, alongside persistent inequalities in education and healthcare (Gutmann, 2007; Parker, 2009). Research shows that early sexual initiation, premarital relationships, and casual sexual encounters are common, especially among young adults (Parker, 2009; González et al., 2018; Profamilia, 2015), creating sustained demand for condoms.

Environmental Impact

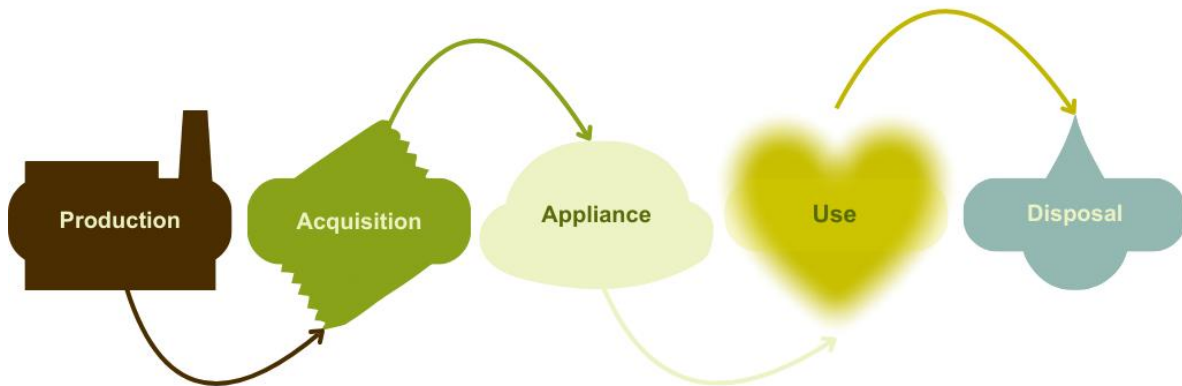


Figure 1 - Condom Lifecycle (own elaboration)

Provision

The environmental impact of condoms, which are made from latex, begins with the production. Rubber production used in condoms has been increasingly associated with forest conversion, particularly in biodiverse tropical landscapes. It results in carbon stored in soil contributing to greenhouse gas emissions (Wang et al., 2023). Rubber plantations offer limited diversity and can accelerate soil degradation and fertilizers to maintain plantation productivity may harm nearby ecosystems (Fox et al., 2014). Some condoms are produced from synthetic materials and rely on non-renewable energy sources. They are associated with activities such as land use change, resource depletion, and carbon intensity (Birnbach, 2020). These upstream impacts remain largely invisible to consumers, yet they play a critical role in shaping the sustainability profile of condoms.

Production

PI (Polyisoprene) condoms create 1.5–2.5 times higher environmental impacts than NR (Natural Rubber) condoms due to greater electricity use in manufacturing, showing how material choice shapes the product's ecological footprint (Jawjit et al., 2021). Condom manufacturing involves stages including compounding, dipping, and leaching. Production causes 34%–73% of Natural Rubber (NR) impacts, while Polyisoprene (PI) uses even more electricity, making energy use the main environmental burden (Jawjit et al., 2021). After production, condoms are mechanically lubricated and sealed using automated machines, improving efficiency but adding environmental costs through energy use and packaging materials like foil, paper, and lubricants that increase waste and resource consumption (Chen et al., 2024).

Distribution

Transportation policies and infrastructure changes in Bogotá have been assessed for their impact on traffic-related emissions, showing that expanding road capacity without managing travel demand can increase pollutants such as CO, NO_x, PM₁₀, SO₂, and VOCs, as scenarios with higher vehicle trips ultimately negated the benefits of infrastructure improvements (Mangones, 2017; Mangones et al., 2017). Integrated modelling approaches in Colombian cities further demonstrate how emissions from trucks and other vehicles evolve with technological upgrades and fuel choices, with natural gas emerging as a transitional option for reducing emissions in public transport fleets while electric buses become financially viable (Guzmán & Orjuela, 2017). Overall, truck emissions remain a significant contributor to urban air pollution and related health risks, underscoring the need for measures such as scheduling adjustments, speed regulation, and cleaner fuel technologies.

Disposal

After use, condoms become persistent waste that is trashed, flushed, or littered, harming ecosystems and infrastructure and contributing to microplastic pollution. End-of-life disposal constitutes a significant part of the total environmental footprint (Perwitiningsih & Farman, 2025). About 3% of condoms are flushed, causing sewage blockages and aquatic litter (Lambert et al., 2013). Most are not biodegradable and persist in landfills. Disposal behavior matters: many users wrap condoms in toilet paper, whose production and disposal can outweigh the condom's environmental impact (Birnbach et al., 2020). Best practice recommends tying condoms, using minimal wrapping, and disposing of them in general waste. And despite disposal impacts, condom use remains environmentally crucial because it prevents unintended pregnancies and STIs.

Stakeholders with benefits

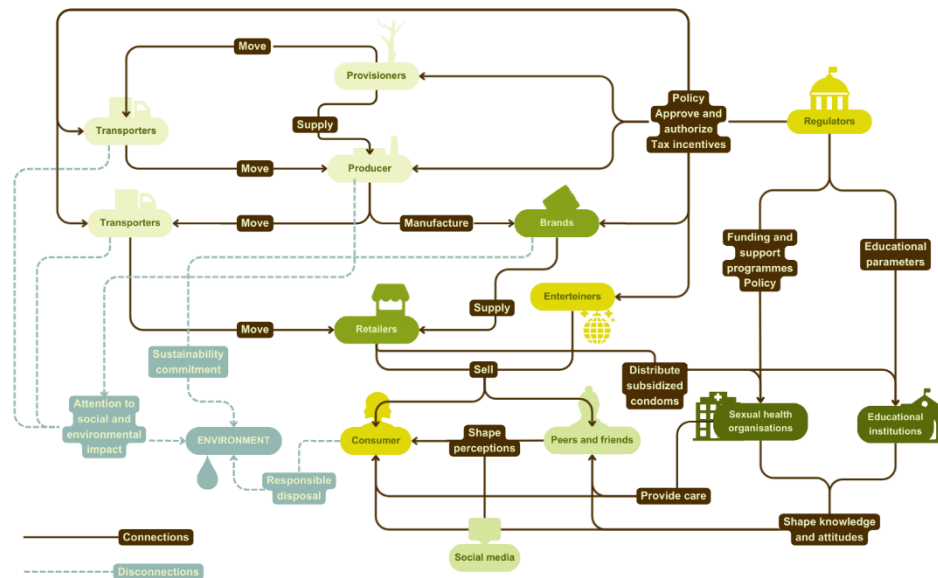


Figure 2 - Stakeholder Analysis (own elaboration)

The stakeholders we considered are presented in [Figure 2](#), and in the following sections we focus in detail on [Consumers](#), [Entertainers](#) and [Regulators](#).

Provisioners

Natural rubber sourcing for condoms involves three main stakeholder groups in Colombia's rubber value chain. Smallholder rubber farmers in Santander, Meta, and Antioquia produce natural latex as a rural development crop (Fedecauchó, 2021). Rubber processing and industrial suppliers, such as Andina Rubber, process raw latex into standardised grades for domestic and international markets (Ministerio de Agricultura y Desarrollo Rural, 2022). Governance bodies, including ConfeCaucho and the Ministry of Agriculture, oversee policy coordination and technical support. These stakeholders collectively structure rubber sourcing and governance while remaining disconnected from downstream consumer use and disposal.

Transporters

Logistics providers such as Roldán Logistics and Solística move raw materials from production areas to processing sites and urban markets through transport, storage, and

warehousing services. Their operational priorities emphasize timely delivery and cost efficiency, with minimal attention to environmental externalities or social impacts along the supply chain (Roldán Logistics, n.d.; Solistica, 2022).

Producer

UNIQUE INTERNATIONAL SAS represents one of the few identifiable condom manufacturers operating within Colombia, producing medical devices including non-latex condoms under national regulations (ProColombia, n.d.). Production decisions are mainly guided by product safety, regulatory compliance, and cost efficiency, with environmental aspects remaining secondary unless explicitly required by regulation or market demand.

Brands

Four major brands dominate Colombia's condom market: Today (mass affordability and reliability), Durex (premium tier with safety and innovation), Duo (sensorial experience and contemporary visual identity), and Trojan (budget-conscious younger consumers) (Profamilia, 2020; García & Rodríguez, 2023). Despite diverse market strategies, none explicitly communicate sustainability commitments in the Colombian market. Internationally, brands such as Hanx, Glyde, Einhorn, and Fair Squared address environmental concerns through fair-trade latex and minimal packaging, though these remain limited in adoption, often perceived as "moral" rather than desirable choices (Condoms.uk, 2022).

Retailers

Drug stores sell condoms and distribute them through community-based programmes that satisfy contraception needs and create awareness, with pamphlet distribution linked directly to increased condom purchasing (Vernon, 1988; Bailey, Christina De Zambrano, 1974). Profamilia uses social marketing strategies that include distributing condoms at subsidised rates to make them available to all population sections including poorer communities (Aconteciendo Aqui, n.d.; UNAIDS, 2020).

Entertainers

Nightlife plays a defining role in Bogotá's cultural and social fabric, shaping how people gather, express identity, and build community. Theatron, Bogotá's largest club and the biggest in Latin America, anchors this vibrant ecosystem, illustrating the scale and influence

of the city's nocturnal culture (Portal Theatron, n.d.; Open Library, University of British Columbia, n.d.). Other iconic Bogotá nightlife districts, such as Zona Rosa and Chapinero, further demonstrate how central nighttime spaces are to the city's social life and urban identity (Colombia Reports, n.d.).

Regulators

Colombia's sexual and reproductive health system operates across national, departmental, and municipal levels. At the national level, MinSalud establishes the overarching policy framework for sexual and reproductive health (Ministerio de Salud y Protección Social, n.d) and INVIMA evaluates and authorises new health technologies, medicines, and products (Instituto Nacional de Vigilancia de Medicamentos y Alimentos, n.d.), with their approval mandatory for adopting new innovations. Bogotá's Secretaría Distrital de Salud has consistent funding and strong technical capacity for sexual health programmes (Puerto-Mojica & Rueda, 2022). Additionally, donations or work to non-profit entities (ESAL, for its Spanish initials) are deductible from income tax under Articles 125 and 255 of the Estatuto Tributario (DIAN, 2018; Ley 1819 de 2016).

Sexual health organisations

Sexual health organisations such as Profamilia and the National Red Cross Society bridge national policy and community practice. Their work aligns with national commitments to guarantee sexual and reproductive rights (Correa-Salazar, 2022; Profamilia, n.d.), and their adoption of new products depends on demonstrated efficacy, affordability, alignment with institutional mandates, and corresponding regulatory approvals issued by MinSalud and INVIMA. In Bogotá, these institutions benefit from a dense urban network of clinics, strong partnerships with district authorities, and comparatively high demand for sexual health services, enabling them to provide medical care as well as psychological, psychosocial, and other forms of support (Nigenda & Langer, 2011).

Educational institutions

Schools and universities inform young people through comprehensive sexuality education, shaping their knowledge and attitudes. These institutions operate within a national discourse that recognises sexual and reproductive health as a central component of youth wellbeing (Ministerio de Educación Nacional, n.d.). Moreover, Bogotá has a progressive environment

where collaboration between public schools, universities, and district health programmes enables more consistent delivery of sexuality education (Ardila-Romero, 2022; Secretaría Distrital de Salud, n.d.).

Consumers

Consumers play a central role in shaping condom consumption, as their choices directly influence usage patterns and downstream environmental impacts. Among younger, sexually active consumers, condom use is embedded in social and situational contexts rather than planned purchasing decisions. General intentions to use condoms are weak predictors of actual behaviour. Instead, preparation-related factors such as access, habit formation, and situational readiness are decisive (van Empelen & Kok, 2008). In nightlife settings, consumption decisions occur *in the heat of the moment*, where immediate motivations outweigh prior intentions. Condoms are more likely to be used when immediately accessible and socially normalised (van Embelen & Kok, 2008; Conner & Flesch, 2001). Furthermore, consumers influence environmental outcomes through disposal practices, which can significantly increase the environmental footprint of condom use (Birnbach et al., 2020).

Friends and Peers

Friends and peer groups shape condom-related behaviours by influencing social norms and perceptions of acceptable behaviour. Individuals are more likely to use condoms when they believe their friends approve of and engage in these behaviours themselves (van Empelen & Kok, 2008). In nightlife settings, peer influence becomes particularly salient, and when condom use is perceived as common within a peer group, it is more likely to be accepted without stigma (Lewis et al., 2021).

Social Media

Social media shapes condom consumption by circulating norms and representations of sexuality. Online platforms now serve as a primary source of sexual health information for many young people (Brook, 2023). Also, influencer content often favours aspirational lifestyle narratives rather than practical protection and often provides limited attention to condoms as alternatives to hormonal contraception (Pfender & Devlin, 2023).

Theories in the sheets

Young, single, sexually active adults engaging in casual encounters after nightlife activities form the core population of this analysis. In Bogotá and other major cities, sexual health risks remain high, with inconsistent condom use, multiple casual partners, early sexual first encounters, and exposure to STIs documented among youth (UrreaGiraldo et al., 2006; Morón Duarte et al., 2014). Among men, unprotected sex is reported across partner types, with 52% engaging in unprotected sex with same sex partners and 66% with different sex partners. Additionally, 24% report a history of STIs (RubioMendoza, 2015). Some of these behaviours unfold in fast-paced nightlife settings where spontaneity, alcohol, peer influence, and situational constraints shape real-time decision-making (Lewis et al., 2021; Lomba et al., 2009). Therefore, we apply Installation and Activity Theory to capture the detailed contextual conditions structuring these encounters, and we analyse already existent brands through Perceptual Maps.

Installation Theory



Figure 3 - Installation Theory (own elaboration)

Material Affordances

Installation Theory views condom usage as a series of situations rather than just a single choice. By examining the condom lifecycle, it becomes clear that material conditions either

support or constrain behaviour at different stages of use and disposal (Lahlou, 2017; 2024). In nightlife settings, factors like alcohol, time pressure, and spontaneity can make casual encounters easier, but they rarely encourage condom use, since condoms are often unavailable and need prior planning. This can lead to a gap between intention and action.

Furthermore, material factors also influence behaviour after the condom is acquired (Lahlou, 2017). Packaging that is discreet, easy to carry, and thoughtfully designed can break the moment of awkwardness at the point of opening just before sexual activity, thereby reducing discomfort and helping to maintain intimacy (see Appendix A).

Inadequate disposal options and the lack of eco-labels or clear recycling information facilitate consumer inaction, signalling that there is nothing to consider and leaving them unaware of environmental consequences. Consequently, condoms are often disposed of improperly, causing harm to the environment. These issues reflect systemic failures rather than personal irresponsibility, highlighting the need to improve material conditions throughout use and disposal. Addressing these systemic issues can lead to safer and more sustainable condom disposal practices without relying on moral appeals (see Appendix B).

Embodied Competences

Within installation theory, embodied competences refer to the mental representations, practical know-how, and habitual responses that individuals apply in specific situations, enabling interpretation and action (Lahlou, 2017). These competences are learned through everyday practice and socialization, and they strongly shape our behavior even when explicit rules or material constraints are absent. In the context of condom use and disposal, embodied competences are central to understanding why sustainability considerations are largely ignored from pre-using stage to the disposal stage. The cognitive dimension further clarifies how these patterns emerge.

At the cognitive level, many users are unaware that condoms have environmental impacts. Condoms are primarily understood as tools for sexual health, while their material composition and disposal consequences remain largely invisible, meaning sustainability rarely shapes how condom use is interpreted. This lack of basic cognitive frameworks makes environmentally responsible disposal unlikely to occur naturally. Furthermore, sexual activity and subsequent condom disposal usually take place in private spaces, which will encourage habitual, automatic behavior rather than cautious decision-making, and the situation

provides few cues that would provoke learning or reflection. These gaps are reinforced by how sex education is structured.

Nonetheless, sex education further weakens embodied competence by focusing on pregnancy and disease prevention rather than on condoms as material products with environmental implications (UNESCO, 2018). Consequently, individuals learn correct condom usage but receive little guidance on responsible disposal practices. Additionally, condom disposal is strongly influenced by humans' disgust-avoidance response. Research shows that bodily fluids will consistently trigger feelings of disgust, serving as an evolved mechanism for disease avoidance (Rozin et al., 2008; Tybur et al., 2013). After sexual activity, people often experience an urge to quickly remove, and discard objects associated with bodily fluids. This reaction encourages fast, low-effort disposal practices, such as flushing condoms down the toilet or throwing them away without consideration, which leads to environmental consequences being easily overlooked.

Social Regulations

In Colombia sexual health regulations has changed largely over the decades. Sexually transmitted infections and unplanned pregnancies remain major sexual health risks, prompting research on condom use among young adults (Pablo et al., 2019). Studies indicate that young Colombian women often associate condoms, especially female condoms, with reduced pleasure, which contributes to reluctance in their use. Sex education in Colombia, particularly in Bogotá, has evolved over the past few years. A key driver of this culture shift was the National Project for Sex Education in 1993 (Mendez, 1996). This initiative aimed to promote sexual health and challenge traditional gender roles within families. This evolution sets the stage for more recent educational reforms.

Recent school-based sex education initiatives emphasise the influence of education on sexual health practices. Although updated curricula now address LGBTQ+ rights and diverse sexual orientations (Colombia Reports, n.d.), these reforms have faced social resistance. Therefore, sex education remains a taboo subject in many regions due to religious values, which contribute to persistently high rates of teenage pregnancy (Colombia Reports, n.d.). Such social barriers also shape access to contraceptives.

Also, most people still obtain contraceptives through private markets, limiting the impact of public price regulation and reinforcing access inequalities (Davila & Vitery, 2025). This dynamic also creates an opportunity for private actors (especially ESALs) to advance social

and environmental responsibility while benefiting from reduced tax burdens, since donations or services to ESALs are deductible under Articles 125 and 255 of the *Estatuto Tributario* (DIAN, 2018; Ley 1819 de 2016). These structural dynamics intersect with broader legal reforms.

Moreover, legal frameworks around sex and sex education in Colombia have also evolved in recent years. Alongside the national sex education plan established in 1993, a significant reform raised the legal age of marriage to 18, marking a significant shift in social norms (Girls Not Brides, n.d.). Furthermore, there has been a growing establishment of facilities designed to support condom use throughout the country, despite longstanding social and cultural values.

Activity Theory

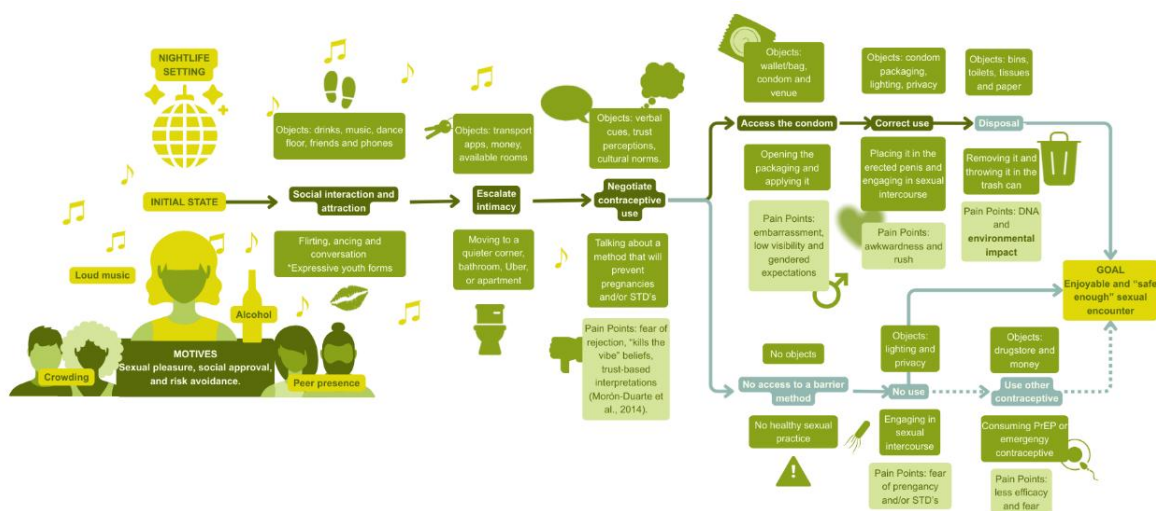


Figure 4 - Activity Theory (own elaboration)

For young adults in Bogotá, sexual encounters in nightlife settings are goal-oriented activities driven by pleasure, social approval, and the avoidance of risks related to STIs and pregnancy. From an Activity Theory perspective (Lahlou, 2017), these motives create an internal sense of incompleteness that guides behaviour toward a sexual encounter that is enjoyable and "safe enough." Bogotá's youth culture, characterised by expressive interdependence and socially embedded sexualities, further amplifies these motives within nightlife spaces (Salvador et al., 2013; Ardila-Romero, 2022). These cultural dynamics shape how young Bogotana(o)s act in the moment.

In these contexts, young Bogotana(o)s rely on routinised practices and shared cultural scripts, reinforced by alcohol, peer dynamics, gender norms, and trust-based interpretations (Urrea-Giraldo et al., 2006; Morón-Duarte et al., 2014). Condom access and negotiation therefore become key friction points. When condoms are not immediately available, individuals often proceed without them, relying on “safe enough” alternatives such as emergency contraception or no prevention at all. Sustainability is absent from these real-time decisions, as condoms are understood as functional protectors rather than environmentally impactful objects (Arnaud et al., 2025). This behavioural pattern points directly to where structural change must occur.

From an Activity Theory perspective, effective intervention lies in modifying the installations where these activities occur (Lahlou, 2017). Embedding sustainable condoms directly within Bogotá’s nightlife spaces can reduce access barriers and support safer practices. When aligned with local scripts of pleasure and emotional expressiveness, sustainability can be integrated seamlessly without adding cognitive or moral effort.

Perceptual Mapping



Figure 5 - Perceptual Mapping (own elaboration)

It is fundamental to consider the already existent condom brands offer. To address pain points and deliver a differentiated, durable, safe, sustainable sexual-health solution, we

mapped current condom brands perceptions (Lacobucci & Grisaffe, 2018). Considering brand awareness, it underpins long-term sustainability and considerations for entering the market (Zaif, 2016), we developed two perceptual maps (*Figure 5*): Price x Awareness, affordability; and Sustainability x Awareness, environmentally responsible practices. Thus, we could identify white-space opportunities and perceived-value differentials to position our solution in the Bogotá market.

Consented Solution: BUCLE (Loop)

Our condom brand focuses on delivering safe, user-centred, and sustainable products that combines reliable protection and pleasure with eco-friendly materials and responsible disposal in a differentiate offer. We designed BUCLE (*Figure 6*) to communicate reliable, pleasurable, unique and affordable protection made from eco-friendly materials with clear disposal guidance, so users can protect themselves and the planet with confidence (*Appendix A and B*). To close gaps in availability and awareness, we will enter the market through nightlife channels, beginning with Theatron (biggest night club in Latin America), raising brand visibility and positioning BUCLE based on its brand identity (*Figure 7*) to help

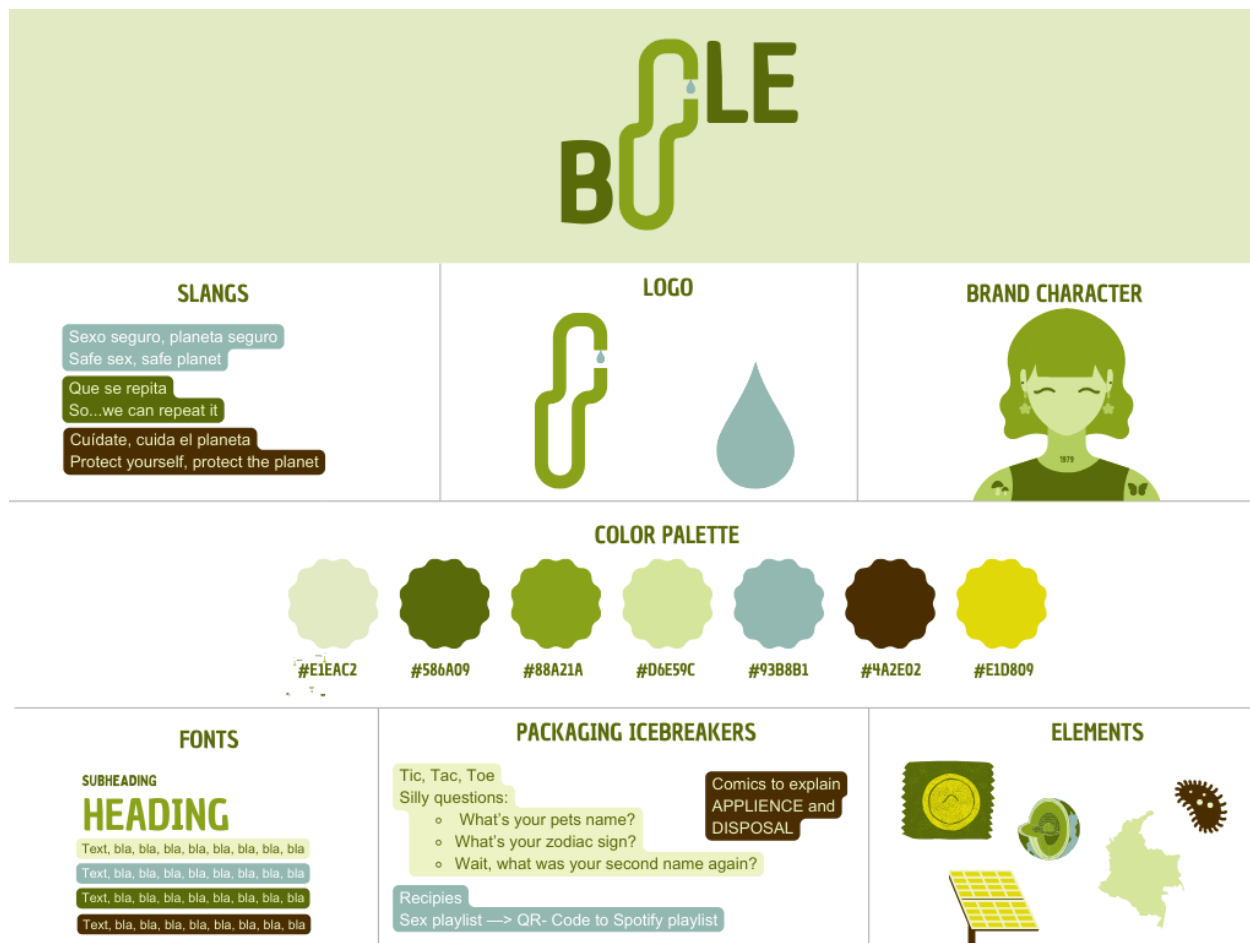


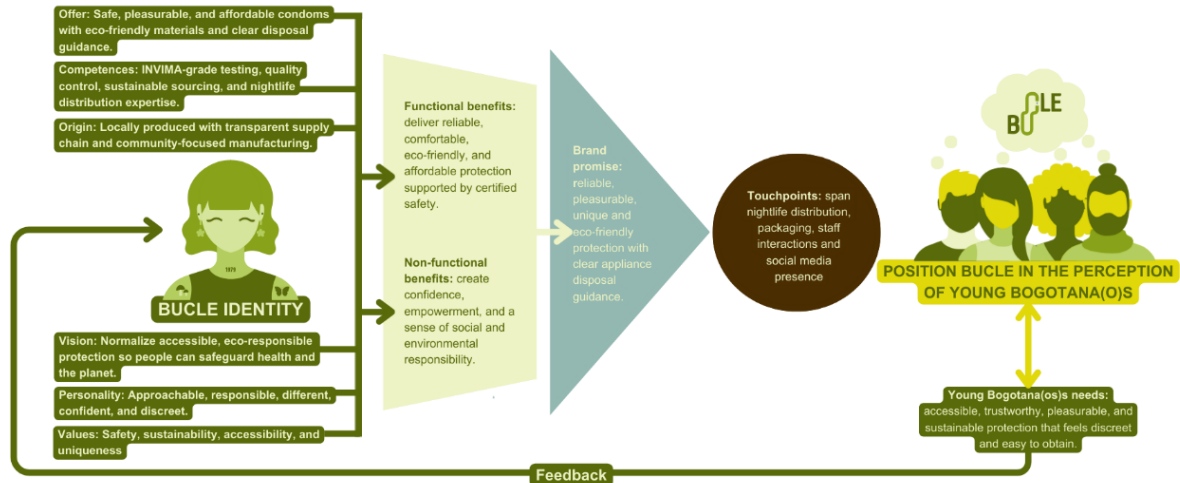
Figure 6 - Brand Guidelines (own elaboration)

reduce pollution, STIs, and unintended pregnancies over time. We also plan to make a social media campaign on our own and with Teathron ([Appendix D](#)), sharing informational and entertaining content to directly with our target audience and reinforce BUCLE's identity.

Our initiative will be tested and certified to meet INVIMA requirements, ensuring eligibility for public health funding ([Appendix E](#)) and allowing our condom to display national safety labels. Production will rely on Make-To-Order logistics and, later on, renewable energy; Distribution on short distance as well as electric transport; And disposal on a specialised packaging for post-use biodegradation ([Appendix DC](#)). Also, we will partner with nightlife venues by integrating condom provision into alcohol-related transactions (see Consumption section) to increase access and normalize responsible behaviour.

Figure 7 - Identity-based Positioning Strategy (own elaboration)

BUCLE will operate as a non-profit entity (ESAL), reinforcing its commitment to public health



and social equity. In Colombia, responsible practices, supporting public health through donations or partnerships with non-profit entities, can lead to tax benefits for organizations. According to Article 125 and Article 255 of the *Estatuto Tributario*, donations made to entities classified under Article 19 and Article 356 as ESAL are deductible from income tax, provided they meet certification requirements (DIAN, 2018; Ley 1819 de 2016). This regulatory framework incentivizes private-sector participation—nightclubs, in this case—by aligning organizational social responsibility with fiscal advantages.

Production

We adopt a MakeToOrder (MTO) logistics model, meaning we only produce condoms when Teathron places an order based on its demand forecast. This approach helps us avoid overproduction, reduce waste, and minimize environmental impact from the very beginning (Li et al., 2025). To strengthen our sustainability commitments, we source natural rubber from Meta, one of Colombia’s most important rubbersproducing regions, officially recognized for its high production levels (Ministerio de Agricultura y Desarrollo Rural, 2018). By choosing Meta, we shorten transport distances to Bogotábased manufacturing, lowering emissions without changing materials and embedding sustainability directly into our supply chain. As we grow and build more financial muscle, we plan to establish our own production facility powered by renewable energy; however, validating the model through the pilot is essential before scaling into a fully integrated, low-carbon manufacturing system. This upstream strategy naturally extends to how we design our packaging.

Packaging offers one of the most flexible opportunities to reduce emissions during production, especially given its significant share of environmental impacts in medical and

personal care products (UNEP, 2017). By simplifying layers, avoiding hard to recycle materials, and prioritising recyclable or recycled options, we can lower our footprint without compromising safety or user experience. At the same time, we enhance pleasure and appeal through playful design: textured condoms for improved sensation and fun, stylish messages on individual wrappers that act as light-hearted icebreakers. This blend of sustainability, humour, and enjoyment helps us connect with young, openminded consumers and makes responsible choices feel exciting rather than restrictive.

Distribution

Colombia's freight system depends largely on road transport rather than lower emission rail or waterways (SLOCAT, 2025), emission reductions are more realistically achieved by optimising road logistics: combine shipments, reduce trips, increase load efficiency, and avoid empty returns (European Environment Agency, 2021). To support this Meta's plant (and our plant, later on) is located near Bogotá, reducing transport distances and associated CO₂ emissions. We also plan to work with electric vehicles for distribution, given that Solistica operates a fleet of fully electric, zero-emission cargo vehicles in Colombia, with capacities suitable for urban logistics (Solistica, 2022), so we intend to partner with them to further minimise our environmental footprint.

Consumption

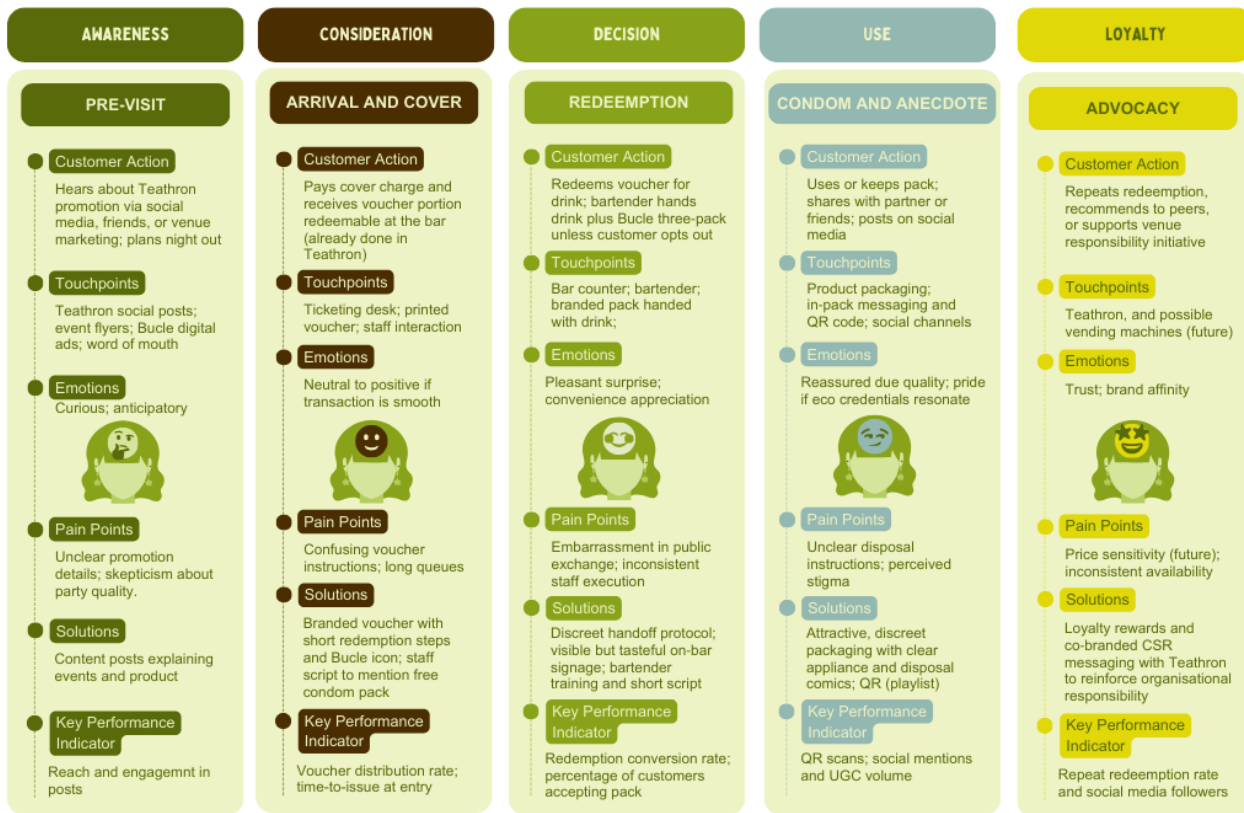


Figure 8 - Customer Journey (own elaboration)

The customer journey maps the sequential stages, touchpoints, emotions, and decision moments a user experiences: awareness, consideration, decision, use and loyalty (Vasileva, 2024). It enables us to target interventions and optimise channels as well as staff to ensure user satisfaction during market entry (Figure 8). It also defines measurable success metrics to validate product, packaging, and distribution choices to secure market position. So, we can guarantee long-term presence for environmental responsibility and healthy sexual practices; the identified pain points are currently suppositions and will be tested and validated during the Teathron pilot before being treated as confirmed insights.

Disposal

Life cycle assessment studies indicate that most of the environmental impact associated with condoms results from energy-intensive production, packaging, transportation, and end-of-life practices, rather than from the latex material itself. Nevertheless, material design continues to offer a significant potential for sustainability-oriented innovation, especially as current disposal behaviours substantially amplify environmental burdens. Most condoms are

made from natural rubber latex, a plant-based biopolymer that is theoretically biodegradable; however, during manufacturing, latex undergoes vulcanisation, which introduces strong sulphur crosslinks to ensure elasticity. Although these crosslinks are essential for performance, they significantly slow down natural degradation, causing condoms to persist in the waste stream despite their renewable origin (Nanthini & Sudesh, 2017). These material constraints are further compounded by everyday disposal habits, as many users wrap condoms in toilet paper or flush them for discreet disposal, increasing secondary waste and infrastructural risks (Birnbach et al., 2020; Lambert et al., 2013). These challenges create a clear need for design driven solutions.

In response to these challenges, the proposed intervention introduces an integrated design that combines discretion, hygiene, and material innovation. After use, the condom can be placed again in the sealable, biodegradable wrapper with a zipper mechanism, allowing for hygienic and discreet disposal without the need for additional toilet paper and reducing the likelihood of flushing (see Appendix B). At the material level, existing research demonstrates that certain bacteria and fungi can degrade natural rubber latex by producing enzymes that break long polymer chains into smaller components (Nanthini & Sudesh, 2017). Laboratory studies show that mixed microbial cultures can degrade up to 69% of natural rubber material, with degradation rates increasing further when bio-fillers such as starch or cellulose are incorporated (EL-Wafai et al., 2023). In addition, designing latex with fewer and more biodegradable crosslinks, particularly disulfide bonds, can make the material more accessible to microbial breakdown. These biological mechanisms further support a more sustainable material pathway.

Importantly, biological residues such as semen, which consist largely of water, do not inhibit biodegradation and instead become integrated into the natural decomposition process (EL-Wafai et al., 2023). Our proposed condom is therefore designed to remain fully safe and reliable during use, while enabling controlled biodegradation after disposal. This positions the product to reduce impact without relying on user behaviour. Therefore, this intervention reduces environmental impact not by demanding behavioural change, but by redesigning material affordances to align discretion, trust, and sustainability across the condom's full lifecycle.

Pleasant Discussion and Limitations

The Influence of Alcohol, Trust, and Availability

Research indicates that alcohol consumption increases intentions for casual sex while undermining consistent condom use by impairing cognitive control and the translation of intentions into protective behaviour (Conner & Flesch, 2001; Wolfs et al., 2023). Condom use rates are typically higher when interpersonal trust is low, such as during one-night stands, but tend to decline as trust increases. Alcohol further, distorts this judgment, fostering risk-taking and “blind trust” (Bauman et al.). This intervention addresses these cognitive and relational constraints by embedding condom access into nightlife contexts, where availability functions as structural trust, supporting safer behaviour without relying on impaired deliberation or interpersonal judgments.

Condom variations

Pleasure-enhancing condom technologies, such as cooling, heating or skin-nurturing sensory-enhancement condoms, are increasingly used (e.g. China) to improve sensory experience. However, their environmental impacts have not been systematically assessed. It therefore remains uncertain whether these pleasure-oriented designs align with sustainability goals or introduce material and production trade-offs that could offset environmental benefits. This gap highlights the need for further empirical research.

Armed conflict

In Colombia, the presence of illegal armed groups has historically been closely linked to the geography of illegal crop cultivation and armed conflict, shaping rural livelihoods and territorial control (Díaz & Sánchez, 2004). These conditions constrain access to agricultural land and hinder the stable production of legal raw materials, as armed groups can have control over territory and economic activity. Initiatives to provide alternative options for rural farmers, such as crop substitution programs, have achieved limited success due to funding shortages, logistical challenges, and persistent insecurity (AFP report, 2025). Future research should examine cooperation models between manufacturers and local communities, such as direct engagement with farmer organisations and the provision of technical and market support, to strengthen legal supply chains and support a more sustainable livelihood.

Limitations

A member of the project group tested female condoms with her partner but encountered significant practical difficulties: the condom broke during initial use and insertion was challenging, causing discomfort. This experience supports existing research suggesting that female condoms require a level of user education and familiarity that is not currently widespread among sexually active populations (Fasehun et al., 2022; Kyomuhangi et al., 2025). Consequently, this project focuses exclusively on male condoms, the second most used contraceptive method in Colombia (Morales et al., 2018). Although female condoms remain an important area for future research, particularly for younger generations who could be introduced to their use early, the current study is limited to male condoms due to considerations of feasibility and user acceptance. Another limitation concerns the integration of condoms into nightlife consumption contexts. While increased availability aims to promote safer sex practices, there is a risk that the presence of condoms may be misinterpreted as an implicit sexual expectation rather than as a protective resource. Without carefully designed, consent-oriented messaging, such interventions could unintentionally blur boundaries regarding sexual intent. Therefore, it is important to frame condom availability clearly as a tool for safety and individual choice, not as a normative expectation.

The exclusive focus on male condoms also raises questions regarding gendered responsibility. Integrating male condoms into nightlife settings may reinforce existing asymmetries by implicitly assigning responsibility for contraception and protection to men. While this approach may help normalize male responsibility for sexual health, it also risks perpetuating unequal expectations across genders. This gendered framing should be approached with caution and critically evaluated in future iterations of the project. Finally, although the proposed biodegradable condom design incorporates innovative material features, it lacks regulatory approval, real-world usage data, and causal evidence of effectiveness, which limits claims about its practical impact.

References

AFP. (2025). *Aiming a blow at narcos, Colombia pays farmers to uproot coca*. Al Jazeera English.

Ardila-Romero, D., C. (2022). The teachers with their blah, blah, blah, and we're all about our zua, zua, zua: The unfolding of school sexualities in adolescent students from a public school in Bogotá, Colombia.

Arnaud, E., Nizard, J., & Bardon, V. F. (2025). The internal condom: Overview, practical aspects and analysis of the barriers to its use. *M.S. Médecine sciences*, 41(8–9), 683–689. <https://doi.org/10.1051/medsci/2025108>

Bailey, J., LopezEscobar, G., & Estrada, A. (1973). A Colombian view of the condom. *Studies in Family Planning*, 4(3), 60–64. <https://doi.org/10.2307/1965287>

Bauman, L. J., & Berman, R. (2005). Adolescent relationships and condom use: Trust, love and commitment. *AIDS and Behavior*, 9(2), 211–222.

Birnbach, M., Lehmann, A., Naranjo, E., & Finkbeiner, M. (2020). A condom's footprint-life cycle assessment of a natural rubber condom. *The International Journal of Life Cycle Assessment*, 25(6), 964–979.

Brook. (2023, May 24). Is social media influencing young people's contraception choices? <https://www.brook.org.uk/blog/is-social-media-influencing-young-peoples-contraception-choices/>

Brook. (2024). Education, access, stigma and young people: Attitudes to contraception, condoms and sexual health. *Brook*. <https://www.brook.org.uk/wp-content/uploads/2024/05/Brook-Education-Access-Stigma-and-Young-People.pdf>

Brown, R. (2025, January 14). Colombia's first unicorn keeps delivering. *Americas Quarterly*. <https://www.americasquarterly.org/article/colombias-first-unicorn-keeps-delivering/>

Carolina Mendez Martinez, & Carlos, J. (2023). Nutrición parenteral domiciliaria. Una necesidad en Colombia. *Medicina*, 45(2), 275–283. <https://doi.org/10.56050/01205498.2238>

- Chen Linhan, Lin Jia, & Zhao Haiyun. (2024). Packaging machine for condom production.
- Chong, A., Gonzalez-Navarro, M., Karlan, D., & Valdivia, M. (2020). Do information technologies improve teenagers' sexual education? Evidence from a randomized evaluation in Colombia. *The World Bank Economic Review*, 34(2), 371–392. <https://doi.org/10.1093/wber/lhy031>
- Colombia. (2022). *Unaid.org*. <https://open.unaids.org/countries/Colombia>
- Colombia Reports. (n.d.). Bogotá nightlife and urban culture. *Colombia Reports*.
- Condom Social Marketing: Selected Case Studies. (n.d.). https://www.unaids.org/sites/default/files/media_asset/jc1195-condsocmark_en_0.pdf
- Conner, M., & Flesch, D. (2001). Having casual sex: Additive and interactive effects of alcohol and condom availability on the determinants of intentions. *Journal of Applied Social Psychology*, 31(1), 89–112.
- Condoms.uk. (2022). Are condoms vegan and eco-friendly? <https://condoms.uk/blogs/sex-education/are-condoms-vegan-and-eco-friendly>
- Congreso de la República de Colombia. (2016). Ley 1819 de 2016. Por medio de la cual se adopta una reforma tributaria estructural y se dictan otras disposiciones. <https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=79140>
- Correa-Salazar, C. (2022). Crossroads in two Colombian cities: Urban health disparities and human rights of Venezuelan migrant and refugee women. *ProQuest Dissertations & Theses*.
- Dávila, F., & Cala-Vitery, F. (2025). Contraceptive market, utilization patterns, and coverage in Colombia (2020–2025). *Contraception*, 111285. <https://doi.org/10.1016/j.contraception.2025.111285>
- Departamento Administrativo de la Función Pública. (n.d.). *Estatuto Tributario*. <https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=57353>
- DIAN. (2018). Concepto tributario 481 de 2018 – Entidades sin ánimo de lucro y donaciones ESAL. *Compilación Jurídica de la DIAN*.

https://normograma.dian.gov.co/dian/compilacion/docs/concepto_tributario_dian_0000481_2018.htm

Díaz, A. M., & Sánchez, F. (2004). A geography of illicit crops (coca leaf) and armed conflict in Colombia. *Crisis States Research Centre*.

Dorsett, R. (2015, March 14). In spite of Christians' rejection, Bogota to install condom machines in public places. *Colombia News*. <https://colombiareports.com/in-spite-of-christian-rejection-bogota-to-install-condom-machines-in-public-places/>

Döring, N., & Lehmann, S. (2022). Verhütungsinformationen in sozialen Medien: TikTok überholt Instagram und YouTube. In *BZgA FORUM Sexualaufklärung und Familienplanung* (No. 1, pp. 7–10).

Dresen, L., Emmer, C., van Marrewijk, J., Metaal, P., Passarge, J., Tempelman, D., Thieken, A., & Verberne, C. (1993). The condom—its ups and downs. *Basic module Environmental Science, IVAM, University of Amsterdam*. <https://condomerie.com/en/condomology/its-ups-and-downs>

Durex. (n.d.). *Durex Colombia – Productos*. <https://www.durex.com.co/>

Duo. (n.d.). *Duo Condoms – Product range and packaging*. <https://www.duocondoms.com/>

Ehiri, J. E., & Birley, M. (2002). Environmental impact of contraceptive use: An overview of available evidence. *Environmental Management and Health*, 13(1), 55–65.

EL-Wafai, N. A., Farrag, A. M., Abdel-Basit, H. M., Hegazy, M. I., Al-Goul, S. T., Ashkan, M. F., ... & El-Tarabily, K. A. (2023). Eco-friendly degradation of natural rubber powder waste using some microorganisms with focus on antioxidant and antibacterial activities of biodegraded rubber. *Processes*, 11(8), 2350.

European Environment Agency. (2021). Rail and waterborne — best for low-carbon motorised transport.

Fair Squared. (n.d.). *Fair trade and climate-neutral condoms*. <https://www.fairsquared.com>

Fasehun, L.-K., Lewinger, S., Fasehun, O., & Brooks, M. (2022). Barriers and facilitators to acceptability of the female condom in low- and middle-income countries: A systematic review. *Annals of Global Health*, 88(1), Article 20. <https://doi.org/10.5334/aogh.3612>

Fedecauchó. (2021). La cadena productiva del caucho natural en Colombia. *Federación Nacional de Cultivadores de Caucho*.

Fox, J., Castella, J. C., & Ziegler, A. D. (2014). Rubber plantations expand in mountainous Southeast Asia: What are the consequences for the environment? *Asia Pacific Viewpoint*, 55(3), 418–433.

García, J. D., & Rodríguez, L. M. (2023). Brand health de marcas de condones en Colombia (Econógrafos No. 38). *Universidad Nacional de Colombia, Facultad de Ciencias Económicas*. <https://fce.unal.edu.co/centro-editorial/docs/econografos-escuela-administracion-y-contaduria/38-brand-health-de-marcas-de-condones-en-colombia>

Glyde. (n.d.). *Ethical, fair-trade vegan condoms*. <https://www.glyde.com>

Goldsmith, E. B., & Goldsmith, R. E. (2011). Social influence and sustainability in households. *International Journal of Consumer Studies*, 35(2), 117–121.

González, C., Molina, T., & Montero, A. (2018). Sexual initiation and associated factors in Latin American adolescents. *Journal of Adolescent Health*, 62(3), S3–S10.

Gutmann, M. C. (2007). *The meanings of macho: Being a man in Mexico City*. University of California Press.

Gutu, B., Mahimbo, A., Percival, N., & Demant, D. (2025). Effect of parent-based sexual health education on parent–adolescent communication and adolescent sexual behavior: A systematic review and meta-analysis. *Perspectives on Sexual and Reproductive Health*, 57(3), 374–422. <https://doi.org/10.1111/psrh.70029>

Guzman, L. A., & Orjuela, J. P. (2017). Linking a transport dynamic model with an emissions model to aid air pollution evaluations of transport policies in Latin America. *Transportmetrica*. (Abingdon, Oxfordshire, UK), 5(3), 265–280. <https://doi.org/10.1080/21680566.2016.1169954>

Hanx. (n.d.). *Vegan and sustainably sourced condoms*. <https://www.hanxofficial.com>

Heaton, T. B., & Forste, R. (1998). Education as policy: The impact of education on marriage, contraception, and fertility in Colombia, Peru, and Bolivia. *Biodemography and Social Biology*, 45(3–4), 194–213. <https://doi.org/10.1080/19485565.1998.9988973>

Hincapie, A., & Quintero, S. (2012). Bodies subject, educated subjects. Notes for an interpretation of discursive struggles for the construction of sex education in Colombia. *Revista Latinoamericana de Ciencias Sociales, Niñez y Juventud*, 10(1), 93–105.

Horrich Aws, Myriam Ertz, & Insaf Bekir. (2025). Exploring the role of social media in shaping sustainable consumer behavior: A qualitative study. *Cogent Business & Management*, 12(1), 2560648. <https://doi.org/10.1080/23311975.2025.2560648>

Höpfel, L., Grimlitz, M., Lang, I., & Wirzberger, M. (2024). Promoting sustainable behavior: Addressing user clusters through targeted incentives. *Humanities and Social Sciences Communications*, 11(1), 1–12.

Iacobucci, D., & Grisaffe, D. (2018). Perceptual maps via enhanced correspondence analysis: Representing confidence regions to clarify brand positions. *Journal of Marketing Analytics*, 6(3), 72–83. <https://doi.org/10.1057/s41270-018-0037-7>

Iqbal, N., Arif, M., Abbas, Q., Mahmood, Q., Anwar, M. N., & Mansoor, M. (2025). Green influencers: The power of social media in shaping eco-conscious communities. *ASSAJ*, 3(02), 402–412.

Jadhav, A., & Vala-Haynes, E. (2018). Informed choice and female sterilization in South Asia and Latin America. *Journal of Biosocial Science*, 50(6), 823–839. <https://doi.org/10.1017/S0021932017000621>

Joint United Nations Programme on HIV/AIDS [UNAIDS]. (2023). Colombia 2022–2023: Summary of the Joint Programme's support to the national HIV response [Country Report]. *UNAIDS*. https://open.unaids.org/sites/default/files/2025/Colombia-country-report_2022-2023.pdf

Kyomuhangi, B., Namasambi, S., Kanyesigye, S. M., Arineitwe, T., Ankunda, C., & Asiimwe, S. (2025). Assessing knowledge and utilization of female condoms among undergraduate female students at Makerere University, Kampala: A cross-sectional study. *Reproductive Health*, 22(1), Article 251. <https://doi.org/10.1186/s12978-025-02020-2>

Ladner, A., Keuffer, N., & Baldersheim, H. (2016). Measuring local autonomy in 39 countries (1990–2014). *Regional & Federal Studies*, 26(3), 321–357. <https://doi.org/10.1080/13597566.2016.1214911>

Lahlou, S. (2017). *Installation theory: The societal construction and regulation of individual behaviour*. Cambridge University Press.

Lahlou, S. (2024). *Why people do what they do. And how to make them change*. Polity.

Lambert, S., Johnson, C., Keller, V. D., Sinclair, C. J., Williams, R. J., & Boxall, A. B. (2013). Do natural rubber latex condoms pose a risk to aquatic systems? *Environmental Science: Processes & Impacts*, 15(12), 2312–2320.

Lewis, R., Blake, C., McMellon, C., Riddell, J., Graham, C., & Mitchell, K. (2021). Understanding young people's use and non-use of condoms and contraception: A co-developed, mixed-methods study with 16–24-year-olds.

Lomba, L., Apóstolo, J., & Mendes, F. (2009). Drugs and alcohol consumption and sexual behaviours in night recreational settings in Portugal. *Adicciones (Palma de Mallorca)*, 21(4), 309–326. <https://doi.org/10.20882/adicciones.222>

Mangones-Matos, S. C. (2017). *Impacts on Safety and Air Pollution from Transportation Policies in Bogotá, Colombia*. ProQuest Dissertations & Theses.

Mangones, S. C., Jaramillo, P., Rojas, N. Y., & Fischbeck, P. (2020). Air pollution emission effects of changes in transport supply: the case of Bogotá, Colombia. *Environmental Science and Pollution Research International*, 27(29), 35971–35978. <https://doi.org/10.1007/s11356-020-08481-1>

Mena-Meléndez, L. (2025). Ethnoracial and rural-urban differences in female sterilization in Bolivia, Colombia, Guatemala, and Peru. *Frontiers in Global Women's Health*, 6, Article 1582729. <https://doi.org/10.3389/fgwh.2025.1582729>

Ministerio de Agricultura y Desarrollo Rural. (2018). *Cifras sectoriales: Caucho natural (SIOC)*.

Ministerio de Agricultura y Desarrollo Rural. (2022). *Cadena del caucho natural – SIOC*.

Ministerio de Educación Nacional. (n.d.). *Ministerio de Educación Nacional de Colombia*. <https://www.mineduacion.gov.co>

Ministerio de Salud y Protección Social. (n.d.). *Sexualidad, derechos sexuales y derechos reproductivos*. <https://minsalud.gov.co/salud/publica/SSR/Paginas/home-salud-sexual.aspx>

Morales, A., Vallejo-Medina, P., Abello-Luque, D., Saavedra-Roa, A., García-Roncallo, P., Gomez-Lugo, M., ... & Espada, J. P. (2018). Sexual risk among Colombian adolescents: Knowledge, attitudes, normative beliefs, perceived control, intention, and sexual behavior. *BMC Public Health*, 18(1), 1377.

Morales, A., Garcia-Montaña, E., Barrios-Ortega, C., Niebles-Charris, J., Garcia-Roncallo, P., Abello-Luque, D., ... & Martínez, O. (2019). Adaptation of an effective school-based sexual health promotion program for youth in Colombia. *Social Science & Medicine*, 222, 207–215.

Morón-Duarte, L. S., Latorre, C., & Tovar, J. R. (2014). Risk factors for adolescent pregnancy in Bogotá, Colombia, 2010: A case-control study. *Revista Panamericana de Salud Pública*, 36(3), 179–184.

Nanthini, J., & Sudesh, K. (2017). Biodegradation of natural rubber and natural rubber products by *Streptomyces* sp. strain CFMR 7. *Journal of Polymers and the Environment*, 25(3), 606–616.

Nazif-Munoz, J. I., & Chabot, R. (2022). Mapping and assessing sexual and reproductive health policy changes over time in Colombia: Measuring their impact on pregnancy terminations. *Humanities and Social Sciences Communications*, 9(1), 1–13.

Nigenda, G., & Langer, A. (2011). Sexual and reproductive health and health sector reform in Latin America and the Caribbean: Challenges and opportunities. In *Inter-American Development Bank eBooks*. <https://doi.org/10.18235/0012534>

Open Collections. (2019). *Library.ubc.ca*. <https://open.library.ubc.ca/>

Ospina Díaz, J. M., Niño Avendaño, C. A., & Vargas Rodríguez, L. J. (2020). Use of the emergency contraceptive pill in university students from Tunja, Boyaca. *Ciencia e Innovación En Salud*. <https://doi.org/10.17081/innosa.85>

Perwitiningsih, P., & Farman, L. (2025). Environmental risks of condom use: The urgent need for green policy reform in birth control. In *E3S Web of Conferences*, 660, p. 03008. EDP Sciences.

Parker, R. (2009). Sexuality, culture, and power in HIV/AIDS research. *Annual Review of Anthropology*, 38, 19–35.

Perez, F., & Dabis, F. (2003). HIV prevention in Latin America: Reaching youth in Colombia. *AIDS Care*, 15(1), 77–87. <https://doi.org/10.1080/0954012021000039789>

Pfender, E. J., & Devlin, M. M. (2023). What do social media influencers say about birth control? A content analysis of YouTube vlogs about birth control. *Health Communication*, 38(14), 3336–3345. <https://doi.org/10.1080/10410236.2022.2149091>

ProColombia. (n.d.). *UNIQUE INTERNATIONAL SAS – Medical device manufacturer*.

Profamilia. (2015). *Encuesta Nacional de Demografía y Salud (ENDS)*. Bogotá, Colombia.

Profamilia. (2020). *Encuesta Nacional de Demografía y Salud (ENDS)*. <https://profamilia.org.co/>

Profamilia. (n.d.). *Profamilia – Servicios de salud sexual y reproductiva*. <https://profamilia.org.co>

Prudence anuncia o retorno da campanha “Testadores de Camisinha.” (2023). *Acontecendo Aqui*. <https://acontecedoaqui.com.br/propaganda/prudence-anuncia-o-retorno-da-campanha-testadores-de-camisinha/>

Puerto Mojica, Y., & Rueda, E. de J. (2022). El semillero de innovación para la salud y la vida, un espacio de posibilidades con miras a la creación en la Secretaría Distrital de Salud de Bogotá. *Boletín de Investigaciones y Cooperación*, 8, 30–31. <https://doi.org/10.56085/23823976.508>

Roldán Logistics. (n.d.). *Comprehensive logistics solutions in Colombia*. <https://ensun.io/search/pharmaceutical-logistics/colombia>

Rojas Briñez, D., Galvis Panqueva, Á., & Flores Hinojos, I. (2019). How should I teach sex education in middle school? An action research study on an ICT-based intervention. *Qualitative Report*, 24(2), Article 16. <https://doi.org/10.46743/2160-3715/2019.3610>

Rubio-Mendoza, M. L., Jacobson, J. O., Morales-Miranda, S., Sierra-Alarcón, C. Á., & Luque-Núñez, R. (2015). High HIV burden in men who have sex with men across Colombia's largest cities: Findings from an integrated biological and behavioral surveillance study. *PLoS One*, 10(8), Article e0131040. <https://doi.org/10.1371/journal.pone.0131040>

Salvador, C., Savani, K., & Kitayama, S. (2023). Emotionally expressive interdependence in Latin America. *Journal of Personality and Social Psychology*.

Secretaría Distrital de Salud. (n.d.). *Salud sexual y reproductiva*. <https://www.saludcapital.gov.co/sitios/VigilanciaSaludPublica/Paginas/SaludSexualyReproductiva.aspx>

SLOCAT. (2025). *Colombia country factsheet (GSR 4)*.

Solistica. (2022, September 28). Solistica is Colombia's new expert in logistics. <https://blog.solistica.com/en/solistica-is-colombias-new-expert-in-logistics>

Today. (n.d.). *Today Condoms – Brand overview*. <https://www.today.com.co/>

UNO. (n.d.). *UNO Condoms – Product overview*. www.condonesuno.com

United Nations Environment Programme. (2017). *Resource efficiency and cleaner production in manufacturing*.

Urrea-Giraldo, F., Congolino, M. L., Herrera, H. D., Reyes, J. I., & Botero, W. F. (2006). Sexual behaviors and incidence of sexual and reproductive health programs among poor secondary students and public university students in Cali, Colombia. *Cadernos de Saúde Pública*, 22(1), 209. <https://doi.org/10.1590/s0102-311x2006000100023>

van Empelen, P., & Kok, G. (2006). Condom use in steady and casual sexual relationships: Planning, preparation and willingness to take risks among adolescents. *Psychology & Health*, 21(2), 165–181.

van Empelen, P., & Kok, G. (2008). Action-specific cognitions of planned and preparatory behaviors of condom use among Dutch adolescents. *Archives of Sexual Behavior*, 37(4), 626–640.

Usmany, P., Rachmawati, R., Rembe, E., Sopacua, F., Santosa, T. A., Arifin, A. H., Fitria, A., & Suhardi, S. (2024). The Effectiveness Of Search Engine Optimization (SEO) In Marketing: A Meta-Analysis Study. *Journal of Economic Bussines and Accounting (COSTING)*, 7(5), 807–811. <https://doi.org/10.31539/costing.v7i5.11446>

Vasileva, S. (2024). Mapping the customer journey in retail. *International Conference on Economics, Business & Management*, 1(1), 53–66. <https://doi.org/10.56065/ICEBM2024.53>

Vernon, R., Ojeda, G., & Townsend, M. C. (1988). Contraceptive social marketing and community-based distribution systems in Colombia. *Studies in Family Planning*, 19(6), 354. <https://doi.org/10.2307/1966629>

Wang, Y., Zeng, Z., Xu, J., et al. (2023). High-resolution mapping reveals underestimated rubber-driven deforestation in Southeast Asia and beyond. *Nature*, 622, 722–728.

Wolfs, K., Bos, A. E., Mevissen, F. E., & van Lankveld, J. J. (2023). The effect of alcohol and sexual arousal on explicit and implicit condom attitudes and intentions to use a condom. *Archives of Sexual Behavior*, 52(4), 1715–1725.

Woog, V., Susheela, S., Alyssa, B., & Jesse, P. (2015). *Adolescent women's need for and use of sexual and reproductive health services in developing countries* (pp. 1–63). New York: Guttmacher Institute.

Why aren't more women buying and carrying condoms? - Get the Gloss. (2018, February 15). *Get the Gloss*. <https://www.getthegloss.com/health/fertility-pregnancy/why-aren-t-more-women-buying-and-carrying-condoms/>

Zaif, A. (2016). The impact of brand awareness on companies' marketing strategies. In *The International Conference "The Risk in Contemporary Economy" ("Dunarea de Jos" University. Faculty of Economics)*, 3, 213–219

Images References and Others

Figure 9:

OpenAI. (2023). *ChatGPT* (25 January paid web version) [Large language model]. <https://chat.openai.com/chat>.

Prompt used: I would like to have a condom package with a zipper, similar to these transparent zip bags. On one side, our brand name should be displayed, and on the other side there should be an icebreaker to reduce the moment of awkwardness. For example, we were thinking about a QR code linking to a Spotify playlist with songs for the act, a Tic-Tac-Toe layout, or silly questions such as: *Wait, what's your second name again?* / *What's your star sign?* / *What's your pet's name?* etc. My teammate has already designed some really great concepts for this, which I will show you [upload Figure 6 and 7]. The condom packaging should follow the same colour palette. Our brand name is BUCLE (English: *Loop*).

Prompt used: Can you keep everything exactly the same, but on the side, with the icebreakers, only use the icebreaker "*Wait, what's your second name again?*" and the Tic-Tac-Toe game? Please leave out the playlist.

Prompt used: Create the same image but with the question „*Wait, what's your favourite ice cream flavour?*" and the playlist title *Afterparty*.

Figure 10:

OpenAI. (2023). *ChatGPT* (25 January paid web version) [Large language model]. <https://chat.openai.com/chat>.

Prompt used: Can you create the same image with "*Set the mood*" as the playlist name?

Others:

The paper benefited from generative AI-assisted text reduction and citation.

Microsoft. (2024). Microsoft Copilot: AI productivity assistant [Software]. <https://copilot.microsoft.com>

Notion AI. (2023). AI writing assistant [paid desktop version]. Notion Labs, Inc. <https://www.notion.so>

OpenAI. (2023). *ChatGPT* (25 January paid web version) [Large language model]. <https://chat.openai.com/chat>.

Appendices

Appendix A



Figure 9 - Packaging I (own elaboration and AI)

Pain Point Awkwardness: Playful Affordances as Icebreakers for Intimacy

To address the pain point of awkwardness surrounding condom use, we developed a set of playful icebreakers integrated directly into the packaging. As shown in the images, users can play a quick game of Tic, Tac, Toe, scan a QR code to access a “*Get in the mood*”-playlist that helps set the mood, or engage in light-hearted questions such as “*Wait, what was your second name again?*” or “*Wait, what’s your star sign?*”. These elements are designed to reduce tension, spark connection, and create a relaxed transition into intimacy, without disrupting the moment.

Appendix B



Figure 10 - Packaging II (own elaboration and AI)

Paint Point Disposal and Environmental Impact: Closing the Loop – from Use to Responsible Disposal

Life cycle assessment evidence shows that the end-of-life phase contributes a non-negligible share of the overall environmental footprint of condoms (Birnbach et al., 2020).

Approximately 2.96% of condoms are flushed, potentially causing sewage blockages or entering aquatic environments as plastic litter (Lambert et al., 2013). Most condoms are not meaningfully biodegradable and can persist in landfills (Perwitiningsih & Farman, 2025). An often overlooked factor is disposal behaviour: around half of users wrap condoms in toilet paper, and the production and disposal of this paper can exceed the environmental impact of the condom itself (Birnbach et al., 2020).

To address this issue, our product features a resealable zipper package that allows the condom to be placed back into its original wrapper after use and disposed of safely in general waste.

As detailed in Appendix C, the material design further enables controlled biodegradation, including the breakdown of biological residues such as semen and other bodily fluids. The slogan **“Seal. Dispose. Loop complete.”** serves not only as a core branding element, but also as a behavioural cue: it reminds users at the moment of opening to return the condom to its packaging after use and reinforces the sustainability logic embedded in the product design.

Appendix C

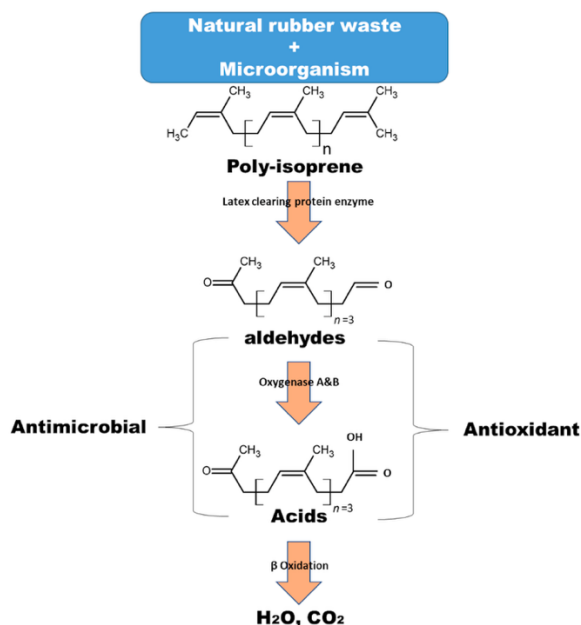


Figure 11 - Biodegradation (Source: EL-Wafai et al., 2023, S. 15)

Paint Point DNA: The biodegradation process further explained:

The biodegradation of rubber has been investigated using microbial consortia and by simulating naturally occurring microorganisms. The initial stage of rubber biodegradation involves the breakdown of natural rubber by specific microbial processes. This process requires both extracellular and intracellular enzymes, including latex clearing protein (Lcp) and oxygenases A and B. These enzymes facilitate degradation, in contrast to abiotic oxidation by free oxygen. Bacteria efficiently utilize propionyl-CoA and acetyl-CoA in their metabolic pathways, including glycolysis, the tricarboxylic acid cycle, and the β -oxidation pathway (Figure 13). As a result, these enzymes ultimately degrade the glycolysis products of rubber. The biodegradation of rubber waste by fungi and bacteria offers significant benefits for ecosystem and human health. Evidence suggests that both bacterial and fungal degradation of rubber waste can substantially reduce environmental burdens and mitigate risks to ecosystems and human health (EL-Wafai et al., 2023, S. 14).

Again: Biological residues such as semen, which are primarily composed of water, do not impede biodegradation and instead become incorporated into the natural decomposition process. Consequently, our proposed condom is engineered to maintain safety and reliability during use, while facilitating controlled biodegradation following disposal.

Appendix D



Figure 12 - Social Media Campaign (own elaboration)

We're partnering with Teathron also as a cultural amplifier for BUCLE. Through this collaboration, we'll activate the brand directly in nightlife spaces where pleasure, visibility, and conversation naturally flow. Teathron's social media channels will help us reach our target audience with playful, informative content that blends sexual health, sustainability, and entertainment.

At the same time, we're building BUCLE's own social media presence, using humour, memes, and bold visuals to spark engagement and normalise sustainable protection. To grow our audience organically, we will apply Search Engine Optimization (SEO) strategies, ensuring our content appears more frequently in searches related to sexual health,

sustainability, nightlife, and pleasure. Beyond keywords and hashtags, SEO success depends heavily on content quality, keyword optimisation, and backlinks—factors shown through meta-analytical evidence to significantly improve organic search rankings and website traffic (Usmany et al., 2024). By optimising captions, alt text, metadata, and link structures, we aim to increase visibility, attract followers, and position BUCLE as a fresh, relatable voice in both public health and nightlife culture.

Appendix E

BUCLE – Projected Income Statement (COP)	
ACCOUNT	COP
OPERATING REVENUE	
Condom Sales (120,000 units)	\$288,000,000
TOTAL OPERATING REVENUE	\$288,000,000
COST OF GOODS SOLD (COGS)	
Production (120,000 × \$720 COP)	(\$86,400,000)
TOTAL COGS	(\$86,400,000)
GROSS PROFIT	\$201,600,000
OPERATING EXPENSES	
Distribution & Logistics	(\$48,000,000)
Marketing & Awareness Campaigns	(\$32,000,000)
Teathron Activations & Staff Training	(\$24,000,000)
Administrative & Operational Costs	(\$48,000,000)
TOTAL OPERATING EXPENSES	(\$152,000,000)
OPERATING INCOME	\$49,600,000
STARTUP COSTS (Non-recurring)	
Branding & Packaging	(\$60,000,000)
Legal & Regulatory Setup	(\$40,000,000)
TOTAL STARTUP COSTS	(\$100,000,000)
NET RESULT FOR YEAR 1 (including startup costs)	(\$50,400,000)
AVAILABLE PUBLIC FUNDS (Non-operational)	\$100,000,000
Sexual Health Grants	\$40,000,000
Circular Economy Funds	Up to 80% deductible
ESAL Tax Benefits	\$140,000,000 + tax benefits
ADJUSTED RESULT WITH FUNDS	\$89,600,000 (positive before tax benefits)

Figure 13 - Projected Income Statement (own elaboration)

BUCLE's projected income statement shows a financially solid model strengthened by our decision to operate through Make-To-Order (MTO) production. Because we only manufacture condoms in response to demand, we eliminate the need for initial inventory and avoid the high carrying costs typical of consumer goods.

Our revenues for the first year reach \$288 million COP, with production costs of \$86.4 million COP, resulting in a healthy gross profit. After accounting for operating expenses (logistics, marketing, venue activations, and administration) the business maintains a positive operating income of \$49.6 million COP. And the only negative balance comes from non-recurring startup costs such as branding and regulatory setup, which place the first-year net result at -\$50.4 million COP. However, once available public funds and grants are applied, the project closes the year with a positive adjusted result, demonstrating that BUCLE is operationally profitable and financially viable under an MTO model that minimizes waste, reduces risk, and aligns with our sustainability goals.