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A Study on the Sustainability of Women-Led Start-ups in the State of Gujarat

1. Dr. Parth Dave*
Assistant Professor,
Atmiya University, Rajkot
Atmiya University "Yogidham Gurukul, Kalavad Rd, Maruti Nagar, Nana Mava, Rajkot, Gujarat 360005
Email: parth.dave@atmiyauni.ac.in . No. - 8320280075
ORCID: 0000-0002-8795-9403

2. Dr. Pratik Pravin
Assistant Professor,
Atmiya University, Rajkot
Atmiya University "Yogidham Gurukul, Kalavad Rd, Maruti Nagar, Nana Mava, Rajkot, Gujarat 360005
Email: pratik.pravin@atmiyauni.ac.in . No. - 9574919107
ORCID: 0000-0003-4235-9698

3. Dr. Nirali Gathani
Assistant Professor,
Atmiya University, Rajkot
Atmiya University "Yogidham Gurukul, Kalavad Rd, Maruti Nagar, Nana Mava, Rajkot, Gujarat 360005
Email: nirali.gathani@atmiyauni.ac.in . No. - 9408729087
ORCID: 0009-0002-1614-8424

4. Dr. Pankti Pandya
Assistant Professor,
Atmiya University, Rajkot
Atmiya University "Yogidham Gurukul, Kalavad Rd, Maruti Nagar, Nana Mava, Rajkot, Gujarat 360005
Email: pankti.pandya@atmiyauni.ac.in .No.9773054392
ORCID: 0009-0004-0071-051X

5. Dr. Devanshi Dave
Assistant Professor,
Atmiya University, Rajkot
Atmiya University "Yogidham Gurukul, Kalavad Rd, Maruti Nagar, Nana Mava, Rajkot, Gujarat 360005
Email: devanshi.dave@atmiyauni.ac.in . No. - 9429003369
ORCID: 0000-0001-9815-5710

6. Dr. Shrey Bhupatkar
Assistant Professor,
Atmiya University, Rajkot
Atmiya University "Yogidham Gurukul, Kalavad Rd, Maruti Nagar, Nana Mava, Rajkot, Gujarat 360005
Email: shrey.bhupatkar@atmiyauni.ac.in .No.8469100235
ORCID: 0009-0000-0360-2080

Abstract
This study examines the sustainability of women-led startups in Gujarat, India, using survey data from 208 entrepreneurs. Findings show that market and operational challenges significantly impact business sustainability, while factors like human capital, government support, technology integration, and organizational agility have no independent effect. The results highlight the complex nature of startup success and the need for targeted, context-specific support. This research offers critical insights for policymakers and ecosystem enablers aiming to strengthen women-led enterprises and promote inclusive, sustainable development in emerging economies.

Keywords: Women-led startups, Startup Sustainability, Entrepreneurship, Women entrepreneurship, Sustainable development.

Introduction

The rise of women entrepreneurs is becoming a powerful global trend. Women are increasingly contributing to economic growth, employment generation, and social development (Kuschel et al., 2017; Shabana et al., 2017). Their growing involvement in leadership and business is helping reshape traditional gender roles and enhance economic inclusion (Lal, 2015).

Despite their skills and determination (Agarwal et al., 2020), many women-led startups—especially in emerging economies like India—face distinct challenges that affect their long-term growth (Shah, 2013). Startups, in general, are vulnerable in their early stages, with high failure rates reported within the first few years (Orobia et al., 2020). Women-owned ventures, in particular, tend to have lower survival rates compared to those led by men (Kulshreshtha & Jain, 2018). These patterns highlight the urgent need to understand what drives or hinders their sustainability.

The concept of sustainability in women entrepreneurship is shaped by various personal, social, economic, and

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cultural factors (Rekarti et al., 2019; Banu et al., 2024). Access to financial resources, technical expertise, and financial literacy are especially crucial for their business success (Andriamahery & Qamruzzaman, 2022). While formalizing businesses is often encouraged, women entrepreneurs may benefit more from support networks, mentoring, and collaborative platforms (Ramani, 2013). Gender diversity in leadership has also been shown to positively influence business performance and sustainability (Weber & Zulehner, 2010). Additionally, women's natural sensitivity toward social and environmental issues aligns closely with sustainable business practices (Barrachina Fernández et al., 2021).

To address these realities, it is important to develop supportive policies and initiatives that create an enabling environment for women entrepreneurs (Goel & Madan, 2019; Solanki, 2019). This includes encouraging innovation, adopting digital tools and mobile applications (Abed, 2021), and overcoming barriers such as limited mobility, societal pressure, and low risk-taking capacity (A & S, 2019). Women entrepreneurs also play a crucial role in achieving sustainable development goals by promoting community development and environmentally conscious business models (Barrachina Fernández et al., 2021).

While these issues are relevant across the country, their impact is particularly visible in regional settings like Gujarat. This study, therefore, focuses on exploring the sustainability of women-led startups in the State of Gujarat. It aims to identify the specific challenges they face, the factors that contribute to their success, and how they navigate structural and social obstacles such as gender bias, traditional cultural expectations, and the demands of balancing business with family life (Colaco & Hans, 2018). The study also considers the effects of the COVID-19 pandemic on their sustainability strategies (B. Chitra , 2022).

This research seeks to fill important knowledge gaps related to women entrepreneurs in Gujarat and contribute practical insights for policy and support systems aimed at strengthening the sustainability of women-owned microenterprises (Al-Qahtani et al., 2022; Banu et al., 2024). Ultimately, it adds to the broader conversation on women entrepreneurship and inclusive development, with the goal of building a more gender-equitable and resilient business ecosystem (Raman et al., 2022; Kumar, 2013).

Sustainability Meaning

Sustainability, a concept that gained prominence in 1972 and was notably defined by the Brundtland Commission in 1987, emphasizes meeting the needs of the present without compromising the ability of future generations to meet their own needs (Basiago, 1995; Terry, 2010; Jon Marco Church et al., 2022; Lanzano, 2021; Jon Marco Church et al., 2022). This principle has become a universal methodology for evaluating whether human actions will foster social and environmental vitality (Basiago, 1995). At its core, sustainability seeks to harmonize human and natural systems to ensure the long-term survival and thriving of all species (Fukushima, 2006).

The escalating importance of sustainability stems from the delicate balance of our ecosystem and society, coupled with finite natural resources and increasing negative environmental impacts (Jon Marco Church et al., 2022; Lanzano, 2021). Consequently, sustainability encompasses a complex interplay of environmental, economic, and societal issues, requiring responsible resource management. Organizations, governments, and educational institutions are increasingly focused on integrating these dimensions, aiming to optimize social, environmental, and economic outcomes simultaneously (Yang et al., 2022). The development of new technologies that address the relationships among environment, society, and economy is seen as a promising path toward achieving this crucial co-existence between the Earth's biosphere and human civilization (Yang et al., 2022).

Review of the literature and hypotheses development

The growing presence of women entrepreneurs in India, particularly in Gujarat, reflects a shift towards inclusive economic development. This review explores the multifaceted dimensions of sustainability in women-led startups, drawing from diverse scholarly contributions.

1. Barriers and Challenges

Women entrepreneurs continue to face gender-specific hurdles that inhibit their growth. Gender-related discrimination persists in access to opportunities and business progression (Dorothy Perrin Moore & E Holly Buttner, 1997). Financial exclusion, especially due to lack of collateral and limited market information, further compounds these challenges (Kuschel et al., 2017; Mashapure et al., 2022). Additionally, women experience sociocultural constraints and underrepresentation in high-tech sectors (Kuschel & Lepeley, 2016). Minority women — particularly those from religious backgrounds face additional institutional and community-level barriers (Aziz et al., 2022).

2. Support Systems and Enablers

Strong support systems significantly bolster the sustainability of women-led startups. Core enablers include skill development, internal capabilities, and family backing (Agarwal et al., 2020; Chatterjee et al., 2018). Government programs and access to financial resources, combined with financial literacy and technical knowledge, form an essential foundation for sustainable growth (Andriamahery & Qamruzzaman, 2022). Sector-specific support, particularly in the IT domain, such as mentorship and policy guidance, has shown positive outcomes (Chandra, 2024).

3. Empowerment, Inclusion, and Social Impact

Women's entrepreneurship fosters not just economic gain but also community transformation. It serves as a medium

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for empowerment and economic independence (Andriamahery & Qamruzzaman, 2022; (Sajuyigbe & Fadeyibi, 2017). Microenterprises have proven societal value (Chatterjee et al., 2018), while broader inclusion efforts align with Sustainable Development Goals (SDGs) by promoting gender equity and social well-being (Kausar & Ahmad, 2020; Prabhakar, 2015).

4. Sustainability Strategies and Business Models

Sustainability in startups is closely linked to inclusive and gender-diverse business models. Partnerships and models like the 4D framework (Dollars, Demand, Digitalization, Distribution) are recognized as effective tools for strategic planning (Ramani, 2013; (Sörensson & Navid Ghannad, 2023). Entrepreneurial orientation — particularly traits like risk-taking and achievement motivation — supports long-term sustainability (Essien & Adelekan, 2021; Sharma & Mathur, 2022).

5. Technology, Innovation, and Digitalization

Tech-driven strategies are increasingly pivotal to women-led startup growth. Adoption of mobile tools, social media, and market networks directly affect performance and reach (Sivathanu & Pillai, 2019; Demartini & Marchegiani, 2018). Advanced technologies, such as Digital Twins and AI, are being explored for climate-resilient and net-zero business solutions (Biswas, 2024), indicating a growing link between women entrepreneurs and digital sustainability.

6. Policy, Government Support, and Ecosystem Impact

Government schemes like **Startup India**, **Make in India**, and **Microfinance Initiatives** provide foundational support (Jhala & Rana, 2020; Datta, 2019). Yet, gaps remain in addressing mobility, policy fragmentation, and sociocultural resistance (Rajvanshi, 2017). Effective startup ecosystems require strategic alignment, digital inclusion, and cross-stakeholder collaboration (Dekeng Setyo Budiarto et al., 2023). International insights — from Estonia, Indonesia, and Oman — suggest the relevance of global learning for policy calibration in Gujarat (Ibrahim et al., 2024).

7. Historical, Cultural, and Regional Context

The evolution of women entrepreneurship in India provides a macro framework for Gujarat's positioning (Lal, 2015; Shetty & Hans, 2019). Gujarat's unique cultural and spiritual landscape, especially in sectors like food and handicrafts, influences entrepreneurial trends (Rekarti et al., 2019). Rural entrepreneurship models also offer valuable learnings (K. Dhanya et al., 2022).

8. Financial Support and Capacity Building

Financial access alone is insufficient without corresponding capacity-building measures. Entrepreneurial success depends on training, institutional support, and fostering key traits like leadership and adaptability (Andriamahery & Qamruzzaman, 2022; Shaw & Singh, 2024). For Gujarat, integrating financial schemes with structured capacity-building is essential (Ibrahim et al., 2024).

9. Triple Bottom Line and SDGs

Sustainable entrepreneurship requires balancing social, environmental, and economic priorities — the **Triple Bottom Line** approach (Ramamurthy Bedaduri & Sujit Kumar Pradhan, 2023). Increasingly, Indian startups are incorporating sustainability as a strategic goal, not merely as compliance (Shivhare et al., 2024; Dr.Geeta J, 2023).

10. Women's Role in Social and Sustainable Development

Figure 1. The conceptual model

Women entrepreneurs promote responsible labor practices, stakeholder engagement, and eco-conscious strategies (Kaur, 2021, pp. 167–183; Aswathy & Vasantha, 2020). The rise of eco-entrepreneurship among Indian women, especially in sustainable agriculture and green businesses, signals a broader environmental shift (Sen, 2022).

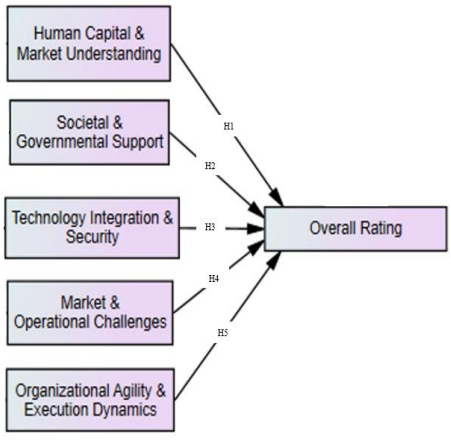
11. Entrepreneurial Intentions and Influencing Factors

Start-up intentions are driven more by intrinsic motivations and ecosystem awareness than by external social norms (Virani et al., 2022). In rural Gujarat, replicating success from rural Karnataka suggests that personal drive and access to support are vital (Mamatha & Mutyala, 2024).

12. Startups and Socio-Economic Development

Women-led startups help reduce poverty and enhance livelihoods through inclusive growth (Dhanya, 2025; Panicker et al., 2023). Comparative lessons from Maharashtra, Tunisia, and Oman illustrate how tailored schemes and entrepreneurial education can strengthen women's economic roles in Gujarat (Ibrahim et al., 2024).

Hypotheses Development



Despite growing literature on women-led startups in Gujarat, several key research gaps remain that limit the formulation and testing of robust hypotheses regarding

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sustainability. Many studies rely on cross-sectional data (Shivhare et al., 2023; Orobia et al., 2020), which constrains the ability to test causal relationships over time, highlighting the need for longitudinal studies to validate how factors such as human capital, market understanding, societal and governmental support, technology integration, and organizational agility influence sustainability. Although support mechanisms like government schemes and incubation programs are often acknowledged (Thareja et al., 2020; Agarwal, 2020; Shaw & Singh, 2024), few studies have quantitatively tested their direct impact on sustainability metrics such as profitability, survival, and growth. Furthermore, sustainability factors are often examined generically, lacking contextualization for Gujarat's diverse entrepreneurial environments—rural vs. urban, tech vs. traditional—which calls for hypothesis testing that reflects these nuances (Chatterjee et al., 2018). The concept of human capital is underexplored at the component level; factors such as formal business education, mentorship, industry experience, and digital literacy remain untested in their individual effects on startup longevity (Weber & Zulehner, 2010). Similarly, while digital technology adoption is rising, the strategic integration of advanced tools like AI and data analytics has not been adequately tested for its long-term impact on competitiveness and sustainability (Onyinye Gift Ejike & Angela Omozele Abhulimen, 2024). A further gap exists in distinguishing between factors that support mere survival versus those driving sustained growth, as many studies conflate the two (Chillakuri et al., 2020). Sector-specific sustainability dynamics are also under-researched, with studies often focusing narrowly on particular industries (Rekarti et al., 2019), limiting generalizability. Additionally, the informal sector remains insufficiently studied; many women-led ventures in Gujarat operate informally, yet there is little hypothesis-driven research exploring how informal settings and formalization initiatives affect their sustainability (Ramani, 2013). Lastly, while challenges such as access to finance and societal attitudes are commonly listed (Kumar & Singh, 2021; Rajvanshi, 2017), few studies rigorously test causal links between these challenges and actual sustainability outcomes, indicating a need for more empirically grounded hypothesis testing.

Research Methods

Sampling Design and Gathering of Data

This study examined women entrepreneurs operating startups in Gujarat, India, with a focus on identifying factors that contribute to business sustainability. Data was collected between mid-2023 and early 2024 through a structured questionnaire distributed online via Google Forms. The survey link was shared across professional networks, emails, WhatsApp groups, and social media platforms like Facebook, LinkedIn, and Instagram, targeting women-led business communities and entrepreneurial forums in Gujarat.

To ensure relevant participation, the survey included filter questions to confirm that respondents were women entrepreneurs running startups based in Gujarat. Only qualified participants could complete the full questionnaire. The exclusive focus on women entrepreneurs aimed to explore gender-specific challenges and success factors within the regional startup ecosystem.

A purposive sampling method was used due to difficulties in identifying the entire population of women startup founders in the state. The online approach was chosen to reach digitally active women likely engaged in scalable, sustainable ventures.

The questionnaire was pre-tested with 30 participants, including experts in entrepreneurship and sustainability, to ensure clarity. Minor revisions were made based on their feedback. The final version was sent to over 1,043 potential participants, yielding 432 responses. After removing incomplete entries, 208 valid responses were analyzed. This sample size was sufficient for both descriptive and inferential statistical analysis.

The survey gathered data on various factors such as education, funding, financial management, workforce, adaptability, supply chain, customer retention, technology use, and environmental awareness. It also addressed legal, socio-cultural, and government-related challenges. The study used a descriptive approach to analyze trends and draw insights into the sustainability of women-led startups in Gujarat.

Data Collection Instrument

The data for this study was gathered through a structured online survey, segmented into two principal sections. The first section captured essential demographic and business-related details of the respondents, including educational background, business experience, funding sources, and current engagement status. This information was critical in contextualizing the entrepreneurial landscape of women-led startups in the state of Gujarat.

Table 1. Demographic Details of Respondents (n = 208)

Demographics	Category	Frequency	Percent (%)
Educational Background	Schooling	3	1.44
	Bachelor's Degree	58	27.88
	Master's Degree	147	70.67
Current Engagement Status	Full-Time Business	92	44.23
	Part-Time Business	116	55.77
Business Duration (Years)	1	80	38.46

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	2	30	14.42
	3	25	12.02
	4	15	7.21
	5	48	23.08
	6	7	3.37
	7	3	1.44
Primary Source of Startup Funding	Self-Funded	178	85.58
	Borrowed Fund	30	14.42
Number of Employees in Business	2	111	53.37
	3	19	9.13
	4	29	13.94
	5	7	3.37
	6	6	2.88
	7	1	0.48
	8	2	0.96
	10	33	15.87
Faced Gender-Based Challenges	Yes	105	50.48
	No	103	49.52
Faced Legal/Regulatory Challenges	Yes	86	41.35
	No	122	58.65
Awareness of External Sustainability Initiatives	Yes	81	38.94
	No	127	61.06
Business Conscious of Environmental Sustainability	Yes	126	60.58
	No	82	39.42

The second section of the survey focused on key constructs influencing the sustainability of women-run startups, covering aspects such as finance, human resources, time efficiency, market understanding, technology adoption, environmental influence, and institutional support. Given that the respondents were primarily entrepreneurs, the instrument was designed to assess their experiences and perceptions using empirically validated constructs drawn from recent literature. Modifications were made to existing scales to ensure contextual relevance to the unique challenges and opportunities faced by women entrepreneurs in Gujarat.

The questionnaire employed a 5-point and 7-point Likert scale, depending on the context of the question. A score of 1 typically represented the lowest level of agreement (e.g., “Strongly Disagree”) or efficiency, while a score of 5 or 7 indicated the highest level of agreement or performance (e.g., “Strongly Agree” or “Highly Effective”), respectively. This scaling approach allowed for nuanced insights into the respondents’ assessments of their business operations and the surrounding ecosystem.

Table 2 outlines the demographic and business characteristics of the surveyed entrepreneurs. It is evident from the data that a significant portion of the respondents held advanced educational qualifications and had self-funded their ventures. The responses further reflect a diverse representation of business maturity levels, funding accessibility, employee strength, and perceptions regarding both internal operations and external support mechanisms. The choice of English as the medium of the questionnaire was based on the assumption that participants engaged in entrepreneurship and digital communication in Gujarat possessed the necessary proficiency to comprehend and respond effectively.

The comprehensiveness and structure of the instrument ensured a reliable measurement of various dimensions related to the sustainability of women-led startups, thereby contributing to the robustness and validity of the findings.

Table 2. Scale details and factor loadings

	Variables	Item code	Factor Loading	Cronbach’s Alpha
1	**Human Capital & Market Understanding**			
1a	You're able to attract talent easily.	HM1	.839	.839
1b	Your employees possess the necessary expertise and abilities.	HM2	.757	
1c	Your team consistently delivers strong output.	HM3	.689	
1d	You have a comprehensive grasp of your intended customer base and its dynamics.	HM4	.619	
1e	you maintain robust collaborative partnerships with key stakeholders in both industry and academia.	HM5	.602	
2	**Societal and Governmental Support**			

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2a	The prevailing societal attitudes towards women in business within Gujarat are generally positive.	SG1	.844	.817
2b	The Gujarat government actively implements supportive measures for women entrepreneurs.	SG2	.758	
2c	Recognition and tangible support from the local community significantly influence business operations.	SG3	.710	
3	**Technology Integration & Security**			
3a	My Technological assets are secured	TS1	.870	.845
3b	Technology is seamlessly woven into our business operations.	TS2	.846	
3c	I quickly embrace new technologies.	TS3	.782	
4	**Market and Operational Challenges**			
4a	We operate within a highly competitive market environment.	MO1	.823	.720
4b	Socio-cultural trends significantly impact our market and customer behavior.	MO2	.744	
4c	Current economic conditions exert a notable influence on our business operations.	MO3	.435	
5	**Organizational Agility & Execution Dynamics**			
5a	Our organization demonstrates timely adaptation to emergent market changes.	OE1	.700	.760
5b	Our rapid execution processes occasionally lead to performance bottlenecks.	OE2	.461	
5c	We facilitate swift and efficient product market entry.	OE3	.445	

Nonresponse bias and Common Method Bias (CMB)

Nonresponse bias was evaluated by comparing responses from early and late participants, revealing no significant differences ($p > 0.05$), which suggests that nonresponse bias is unlikely to have influenced the study results (Armstrong & Overton, 1977). Common Method Bias was assessed through Harman's one-factor test recommendation of (Podsakoff & Organ, 1986), where the first factor explained 35.99% of the total variance below the 50% cutoff indicating that common method bias does not pose a substantial risk to the validity of the findings. The data revealed that Common Method Bias and nonresponse bias had a negligible impact on the study's findings.

Results of Hypotheses Testing

H1: Human capital and market understanding do not significantly affect the overall sustainability of startups.

The regression result indicates that Human Capital & Market Understanding has a positive but statistically insignificant impact on **Overall Rating** ($\beta = 0.161$, $p = 0.101$). The model explains only **1.3%** of the variance, suggesting that this factor alone does not significantly predict overall ratings in the current context.

H2: Societal and Governmental Support do not significantly affect the overall sustainability of startups.

The regression result indicates that **Societal and Governmental Support** has a positive but statistically insignificant impact on Overall Rating ($\beta = 0.144$, $p = 0.156$). The model explains only 1.0% of the variance, suggesting that this factor alone does not significantly predict overall ratings in the current context.

H3: Technology Integration and do not significantly affect the overall sustainability of startups.

The regression result indicates that Technology Integration and Security has a positive but statistically insignificant impact on Overall Rating ($\beta = 0.147$, $p = 0.153$). The model explains only 1.0% of the variance, suggesting that this factor alone does not significantly predict overall ratings in the current context.

H4: Market and Operational Challenges do not significantly affect the overall sustainability of startups.

The regression result indicates that Market and Operational Challenges has a positive and statistically significant impact on overall rating ($\beta = 0.235$, $p = 0.045$). The model explains 1.9% of the variance, suggesting that this factor has a modest but meaningful influence on overall ratings in the current context.

H5: Organizational Agility and Execution Dynamics do not significantly affect the overall sustainability of startups.

The regression result indicates that Organizational Agility and Execution Dynamics has a negative and statistically insignificant impact on Overall Rating ($\beta = -0.009$, $p = 0.925$). The model explains virtually 0.0% of the variance, suggesting that this factor does not contribute meaningfully to predicting overall ratings in the current context.

Table 3. Outcomes of hypotheses testing

Hypotheses	Path	Path Coefficient (β)	p-value	Results
H1	Human Capital & Market Understanding → Overall Rating	0.114	0.101	Rejected
H2	Societal and Governmental → Overall Rating	0.099	0.156	Rejected
H3	Technology Integration and Security → Overall Rating	0.099	0.153	Rejected

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H4	Market and Operational Challenges → Overall Rating	0.139	0.045 *	Supported
H5	Organizational Agility and Execution Dynamics → Overall Rating	-0.007	0.925	Rejected

As per table 3, The analysis reveals that **Market and Operational Challenges** have a statistically significant and positive impact on the overall rating (β = 0.139, p = 0.045), thereby supporting **H4**. In contrast, all other factors—**Human Capital & Market Understanding, Societal and Governmental Support, Technology Integration and Security**, and **Organizational Agility and Execution Dynamics**—exhibit either positive or negative effects that are not statistically significant (p > 0.05), leading to the rejection of their respective hypotheses.

Support Networks, Challenges, Success Factors, and Impact

To better understand the perspectives of women entrepreneurs in Gujarat, responses to questions 20–24 were analyzed. These covered areas such as the effectiveness of support networks, ease of doing business, key challenges, success factors, and perceived impact. The following table 4 and figure 2 summarizes the top responses and their frequencies.

Table 4. Perspectives of women entrepreneurs in Gujarat

Q.No	Question	Top Response (Frequency)	% of Total	Key Takeaway
20	Effectiveness of support networks (e.g., mentorship, business groups)	Somewhat effective (64 responses)	30.8%	Most women entrepreneurs find support networks moderately helpful, signaling room for improving quality or reach.
21	Ease of doing business in Gujarat	Good (117 responses)	56.3%	While a majority rate ease of business as good, only 16.3% found it excellent—indicating potential regulatory or infrastructural friction.
22	Biggest challenge faced	Balancing work-life responsibilities (78 responses)	37.5%	Work-life balance is the most significant barrier, suggesting a need for flexible work environments and family support systems.
23	Most important success factor	Social Support (48 responses)	23.1%	Social and community support is the most cited success factor, underlining the importance of networks and societal backing.
24	Area of most positive impact by the business	Social Impact (91 responses)	43.8%	Women-led startups in Gujarat primarily contribute to community development and employment, reinforcing their role in inclusive growth.

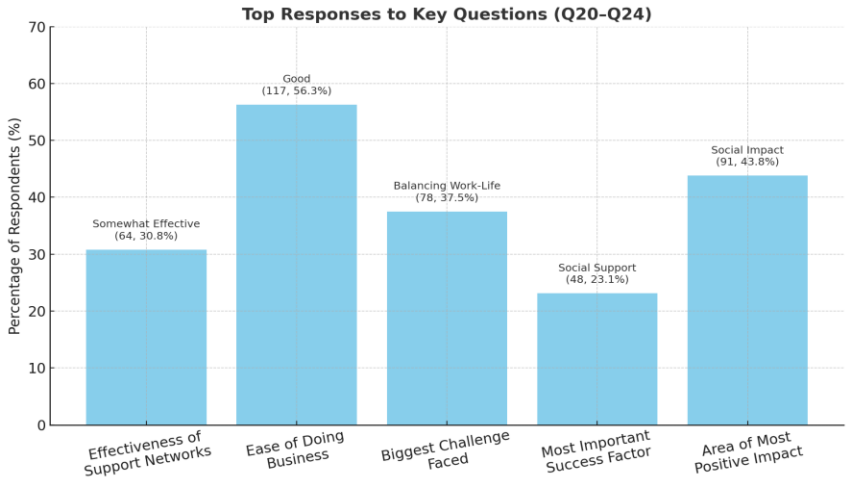

Figure 2. Responses of Q. 20 to Q. 24

The results indicate that while support networks are seen as somewhat effective, work-life balance remains the biggest challenge. Social support emerges as a key enabler of success, and the primary impact of women-led startups is observed in social development, particularly through community engagement and employment generation.

Conclusion

This study contributes to the growing body of empirical research on women-led startups by rigorously examining the impact of multiple sustainability factors within the unique entrepreneurial context of Gujarat. The findings provide robust evidence that Market and Operational Challenges significantly influence

business sustainability, affirming Hypothesis H4. This highlights the critical importance of market responsiveness, competitive positioning, and the ability to manage dynamic external environments for the long-term viability of women-led ventures. However, Hypotheses H1, H2, H3, and H5—relating to Human Capital & Market Understanding, Societal and Governmental Support, Technology Integration & Security, and Organizational Agility & Execution Dynamics—were statistically unsupported, indicating that these variables, while relevant, may not exert independent influence on sustainability when analyzed in isolation. These findings suggest that sustainability outcomes are shaped by a complex, possibly synergistic interplay of internal and external factors, which linear models may not fully capture. Future research should consider employing integrative analytical frameworks, such as structural equation modeling or mixed-methods approaches, to explore mediating and moderating effects among variables. Additionally, longitudinal studies could provide deeper insights into how these relationships evolve over time. By shedding light on the nuanced dynamics influencing women-led startups in Gujarat, this study offers both theoretical advancement and practical guidance for policymakers, ecosystem enablers, and entrepreneurs striving to enhance the resilience and scalability of women-driven enterprises in emerging markets.

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