



“SWOT Analysis of Female Artisans in Batik Production: Challenges and Strategic Insights from Santiniketan, WestBengal

TANIYA KAR¹, MOUMITA KUNDU²

SACT-Lecturer, Department of Geography¹, SACT-Lecturer, Department of Geography²

Serampore Girls' College

13, T.C. Goswami Street, Serampore, Hooghly-712201, India

Abstract

This research delves into the significance of traditional crafts, with a particular focus on batik, and their notable capacity to advance sustainable development within the framework of the green economy. Traditional crafts align closely with sustainability principles—such as slow fashion, localized production, and the longstanding practices of recycling and reuse. For instance, the Kantha quilting tradition has played a vital role in empowering women refugees, thereby promoting more sustainable approaches to fashion.

Batik, a culturally rich art form especially prevalent in Southeast Asia and Indonesia, exemplifies sustainable production techniques that not only minimize pollution and conserve resources but also maintain economic viability and prioritize worker safety. Within many communities, the craft of batik is a respected tradition, predominantly preserved and transmitted by women across generations. These artisans possess deep knowledge of motifs, natural dyes, and regional methods—skills that are essential to maintaining the authenticity and dynamism of the tradition. Despite often working within informal or low-income settings and facing limited resources and market access, many women engaged in batik production achieve financial independence and greater agency in household decision-making. Such empowerment has broader social implications, as women are more likely to invest in education, healthcare, and community well-being. Moreover, women artisans frequently prioritize environmentally conscious practices, including the use of natural dyes and traditional, non-industrialized processes. Such eco-friendly methods help reduce chemical waste, encourage local material sourcing, and contribute meaningfully to the sustainable fashion movement.

In Santiniketan, batik remains a vital craft primarily sustained by women. Historically, textiles were associated with repair work, but the advent of batik introduced new opportunities for artistic expression and personal empowerment. Traditional Alpona designs, once confined to domestic contexts in rural Bengal, have gained broader recognition through the medium of batik, enabling women from diverse backgrounds to participate and express their creative visions. This shift not only fosters artistic growth but also enhances economic independence for many women.

Utilizing tools such as SWOT analysis and the Quantitative Strategic Planning Matrix (QSPM), this research investigates the perceptions of female artisans regarding batik hubs in Santiniketan and examines the sector's developmental potential. Findings from the Internal Factor Evaluation Matrix (IFEM) and External Factor Evaluation Matrix (EFEM) highlight the strengths, weaknesses, opportunities, and threats faced by the batik industry, based on empirical observations gathered from field surveys of female weavers.

Keywords: Batik production, SWOT analysis, women artisans, challenges, strategies, empowerment, sustainable crafts

Introduction

Traditional practices, in essence, are the cumulative actions, skills, and knowledge transmitted across generations within particular cultures or communities. (Warren et al. 1995). These practices are deeply embedded in collective beliefs, oral narratives, rituals, and the lived experiences unique to each group, and their continuity often serves as a counterpoint to the homogenizing effects of globalization. (Smith and Akagawa, 2009). In many societies, these practices cover various economic aspects and also express cultural heritage and social dimensions (Eicher & Sumberg, 1995). In the context of Santiniketan's batik industry, this form of textile art is not merely an economic activity; it encapsulates the community's eco-cultural expertise and social heritage. The endurance of these traditional methods is notable—they are preserved and taught primarily through observation, mentorship, and storytelling rather than through formal instruction. They also transform batik into more than just a product; it becomes a tradition of storytelling (Roy, Poulomi. 2017). Artisans in Santiniketan, for instance, consciously maintain established motifs and techniques, resisting the pressures of market-driven trends. Such heritage-based approaches foster both the preservation and evolution of craftsmanship. The transmission of these skills requires specialized knowledge and technical proficiency, which serve as critical links between generations. Moreover, traditional practices reinforce communal bonds and cultural identity, facilitating a sense of continuity while also enabling adaptation to shifting environmental and social contexts. In many cases, these practices act as a form of cultural resistance, safeguarding autonomy and local distinctiveness in the face of external influences. Economically, the batik sector is significant, particularly for rural populations in Santiniketan, where it provides employment opportunities for individuals with limited access to formal education (Sen, 2020). The industry has also become integral to local tourism, offering authentic, intricately designed souvenirs that reflect the community's heritage. Of particular importance is the role of women artisans, whose contributions not only sustain the craft but also embody a feminist commitment to "slow craft" and environmentally conscious production. Despite market pressures, many of these women prioritize sustainable techniques and cultural preservation, thereby reinforcing both economic resilience and the ongoing vitality of traditional practices. (Sen. 2020).

Literature Review:

Women play a pivotal role in India's informal economy, particularly within sectors like textiles, handlooms, and crafts. These industries rely heavily on women's labor, yet often offer low wages, limited job security, and minimal legal protection. (Bhasin & Kapoor, 2021). Their contributions are crucial for the survival and sustainability of these traditional industries, but their labor is habitually undervalued and undercompensated.

Batik production stands out as a significant example. This wax-resist dyeing technique functions both as a cultural art form and an essential source of livelihood for many rural women, especially in regions such as Santiniketan. Women in these areas have preserved Batik methods across generations, using their skills not just for artistic expression, but as a means of economic survival. (Chakraborty, 2020). Despite this expertise, most female artisans remain in informal employment, facing barriers such as inadequate training, scarce access to finance, and little connection to organized markets.

Numerous challenges confront these artisans on a daily basis. Structural barriers like limited credit access, insufficient workspaces, and health risks from chemical dyes are widespread (NCEUS, 2009; Roy & Sinha, 2019). Furthermore, the lack of protective equipment, low awareness of legal rights, and dependency on intermediaries for market access further marginalize these women within the value chain. Social expectations and the burden of domestic responsibilities only deepen their vulnerability.

The SWOT (Strengths, Weaknesses, Opportunities, Threats) framework is widely used in business and development analysis (Singh & Kaur, 2021). It has also been applied to women's cooperatives, self-help groups, and artisan clusters. Yet, its use within the Batik sector—especially in the context of women artisans' lived experiences—has not been thoroughly explored.

Despite a growing body of literature on women's roles in craft-based industries, few studies have applied a gender-sensitive SWOT analysis to guide meaningful interventions. There is a clear need for micro-level research focused on the Batik sector that uses this tool to generate practical, community-based strategies. This study aims to address this gap by drawing on primary field data to recommend ways to strengthen women's participation and empowerment in Batik production.

Objective:

The primary aim of this research is to analyze the challenges and strategic adaptations of female Batik producers through the lens of SWOT analysis. More specifically, the study intends to:

- Identify the internal strengths of female Batik artisans, such as technical skills, cultural heritage, and community networks.
- Examine internal weaknesses—including health risks, financial limitations, and lack of formal training—that restrict productivity and empowerment.
- Investigate external opportunities available to these artisans, for instance, governmental support schemes, expanding markets, and skill development programs.
- Analyze external threats, such as increased competition, price instability, and gaps in policy, that undermine their livelihoods.
- Develop strategic recommendations, grounded in the SWOT framework, to enhance working conditions, sustainability, and socio-economic empowerment for women in Batik production.

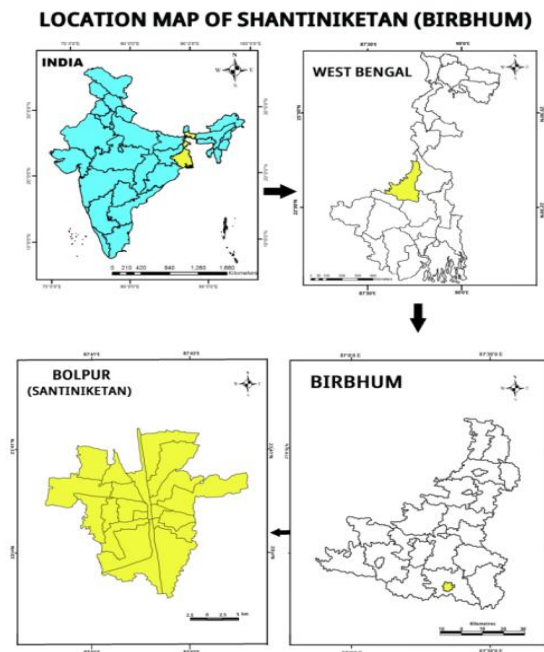
Statement of the problem:

Despite their critical role in preserving traditional Batik crafts, female workers in this sector continue to confront significant challenges—low wages, health hazards, insufficient training, and limited access to broader markets. Their expertise and labor remain undervalued within the informal sector, and there is a significant gap in strategic analysis aimed at addressing their needs. By applying SWOT analysis, this research seeks to highlight the core challenges faced by these women and to propose actionable strategies that aim to improve their livelihoods and promote their broader empowerment within the industry.

Study area:

Birbhum, situated at the northernmost edge of West Bengal's Burdwan division, occupies a distinct triangular area recognized for its verdant landscape. The district headquarters is established in the historically significant town of Suri. To the west and north, Birbhum shares boundaries with Jharkhand's culturally notable Santhal Pargana division, while to the east and south, it is flanked by Murshidabad and Burdwan districts. Encompassing approximately 4,545 square kilometers, Birbhum's topography is marked by gently rolling hills, fertile plains, and tranquil water bodies. These natural features not only enhance the region's aesthetic appeal but also contribute to a vibrant cultural heritage. This rich heritage is especially

evident in the district's celebrated handicrafts, which reflect the exceptional craftsmanship and artistic traditions of local artisans.



Methodology:

Research Design:

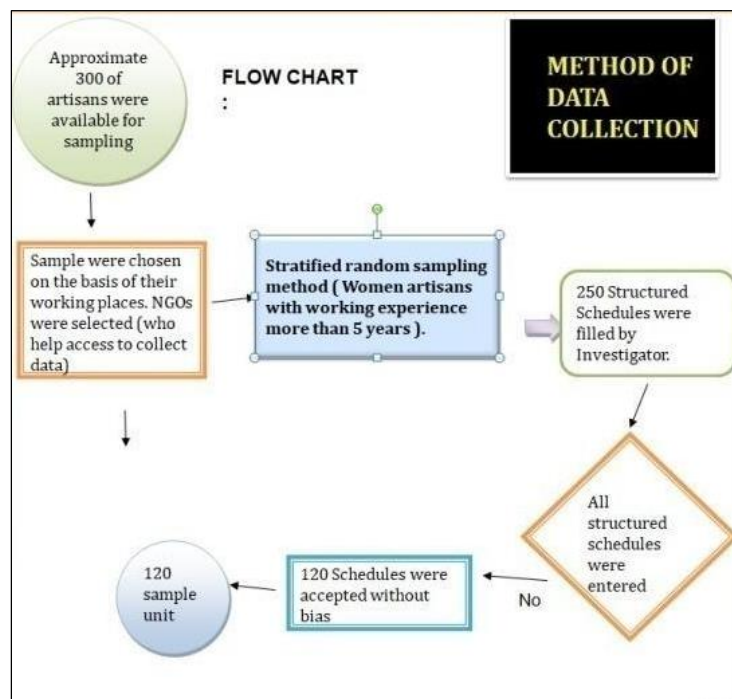
This study employs a descriptive and exploratory approach to examine both the difficulties faced by female Batik workers and the adaptive strategies they deploy. The research is anchored in a SWOT analysis framework, systematically considering internal strengths and weaknesses as well as external opportunities and threats impacting these artisans.

Data accusing method:

Data collection unfolded in the culturally rich locales of Santiniketan, Sriniketan, and Prantik. Researchers selected 120 female artisans, all with over five years of Batik experience and aged above 20, using stratified sampling. Direct, in-person interviews were conducted, with the primary investigator facilitating communication by translating questionnaires from English to Bengali, ensuring participants could express their experiences fully. The methodology combined structured questionnaires, focus group discussions (with 5–7 artisans per group), and key informant interviews with NGO representatives, cooperative leaders, and local officials to capture both individual perspectives and institutional insights.

Data analysis: For analysis, the study adopted both quantitative and qualitative methods. Researchers examined variables such as income, job satisfaction, and preservation of traditional techniques. Descriptive statistics were used to profile participants by age, education, income, and marital status, with particular attention to widows within the Batik workforce. Data processing utilized tools like MS Excel 2010, SPSS 22.0 (paid version), and QGIS. The Quantitative Strategic Planning Matrix (QSPM) and SWOT frameworks were applied to interpret how artisans perceive the current state and future prospects of Santiniketan Batik Hubs. Comparative insights were drawn from related research. For example, Sulistyowati et al. (2020) highlighted the unique strengths and cultural value of handmade Batik in Yogyakarta, while also noting limited market reach and weak innovation as key challenges. Fitrani and Pranowo (2019) used the TOWS matrix to develop actionable strategies for Batik producers in Central Java. Yuliana and Nugroho (2021) utilized the Analytic Hierarchy Process (AHP) to assess strategic factors for Batik manufacturers in Solo. Additionally, Rahmawati et al. (2021) investigated issues within Batik dress enterprises.

In summary, the Batik sector, particularly as experienced by female artisans, is shaped by a complex interplay of tradition, innovation, and resilience in the face of structural constraints.



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Findings and SWOT Analysis:

Female Batik artisans play a vital—if often undervalued—role in sustaining both the craft itself and the rural economy at large. Yet, they regularly contend with a host of socio-economic and structural obstacles: persistently low wages, lack of formal acknowledgment, limited access to skills training, health hazards inherent to their work, and little bargaining leverage. Despite these challenges, women in the sector consistently exhibit remarkable resilience. Many join self-help groups, experiment with environmentally friendly techniques, and branch out into alternative markets—turning to fairs, tourism, and digital platforms to expand their reach. A thorough examination of the strengths, weaknesses, opportunities, and threats faced by women in Batik production is crucial for understanding their day-to-day realities and identifying effective solutions. By employing the SWOT analysis framework, this study offers a multi-dimensional perspective that considers both the internal and external factors shaping women’s participation in this traditional craft. Unlike approaches that focus solely on existing problems, the SWOT method allows for a strategic assessment—identifying how female artisans might build upon their strengths, tackle barriers, take advantage of emerging opportunities, and offset potential threats within the ever-changing textile and handicraft sector. The SWOT analysis, developed by Albert Humphrey at Stanford University in the 1960s (Nyarku and Agyapong, 2011), is a valuable tool for evaluating the current status and future possibilities of the batik industry in the selected district. Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T) are four key elements of the strategic management framework. Strengths and weaknesses are internal factors, while opportunities and threats are external (Gurel and Merba, 2017). Through a thorough questionnaire survey, we identified six strengths, seven weaknesses, ten opportunities, and nine threats. This information provides a strong basis for developing batik production in the district. These insights connect to various strategies in the Quantitative Strategic Planning Matrix (QSPM). This approach helps us identify the most effective strategies for the organization's growth.

Calculation of IFEM and EFEM: The internal and external elements from the SWOT analysis provide the foundation for creating the Internal Factor Evaluation Matrix (IFEM) and the External Factor Evaluation Matrix (EFEM). IFEM and EFEM are both crucial for developing the Quantitative Strategic Planning Matrix (Gupta, 2015). We figured out the Weighted Value and Rating Value for each part of the IFEM and

EFEM matrices by having active discussions with female batik artisans. The score for each matrix is calculated by multiplying the Weighted Value by the Rating Value.

Each internal and external factor receives a weighted value between 0.01 (indicating minimal importance) and 1.00 (signifying high importance). Alongside this, a rating value is assigned: 1 for minor significance, 3 for major significance. The overall score for each factor is determined by multiplying the weighted value by the rating value.

For Strategy I, a combination of key Strength-Opportunity (SO) factors guided its formulation. Input was directly gathered from female batik artisans via a perception survey using a three-point scale (agree, disagree, neutral). The strategy receiving the highest level of agreement among participants was selected, ensuring that the chosen approach aligns with the preferences and insights of those most affected.

Strategy II centers on constructing the Quantitative Strategic Planning Matrix (QSPM). Here, alternative action plans were developed to address vulnerabilities associated with Weakness-Threat (WT) scenarios. Three robust WT-focused strategies were designed to mitigate internal weaknesses and external threats.

A comprehensive SWOT-QSPM analysis was performed to support effective strategy development for women weavers in the batik sector. This process involved examining thirteen internal factors that illuminated both strengths and weaknesses among female batik artisans in Santiniketan. The weighted values for strengths ranged from 0.65 to 0.95, with corresponding scores between 1.2 and 3.8. Weaknesses showed weighted values from 0.65 to 0.90, and scores between 1.2 and 3.6 (see Table 1 for details). In summary, these analyses provided a rigorous, data-driven foundation for strategic decision-making tailored to the specific context of women batik artisans.

Table 1: Internal Factors Evaluation Matrix (IFEM) of Strength-Weakness Factors

Internal Factors			Weighted Value	Rating Value	Weighted Score
Strength	S1	High level of skill and attention to detail.	0.9	3	2.7
	S2	Strong traditional knowledge passed down through generations.	0.95	4	3.8
	S3	Flexible home-based work allows them to balance family responsibilities	0.85	4	3.4
	S4	Employment Generation, Women-Centric Workforce	0.7	3	2.1
	S5	Sustainability and Eco-Friendliness	0.8	3	2.4
	S6	Tourism and Heritage Craft Promotion	0.95	4	3.8
	S7	Integration with Handloom Industry	0.7	2	1.4
Weak	W1	Wage disparity and lack of regular income.	0.9	4	3.6
	W2	Limited access to advanced training or modern design tools.	.85	3	2.55
	W3	Few women are involved in marketing or entrepreneurship.	0.9	4	3.6
	W4	Women weaver face scarcity of working capital	0.8	3	2.4
	W5	Illiteracy among women weaver	0.65	3	1.95
	W6	Climatic condition	0.6	2	1.2

Source: Primary Survey

The Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices provide a structured assessment of the primary strengths, weaknesses, opportunities, and threats facing women artisans in the batik sector. Key internal strengths identified include “traditional knowledge passed down through generations” (S2, 3.8) and “promotion of tourism and heritage crafts” (S6, 3.8). “Flexible home-based work

allows for family balance (S4, 3.4), and artisans possess a “high level of skill and attention to detail” (S1, 2.7) and meticulousness remain notable assets. Conversely, significant internal weaknesses persist, such as “wage disparity and lack of stable income” (W1, 3.6), “few women in marketing or entrepreneurship” (W3, 3.6), “limited access to training” (W2, 2.5), and organizational shortcomings. wage disparities, unstable income, limited representation of women in marketing and entrepreneurship, inadequate training opportunities, and organizational shortcomings. On the external front, artisans encounter a mix of opportunities— “increasing demand for handmade products” (O1, 3.6), “digital training” (O10, 3.6), and support from NGOs and government initiatives (O2, 2.85 alongside notable threats, including “climatic instability” (T4, 3.2), “limited digital presence” (T2, 3.2), and “market unpredictability” (T7, 2.1).

Table 2: External Factors Evaluation Matrix (EFEM) of Opportunity-Threat Factors

External Factors			Weighted Value	Rating Value	Weighted Score
Opportunity	O1	Growing demand for handmade products	0.9	4	3.6
	O2	Support from NGOs, SHGs, and government training programmes.	0.95	3	2.85
	O3	Digital platforms for selling Batik products online.	0.8	3	2.4
	O4	Geographical Indication (GI) Tag Promotion	0.7	3	2.1
	O5	Social Media Promotion	0.8	3	2.4
	O6	Tourism and Heritage Craft Promotion	0.95	4	3.8
	O7	Craft Villages and Museums	0.95	4	3.8
	O8	Fusion with Contemporary Fashion	0.7	2	1.4
	O9	Women’s Entrepreneurship	.85	3	2.55
	O10	Digital Training	0.9	3	3.6
Threats	T1	Use of Chemical Dyes	0.7	2	1.4
	T2	Limited Digital Presence	0.8	4	3.2
	T3	Loss of Traditional Knowledge	0.6	3	1.8
	T4	Climate Dependency	0.8	4	3.2
	T5	Improper Wax Disposal	0.6	2	1.2
	T6	Raw Material Issues	0.6	3	1.8
	T7	Fluctuating Demand	0.7	3	2.1
	T8	Export Challenges	0.6	3	1.8
	T9	Middlemen Exploitation	0.5	3	1.5

Source: Computed By Author

In aligning internal strengths with external opportunities, the batik industry has several avenues for targeted growth:

- i. **SO Strategy 1:** The persistent, year-round demand for batik products expands the industry’s market reach and sustains sector momentum.
- ii. **SO Strategy 2:** As the batik sector becomes more profitable, it holds significant potential to generate employment, particularly benefiting women and marginalized groups who have traditionally been underrepresented in this field.
- iii. **SO Strategy 3:** The batik industry provides consistent contributions to the local economy, ensuring economic activity throughout the year rather than seasonally.
- iv. **SO Strategy 4:** Favorable weather patterns facilitate increased production capacity, enabling the industry to better meet both domestic and international demand.

Strategic Planning II: Weakness-Threat (WT) Strategies

To address existing weaknesses and counteract potential threats, the following strategies are recommended:

- i. **WT Strategy 1:** The establishment of cooperatives and self-help groups (SHGs) within the batik sector can mitigate challenges faced by informal and marginalized workers, stabilize pricing, attract investment, and guide production toward more lucrative markets.
- ii. **WT Strategy 2:** Improving infrastructure—particularly transportation and storage—combined with the development of digital marketing platforms, will help maintain a stable supply of raw materials and finished products throughout the year. Supplementary measures, such as skill development initiatives and cluster-based innovation, further strengthen industry resilience.
- iii. **WT Strategy 3:** The implementation of effective government policies is essential for safeguarding incomes by regulating market prices and reducing risk. Furthermore, adopting modern machinery can address environmental concerns, such as groundwater conservation and appropriate wax disposal, while decreasing dependency on climate variables.

Collectively, these strategies position the batik industry for sustainable advancement, balancing economic growth with social inclusion and environmental stewardship.

Calculation of Quantified Strategy Planning Matrix (QSPM)

Calculation of the Quantified Strategy Planning Matrix (QSPM) involves two primary components: the Attractiveness Score (AS) and the Total Attractiveness Score (TAS). The AS is assigned on a scale from 1 (not attractive) to 4 (highly attractive). In this context, feedback was collected from female artisans through focus group discussions, and each WT strategy was evaluated using the AS.

For each factor identified in the Internal Factor Evaluation (IFE) and External Factor Evaluation (EFE) matrices, the corresponding AS is multiplied by the factor's score, resulting in the TAS for each WT strategy. The Sum Total Attractiveness Score (STAS) is then calculated by summing all TAS values for a given WT strategy, as presented in Table 3.

The WT strategy with the highest STAS is regarded as the most effective for addressing weaknesses and mitigating threats (David et al., 2009). The calculation can be summarized as follows:

$$\text{TAS} = \text{AS} \times \text{Score (EFE or IFE Matrix)}$$

$$\Sigma \text{TAS} = \text{STAS}$$

Table 3: Calculation table for Quantified Strategy Planning Matrix (QSPM)

Factors	Weighted Score	WT1		WT2		WT3	
		AS	TAS	AS	TAS	AS	TAS
S1	2.7	3	8.1	3	8.1	3	8.1
S2	3.8	3	11.4	3	11.4	2	7.6
S3	3.4	2	6.8	4	13.6	3	10.2
S4	2.1	3	6.3	4	8.4	2	4.2
S5	2.4	3	7.2	3	7.2	3	7.2
S6	3.8	3	11.4	3	11.4	2	7.6
S7	1.4	2	2.8	2	2.8	2	2.8
W1	3.6	3	10.8	4	14.4	3	10.8
W2	2.55	3	7.65	4	10.2	3	7.65

W3	3.6	4	14.4	4	14.4	3	10.8
W4	2.4	4	9.6	3	7.2	3	7.2
W5	1.95	2	3.9	2	3.9	1	1.95
W6	1.2	2	2.4	2	2.4	1	1.2
O1	3.6	3	10.8	4	14.4	2	7.2
O2	2.85	4	11.4	4	11.4	3	8.55
O3	2.4	3	7.2	4	9.6	3	7.2
O4	2.1	2	4.2	3	6.3	2	4.2
O5	2.4	2	4.8	3	7.2	1	2.4
O6	3.8	3	11.4	2	7.6	1	3.8
O7	3.8	3	11.4	2	7.6	2	7.6
O8	1.4	2	2.8	3	4.2	2	2.8
O9	2.55	4	10.2	4	10.2	3	7.65
O10	3.6	3	10.8	4	14.4	3	10.8
T1	1.4	1	1.4	1	1.4	2	2.8
T2	3.2	3	9.6	4	12.8	2	6.4
T3	1.8	3	5.4	3	5.4	3	5.4
T4	3.2	3	9.6	3	9.6	3	9.6
T5	1.2	2	2.4	2	2.4	2	2.4
T6	1.8	2	3.6	4	7.2	2	3.6
T7	2.1	4	8.4	4	8.4	3	6.3
T8	1.8	3	5.4	4	7.2	3	5.4
T9	1.5	3	4.5	3	4.5	3	4.5
STAS			238.05		267.2		195.5
Priority			2nd		1st		3rd

Source: Computed By Author

The SWOT analysis and QSPM Matrix both underscore the economic potential of the batik industry, particularly in generating meaningful employment opportunities for women and marginalized workers. This positions the batik sector as a strategic area of focus for socio-economic development initiatives. In terms of actionable strategies, targeted improvements in infrastructure—including transportation and storage facilities—as well as the adoption of digital marketing platforms, are essential for ensuring a steady year-round supply of both raw materials and finished products. These measures can significantly reduce the risks associated with market volatility.

Furthermore, prioritizing skill development and fostering cluster-based innovation have emerged as critical WT strategies for driving sustainable growth within the industry. It is therefore imperative to address these internal and external factors identified by the SWOT analysis to secure long-term advancement of batik craftsmanship in Birbhum District, West Bengal. Through the implementation of these comprehensive strategies, the batik industry has already demonstrated a positive impact on the socio-economic status of female artisans in the region, enabling a shift from traditional occupational roles to more modern, environmentally sustainable livelihoods.

Conclusion:

This analysis centers on the multifaceted challenges faced by women engaged in Batik production. These artisans possess considerable traditional expertise and benefit from strong community networks. Yet, the sector is riddled with persistent issues—suboptimal working conditions, inadequate wages, and a notable absence of formalized training. These obstacles collectively hinder progress and limit the potential for socio-economic mobility. On a brighter note, evolving trends in sustainable fashion and increased NGO

involvement present tangible opportunities for growth. Nevertheless, these prospects are tempered by external threats, including intense market competition and the often-restrictive nature of policy access. Addressing these complexities requires a collaborative approach. By leveraging existing strengths and capitalizing on emergent opportunities—while simultaneously working to mitigate structural weaknesses—women in Batik production can enhance both their economic circumstances and sense of agency. In this context, the SWOT framework is not merely a theoretical tool; it functions as a practical guide for strategic advancement. Ultimately, sustainable improvement in this sector will demand ongoing coordination among government entities, non-governmental organizations, and established artisan networks.

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