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PANGAIA: Innovation derived from inclusivity and the Earth

“[I]n no uncertain terms that getting materials into the mass-market that have superior performance and sustainability credentials is the way to drive the commercial success of this company.”

— Amanda Parker, Chief Innovation Officer, PANGAIA

“[There’s] enormous challenges such as the climate crisis require unprecedented innovation and collaboration to devise and deliver solutions. PANGAIA looks set to be the first fashion company truly tackling this challenge, from the bottom up.”

— Brooke Roberts-Islam, Forbes

Science, purpose, and design

PANGAIA is a biomaterial and apparel company.¹ The private, for-profit company was founded in the United Kingdom in 2018. They employ an estimated 200 people.² Their mission is to “solve environmental problem[s] of the fashion/apparel & nature industry.”¹

Their business model is twofold: direct-to-consumer (D2C) and business-to-business (B2B). They sell their garments to consumers on their e-commerce website³ and in temporary stores (i.e., pop-ups)⁴ and their proprietary biomaterials innovation to businesses, under the brand name PANGAIA Science.⁵ The two business models complement one another and serve as an upshot for an increased customer base, niche market positioning, and influence of their manufacturing process (an uncommon practice in the fashion industry).⁵

PANGAIA Science, their B2B arm, offers over 200 fabrics formulated and designed to transition the fashion industry to sustainable, natural materials.⁵ They conduct their research and development (R&D) in-house with a team of scientists, technologists, and designers. The PANGAIA Science team’s developments are biomorphic. Their mantra has become the DNA of their company: “Science, purpose, and design.”⁵ They have developed biobased fibers, plant fibers, technical fabrics, and garment treatments. All innovations strive to use an existing natural process performed by the material or reuse waste from another industry.

The materials and treatments developed by PANGAIA Science are commoditized into garments by their D2C business and licensed to companies by their B2B business. PANGAIA intends for their material innovations to be released often, like a formal tech company submitting updates to software, and is hopeful for mass adoption. They are innovating for the industry, not just for their D2C bottom line.⁶

Their D2C business sells garments, such as monochromatic sweat suits, sneakers, and coats, via e-commerce.³ They sell a minimal number of staple pieces and focus on limited-time collections, which will with homage to parts of nature, such as earth tones, fungi, or space. These collections personify their nature muse in color and graphic details (e.g., text printing, stitched images). Their collections are often done in collaboration with an artist who aligns with PANGAIA's values.⁶ These limited collections donate proceeds to a cause related to the artist. For example, they collaborated with Jaden Smith and proceeds went to Jaden Smith's company, JUST, and his family's foundation, Will & Jada Smith Family Foundation (WJSFF), which focuses on racial justice. In 2021, they raised \$100,000 for causes from capsule collection sales proceeds.⁷

From the bottom up

The substantial environmental damage caused by the fashion industry is no longer an industry secret. "The fashion industry produces 10% of all humanity's carbon emissions" (more than maritime shipping and international flights combined).⁸ The fashion industry is also the second-largest consumer of the world's water supply.⁸ Consumers have taken notice, and companies like PANGAIA are inspired to correct course.

Forbes declared, "PANGAIA looks set to be the first fashion company truly tackling this challenge, from the bottom up."⁶ PANGAIA encompasses sustainability in its identity. Their name is a compound of PAN (all inclusive) and GAIA (Mother Earth and everything is connected).¹ There is nothing more personal than a brand's name, and PANGAIA's intention boasts a public commitment to sustainability both in its standard definition and in an unusual manner.

As a company, PANGAIA is intentional about employee relations. PANGAIA's staff represents a global population with 35 countries represented and 19 languages spoken. They're also 76% women, 22% male, and 2% non-binary.¹⁰ They are vocally and monetarily committed to diversity, equity, and inclusion (DEI) hiring practices, trainings, and initiatives.⁹ They honor Juneteenth as a company holiday, have contracted diversity trainings with racial justice firm, The Outer Box, and collaborated with artists to benefit women's empowerment. "[PANGAIA] know[s] that true environmentalism is intersectional and are committed to leading by example to ensure that the narrative and perception of the industry we are a part of is truly representative of our Mother Earth."¹⁰

To take their commitment a step further than hiring and equity trainings, they voluntarily publish their diversity numbers in their yearly impact statement, despite being a private company not legally bound to do so. They also adopted a Modern Slavery Statement. The statement declares their commitment to workers' rights, including intolerance of trafficking, child labor, or harassment. This statement is applied internally at PANGAIA, to their suppliers, and to their partners.¹¹ The statement outlines trainings and additional resources for employees and business partners to comply and educate with. They outline plainly they will review and take remedial action if a supplier or partner is found to breach the Modern Slavery Statement.

These vocal, proactive policies confirm equity as an integral piece of sustainability, both as a concept and for their company's mission.

As a private company, PANGAIA does not publish its financials. Therefore, it is available (nor apparent) if PANGAIA compensates or reviews employees based on sustainable performance outputs. It can be assumed sustainability is indirectly accounted for in an employee's pay due to the structure of the company.

PANGAIA's supply chain transparency is a critical point of focus for the company. They have conducted a life cycle analysis (LCA) to track and report on their manufacturing process. As of 2021, they have 81% transparency. In the selection of their materials, they are strict on their suppliers' policies and business practices through the application of the Modern Slavery Statement mentioned above. Its relationship with its suppliers projects its internal commitment. Their Modern Slavery Statement includes the provision: "We expect all suppliers, regardless of location, to share our commitment to eradicating modern slavery within the supply chain in accordance with the United Nations Universal Declaration of Human Rights, and the Workplace Standards developed under the United Nations convention."¹¹ PANGAIA employs a Supplier Code of Conduct to enforce social responsibility of their suppliers. They report on possible risks and action plans if a supplier breaches their Code of Conduct, focusing on workplace management risks.¹¹ In holding their suppliers accountable, they are deconstructing outdated industry norms where it was not the brand's responsibility until the materials were within their facility. "[This is] rooted in the research and development focus of materials being divorced from the design and aesthetics of fashion in these largely siloed sectors. PANGAIA is a hybrid company, apparently the first of its kind, that will bring together material science through its research and development facility, and demonstrate its textile prowess via its own-brand fashion collections."⁶

In material sourcing, PANGAIA selects suppliers who are GOTS certified for organic fibers and the Run By Textile Exchange's certification for recycled content. They source virgin biomaterials (e.g., cotton, wool, and wildflowers) and recycled materials (recycled cotton, recycled cashmere) to be used in their products. They will also work with non-governmental organizations and adjacent industries to capture wild or useful waste, respectively, to integrate into their materials or treatments.⁹ They have also retained Intertek, a consulting firm, to develop "quality, compliance, sustainability, governance and social conduct standards and requirements to be applied to our products, production, and in the processes."¹¹

As with most of their company operations, PANGAIA is transparent about the garment's make up through publication (both complimentary and self-critical) on the garment's detail page. On each detail page, they outline the sourced materials, how it was treated/grown, and present the "positive impact of choosing this product" by way of "driving emissions avoided, days of drinking water saved, and land saved from pesticides."¹² For example, their bestselling hoodie, 365 Hoodie, is made of 100% organic cotton and produced with rainwater. It avoided 12.3 km of driving emissions, 876 days of drinking water, and 5m² of land saved from pesticides.¹² Their intentional transparency ensures their customers and stakeholders are informed on their

purchases and the company's operations. Beyond the detail page, they publish the garment's make up directly on the item in black screen-print. The aforementioned 365 Hoodie has "THIS HOODIE IS COLORED WITH AN ENVIRONMENTALLY FRIENDLY DYE, CREATED USING A RECYCLED WATER SYSTEM. THE FABRIC IS MADE FROM ORGANIC COTTON."¹² This transparency has become their selling point to eco-conscious consumers.⁶

PANGAIA has also committed to sustainable initiatives outside its own creation. "Our approach to impact and sustainability has been informed by the SDGs since day one, with a particular focus on the following goals."⁷ PANGAIA contributes to six United Nations' Sustainable Development Goals (SDGs). They committed to SDG 9: Industry, innovation, and infrastructure; SDG 10: Reduced inequalities; SDG 12: Responsible consumption and production; SDG 13: Climate action; SDG 14: Life below water; and SDG 15: Life on land.⁵ They also partnered with in Fashion Minority Report, a nonprofit working with designers from lower socio-economic backgrounds, on a career development program through mentorships and internships.¹⁰ This program involvement serves as an avenue to support marginalized communities and an educational opportunity to train the next generation of designers to think with the Earth in mind. They educate their industry by way of action and putting innovative, eco-conscious materials on the market.

Innovation for change

PANGAIA has addressed the critical fashion industry factors, such as water use, carbon emission, synthetic materials, and packaging. Their innovative strategies address resource use, emissions targets, and internal operations. PANGAIA funds research to reach key performance indicators both internally and within the fashion industry at large.⁹

According to McKinsey, laundering 1 kilogram of clothing over its entire life cycle emits 11 kilograms of greenhouse gases.¹³ To address this, PANGAIA developed "PPRMINT™ Oil Treatment", which infuses peppermint oil into its clothing to neutralize odors and reduce washing. PANGAIA notes the antibacterial effect of the peppermint oil can withstand 50 washes.¹⁴

To reiterate: The fashion industry produces 10% of global carbon emissions.⁸ PANGAIA reversed the narrative of fashion's emitting relationship with carbon by using carbon to print onto their garments with the development of AIR INK®. "[AIR INK®] turns air pollution particles into water-based black ink, used to print our logo and text."¹⁵ This innovation introduces a reuse opportunity carbon that has been cursing the fashion industry. The technology was designed in partnership with the Massachusetts Institute of Technology (MIT) in which the team manipulated the liquidized carbon to "different grades of inks, dispersions and coatings."¹⁵

Beyond their intentional selection of organic or recycled biomaterials in all their products, They have led two notable innovations to detour the use of synthetic materials or animal byproducts. Down, used as an insulator in thermal, outdoor garments, is collected through inhumane plucking and slaughter of ducks and geese.¹⁶ Leather, a common textile material, is collected through animal slaughter. PETA estimates more than 1 billion animals are killed globally each

year to produce leather.¹⁷ In response to the inhumane animal treatment and their stance against synthetics (due to its oil underpinning), PANGAIA developed FLWRDWN™ and Vegea.

FLWRDWN™ creates the insulation of down using dried wildflowers to use in lieu of synthetics fillers such as polyester or goose down. In addition to a natural alternative, the wildflowers are sourced sustainably. The fields are managed by a non-governmental organization and “grown without pesticides or artificial irrigation.”¹⁸ The wildflowers are harvested at the end of the growing season in effort of preservation of biodiversity and pollinator’s habitats. “The leftover material from this process, which would usually be discarded, is used to create FLWRDWN™.”¹⁸ PANGAIA employs this biomaterial in their coats and vests. To sweeten the deal, FLWRDWN™ is biodegradable within 10 years, early research has found;¹⁸

Vegea is a leather-appearing material made from “grape skins from winemaking, vegetal oils and natural fibers from agriculture.”¹⁹ “It utilizes and repurposes waste materials, thereby extending the utility of the grapes and making the winemaking process more circular.”¹⁹ PANGAIA employs Vegea in its leather sneakers. They are vocal about their shortcoming (it is not currently biodegradable) but have counted that with the notation that vegan leather (a synthetic substitute to animal hid leather) is not sustainable either due to its oil composition.¹⁹

Beyond materials selection and innovative material science, PANGAIA also employs packaging that is more sustainable than typical plastic packaging used in the fashion industry. The decomposing fiber package is called TIPA and is designed to mimic the skin protection on fruit. Their packaging can biodegrade in 24 weeks in compost.²⁰

In the DNA

Sustainability is an integral part of PANGAIA’s operations, job functions, and business model. They have not appointed sustainable titles, but it appears their Chief Impact Officer and/or the Chief Innovation Officer would be their two leading executives in the space focusing on the DTC and B2B operations, respectively. This is assumed in secondary source research of selected spokespeople in media interviews and the layout of their website. (Initiatives are listed under Impact and science is labeled as innovation).

They also contribute proceeds to causes and programs. Financial contributions are directed based on a clothing capsule collection or campaigns. One of their ongoing programs is the Tomorrow Tree Fund which allocates a portion of purchase to “support grassroots NGOs with a commitment to plant, protect and restore 1 million trees around the globe.”²¹ This program has supported 160,000 trees, as reported on PANGAIA’s website.²¹ During the Australian wildfires, PANGAIA donated 100% of profits to the New South Wales Rural Fire Services for 48 hours. They also released a capsule collection benefiting the Amazon Forever campaign to support indigenous communities impacted by deforestation in Brazil.⁷

The outside looking in

Greenwashing is the practice of marketing sustainable, eco-friendly, or responsible claims without the actual impact. An example of this can be putting “sustainably sourced” on a

garment made using child labor. Greenwashing has become common in the fashion industry because there is not a standard(s) holding the industry accountable. It has become a common marketing ploy because “two-thirds of shoppers are willing to pay more for eco-friendly goods and that half consider a product's sustainability before deciding whether to purchase.”²² Sustainability applied, not as a marketing ploy, is critical for PANGAIA's success as the media has dubbed them as “a materials science company masquerade[d] as a fashion brand.”²³

Employees working on PANGAIA are curious, eco-conscious, passionate people. They often share LinkedIn posts of triumph during releases of technical advances in their materials. Their Vice President of Global Communications shared, “It's always exciting to see the evolution of a brand and especially one which has grown so significantly - always with purpose at the core,” following the launch of their eco-friendly jeans.²⁴ Their Head of Technology shared, “More cutting-edge innovation from the Pangaia Material Science team - a surprising alternative to sustainable cotton!” following a Forbes article on their sustainable cotton.²⁵ (I was unable to secure an employee for interview, therefore collected LinkedIn posts as a voice of the employee to personify the sustainability importance and success to their employees.)

“Pangaia's solution is something it calls “high-tech naturalism,” wherein the future of a sustainable fashion industry involves using existing natural materials and augmenting them with scientific and technological processes.”²³ PANGAIA has not fell into the similar trap that other fashion brands have – taking the best available material. They have innovated their own materials with their sustainable knowledge at the core. PANGAIA's product also answers the demand of consumers for transparency and eco-friendly products.²² Their research and development arm has made their commitment to sustainability successful. They have committed an appropriate investment into finding solutions, rather than shoe-horning materials that exist. “[The material description printed on the garments is] a gentle reminder to both wearers and onlookers that the items are planet-friendly, first and foremost. The clothing is inseparable from the mission with which it's made, and that appeals to a lot of parties, consumers and scientists alike.”²³ Their garments continue to elevate the narratives of technological innovation, sustainable sourcing, and social issues.⁷

Make it fashion, not a trend

The fashion industry has taken notice of the consumer demand for responsible products. In a study conducted by Harvard Business Review, “more than 90% of the CPG categories, sustainability-marketed products grew faster than their conventional counterparts.”²⁶ With Gen Z coming into the workforce and their spending power paired with Millennials, the demand will continue to pressure the market to focus on more than their sales margin. A Forbes report found, “62 percent of Generation Z, who will begin entering the workforce this year, prefer to buy from sustainable brands, on par with our findings for Millennials.”²⁷

Dr. Amanda Parkes, PANGAIA's chief innovation officer, said, “The transparency goes hand in hand with innovation, as there's no point in having great materials and a terrible factory that makes the clothes. We work with a holistic approach; when we measure impact, we have to

measure every single part of it.”²⁸ Innovation and transparency are not radical or new concepts in business. Innovation is what propelled tech giants such as Amazon and Google to their dominance today²⁹, and transparency is how Whole Foods became more than a niche health store.³⁰ PANGAIA’s science-first model is a model companies could (and should) adopt in their transition to sustainability. They develop to solve, not to sell.

PANGAIA are intentional with who they buy from, partner with, and collaborate with to keep their values at their center.⁷ This is the key factor in their success as a sustainable darling in the fashion industry; they’ve been covered in Vogue³¹ and are adorned by celebrities like Jennifer Lopez³² and Harry Styles.³³ If a company intends to adopt a sustainable position, whether that is to truly do good in the world or to increase sales, they should allocate time, effort, and funds to a research and development department solely committed to solution-first products. “PANGAIA is bringing materials science direct to [the] consumer—the future textiles/smart materials of the world now not only live in laboratories, but can reach the consumer with a click, and solve major environmental problems at the same time.”⁶

“[Parkes] states in no uncertain terms that getting materials into the mass-market that have superior performance and sustainability credentials is the way to drive the commercial success of this company.”⁶ Their commercial success is a committed, altruistic marketing campaign and is applicable to all companies, beyond fashion.

PANGAIA Science is the foundation of the company through its employment and funding of science, research, and innovation. Companies should employ a research arm dedicated to sustainability applications in their industry. PANGAIA develops the materials they want to see in their products and solves the industry’s most pressing issues (carbon emission, water use, and pollution).

Developing a new division or subsidiary is expensive. Another key application demonstrated by PANGAIA is their stringent involvement in their materials sourcing and manufacturing. A company intending to become more sustainable could adopt a similar involved sourcing model. PANGAIA only purchases from respective certified sources and holds its suppliers accountable to ethical labor practices. This is a universal strategy since all businesses and organizations use some sort of materials, whether that is equipment (e.g., computers, desks), materials (textiles, gems, natural resources, food), or supplies (paper, pens). If a business began holding its suppliers accountable, the supply market would also shift to responsible practices to compete in the marketplace.

PANGAIA also employed the SDGs in their business model. Companies can audit the SDGs and their organization’s mission and/or output and likely find one (or more) goals that complement the company as it currently stands. For example, a construction company can focus on SDG 9: Industry, innovation, and infrastructure; a sushi restaurant could focus on SDG 14: Life below water; a Pilates studio could commit to SDG 3: Good health and well-being. In the selection of SDGs, an organization can begin introducing programming, products, and proceed to elevate the goal. This presents a seamlessly applicable method by the adoption of a preset intention.

Sustainability should be treated as a technical software update that requires continued agility and releases of its practices and application. PANGAIA is completely sustainable, and they do not attempt to convince the market otherwise.⁶ The nobility of PANGAIA's sustainability is the commitment to keep innovating, funding the effort internally, and being unapologetic in accountability of those who collaborate with them. For the sake of the future, sustainable fashion needs to become fashion, not just a trend.

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