

Revitalizing Marginalized Communities Towards Sustainable Well Being: An Apparel Sector Study

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Keywords

Marginalized, community, sustainable, livelihood, apparel.

Abstract

In the world marked by unprecedented economic challenges, promoting long lasting stability of social-ecological system is the call of the hour. Harnessing self-sufficient and marginalized communities for a more sustainable and equitable future is quite pertinent in today's changing landscape worldwide. Creating avenues enabling and empowering community capital development fosters effectiveness and sustainable community livelihood. With a meaningful proposition to adhere essence of sustainable wealth creation the need for building self-sustainable and marginalized economy is the new reality of global business. The broader objectives of the study aim to determine opportunities for vulnerable communities in apparel livelihood. The paper also focuses to understand key sustainable strategies for local realities. The sample size comprises of 354 respondents belonging to marginalized community residing in lower to middle income brackets predominantly in apparel sector. The data analysis comprises descriptive statistics, reliability and validity testing and co-relation analysis. The study situates marginalized apparel workers within global supply chains, emphasizing buyer accountability, labour standards, and ethical sourcing. It also links livelihood outcomes to ESG compliance and India's role in global value chains. The results reveal that sustainable marginalized community is directly impacted by motivation, job-linked opportunities and wellbeing. The paper attempts to project a realistic evidence-based livelihood study fostering resilience that potentially enhance in community development at large.

Citation

Naskar P., Digar, B., Kundu, P. (2026). Revitalizing Marginalized Communities Towards Sustainable Well Being: An Apparel Sector Study. *Science, Education and Innovations in the Context of Modern Problems*, 9(7), 1-18. <https://doi.org/10.56834/sei/9.7.7>

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Received: January 03, 2026

Accepted: April 21, 2026

Published Online: May 06, 2026

INTRODUCTION

In the changing and unpredictable global environment resilience and vulnerability are the key elements impacting local economic forces. The geographical distribution of resources is considered to be the key parameter fostering economic development. The principle of resilience and sustainability is based on the notion that human and natural eco-system are not simply interdependent but stems from social and ecological capacity in a world of transformation (Meyer, 2020). Promoting resilience actually addresses

challenges that how sustainability is formulated in economic environment and social policy arena worldwide. Globalisation has occurred in varied waves in different times with different manifestation advocating solutions to promote autonomy, local resilience, diversity, integration and diminishing vulnerability at large (Sahu, 2017). Change is desirable and reliable efforts strongly coupled with understanding and adaptive capacity is the key towards sustainable community development. Defining the concept of the sustainable community is integrity connected to equity, autonomy and freedom focusing harnessing social capital in the creation of resilience needed for sustainable community (Rahman et al., 2026). Fundamentally, the pillar of sustainable development needs the current and future ecological and economic consequence of sustainability benefiting marginalised population and vulnerable groups in the process of socio-economic journey of change. The collective goal of socio-economic initiative allows for sustainable development encompassing communities to adopt significant change livelihood and the understanding ability of group to response to challenges (Mazibuko, 2012). The era of sustainable practices with the integration of sustainability and automation will lead the way towards improving livelihood in vulnerable communities and ensuring economic sustainability with smart sustainable future.

REVIEW OF LITERATURE

Social-Capital as a Catalyst for Local Sustainable Development: An Insight

The grassroots of developing economic efficiency can be focused on local and regional economic growth. The interconnectedness of social economy and sustainable local growth comprises the core component of a social economy pursuing sustainable growth (Shahzad et al., 2025). In the context of socially oriented approach, the unique features of promoting environmental sustainability and cultural diversity represent the relational assets with embody social capital in social innovation processes. The trio element showcasing new approach is characterised in the social-economic framework is depicted in fig 1.

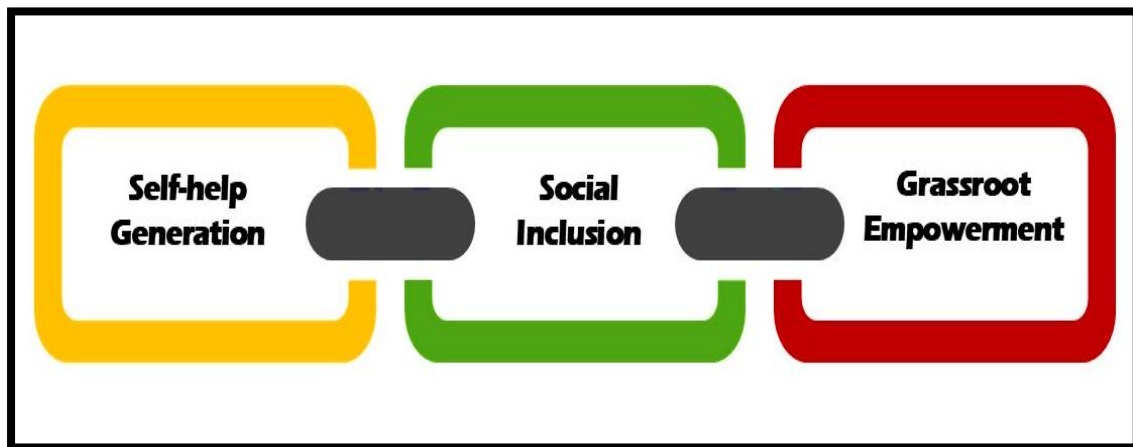


Figure 1: Dimensions of Social Capital (Authors Creation)

Mobilising social resources by forming relational assets paves the way towards enhancing regional capabilities and capacity building at large. Channelising sustainable local and regional development through collective collaboration and the participation in the community improve redistribution of income, promote equality and opportunity and pursuing sustainable values (Kim and Lim, 2017). The target of sustainable local, regional development rest on livelihood avenues to maintain human life and ecosystem services with concerns of economic growth, social development, human rights and community progression. The understanding of liveability and livelihood is the crux of social consciousness building fostering trust and moral responsibility at the community level (Bhuiyan, 2011).

Linking Sustainability and Resilience Community in the Apparel Sector: A Review

The world is full of challenges. These challenges have a repetitive trend which is turning into a crisis. Therefore, each community should develop early foresight to identify a crisis or have a sustainable ability to mitigate challenges through more tolerance and resilience. Life is a process of becoming.

In the journey of local and regional development harmonising social enterprises and social capital fosters transparency, reliability and democracy on one hand and enabling solidarity, collaboration and growth on the other (Shabbir and Batool, 2025). The linkage of social capital towards sustainable development can be viewed in the context of local and regional development. & illustrated in fig 2.

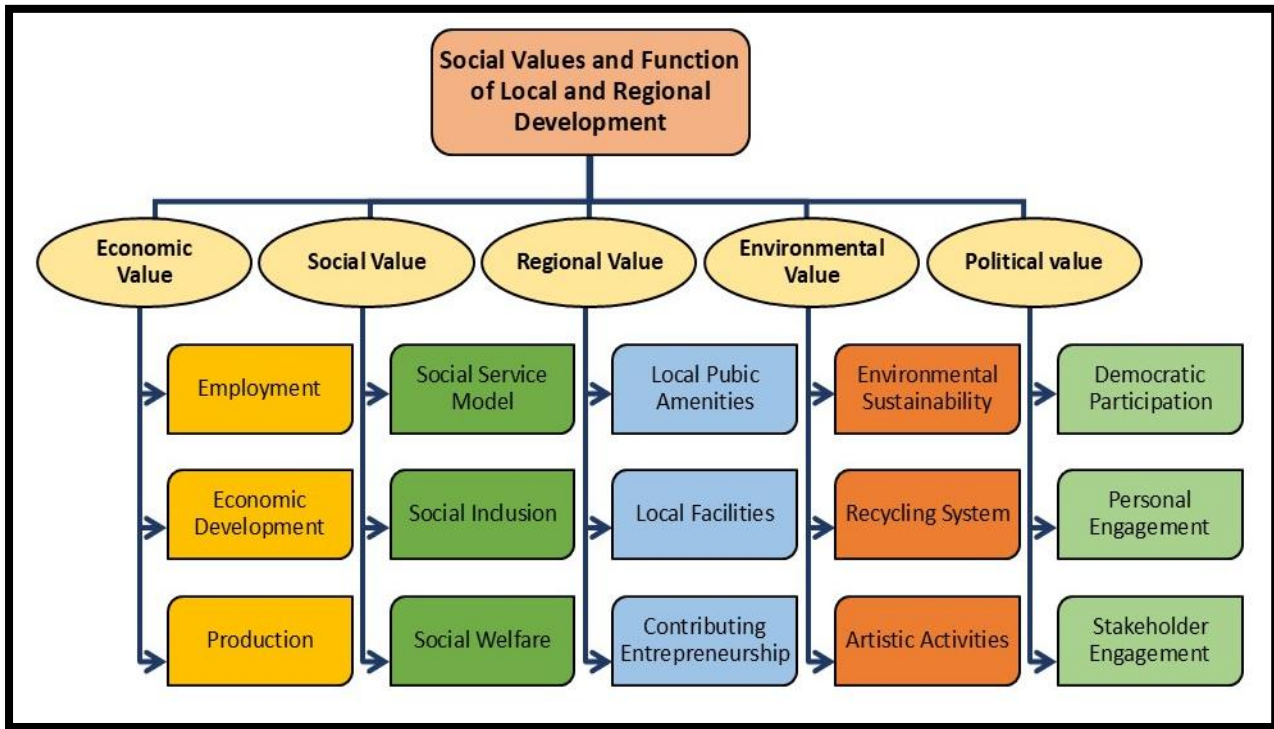


Figure 2: Attributes of Social Values (Authors Creation)

Resilience economy is about the ability to transform change and develop communities channelising tolerance, adaptability and capacity proactively embracing change (Singh et al., 2025). Being more marginalized helps to create lasting change and resilience driven communities has the passionate initiative in creating a difference with positive outcome. The awareness to raise social commitment is focusing towards best approaches for more resilience community development is the bell tone in present times and is projected in fig 3.

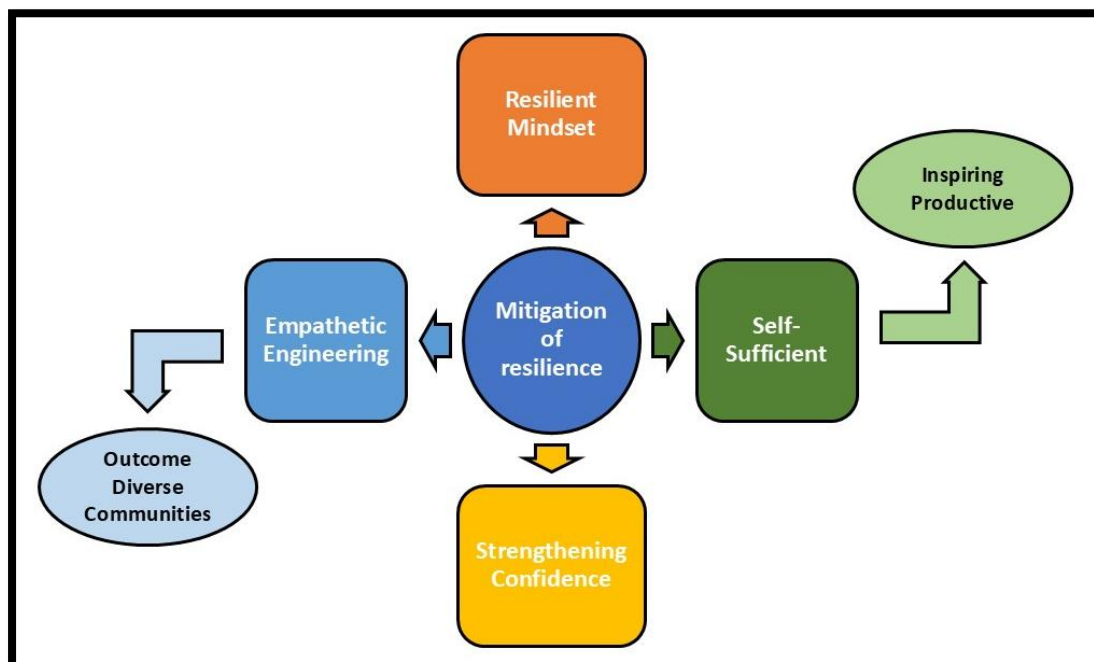


Figure 3: Approaches for Marginalized Community Development (Authors Creation)

Improvement in standard of living is the very essence of sustainable living which rest on three pillars of economic dimension, environmental dimension and social dimension. With the increasing awareness of automated production, the sustainability quotient of textile and apparel industry focuses on triple bottom line and its factors of people, profit and planet by the organisation.

With the steady increase of population growth there has been a considerable expansion of textile production consumption worldwide. Study reveals that textile and apparel industries do generate environmental harm at all stages of production creating wide environmental impact (Senadeera et al., 2025). However, textile industry represents a prime pollution source along with contributing major share of the economy is the business hemisphere. In most of the developed and developing countries sustainable manufacturing measures have been adopted in the textile production business leading to increase in market share and competitiveness of the industry. Further it may be witnessed that apparel industry is broadly engaged in recycling processes which in turn will reduce negative impact on environmental balance and increasing economic wellbeing. With automated production-energy centric operation will invariably make textile production cost effective encouraging sustainable practice in textile operation (Chowdhury et al., 2022). In present time collaborating sustainable goals with marginalized community promotion includes redundancy diversity, modularity and ecological flexibility for better understanding and managing adoptive system. Learning to live with changes and uncertainty and building adoptive capacity is the essence of marginalized-centric sustainable practices through demographic growth and institutional opportunities. Enhancing the resilience for human welfare conceptually align with are of sustainable practices focusing economic benefits deriving out of textile and apparel industry. In the present digitalised business terrain, the relevance of sustainability issues in the context of textile industry needs to be reviewed that reveals the apparel product and process from sustainable assessment (Agrawal and Gandhi, 2025). However, from the economic, social and cost prospective the worth, contribution and performance of textile and apparel industry require further attention to make more efficient and productive in the coming time line.

Aligning Human Resource Development Practices for Sustainable Communities

Human beings are measured as ‘soft resources and evidently capital assets are imperative for any development processes. Management of human resources has emerged with man power planning, training, financial incentives, motivation, grievance redressal and are the key issues that require utmost care and attention (Mishra, 2017). Human resource development practices emphasize on direct impact on human factor that are essentially important for people in general and as well as for the community in particular. Streamlining manpower capabilities, availing new opportunities and motivating multi-group community performance subsequently predicts higher work engagement with future directions of sustainable community growth (Surjit et al., 2025). Mapping human resource development requirements is an integral component of any development agenda. Thus, the growing need to harmonize and strengthen the traditional knowhow with worker’s potential and new training skills is quite pertinent and relevant. The core and critical elements empowering people with skill and knowledge and depicted in fig 4.

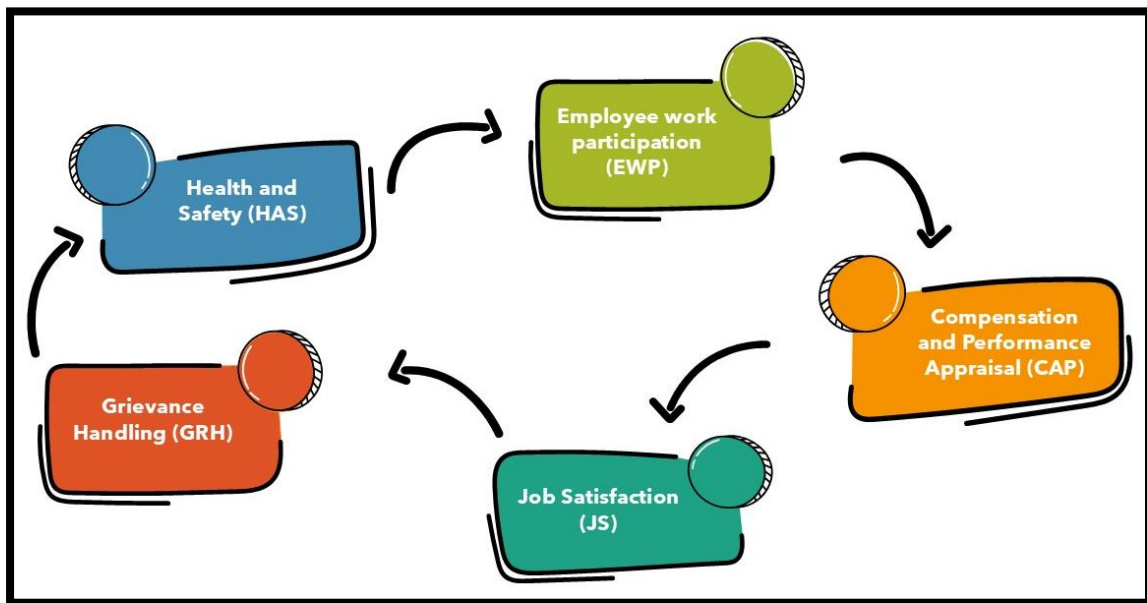


Figure 4: Elements of Human Factor (Authors Creation)

Human resource development assumes new significance encouraging trained workforce and skilled jobs creating substantial opportunities for employment generation towards new heights with sustainable growth. Enhancing community competitiveness and empowerment through human capital and operations management is the most sustainable-driven goals that underline community progression (Alam and Dhamija, 2022). Studies reveal that the dimensions of human resource development (HRD) depend on the distinct work practices that are used to manage diverse group of workers within a community. The crux of HRD function rests on the ability of a skilled community workforce to handle challenges of growth and uncertainty in the fluctuating business environment (Shahid et al., 2025). The inter-alia between the role of human resources and skill performance of the underprivileged population will create competence and increasingly contribute to the sustainable livelihood and promising future.

Impact Pathways Between Supply Chain Management and Apparel Industry: An Overview

The world apparel market is facing a critical crossroad where the operations and supply chain management (OSCM) is shifting out of the traditional linear modes of operation to circular and low-carbon modalities. The driving force behind this change is the high level of environmental impact due to this sector contributing about 10-percent of the total global emissions of greenhouse gases and 20-percent of the total water pollution caused by industries (Raut et al., 2019). One of the key aspects of this development is the introduction of circular supply chains (CSC), which predict resource efficiency and waste reduction. Empirical evidence, nevertheless, suggests that Indian textile supply chains face major barriers to deal with circularity, especially financial risk (54 per cent likelihood) and quality risks (72 per cent likelihood) of materials that have undergone recycling (Sanil et al., 2016). Strong mitigation requires that there is the establishment of strong waste-collection systems and also the driving forward of the flexible procurement strategies to control these systemic disruptions. At the same time, the industry-level modules of influence have to deal with the necessity of a just transition, so that moving towards low-carbon economy does not peripherals 181million workers who often find themselves in precarious working situations (Anbanandam et al., 2011). The existing practices of OSCM often create so-called paradoxical requirements, where the top-down sustainability requirements of fashion brands, including extreme water-footprint reduction, collide with the intensive production concept, resulting in the destruction of the health and safety of workers. A truly effective supply-chain approach should not be technical, and focus on environmental intervention, but should also include expansionary governance and worker-based research (Moazzem et al., 2021). With the integration of risk reduction around circularity and social justice concerning the workers, the apparel industry will be able to create a sustainable pathway that harmonises ecology care and human rights.

Challenges, Prospects on Global Value Chains and Sustainability: Perspectives from the Textile Sector

The textile and apparel industry is highly integrated into global value chains (GVCs), which have provided growing economies with significant economic opportunities. It has been a cornerstone of export-led industrialisation and employment, responsible in the world economy, via formal and informal employment respectively, for about twenty million formal jobs, as well as three times that number of informal jobs, the latter being a point of significant concern. However, the increase of GVCs has equally come with structural and sustainability issues. A key huddle exists as a result of the complex, multi-level structure of apparel supply chains that involves buyers, tier-1 suppliers, and several layers of subcontracting (Sadhna et al., 2024). The issue of adherence to environmental and labour standards in such networks is also burdensome to monitor, especially when unregistered subcontractors and informal facilities work beyond the direct control. Bangladesh evidence suggests that over 30 percent of the surveyed factories are informal but partially involved in export production, thus increasing the risk of poor working conditions and child labour in the supply chain. These weaknesses in governance are precursors of the sustainability issue associated with global textile manufacturing (Atkar et al., 2021). Primarily, global shocks also demonstrate the weaknesses of GVC-based production systems. The disrupted COVID-19 apparel value chain as evolved because of supply disruption, lack of inputs, and reduced global demand, causing the developing countries to lose a lot of wage, jobs, and stability in their firms. These upheavals have deepened supply chain restructuring, regionalisation and resilience controversies in the global production systems. Nevertheless, with these setbacks, the sustainability perspectives through the implementation of green supply-chain practices, circular production features, and enhanced labour criteria open opportunities, which are steadily being prefigured in textile industry studies and policy-driven discussions related to the transitions in environmental sustainability (Panigrahi & Rao, 2018). The improvement of governance, increased transparency, and responsible sourcing may, therefore, be useful in creating a more sustainable global textile value chain.

Examining Sustainable Livelihood Programme for Marginalized Communities

In order build adaptive capacity and marginalized community the notion of natural resource dynamics perspective is a perquisite phenomenon. The frames for assessing resilience are encompassed with diverse opportunities of human-socio factors in the human ecosystem. The capacity of a human-rangier system to sustain with preferred mode of economic activity is the basic instinct and likeliness of any community residing in the under-developed region (Sharma et al., 2021). Therefore, to arrive at a reasonable and progressive solution towards developing a marginalized community the array of solutions viz. promote autonomy; local reliance; diversity and risk aversion to minimize vulnerability; promote integration and risk taking to encourage economic growth necessitates to be emphasized and prioritized. The core constituents that drive towards building reliant work-force for sustainable livelihood and is portrayed in fig 5.

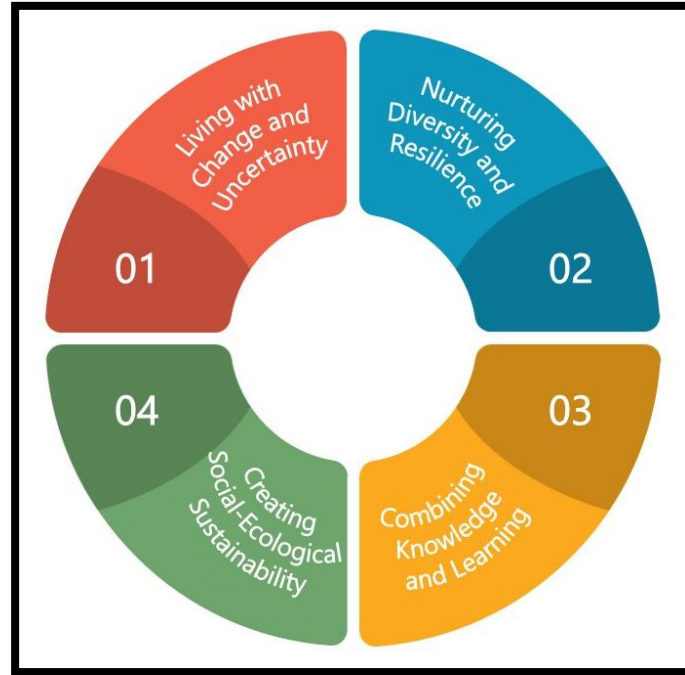


Figure 5: Phases of Sustainable Livelihood (Authors Creation)

Amidst confronting structural barriers of poverty, inequality, discrimination, social injustice, the challenges towards achieving sustainable livelihood urge to attain sustainable livelihood which ensures ability of individuals to upgrade well-being and quality of life (Bhoi & Behera, 2025). In spite of varied economic, social, environmental, political and demographic constraints, the key strategies for improving community livelihood are outlined in fig 6.

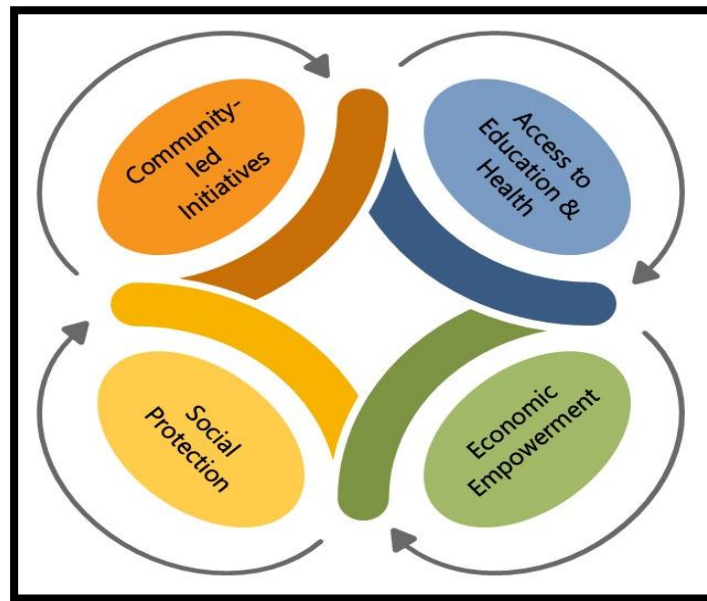


Figure 6: Key Strategies for Community Development (Authors Creation)

Improving Livelihoods for vulnerable communities requires a comprehensive and sustainable approach that addresses economic empowerment, social inclusion and environmental sustainability. These sustainable livelihood programs provide the basic components and services that can help an individual to improve the living impacting economic progress and wellness (Krishna, 2012). Improving livelihoods in vulnerable communities is a complex and multifaceted challenge that calls a sustainable-equity approach to ensure their needs and priorities for shaping their lives and living.

Cultivating Resilience through Local Scenario Development: An Outlook

The issues relating to the management of community development channelizing resilience alliance is of utmost relevance. Integrated systems of people and ecosystems tend to be dynamic and complex when viewed from adaptive perspective. Evidences support that the requirement for multidisciplinary approaches for upliftment of local community and its challenges need to be addressed and cannot be ignored (Agarwal et al., 2022). Less resilient systems become increasingly susceptible to disturbances

and barriers which are compounded by problems of sustainability concerns. The potent query arises “How resilient is the global social-ecological system to such surprises? How do ecological, social and economic processes interact?” Developing scenario is an iterative process exploring human actions that build or diminish resilience. In the present fluctuating environment collaborative efforts of the stakeholders and scenario planners should unite in a common platform to develop scenario favouring local development addressing resilience and sustainability of diverse development paths (Sapovadia, 2025). Scenario development has emerged as key indicator and well-understood deterministic system to predict the far-future complex social-ecological system. Scenarios are set of plausible narratives about the coming future that can be applied for decision-making and planning. The focus on the assessment of unpredictable, uncontrollable drivers to human demands for ecosystem services and to develop probable policy-relevant solution for human welfare and well-being. In the process of local scenario development creates futuristic pathways for long-term human- dimension community fostering resilience and sustainability at large (Gokilavani et al., 2024).

Research Gap

The notion of sustainable community may be coined as communities that fulfil the necessity of current and future inhabitants while taking care of the environmental balance and quality of life. It is quite imperative to restore, revive and recreate the capacity of individuals to transform towards building ability and initiate action. A group’s collaborative response could create marginalized communities fostering and promoting sustainable development. Although handful of studies on ecological and economic aspects have been addressed in several research studies but specific focussed research on marginalized community development have rarely been studied in Indian context. A growing consensus towards community level sustainable development has the ability to effectively create change in our neighbourhood. At this backdrop the research focus has been the study of livelihood initiatives within marginalised communities with the ability to successfully engage with sustainable development issues.

Rationale of the Study

In the increasingly digitalized world to manage complex, dynamically interconnected situations concerning ecological, social and economic issues mobilizing marginalized communities fosters towards reaching at successful sustainable development goals. The study attempts in bridging connection with Textile sector comprising unorganized and marginalized population. The Indian textile industry is one of the first and firmly established industries providing elementary amenities of livelihood and generate employment opportunities. The textile and apparel sector provides direct and indirect employment with inclusive development by enhancing skills and innovation for vulnerable communities. Research reveals that competition and digitalization in the work-space have accelerated the need for building strong social capital in creating change in the underprivileged community. Resilience emerges from both intra-scale and cross-scale interaction. Understanding the nature of resilience communities need to encourage diversity by providing new options for employment integrating and facilitating with a positive change. With the growing intensity to reorient and recreate disadvantaged neighbourhoods, nurturing of marginalized communities has emerged as one of the foremost agenda in the diverse horizon of sustainable development goals.

OBJECTIVES OF THE STUDY

In today’s scenario understanding the innovative path of sustainable practices focus towards enhancement of qualitative human life and livelihood. Then paper proposes to highlight the hybridized sustainable practices of textile sector and its futuristic impacts on the marginalized groups. The research study bestows to the garment sector by discovering how proposed hybrid livelihood sustainable practices can comply towards building marginalized community. The objectives of the study centres around

Primary Objectives

- To determine opportunities for marginalized communities in apparel occupation practices (*Analytical analysis through hypothesis estimation. Selection of alternative hypothesis by comparing the calculated value with a 5% significance level.*)

Secondary Objectives

- To assess key sustainable livelihood strategies for local realities (*The study objectives were addressed through a descriptive study, including demographic analysis by comparing mean values.*)

RESEARCH METHODOLOGY

Variables of the Study

The study examines the role of sustainable livelihood practices in promoting community development among marginalized populations engaged in the apparel sector.

Dependent Variable: Community Development for sustainable livelihood

Independent Variable:

- i. Well, Being & Quality of Life
- ii. Automated hybridized textile process
- iii. Economic and environmental development
- iv. Motivation and social capital
- v. Job-linked livelihood program

The study postulates that sustainable livelihood practices within the textile and apparel sector can contribute significantly towards addressing the three major concerns of marginalized communities, namely livelihood generation, sustainability, and community development.

Research Design

The study adopts a mixed-method research design by integrating both quantitative and qualitative approaches to achieve a comprehensive understanding of sustainable livelihood practices among marginalized communities. The use of a mixed-method approach enables triangulation of findings and enhances the reliability and validity of the study.

The research design is divided into two segments:

Segment I: Quantitative Data Collection

A structured survey was conducted among 354 respondents belonging to marginalized and economically vulnerable communities engaged in textile and apparel-related occupations. The survey aimed to collect data relating to:

- Demographic characteristics
- Textile-linked livelihood programmes
- Social capital and motivation
- Economic status and employment opportunities
- Sustainable livelihood practices

The questionnaire was designed based on the Sustainable Livelihood Framework and existing literature related to community development and sustainability studies. A five-point Likert scale ranging from 1 = Strongly Disagree to 5 = Strongly Agree was used to measure respondent perceptions across the selected variables.

Segment II: Qualitative Data Collection

To supplement the quantitative findings, qualitative data were collected through:

- In-depth interviews with 30 key informants, including community leaders, local government officials, representatives of non-government organisations (NGOs), and textile-linked training institutions working with economically backward communities.
- Focus Group Discussions (FGDs) involving 6-10 community members to understand their perceptions regarding textile-linked occupational practices, livelihood challenges, and strategies for sustainable improvement.

The qualitative component provided contextual understanding and deeper insights into livelihood resilience, community participation, and sustainable development practices.

Study Population

The study population consists with marginalized population in South and North 24 Parganas District of West Bengal including

- Low Households: Households living below the poverty line, struggling to access basic necessities.
- Textile workers: Community members comprising majority of respondents identified as self-employed, Garments Workers and Sewing Operators.
- Refugee communities: Communities that have been misplaced due to conflict and facing social challenges and barriers to access basic services.

Sampling Strategy

The study employed a multi-stage sampling approach.

- Purposive sampling was initially used to identify marginalized communities associated with textile-linked livelihood activities based on occupational patterns and economic vulnerability.
- Thereafter, simple random sampling was applied to select respondents and households for the survey research.

The combination of purposive and random sampling techniques ensured the inclusion of relevant respondents while reducing selection bias.

Data Collection Tools

- Survey Questionnaire
- In-depth interview guide
- Focus group discussion guide

These instruments were developed based on the objectives of the study and relevant sustainable livelihood literature.

Methodological Transparency

Transparency in the methodological approach was maintained to make the study reliable, valid, and reproducible. Survey questions were designed based on the extant literature in sustainable livelihoods and community development. Reliability test was done via the Cronbach's Alpha technique, which gave a score of 0.904, suggesting that all survey questions were internally consistent.

Validity test was done via the Pearson Correlation analysis technique at a significance level of 5 percent to test the strength of the relationship between variables. Data analysis was done via the SPSS software.

Research ethics were upheld throughout the research process by ensuring that all respondents voluntarily participated in the study after giving their informed consent. The confidentiality and anonymity of all respondents were protected throughout the data collection and analysis processes.

Techniques of Data Analysis Used

The data collected were analyzed using both quantitative and qualitative data analysis methods.

Quantitative Data Analysis Methods

Quantitative data were analyzed using:

- I. Demographic Analysis
- II. Descriptive Statistics
- III. Reliability and Validity Test
- IV. Multiple Regression Analysis

The above statistical tools were used to analyze the relationship between independent variables and sustainable community development.

Regression Model Used in This Study

$$SCD = \beta_0 + \beta_1 WBQL + \beta_2 AHTP + \beta_3 EED + \beta_4 MSC + \beta_5 JLLP + \varepsilon$$

Where:

- SCD = Sustainable Community Development
- WBQL = Well-being and Quality of Life
- AHTP = Automated Hybridized Textile Process
- EED = Economic and Environmental Development
- MSC = Motivation and Social Capital
- JLLP = Job-linked Livelihood Program

Qualitative Analysis

Qualitative data collected through interviews and focus group discussions were analysed using thematic analysis to identify recurring themes, livelihood challenges, resilience practices, and sustainable development strategies among marginalized textile communities.

I. Demographic Analysis:

Gender Distribution

The majority of respondents are male (250), while females account for 104 individuals. This shows a strong male dominance in the sample group, although female participation is still notable. The data reflects the generally male-skewed nature of employment in many labour-intensive industries, including the apparel sector.

Age Group Distribution

The data indicates that the sample is heavily concentrated in the 20–29 age group (240 respondents), with smaller representation in the 30–39 (67) and 40–49 (47) age ranges. There are no participants aged 50–59 or 60 and above, highlighting a predominantly young workforce. This suggests that the majority of respondents are either early in their careers or actively participating in sectors requiring physical labour and adaptability, such as apparel manufacturing.

Educational Qualification

A significant portion of respondents, 254 individuals, have completed high school or an equivalent level of education. This is followed by 48 with a bachelor's degree, 34 with vocational/technical training, and 18 with a master's degree. No respondents have attained a doctorate-level education. The data suggests that while the majority possess foundational education, a growing number are engaging in higher education and skill-based training, supporting a potentially evolving and skilled labour pool in the sector.

Occupation

The occupational landscape shows that a majority of respondents identify as self-employed (133), followed by Garments Workers (87) and Sewing Operators (53). A smaller segment works as mechanics (25), while 56 fall under the 'Other' category, indicating diverse or less common job roles. This reflects a substantial presence of both independent workers and those embedded in the structured apparel production line.

Primary Source of Livelihood

The leading livelihood source is tailoring (181), which aligns closely with the occupational data and underscores the tailoring industry's importance in the region. This is followed by apparel-related business activities (67), farming (52), and mechanical roles within the textile sector (12). Other sources (42) indicate some degree of livelihood diversity beyond the core apparel-related professions. The dominance of tailoring emphasizes the centrality of garment production to economic survival and employment in the sample group.

II. Descriptive Statistics

Independent Variables:

A: Well-being and Quality of Life						
Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Rank
Textile work improved my well-being.	354	3	5	4.27	0.739	1
Sustainable apparel improved my life quality.	354	2	5	4.06	0.705	5
Solidarity boosts my community's wellbeing.	354	2	5	4.21	0.753	2
Textile work improved my basic access.	354	3	5	4.19	0.674	3
Community support increases my security, happiness.	354	3	5	4.13	0.724	4
Valid N (listwise)	354					

A: Well-being and Quality of Life

Participants showed strong agreement that textile work positively influences personal well-being, with the highest score for improved personal well-being (mean = 4.27). Solidarity and better basic access were also highly rated, reflecting positive community-level impacts. Although "sustainable apparel improving life quality" scored slightly lower (mean = 4.06), it was still viewed favourably. Overall, responses were consistent, indicating a shared belief in the wellbeing benefits of textile engagement.

B: Automated Hybridized Textile Process						
Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Rank
Access training on hybrid processes.	354	3	5	4.27	0.707	1
Technology boosts my productivity in textiles.	354	3	5	4.19	0.701	3
Automation eases labour challenges in production.	354	2	5	4.19	0.756	3
Hybrid textile tech supports community sustainability.	354	3	5	4.10	0.707	4
Confident me with automated textile tools.	354	2	5	4.24	0.720	2
Valid N (listwise)	354					

B: Automated Hybridized Textile Process

Respondents strongly agreed on the value of training in hybrid processes (mean = 4.27) and felt confident using automated textile tools (mean = 4.24). While "hybrid textile tech supporting community sustainability" received the lowest rating (mean = 4.10), it still reflected positive sentiment. The consistency in scores suggests widespread comfort with technological integration in textile production.

C: Economic and Environmental Development						
Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Rank
The textile sector strengthens regional economic stability.	354	3	5	4.17	0.710	3
Current practices support environmental sustainability well.	354	2	5	4.23	0.748	1
Sustainable fibres support low-income communities.	354	1	5	4.12	0.771	4
Sustainable production boosts apparel sector growth.	354	2	5	4.12	0.746	4
Textile sector governance supports local development.	354	2	5	4.19	0.713	2
Valid N (listwise)	354					

C: Economic and Environmental Development

There was a positive perception of the textile sector’s role in supporting environmental sustainability (mean = 4.23) and governance contributing to local development (mean = 4.19). Support for low-income communities and sector growth through sustainability scored slightly lower (mean = 4.12), with more varied responses. Still, the overall trend indicates recognition of the textile sector’s economic and environmental contributions.

D: Motivation and Social Capital						
Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Rank
I’m motivated to join textile initiatives.	354	3	5	4.24	0.663	1
Social bonds drive my apparel sector involvement.	354	3	5	4.17	0.724	4
Resilience helps my community overcome challenges.	354	3	5	4.19	0.729	3
Shared goals, trust strengthen textile community.	354	3	5	4.10	0.711	5
Collaboration boosts textile growth, survival.	354	2	5	4.23	0.720	2
Valid N (listwise)	354					

D: Motivation and Social Capital

The highest-rated statement was personal motivation to join textile initiatives (mean = 4.24), followed by collaboration and community resilience. Shared goals and trust within the textile community were rated slightly lower (mean = 4.10), suggesting stronger individual than collective perceptions. Variation was minimal, showing generally aligned views on social capital and motivation.

E: Job-Linked Livelihood Program						
Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Rank
Textile programs give me employment access.	354	3	5	4.22	0.679	1

Training programs boost career opportunities.	354	2	5	4.19	0.745	2
Textile initiatives build long-term skills.	354	3	5	4.18	0.700	3
Gained from textile capacity-building.	354	2	5	4.16	0.704	4
Apparel industry aids youth, women's jobs.	354	2	5	4.18	0.712	3
Valid N (listwise)	354					

E: Job-Linked Livelihood Program

Employment access through textile programs was rated highest (mean = 4.22), with training and long-term skill development also seen positively. Capacity-building had the lowest score (mean = 4.16), but still indicated general approval. Overall, the responses reflect strong confidence in the textile sector's ability to support livelihoods.

Dependent Variable:

F: Sustainable community development						
Descriptive Statistics						
	N	Minimum	Maximum	Mean	Std. Deviation	Rank
Textile industry builds self-reliance.	354	2	5	4.15	0.719	4
Community efforts support sustainable livelihoods.	354	3	5	4.21	0.735	1
Community textiles drive lasting sustainability.	354	3	5	4.16	0.719	3
Apparel sector fosters healthier, united communities.	354	3	5	4.16	0.732	3
Sustainable textiles aid community resilience.	354	3	5	4.20	0.636	2
Valid N (listwise)	354					

Dependent Variable: Sustainable Community Development

Community efforts toward sustainable livelihoods were rated highest (mean = 4.21), followed closely by community resilience through textiles. Self-reliance through the textile industry had the lowest mean (4.15), but the variation was minimal, suggesting broad agreement that textile activities contribute meaningfully to sustainable development.

III. Reliability and Validity Testing

Reliability testing is conducted to make sure about the reliability of the data and analyzing an error free outcome.

Table1: Reliability Test Statistic

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.904	0.904	30

Validity testing is a crucial aspect of ensuring that the constructs accurately measure the intended concepts. Validity testing was conducted using the Pearson Correlation Test at a significance level of 5%.

Table 2: Snapshots of Validity Testing Results

Sl. No.	Validity Testing	Results
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1.	The Textile sector strengthens regional economic stability	Indicates an optimum and significant relationship (r = 0.995) between ‘Current practices support environmental sustainability well’
2.	Sustainable apparel livelihood programme improves life-quality	A moderate to high relationship (r = 0.729) exists between ‘Textile work improved individual well-being’
3.	Community support increases security and happiness	Indicates a strong correlation (r= 0.849) within ‘Textile work improved basic necessities’
4.	Sustainable production boosts apparel sector growth	A very high relationship (r = 0.952) exists between ‘Sustainable fibre supports low-income communities’.
5.	Social bonds drive apparel sector involvement	Projects an impactful relationship (r = 0.801) between ‘Resilience helps community to overcome challenges’.

IV. Multiple Regression Analysis

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.843 ^a	0.711	0.707	0.24032
a. Predictors: (Constant), E: Job-Linked Livelihood Program, D: Motivation and Social Capital, B: Automated Hybridized Textile Process, A: Well-being and Quality of Life, C: Economic and Environmental Development				

P-Value (0.000) is less than 0.05, which means the model is statistically significant. The regression analysis robustly supports that community development for sustainable livelihood in the apparel sector is significantly influenced by motivational factors, social capital, and joblinked programs, with technology and environmental initiatives playing supportive, though less dominant, roles.

Regression						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	49.547	5	9.909	171.572	.000 ^b
	Residual	20.099	348	0.058		
	Total	69.646	353			
a. Dependent Variable: F: Sustainable Community Development						
b. Predictors: (Constant), E: Job-Linked Livelihood Program, D: Motivation and Social Capital, B: Automated Hybridized Textile Process, A: Well-being and Quality of Life, C: Economic and Environmental Development						

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	-0.102	0.148		-0.692	0.489
	A: Well-being and Quality of Life	0.169	0.063	0.147	2.691	0.007

B: Automated Hybridized Textile Process	0.100	0.060	0.094	1.653	0.099
C: Economic and Environmental Development	0.114	0.068	0.107	1.674	0.095
D: Motivation and Social Capital	0.409	0.058	0.369	7.055	0.000
E: Job-Linked Livelihood Program	0.228	0.057	0.214	3.980	0.000
a. Dependent Variable: F: Sustainable Community Development					

The overall findings of this study indicate a strong and consistent belief among respondents that various aspects of the textile sector significantly contribute to sustainable community development. The analysis combined descriptive statistics, reliability testing, correlation, and regression to explore the influence of five independent variables on the dependent variable.

DISCUSSION AND INTERPRETATION

Reliability

The reliability of the instrument used was confirmed with a high Cronbach's Alpha of 0.904, indicating excellent internal consistency across the 30 items.

Descriptive Findings

Descriptive statistics revealed consistently high mean scores (ranging from about 4.06 to 4.27 on a 5-point scale) across all variables, showing a generally positive perception of the textile sector's contributions. The most highly rated items were associated with:

- Well-being and quality of life, particularly personal well-being.
- Access to hybrid textile training under technology.
- Motivation to join textile initiatives.
- Employment access through textile programs.

The low standard deviations (generally below 0.75) suggest a strong consensus among participants on the importance and impact of these areas.

Correlation Insights

The correlation matrix showed significant positive relationships among most variables at the 0.01 level, further confirming that:

- Well-being, training, economic contributions, social motivation, and livelihood programs are mutually reinforcing.
- Items like "textile work improving well-being" and "community support increasing security" showed moderate to strong correlations
- Similar strong correlations appeared between job-related initiatives and youth/women's job support

Regression Analysis

The multiple regression model showed that the five independent variables collectively explained 71.1% of the variance in sustainable community development ($R^2 = 0.711$), indicating a very strong predictive relationship.

Among the predictors:

- Motivation and Social Capital ($\beta = 0.369$, $p < .001$) was the strongest predictor, showing that personal drive and community bonds play a central role in promoting sustainable development.
- Job-Linked Livelihood Program also had a significant effect ($\beta = 0.214$, $p < .001$), highlighting the importance of employment and skill-building.
- Well-being and Quality of Life was statistically significant ($\beta = 0.147$, $p = .007$), while Technology and Economic/Environmental Development had positive but marginal significance ($p > .05$), suggesting their effects are present but slightly less dominant.

This analysis strongly projects that the textile sector through improvements in personal well-being, community support, training, employment, and social capital plays a pivotal role in driving sustainable community development. Motivation and livelihood-linked programs stand out as the most impactful areas, suggesting that future interventions should particularly focus on empowerment, social cohesion, and job creation for sustained impact.

Constraints in Textile Livelihood for Marginalized Communities

The study bestows to the garment sector by discovering hybrid livelihood sustainable practices to attain sustainable future. The identifiable prime concerns include

- Skill performance gaps and lack of in-depth knowledge about manufacturing process
- Inadequate awareness about latest apparel applications and techniques
- Lack of understanding of textile quality, grades, parameters and yarns
- Insufficient knowledge of latest fashion designs/trends and effluent treatment process
- Lack of knowledge about inventory, storage, logistics
- Inability to operate latest sewing machines and maintenance operation
- Inadequate knowledge about quality standards for various textile products

Future Textile Trends and Recommendations

Garment industry is one of the leading industries impacting environmental issues across the globe. India has emerged as the 2nd largest producer of textiles and garments in the world. Collaborating eco-friendly textile with natural fibre is the proposed hybrid sustainable practices and is the call of the hour. In today’s scenario “Think globally, act locally” is the bell-tone of tomorrow for the world textile, apparel and fashion industry can be visualized in figure ...

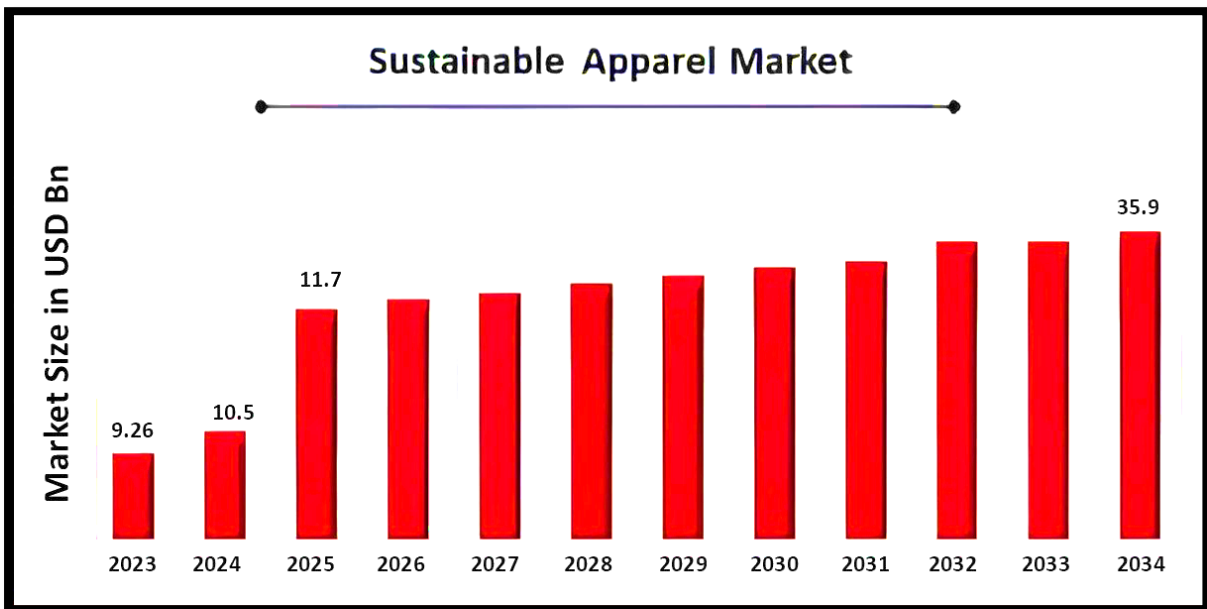


Figure7: Sustainable Apparel Market Trend (Source: www.marketresearchfuture.com)

In order to cope up with unescapable competition faced by Indian textile industry both in international and domestic markets, the major recommendations are:

- Encouraging and Channelizing Textile education and training among the workforce
- Strengthening infrastructure facilities for skilled and unskilled textile workers
- Providing boost to Public-Private Partnership Model in Textile sector
- Enhancing enterprise competitiveness with human capital and operation management
- Support community-led initiatives and provide resources for upliftment
- Promoting economic empowerment programs viz, microfinance, entrepreneurship etc.
- Organising education and skill development programs to improve livelihoods

Implications of the Study

Indian textiles and garment sector is poised for a quantum leap with emerging technologies in weaving, spinning, processing, nonwovens knitting towards achieving the global benchmark. At this outset the need is not only confined towards restoring traditional knowledge-skill but to harmonize latest knowhow safeguarding the ecosystem and living. Being the one of the oldest industries in the Indian economy, sustainability of Textile sector required to be looked into the holistic growth of human resource. The paper makes a modest attempt to visualize the optimum solutions of promoting resilience linking community development programmes in locals. The study aims to examine strategies in improving livelihood in vulnerable communities with

focus on sustainability, equity and community-led initiatives. The essentiality of the study seeks to contribute to the development of realistic and evidence-based policies and programs that has the potential to support marginalized communities to achieve sustainable livelihoods and improve well-being.

Concluding Remarks

Resilience and vulnerability are both shaped by global and local economic forces. The message of resilience is more radical for policy makers than that of sustainability. Promoting resilience is concerned with the knowledge required to facilitate robust governance systems bridgewaying comprehensive and sustainable livelihood programs for economically backward communities. In the digitalized global economy, the urge for improving the livelihoods in the vulnerable community can be comprehended by promoting participatory decision making and fostering partnerships with stakeholders. Mapping of skilled work-group at the grassroots level with limited financial resources can drive a transformative change fostering resilient and best practices both from global and local perspectives. Achieving community sustainability requires the silver lining connection between resilience, diversity and long-lasting stability of social-ecological systems. Through constructive work visioning village-centric development and community-care can truly pave the way in creating self-sufficient and marginalized communities and prefiguring a more sustainable, humanistic and equitable future.

DECLARATIONS

Ethics Approval and Consent to Participate. The present study was conducted in accordance with accepted ethical standards for social science research involving human participants. The research process ensured respect, dignity, privacy, and voluntary participation of all respondents belonging to marginalized communities engaged in apparel-sector livelihood activities. Informed consent was obtained from all participants prior to data collection. Respondents were clearly informed about the purpose and objectives of the study, and their participation was entirely voluntary.

Consent for Publication. All authors have reviewed and approved the final version of the manuscript and consent to its publication.

Availability of Data and Materials. The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest. The authors declare that there is no conflict of interest regarding the publication of this manuscript.

Funding Statement. This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Author Contributions

- Dr. Partha Naskar: Conceptualization, supervision, methodology, formal analysis, manuscript review and editing.
- Biki Digar: Data collection, investigation, literature review, drafting of the manuscript.
- Pitu Kundu: Statistical analysis, interpretation of results, proofreading, and technical support.

Acknowledgements

The authors sincerely acknowledge the valuable cooperation and participation of the respondents, community members, and institutional stakeholders who contributed to this research study.

Originality Statement.

The authors declare that this manuscript is original, has not been published previously, and is not currently under consideration for publication elsewhere.

AI Use Disclosure.

The authors confirm that no generative artificial intelligence (AI) tools were used in the collection, analysis, or interpretation of data. Any language editing support, where applicable, did not affect the scientific originality, interpretation, or conclusions of the study.

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