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Analyzing the Cost Implications of Sustainable Development Practices in the Textile Industry: A Paradigmatic Study in the Indian Periphery.

Dr. Richa Tiwari[1], Gopitha A[2], Manvi Nahar[3], Thammali Preetham Goud[4], P N Belliappa[5], Varun Jain[6], Amith Hemagiri U[7]

[1]Professor Center for Management Studies, Jain (Deemed-to-be University)
[2,3,4,5,6,7] Student Center for Management Studies Jain (Deemed-to-be-University)

ABSTRACT

Understanding the state and existing practices of sustainable innovation and its cost implications in the textile sector is the goal of this review study. One of the sectors with the greatest difficulties integrating sustainability into daily operations is the textile industry. In order to synthesize empirical data pertinent to sustainable innovation in the textile industry, we conducted a systematic review in this study. The results demonstrated that scholars' interest in sustainability innovation has grown recently. The textile industry's sustainability innovation best practices were recognized. Environmentally friendly design, ecolabels, life cycle analyses, materials, and packaging are examples of sustainable product innovation. Cleaner production, eco efficiency, waste handling, supply chain management, and enzymatic textile processing are all examples of sustainability process innovation. Enzymatic textile processing, cooperation, business model innovation, culture and knowledge management, and the environmental management system (EMS) are examples of sustainability organizational innovation. This study discovered that, as opposed to social innovation, the predominant sustainability innovation practice highlighted in the textile sector is more closely tied to ecological innovation. It is crucial for corporate stakeholders and policymakers to jointly develop sustainability innovation in the textile industry since consumer demand for eco- friendly products is rising and laws are becoming more stringent.

Our research paper provides studies the ongoing global market for organic apparel, popularity of sustainable and organic clothing, Value-based eco- friendly purchasing, financial viability of adopting sustainable development. The research scope includes a sociological examination of the shift towards sustainability, considering consumer attitudes and climate change implications. A probability sampling method ensures representative data collection, focusing on Bangalore to capture the vibrant textile industry and diverse perspectives. Data collection is facilitated through Google Forms, allowing for widespread participation and efficient analysis. Overall, the study provides valuable insights for industry stakeholders and policymakers to enhance sustainability practices in the textile industry.

Keywords: Sustainability, Financial cost, Textile industry, product Innovation, Eco- friendly, demand, organic practices.

INTRODUCTION

The textile industry, a cornerstone of global manufacturing and fashion, has come under increasing scrutiny in recent years due to its significant environmental and social impacts. Concerns about the industry's role in resource depletion, pollution, and labour exploitation have frequently been eclipsed by the unrelenting drive of rapid production and economic effectiveness. However, as consumers and industry stakeholders become more aware of sustainability challenges, they are being compelled to reconsider ingrained habits and look for more ethical substitutes.

The cost implications of sustainable development practices within the textile sector are a crucial aspect of this change that is examined in depth in this study. Sustainable development practices cover a wide range of tactics targeted at lessening the industry's environmental impact and boosting moral working conditions. These practices hold the potential of coordinating industry expansion with international environmental and social goals, from recycling and the use of eco- friendly materials to fair labor standards and transparency in the supply chain.

Sustainable practices have notably increased in the Indian textile business. Government measures, changing consumer tastes, and rising environmental consciousness all contribute to this transition. The use of organic and sustainable fibres, energy-efficient manufacturing techniques, adherence to certifications and standards, decreased water use, responsible chemical management, recycling and circular economy initiatives, improved worker welfare, growing consumer awareness, government support, and ongoing research and innovation are some of the key drivers of this growth. Although there are still issues, the industry's move towards sustainability is a beneficial development because it is in line with worldwide trends and takes social and environmental concerns into account.

The popularity of sustainable and organic clothing demonstrates how modern consumers are adopting eco-friendly design trends. The demand for organic textiles is growing in line with its market size, which is also expanding. For instance, organic cotton, the world's biggest producer (51%) with 1.23 million

tonnes expected to be produced in 2022, has emerged as the most well- known sustainable textile in India. Fortuna Business Insights published a paper titled "Organic Cotton Market, 2021-2028" that contained two noteworthy findings.

First, by 2028, the market for organic cotton will reach an impressive figure of USD 6,730.9 million. It is anticipated to expand at a CAGR of 40.0% between 2021 and 2028. Natural fertilizers and safe materials were used to make organic cotton, a naturally grown textile with a lesser environmental impact than synthetic cotton.

The psychology of buyers has also undergone a significant transformation. 'Value-based eco- friendly purchasing' has become more popular as a result. The contradictory state of the textile sector now is to blame for the organic fashion surge.

On the plus side, the Business Research Company's recently issued worldwide Market Report, 2023 predicted that the worldwide textile market would expand at a 6.6% CAGR from $573.22 billion in 2022 to $610.91 billion in 2023.

The one obvious drawback is that the textile and apparel sector is one of the most polluting in the world. According to studies conducted worldwide, cleaning procedures and textile waste degrade the quality of 20% of the world's freshwater bodies and about 5% of landfill area. Before arriving on our hangers, fast fashion items frequently go through a protracted and demanding chemical procedure.

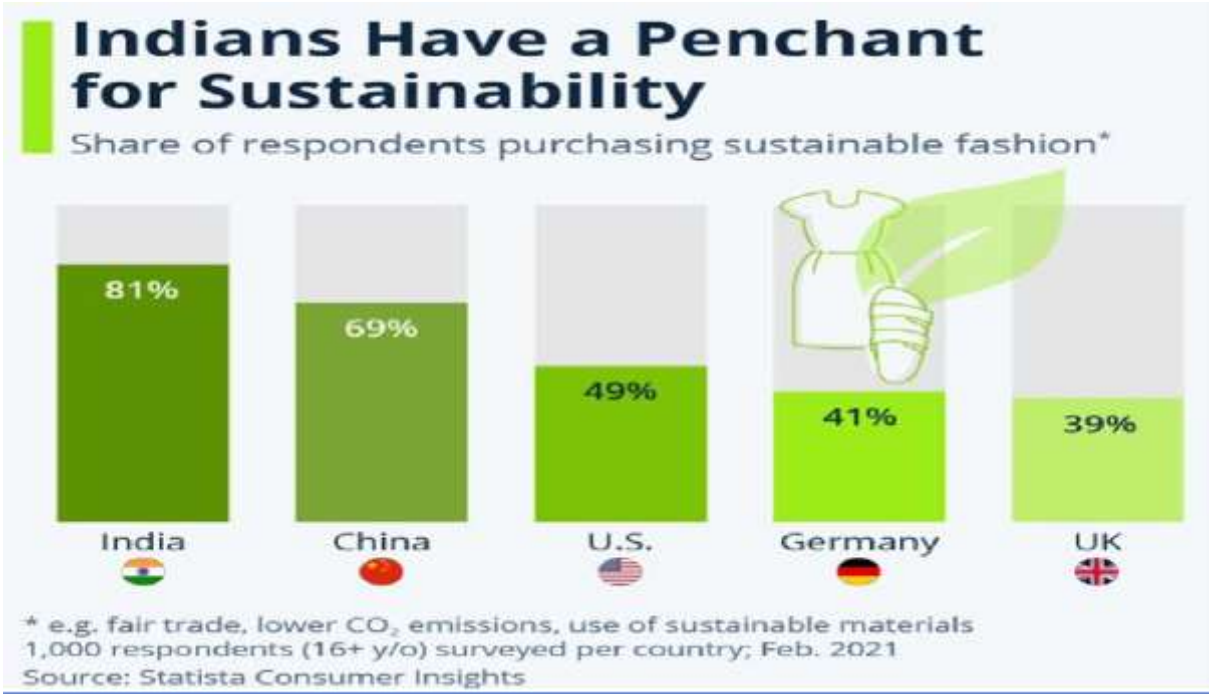
The global market for organic apparel has experienced a period of intense growth as a result of the heat of climatic change and the virulent effects of prioritizing development over environmental concerns. Cork, Hemp, Organic Cotton, Recycled Cotton, and Linen are some of the raw materials driving the expansion of the sustainable fashion sector.

Sustainable textiles don't need to be produced with hazardous pesticides and fertilizers, making them environmentally friendly. They neither employ genetically engineered seeds nor dilute the soil's nutrients. Pesticides that have been certified as organic are used to make organic fibres, which also use little water overall. They use 88% less energy and 62% less water than the manufacture of synthetic cotton.

Hemp is a resourceful, environmentally friendly fabric that absorbs CO2 from the atmosphere and has carbon-negative qualities. It is a chemical-free fabric that is water-efficient, improves soil quality through phytoremediation, and uses no chemicals in its production. It is a rather well-liked substance in the West and is gradually gaining ground there as well.

The idea of "ethical fashion" is advancing because there are no divisive opinions regarding the sustainability of organic apparel. In the leisure and fashion industries, it has provided new and energizing techniques, which has caused the abnegation of outdated feudal thinking paradigms. The trend of mindless purchasing has faded. Customers are aware of the textiles and asking questions about them while favouring organic clothing over chemical-based items, which has definitely demonstrated a cogent change in the fashion sector. Organic fashion lines are being introduced by brands, and the emergence of organic fashion brands is at its height of development.

Statistics from the sustainable fashion sector indicate that due to India's growing interest in ethical fashion, the market is anticipated to increase to $9.81 billion in 2025 and $15.17 billion in 2030 at a CAGR of 9.1 percent.



89 percent of Indians polled as part of a 2021 Statista Consumer Insights special reported to shop for environmentally friendly and sustainably produced clothing, such as items created from fair trade materials, fair trade goods, or goods with lower CO2 emissions. According to our graph, this places Indian survey respondents as the most environmentally conscientious dressers among all the nations examined.

Out of the five countries surveyed, China comes in second position with 69 percent of respondents purchasing eco-friendly apparel, accessories, or shoes. Only 49 and 41% of respondents, respectively, from participants in Western nations like the United States or Germany, claimed to often purchase eco-friendly clothing and related things.

According to other parts of the study, 45% of the respondents who were Indian citizens said they would be willing to pay significantly more for clothing if it were manufactured fairly. While just 47% of Indians claimed to base their purchase on the brand or manufacturer, quality, pricing, and comfort were the three most important factors for sustainable fashion purchases in India.

Due to the life cycle resource consumption and environmental emissions of textile products, an essential part of modern human life, there has been a lot of interest from both suppliers and consumers recently . Some textile producers have made sustainable development a priority in their operations. The Global 100 Most Sustainable Corporations in the World Index was released by Institutional Knights, a Canadian communications and research firm. It includes manufacturers who were chosen based on the results of four screening procedures that evaluated 12 key performance indicators for ecological responsibility (such as resource and energy usage efficiency) and community involvement (such as employee turnover and leadership diversity).

The financial viability of adopting sustainable development must be carefully considered by textile producers in India in light of the fast shifting economic environment where it is no longer merely a choice but a strategic need. This study aims to clarify the intricate financial processes at work, assisting industry stakeholders in making decisions, navigating difficulties, and maximising possibilities related to sustainability.[1]

REVIEW OF LITERATURE

Ready or not, we are moving into a resource-constrained world where organisations increasingly need to consider total return on resources, not just assets and capital. They need to monitor how much water, soil and other natural resources they use and what benefits they derive from it. Companies that cannot calculate this equation will find themselves at the mercy of price increases, volatility, regulation, and societal pressures, while those that have mastered it will enjoy a competitive advantage and gain market share. (Knut Haanaes, David Michael, Jeremy Jürgens, and Subramanian Rangan).

Diffusion of sustainable practices, even behaviours such as recycling and composting, are often more a product of social knowledge and influences, rather than discrete individual choices or declarative knowledge (Pei, 2019, Redman and Redman, 2014, Rogers, 2003).

Greentailing is a trend towards more ethical business practices that involves integrating green practices into all aspects of a company's operations and sales of environmentally friendly goods and services. According to Ferraro and Sands(2009), green firms have the potential to offer significant returns on investment and cost savings, which can give green retailing a competitive advantage. Sinha explained that "the business of selling environmentally friendly items to the general public and/or the practice of running a business that sells products to the general public using environmentally friendly ways" are examples of sustainable practices.

Sustainable manufacturing is crucial for cost-effective resource usage, waste reduction, and waste management. There are a number of reference materials that offer methods for analysing and changing textile production processes to use less energy and water, which reduces pollution (Hasan, 2020).

There is a need for sustainable practices and the active involvement of various stakeholders in promoting environmentally friendly approaches which is why Green marketing is also gaining importance in recent times. Robert Dahlstrom (2018) found that Green Marketing benefits numerous economic actors. It benefits the environment, emerging economies, customers, company strategy, products, manufacturing methods, and supply chain. Green marketing businesses form connections with government, local communities, NGOs, industry experts, and rivals

In a study by Krings and Schusler T(2018), unveiled a spectrum of strategies employed by community organisations, ranging from impending development to negotiating for local safeguards, diving, alternative solutions, and forming alliances with gentrifiers. The authors emphasise the ethical and practical implications of these responses, advocating for an intersectional approach that seamlessly integrates economic, social and environmental dimensions within the practice of social work. Authors recommended the need for a comprehensive comparative analysis that not only considers the financial cost, but also the social and environmental repercussions of sustainable development within contemporary context, thereby providing a holistic perspective on the genuine cost implications of sustainable development.

Guarnieri (2021) has meticulously examined the financial dimensions of sustainable development, emphasising substantial resource consumption, and the generation attributed to contemporary construction practices. Through the study, the author underscores the financial feasibility and imperativeness of incorporating sustainability into contemporary development efforts.

The nation's production and consumption of textiles have increased due to population growth, which has also caused the world economy to flourish. According to studies, the worldwide textile sector is worth $3 trillion annually and accounts for 2% of the global gross domestic product (GDP). The

[1] (https://www.statista.com/chart/29693/sustainable-fashion-purchasers/)

(https://timesofindia.indiatimes.com/blogs/voices/trend-of-sustainable-clothing-booming-in- india/)

production of apparel and textile products, one of the major industries in the world, totals more than 100 million metric tonnes annually. The main environmental effects of textile products occur during the production stages. At every stage of production, from the gathering of raw materials to the final disposal of the products, the textile and apparel industries cause environmental harm. For example, the release of heavy chemical loads, excessive water use, excessive energy use during the production of fabrics, air emissions, solid waste generation, and odour formation are all significant effects of the textile and apparel industries. Studies showed that the textile sector should utilise more environmentally friendly materials. (Yao, 2021; Hiller, 2021; Lu, 2021; Niinimaki et al., 2021)

However, the textile sector both contributes significantly to economic growth and is a significant source of pollution. In a similar vein, research claimed that China, which is the world's largest exporter and producer of textile goods, was responsible for 25.1% of all CO2 emissions in 2010. This estimate shows that power generation was responsible for 37.2% of China's total CO2 emissions. A study found that the annual carbon emissions from the textile industry exceed 1.2 billion. As a result, dyeing in the textile sector is reportedly not a sustainable activity due to high chemical usage, high water and energy consumption, and a high rate of effluent emission. Therefore, the textile and garment industry have a significant impact on the ecosystem, which is a key factor in the revolutionization of a country's economic situation. The majority of industrialised and several emerging nations today have included sustainable manufacturing practises into their textile production processes, which has increased the market share and competitiveness of the sector. (Hasanbeigi and Price, 2012; Mortensen, 2021, Niinimaki et al., 2020)

Performance sharpness is shown everywhere by greater performance, according to Singh et al. (2019)'s analysis of SM. Three scenarios were suggested by automation in manufacturing, digital threads, industrial systems, and artificially-built industrial tools as a facility (Lu et al., 2020a, 2020b). Information technology, environmental issues, managerial economics, law, and organisational issues should all be given more attention, according to Kusiak's (2021) suggestion. Universal manufacturing should also be known for its flexibility, similarity, and empathy. Management, cost-cutting, and environmental promotion have a significant influence on the adoption of sustainability, according to a 2020 study by Yadav et al. It is crucial for SMEs preparing for manufacturing permanently to stay in business for a long time given the ongoing increase in product innovation, expenses, and the expanding ecosystem and governmental regulations (Sharma et al., 2022). Calder et al. (2019) and Goyal et al. (2019) concluded that SMEs acceptance, industry ease of implementation for sustainable business and profitability, as well as environmental awareness. In order to remain in operation and protect future generations from the negative effects of the manufacturing process, manufacturing organisations must implement the enablers (Malek and Desai, 2019a; Yadav et al., 2020).

Muthu(2022, 2019, 2016) stated that scholars stress the significance of achieving a harmony between economic growth and environmental conservation. Although the initial investment may be higher, the long-term advantages encompass reduced operational costs, enhanced brand reputation, and potential savings through resource efficiency. Businesses and organisations increasingly rely on diverse metrics and frameworks to evaluate and convey their sustainable development endeavours, including environmental, social, and governance (ESG) reporting. Researchers delve into the efficacy of these metrics in quantifying the financial impacts within the textile industry.

Braungart M, McDonough W (2009) and Goodall P, Rosamund E, Harding J (2014) investigated concerns like upfront investment expenses, resistance to change within organisations, and the intricacies of balancing economic and environmental objectives. Grasping these challenges is vital for formulating effective strategies for sustainability. Evaluating the Return on Investment (ROI) of such technologies stood out as a crucial area of focus. Quality of life and community impact: Sustainable development initiatives bear concrete consequences on the well-being of communities. Scholars emphasise that fair resource distribution and sustainable practices can mitigate social disparities, foster social cohesion, and build stronger communities. Furthermore, sustainable development promotes clean air, water, and green spaces.

In summary, the literature examining the financial implications of sustainable development in modern contexts provides a comprehensive outlook on the multifaceted nature of sustainability in both business and society.

OBJECTIVES

To understand how sustainable development practices impact the financial aspects of the textile business.

To provide light on whether sustainable development strategies, which are frequently seen as a responsible fashion.

To understand the motivating factors that enhance the commercial success in the textile sector.

To recommend insights to service providers in the terms of customer perception towards adoption of sustainable fashion.

To recommend the bottleneck factors in adoption of sustainable fashion due to financial derivatives.

HYPOTHESIS

- The Indian textile sector adopts sustainable development practises, which results in longer-term cost reductions but higher initial investment costs.
- Utilising environmentally friendly technology and methods lowers waste and resource consumption, which eventually lowers production costs.

- Companies that prioritise sustainability and ethical business conduct benefit from enhanced brand loyalty and consumer trust, which may more than balance any increased expenses.
- The risk of price changes resulting from environmental and social concerns in the textile sector is reduced by sustainable procurement of raw materials and supply chain management techniques.

MOTIVATION OF THE STUDY

The motivation of this research is to comprehensively investigate the financial aspects of implementing sustainable development strategies within the textile industries, contemporary landscape. Through a comparative analysis, the study aims to quantify the cost, effectiveness of various sustainable practices and technologies. By shedding light on the economic impact of sustainability in Texas, it tries to provide actionable insights for industry stakeholders, guiding them towards environmentally, responsible and financially viable decisions.

RESEARCH METHODOLOGY

This study adopts a mixed-methods research design to comprehensively analyze the cost implications of sustainable development practices in the textile industry.

Quantitative data is gathered through surveys and questionnaires distributed to stakeholders in the Indian textile industry. These surveys cover various aspects such as demographic information, subscription fees, convenience factors, and current sustainable practices within the industry. The questionnaire is meticulously crafted after thorough investigation of the subject matter to ensure relevance and effectiveness in capturing essential insights. Approximately 150 respondents are targeted for inclusion in the study sample.

The collected data undergoes statistical analysis employing techniques like correlation analysis, mean average calculations, and descriptive statistics. These analyses aim to derive numerical insights and identify relationships, thus shedding light on the cost implications of sustainability practices in the textile industry. In addition to primary data collection, secondary data is gathered from previous scholarly papers, industry reports, and other relevant sources to provide contextual background information and enhance the depth of analysis.

The research scope encompasses a sociological examination of the multifaceted impacts of sustainable development practices in the textile industry, particularly focusing on the shift from traditional practices to more sustainable alternatives. It delves into consumer attitudes, preferences, and behaviors regarding sustainable textile production and consumption. Furthermore, the study explores the implications of these practices on climate change and proposes recommendations to enhance energy efficiency within the industry.

As part of secondary research, the study extensively reviews literature from various sources, including academic journals, industry reports, white papers, and reputable news outlets. Both qualitative and quantitative primary research methods are employed to gauge consumer perspectives on sustainable textile practices, especially in the wake of the COVID-19 pandemic. Overall, this research employs a descriptive research methodology supplemented by both quantitative and qualitative approaches to provide a comprehensive analysis of the cost implications of sustainable development practices in the Indian textile industry. The research design ensures robust data collection and analysis, enabling valuable insights for industry stakeholders and policymakers alike.

Sampling Method:

The study utilizes a probability sampling method to ensure representative data collection. Random sampling techniques are employed to select participants for the survey, which is conducted online. This method enhances the reliability and validity of the study findings by minimizing bias and ensuring equal representation within the sample.

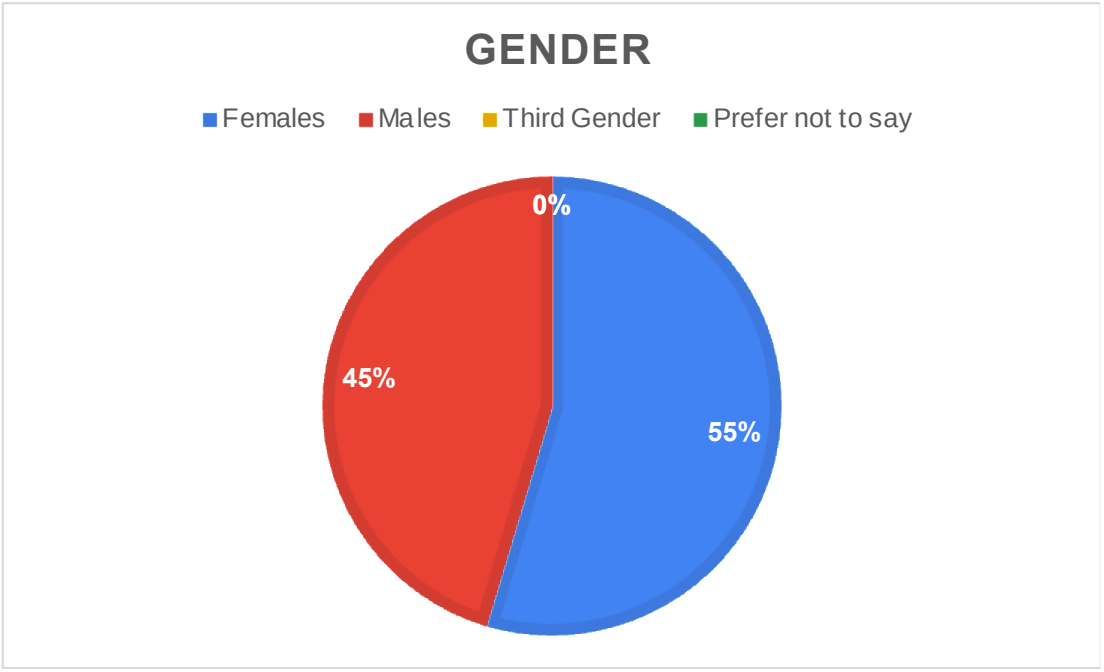
Sample Area:

The research focuses on the city of Bangalore, India, known for its vibrant textile industry and significant youth population. A probability sampling approach is utilized to select participants from this region, ensuring the sample's representativeness and increasing the generalizability of the findings.

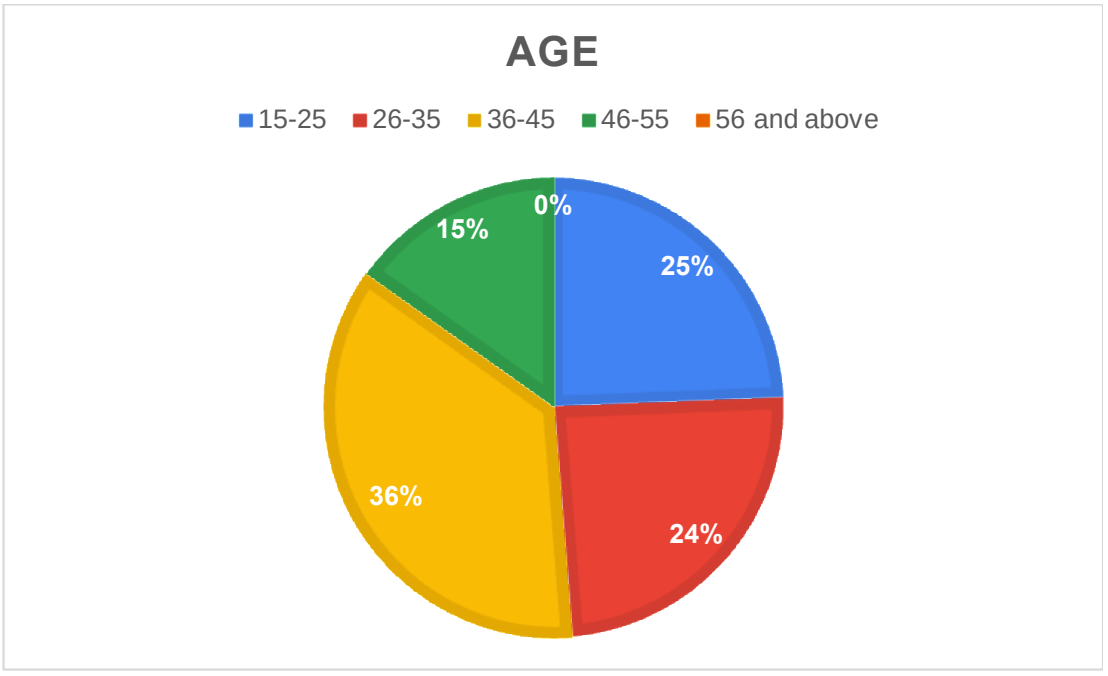
Survey Method and Medium:

Data collection is facilitated through a meticulously designed questionnaire administered via Google Forms. The questionnaire encompasses closed-ended and open-ended questions, allowing for comprehensive data collection on various aspects of sustainable textile practices. Distribution channels include email and social media platforms, ensuring widespread participation and diverse perspectives. The use of Google Forms streamlines data collection and analysis processes, enhancing efficiency and accuracy in capturing essential insights.

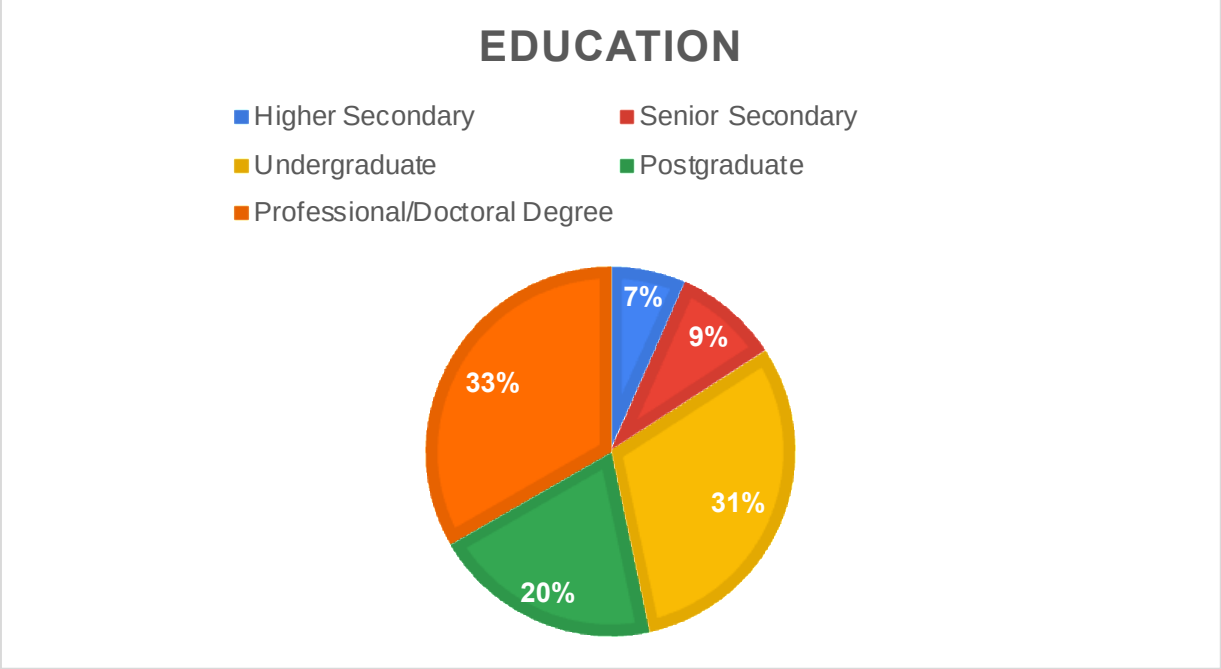
DATA INTERPRETATION AND ANALYSIS



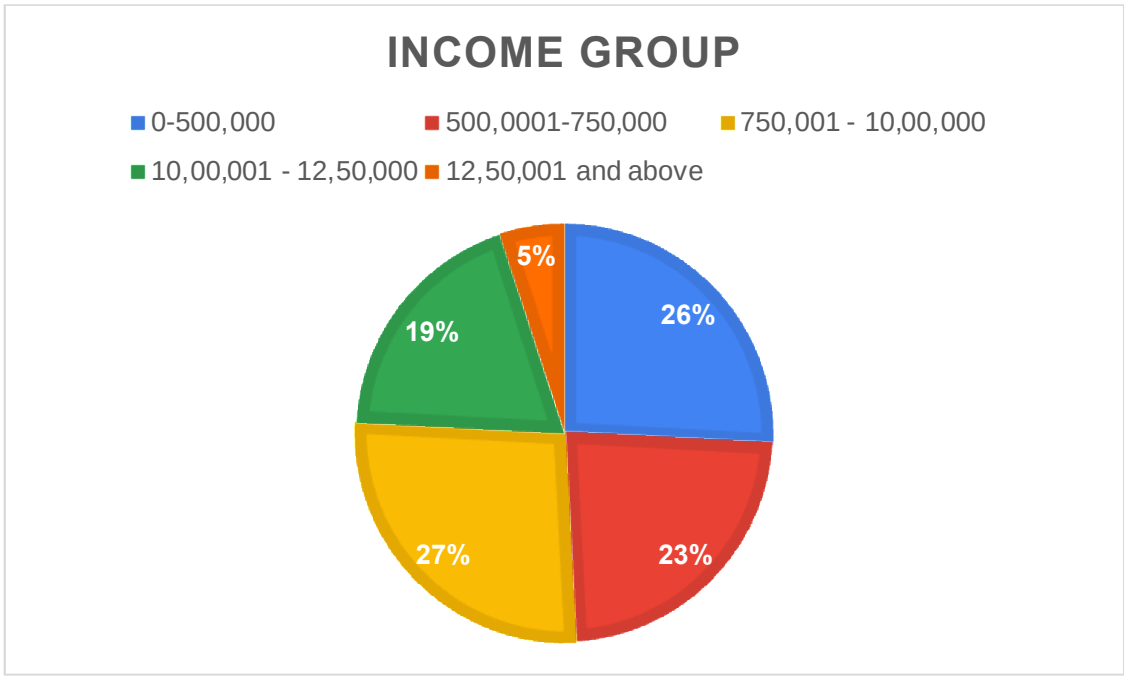
There are 65 females and 54 males out of a total of 120 people in the group. This distribution suggests that there is a slight majority of females compared to males, but the overall gender balance is relatively close to even. While the majority of individuals in the group may identify as male or female based on the provided information, it's crucial to acknowledge the possibility of other gender identities being present but not explicitly mentioned.



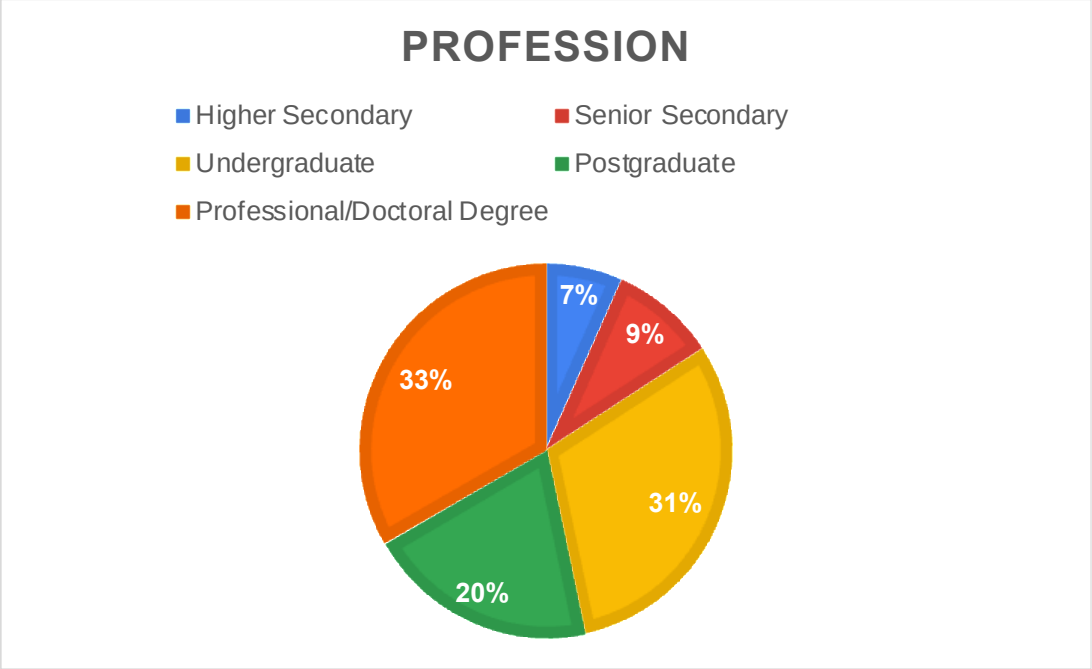
The group displays a diverse age distribution, with significant representation from individuals aged 36 to 45 (43 individuals) and a notable presence of youth and young adults aged 15 to 25 (29 individuals). There's also a balanced distribution across other age brackets, including individuals aged 26 to 35 (29 individuals) and those aged 46 to 55 (18 individuals). However, there's a conspicuous absence of individuals above the age of 55. This diversity in age ranges suggests a mix of perspectives and life experiences within the group, but the lack of representation from older adults may lead to a gap in perspectives from that demographic. To foster inclusivity and broaden the range of perspectives, efforts could be made to engage individuals from a wider age spectrum, including older adults, in group activities and discussions.



The dataset reflects a diverse educational background among the group members. While a smaller number of 8 individuals have completed education at the Higher Secondary and 11 individuals, Senior Secondary levels, a larger proportion have pursued higher education. Notably, 37 individuals have attained an Undergraduate degree, followed by 24 individuals with a Postgraduate qualification. However, the majority of 40 individuals hold Professional or Doctoral degrees, indicating a significant emphasis on advanced education within the group. This distribution suggests a mix of academic achievements, with a notable focus on higher education and professional development. Such diversity in educational backgrounds likely contributes to a rich array of expertise and perspectives within the group, facilitating robust discussions and collaboration across various domains.



Among the 120 individuals in the group, there is a varied distribution of income levels. The majority of individuals fall within the lower income brackets, with 31 individuals earning between 0 and 500,000. However, there is a relatively balanced representation across the middle income brackets, with 28 individuals earning between 500,001 and 750,000, 32 individuals earning between 750,001 and 1,000,000, and 23 individuals earning between 1,000,001 and 1,250,000. Notably, there is a smaller proportion of individuals with higher incomes, as only 6 individuals have incomes exceeding 1,250,000. This distribution suggests a diverse range of economic backgrounds within the group, with a significant portion falling within the middle income range and a smaller but notable presence of both lower and higher income earners. Such diversity in income levels likely contributes to a range of perspectives and experiences within the group, influencing discussions and decision-making processes.



Among the surveyed individuals, there is a diverse distribution of occupations. A small portion of 4 and 5 individuals in the group consists of students and homemakers respectively, suggesting a mix of individuals at different life stages and roles within the household. In terms of employment, the group is almost evenly split between the Private Sector consisting 51 individuals and the Public Sector with 48 individuals, indicating a balanced representation of individuals working in both sectors. Additionally, there is a smaller but notable presence of individuals who are self-employed, professionals, or business owners - 12 individuals, highlighting entrepreneurship and independent work within the group. This distribution suggests a varied occupational landscape within the surveyed population, with individuals engaged in different sectors and roles, which likely contributes to a diverse range of perspectives and experiences within the group discussions and interactions.

SN. NO.	FACTOR	MEAN	STANDARD ERROR
1	future generations' quality of life	3.865546	0.069511
2	Textile Sustainability Risk	3.655462	0.075891
3	cost-effectiveness & environment	3.890756	0.078068
4	Sustainability for long-term cost savings	3.773109	0.074947
5	Government regulations for sustainability	3.747899	0.07378
6	Sustainable practices for the environment.	3.915966	0.079684
7	well-being of factory workers	3.848739	0.070239
8	Long Term Competitive Edge Sustainability	3.756303	0.081789
9	The certification of "Global Organic Textile Standard (GOTS)" for promoting sustainability.	3.756303	0.076386

10	good education to achieve sustainability	3.663866	0.091885

	Impact of Government incentives on reducing operational costs	cost-saving measures that also benefit the environment	the well-being of the communities	Government incentives and regulations in making sustainability affordable	Sustainable practices for preserving the environment	sustainable textile practices in impacts the well-being of factory workers.
I am committed to contributing to the well-being of the communities in which I operate.	**0.458**	**0.553**				
Sustainability practices in the textile industry can lead to long-term cost savings.		**0.512**	**0.485**			
Sustainable practices in the Indian textile industry are essential for preserving the environment.				**0.539**		
The adoption of sustainable textile practices in India positively impacts the well-being of factory workers.				**0.474**	**0.515**	
The certification of textiles with eco-friendly labels like "Global Organic Textile Standard (GOTS)" is crucial for promoting sustainability.					**0.498**	
The topics addressed in this survey impact my and future generations' quality of life very much.			**0.506**			
To achieve sustainable development, all the people in the world must have access to a good education.						**0.507**

FINDINGS AND DISCUSSION

1.Competition of Textile companies investing in sustainability and Textile Sustainability Risks: Volatility, Preferences and correlation.

Textile firms face heightened global competition and shifting consumer preferences towards sustainability, prompting investments in eco-friendly practices. Amidst challenges like COVID-19, Kaizen methodologies support adaptation through employee engagement and continuous improvement, while MICMAC analysis identifies critical success factors for implementation during crises. Enhancing resilience requires investments in technology, digitalization, and stakeholder collaboration for sustained competitiveness.

2.Well- communities and cost-effectiveness & environment well being

Sustainable manufacturing practices, like energy efficiency and waste reduction, mitigate environmental pollution and foster community well-being. Within the circular economy, they drive local economies and innovation while promoting inclusivity. Industry 4.0 technologies optimize costs and efficiency through digitization and data analytics, supporting sustainable practices and circular principles. Understanding institutional pressures and investing in sustainable measures yield long-term savings, while circular economy principles enhance resource efficiency and revenue generation. Integrating Industry 4.0 with sustainability and circular economy principles maximizes benefits for communities, cost-effectiveness, and environmental sustainability, promoting social responsibility.

3.Sustainability & long-term cost savings and cost-effectiveness & environment

Rudrajeet Pal proposes, “a holistic framework of design aspects in reverse value chains, and extends existing knowledge on how these aspects manifest value creation.” This framework elucidates the influence of design factors on value generation within reverse logistics, contributing to existing knowledge. It supports the advancement of circular economy practices in textiles by offering insights into optimizing reverse value chains for sustainability, cost-efficiency, and environmental impact through systematic analysis.

In summary, there's substantial potential for value creation in used clothing networks through sustainability, long-term cost savings, and environmental preservation. By embracing circular economy principles and innovative approaches, stakeholders can maximize value creation while minimizing negative environmental impacts.

4. Sustainability & long-term cost savings and Commitment towards Community Well-being.

In Indonesia's textile and clothing sector, embracing sustainable practices like renewable energy usage and waste reduction presents opportunities for long-term cost savings and enhanced competitiveness. By investing in sustainable supply chain strategies, companies can minimize operating expenses while minimizing environmental impact, thus promoting resilience and long-term viability.

Future research endeavors should focus on developing standardized frameworks for assessing Sustainable Supply Chain Management (SSCM) performance, facilitating effective benchmarking and adaptation to evolving sustainability trends. Studies such as Vita Sarasi's (2023) likely shed light on both opportunities, such as rising customer demand for ethical textiles, and challenges, like high upfront investment costs and regulatory complexities, in integrating sustainable practices.

5. Impact on future generations' quality of life and Commitment towards Community Well-being.

Sustainable practices in the textile and apparel sector, such as eco-friendly production processes and responsible waste management, can significantly improve the quality of life for future generations by mitigating pollution and resource depletion. Research underscores the need for long-term sustainable plans considering social, environmental, and economic impacts.

George K. Stylios' study (2004) explores various textile innovations, including eco-friendly production techniques and intelligent textile applications, reflecting the industry's commitment to advancement. The textile and apparel industries prioritize community well-being through ethical sourcing practices and corporate social responsibility initiatives, promoting social bonds and sustainable development.

6. The adoption of sustainable textile practices in India positively impacts the well-being of factory workers.

In India, sustainable textile practices often incorporate initiatives aimed at enhancing working conditions in factories, such as ensuring fair wages, providing safe environments, and upholding workers' rights. Research suggests that companies committed to sustainability tend to invest more in employee training and capacity-building programs, which can enhance job satisfaction and overall well-being.

These sustainable practices also contribute to improving the health and safety of textile workers by reducing workplace accidents, enhancing occupational health standards, and minimizing exposure to hazardous chemicals. Businesses implementing sustainable methods, such as effective chemical management systems and ergonomic workplace designs, may experience lower rates of work-related illnesses and injuries among their workforce.

Moreover, sustainable businesses prioritize social compliance and transparency across their operations, adhering to labor regulations, employing ethical sourcing methods, and offering clear reporting on environmental and social performance. Research findings may indicate that increased accountability and transparency in the textile sector raise awareness of labor practices and incentivize businesses to maintain higher standards of worker well-being to uphold their reputation and legitimacy.

7. Long Term Competitive Edge Sustainability and Government regulations' crucial role in making sustainability affordable

George K Stylios(2010) states, “Runs the whole gamut of textile innovation, research and testing, some of which investigates hitherto untouched aspects”. This study explores previously uncharted territories, revealing new opportunities for advancement and addressing knowledge gaps. It encompasses a diverse range of topics, including cutting-edge materials, sustainable production methods, advanced testing techniques, and smart textile applications. Through interdisciplinary collaboration and thorough investigation, the study uncovers untapped potential in the textile industry, driving innovation and shaping its future for various applications and sectors.

Government regulations play a pivotal role in promoting sustainability in the textile and apparel industries by establishing environmental standards, promoting eco-labeling programs, and providing incentives for sustainable innovation. Research indicates that government rules can make sustainability more affordable by offering financial support, tax benefits, and access to funding for sustainable activities. However, initial implementation of sustainability measures may lead to increased costs for businesses. Governments can level the playing field, encourage industry-wide adoption of sustainable practices, and drive economies of scale by enacting clear and enforced policies.

8. Access to good education to achieve sustainability and need of Sustainable practices for preserving the environment.

George.k Stylios(2012) states, “Cotton fabric processing, asbestos substitutes, textile adjuncts to cardiovascular surgery, wet textile processes, hand evaluation, nanotechnology, thermoplastic composites, robotic ironing, protective clothing.” Research underscores education's vital role in fostering sustainability within the textile sector, empowering stakeholders to make informed decisions. Education on environmental science, social responsibility, and sustainable business practices is essential for professionals, legislators, and consumers. Teaching sustainability to future textile workers cultivates ethical behavior and a mindset of continual improvement.

Urgency for implementing sustainable practices to minimize pollution, resource depletion, and environmental damage is highlighted, alongside examples of eco-friendly manufacturing techniques and circular economy initiatives. Evidence of the positive correlation between education levels and sustainability performance in the industry may be presented, along with case studies demonstrating environmental benefits and resource efficiency. Collaboration among government, business, and academia is crucial for advancing sustainability education and finding solutions to environmental challenges, emphasizing the necessity of adopting sustainable practices for environmental protection within the textile and apparel industries.

9. Eco-Friendly Textile Certification "Global Organic Textile Standard (GOTS)" is crucial for promoting sustainability.

Research indicates that certifications like GOTS play a crucial role in promoting sustainability within the apparel industry by establishing clear guidelines for socially and ecologically responsible production practices. GOTS certification ensures the use of organic fibers and adherence to stringent standards for social responsibility, environmental impact, and chemical usage throughout the supply chain, thereby enhancing consumer trust in sustainable clothing products.

The study by Vinaya Shukla(2022), “The garments/textiles industry is the second most polluting industry in the world.” suggests that the adoption of GOTS certification in the apparel industry positively impacts eco-friendly production methods, ethical labor standards, and the sourcing of sustainable materials. It improves supply chain transparency, traceability, and accountability while also driving improvements in social compliance and environmental performance. Additionally, the industry's efforts to address environmental pollution, highlighted as the second most polluting industry globally, through reduced resource consumption, circular economy initiatives, and sustainable practices, are crucial for ensuring a more sustainable future for society and the environment.

10.Incorporating Sustainability Across Disciplinary Education and Sustainable Development Increases Production Costs.

Development activities can result in long-term benefits like increased market competitiveness, lowered regulatory risks, and improved brand perception, even though they may initially increase production costs. Research emphasizes integrating sustainability into disciplinary education, fostering awareness and solutions, and enabling future professionals to drive change. Despite higher costs, sustainable development offers significant benefits, requiring investments in technology and training.

In the study by Janya chanchaichujit (2023), “There would appear to be no limit to the future potential for textile applications.” Ongoing textile innovation, spanning from eco-friendly fashion to smart textiles, offers endless possibilities. Balancing sustainability and profitability is crucial for textile companies, requiring strategies like resource efficiency and innovative business models. Integrating sustainability into education is key, highlighting challenges and opportunities in the industry's pursuit of sustainable development goals.

LIMITATIONS

1. Implementing sustainability initiatives not too costly and government incentives or subsidies have an impact on reducing operational cost.

While sustainability initiatives offer long-term cost savings, the initial investment required may pose a barrier for some organizations, particularly small businesses or those with limited resources. Lack of awareness about potential benefits and government incentives, along with regulatory obstacles, can further impede implementation. Technological limitations, complex supply chains, and differing organizational cultures also present challenges. Additionally, consumer demand for sustainable products and ongoing commitment are essential for success. The study acknowledges limitations such as sample size constraints, difficulty in reaching interviewees, and resource constraints, which could affect the proposed framework. Increasing sample size and interviews may have influenced results, but logistical constraints restricted these factors in the research.

2. Sustainable development in the Indian leads to higher production costs, making products more expensive for consumers and implemented cost - saving measures to benefit environment.

Implementing sustainable practices often requires investments in technology, infrastructure, and training, leading to increased production costs and potentially higher consumer prices. Despite growing awareness of sustainability, some consumers may resist paying more for sustainable products, affecting market demand. Developing and maintaining sustainable infrastructure, such as renewable energy systems and waste management facilities, is costly and requires extensive planning, especially for smaller enterprises navigating complex regulatory landscapes.

Striking a balance between economic growth and sustainable development poses a challenge, with economic priorities sometimes overshadowing sustainability goals. Limited awareness and understanding of sustainable practices hinder adoption, particularly in rural areas lacking necessary infrastructure for waste management and renewable energy sources. Socioeconomic disparities further exacerbate challenges in resource distribution and sustainable development implementation.

Cultural norms and behaviors also influence the acceptance of sustainable practices, with overcoming cultural barriers and promoting behavior change presenting a challenge. Political will and effective governance are essential for driving sustainable development, but inconsistent policies, corruption, and enforcement gaps can impede progress. The study suggests opportunities for further research, focusing on barriers to sustainable consumption in the textile industry and consumer behavior perceptions. It also emphasizes the study's utility for sustainable businesses, policy-making, and governance, suggesting potential applications in rural areas and comparative studies across developing countries.

3. GOTS is crucial for promoting sustainability and implementing initiatives not too costly

Finding suppliers that meet the GOTS standards and have the necessary certifications can be challenging, especially for smaller businesses or in certain regions. GOTS compliance may require significant investments in equipment, training, and certifications, which can be financially burdensome for small businesses, potentially impacting their competitiveness.

The textile industry often involves complex supply chains with multiple stakeholders, making it challenging to ensure compliance with GOTS standards throughout the entire production process. While there is a growing interest in sustainable textiles, some consumers may not be aware of GOTS or may not prioritize purchasing GOTS-certified products, which can impact market demand. While GOTS sets high standards for sustainable practices, there is always room for improvement. Keeping up with evolving environmental and social standards can be a challenge for businesses.

RECOMMENDATION AND CONCLUSION

To enhance the analysis of the cost implications of sustainable development practices in the textile industry, several recommendations are proposed. Firstly, there is a call to expand the demographic study to incorporate a more nuanced understanding of gender identities beyond binary categorizations. Additionally, there's a suggestion to delve deeper into the impact of varying educational backgrounds on attitudes and actions towards sustainable development practices through qualitative interviews or surveys. Furthermore, refining the analysis of income levels within the industry can provide a more comprehensive understanding of the financial effects of sustainable strategies.

The study's findings reveal a diverse demographic makeup within the textile sector, encompassing various gender identities, age groups, income levels, educational backgrounds, and occupational diversity among respondents. Moreover, the prevalence of higher education and professional qualifications suggests a wealth of knowledge within the surveyed population, emphasizing the significance of educational backgrounds in shaping attitudes towards sustainable development practices.

The participation of individuals from diverse occupations and industries, including self-employment and both public and private sectors, underscores the complexity of sustainable development's impact across various sectors. Recognizing this diversity is crucial for understanding the multifaceted effects of sustainable strategies in the textile industry. Overall, considering a range of demographic variables is essential for a comprehensive assessment of the financial implications of sustainable development practices, facilitating informed decision-making and promoting sustainable development in the Indian textile sector.

FUTURE SCOPE

The future trajectory of sustainable development in the textile industry presents numerous avenues for growth and advancement. Firstly, technological innovations such as waterless dyeing, recycled fibers, and energy-efficient machinery are poised to significantly reduce environmental impact and operational costs. Additionally, increased transparency in the supply chain, facilitated by technologies like blockchain, will ensure sustainability standards are upheld throughout the manufacturing process. Moreover, wider adoption of circular economy practices, such as designing recyclable products and implementing take-back programs, will play a pivotal role in minimizing waste and extending product lifecycles.

Moving forward, research and development efforts in sustainable textile production are expected to focus on several key areas. Enhanced research methodologies, encompassing both quantitative and qualitative data analysis, will provide a more comprehensive understanding of sustainable practices. Moreover, expanding data collection methods and conducting consumer behavior studies will enable businesses to tailor their strategies to meet evolving

consumer preferences. Furthermore, research into policy and governance frameworks, along with geographical and comparative studies, will inform regulatory measures and provide insights into regional variations in sustainable practices.

Overall, the future of sustainability in the textile industry will hinge on continued innovation, collaboration among stakeholders, and a steadfast commitment to environmental and social responsibility. Efforts in research and development will be instrumental in driving progress towards more sustainable and equitable practices within the industry.

REFERENCE

Harsanto, B., Primiana, I., Sarasi, V., & Satyakti, Y. (2023). Sustainability Innovation in the Textile Industry: A Systematic Review. Sustainability, 15(2), 1549.

Chourasiya, R., Pandey, S., & Malviya, R. K. (2022). Developing a framework to analyse the effect of sustainable manufacturing adoption in Indian textile industries. Cleaner Logistics and Supply Chain, 4, 100045.

Emerald. (2023). The analysis of critical success factors for successful Kaizen implementation during the COVID-19 pandemic: A textile industry case study. Total Quality Management & Business Excellence. DOI: 10.1108/TQM-08-2023-0254

Rudrajeet Pal. (2017). Relationships between Industry 4.0, sustainable manufacturing, and circular economy: Proposal of a research framework. International Journal of Operations & Production Management, DOI: 10.1108/IJOA-04-2020-2120

Rudeajeet Pal. (2017). Value creation through reverse logistics in used clothing networks. International Journal of Logistics Management, [Volume](Issue), page range. DOI: 10.1108/IJLM-11-2016-0272

Sarasi, V., Primiana, I., Harsanto, B., & Satyakti, Y. (2023). Sustainable supply chain of Indonesia's textile & apparel industry: Opportunities and challenges. Research Journal of Textile and Apparel, DOI: 10.1108/RJTA-08-2022-0091

Stylios, G. K. (2004). International textile and clothing research register. International Journal of Clothing Science and Technology, DOI: 10.1108/09556220410794961

Nurhayati, R., Taylor, G., Rusmin, R., Tower, G., & Chatterjee, B. (2016). Factors determining social and environmental reporting by Indian textile and apparel firms: A test of legitimacy theory. Social Responsibility Journal, DOI: SRJ-06-2013-0074

Stylios, G. K. (2004). International textile and clothing research register. International Journal of Clothing Science and Technology. DOI: 10.1108/09556220410794961

Stylios, G. K. (2009). International textile and clothing research register. International Journal of Clothing Science and Technology. DOI: 10.1108/95562220980000731

Habib, M. A., Balasubramanian, S., Shukla, V., Chitakunye, D., & Chanchaichujit, J. (2022). Practices and performance outcomes of green supply chain management initiatives in the garment industry. Management of Environmental Quality. DOI: 10.1108/MEQ-08-2021-0189

Stylios, G. K. (2003). International textile and clothing research register. International Journal of Clothing Science and Technology. DOI: 10.1108/09556220310794953

Mishra, S., Jain, S., & Malhotra, G. (2021). The anatomy of circular economy transition in the fashion industry. *Social Responsibility Journal*, *17*(4), 524-542.

Aggarwal, A. (2010). Economic impacts of SEZs: Theoretical approaches and analysis of newly notified SEZs in India.

Aggarwal, A. (2010). Economic impacts of SEZs: Theoretical approaches and analysis of newly notified SEZs in India.

Abbas, J., Zhang, Q., Hussain, I., Akram, S., Afaq, A., & Shad, M. A. (2020). Sustainable innovation in small medium enterprises: the impact of knowledge management on organizational innovation through a mediation analysis by using SEM approach. *Sustainability*, *12*(6), 2407.

Torri, M. C., & Martinez, A. (2014). Women's empowerment and micro-entrepreneurship in India: Constructing a new development paradigm?. *Progress in Development Studies*, *14*(1), 31-48.

Smith, N. C. (2003). Corporate social responsibility: whether or how?. *California management review*, *45*(4), 52-76.

Barrientos, S., Gereffi, G., & Rossi, A. (2011). Economic and social upgrading in global production networks: A new paradigm for a changing world. *International Labour Review*, *150*(3-4), 319-340.

Bair, J. (2005). Global capitalism and commodity chains: looking back, going forward. *Competition & Change*, *9*(2), 153-180.

Nash, J. (1981). Ethnographic aspects of the world capitalist system. *Annual Review of Anthropology*, *10*(1), 393-423.

Carley, M., & Christie, I. (2017). *Managing sustainable development*. Routledge.

Gupta, V. (2008). An inquiry into the characteristics of entrepreneurship in India. *Journal of International Business Research*, *7*, 53.

Huertas-Valdivia, I., Ferrari, A. M., Settembre-Blundo, D., & García-Muiña, F. E. (2020). Social life-cycle assessment: A review by bibliometric analysis. *Sustainability*, *12*(15), 6211.

Pipkin, S., & Fuentes, A. (2017). Spurred to upgrade: A review of triggers and consequences of industrial upgrading in the global value chain literature. *World Development*, *98*, 536-554.

Mao, G., Hu, H., Liu, X., Crittenden, J., & Huang, N. (2021). A bibliometric analysis of industrial wastewater treatments from 1998 to 2019. *Environmental Pollution*, *275*, 115785.

Lipietz, A. (1997). The post-Fordist world: labour relations, international hierarchy and global ecology. *Review of International Political Economy*, *4*(1), 1-41.

Suwandi, I., Jonna, R. J., & Foster, J. B. (2019). Global commodity chains and the new imperialism. *Monthly Review*, *70*(10), 1-24.

Horner, R., & Nadvi, K. (2018). Global value chains and the rise of the Global South: unpacking twenty-first century polycentric trade. *Global Networks*, *18*(2), 207-237.

Nurse, K. (2006). Culture as the fourth pillar of sustainable development. *Small states: economic review and basic statistics*, *11*, 28-40.

Edwards, A. R. (2005). *The sustainability revolution: Portrait of a paradigm shift*. New Society Publishers.

Baker, S. (2015). *Sustainable development*. Routledge.

Bair, J. (2008). Analysing global economic organization: embedded networks and global chains compared. *Economy and Society*, *37*(3), 339-364.

Kaplinsky, R. (2004). Spreading the gains from globalization: What can be learned from value-chain analysis?. *Problems of economic transition*, *47*(2), 74-115.

Landgren, T. M., & Pasricha, A. (2011). Transforming the fashion and apparel curriculum to incorporate sustainability. *International Journal of Fashion Design, Technology and Education*, *4*(3), 187-196.

Punj, N., Ahmi, A., Tanwar, A., & Rahim, S. A. (2023). Mapping the field of green manufacturing: A bibliometric review of the literature and research frontiers. *Journal of Cleaner Production*, 138729.

Redclift, M. (2002). *Sustainable development: Exploring the contradictions*. Routledge.

Wu, J., Ge, Z., Han, S., Xing, L., Zhu, M., Zhang, J., & Liu, J. (2020). Impacts of agricultural industrial agglomeration on China's agricultural energy efficiency: A spatial econometrics analysis. *Journal of Cleaner Production*, *260*, 121011.

Zang, Y., Liu, Y., Yang, Y., Woods, M., & Fois, F. (2020). Rural decline or restructuring? Implications for sustainability transitions in rural China. *Land Use Policy*, *94*, 104531.

Goldfrank, W. L. (2000). Paradigm Regained? The Rules Of Wallerstein? s World-System Method. *Journal of world-systems research*, 150-195.

Telfer, D. J., & Sharpley, R. (2015). *Tourism and development in the developing world*. Routledge.

De Marchi, V., Di Maria, E., Golini, R., & Perri, A. (2020). Nurturing international business research through global value chains literature: A review and discussion of future research opportunities. *International Business Review*, *29*(5), 101708.

Suchek, N., Fernandes, C. I., Kraus, S., Filser, M., & Sjögrén, H. (2021). Innovation and the circular economy: A systematic literature review. *Business Strategy and the Environment*, *30*(8), 3686-3702.

Mezzadri, A. (2016). *The sweatshop regime: Labouring bodies, exploitation, and garments made in India*. Cambridge University Press.

Hess, M., & Yeung, H. W. C. (2006). Whither global production networks in economic geography? Past, present, and future. *Environment and Planning A*, *38*(7), 1193-1204.

Ray, S., & Ray, P. K. (2011). Product innovation for the people's car in an emerging economy. *Technovation*, *31*(5-6), 216-227.

Gereffi, G. (2005). The global economy: organization, governance, and development. *The handbook of economic sociology*, *2*, 160-182.

Marshall, Fiona, Linda Waldman, Hayley MacGregor, Lyla Mehta, and Pritpal Randhawa. "On the edge of sustainability: perspectives on peri-urban dynamics." (2009).

Rath, A. (1990). Science, technology, and policy in the periphery: a perspective from the centre. *World Development*, *18*(11), 1429-1443.

Panizzolo, Roberto, Patrizia Garengo, Milind Kumar Sharma, and Amol Gore. "Lean manufacturing in developing countries: evidence from Indian SMEs." *Production Planning & Control* 23, no. 10-11 (2012): 769-788.

Hätönen, J., & Eriksson, T. (2009). 30+ years of research and practice of outsourcing–Exploring the past and anticipating the future. *Journal of international Management*, *15*(2), 142-155.

Snyder, R. (2001). Scaling down: The subnational comparative method. *Studies in comparative international development*, *36*, 93-110.

Roy, V., & Singh, S. (2017). Mapping the business focus in sustainable production and consumption literature: Review and research framework. *Journal of Cleaner Production*, *150*, 224-236.

Meyer, K. E. (2003). FDI spillovers in emerging markets: A literature review and new perspectives. *Copenhagen Business School (Mimographed.)*, *2*.

Choe, K. A., & Roberts, B. H. (2011). *Competitive cities in the 21st century: Cluster-based local economic development*. Asian Development Bank.