

Critical Factors for Sustainable Resilience in Female Social Entrepreneurship a Multivariate Predictive Model in Contexts of Economic Volatility

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Abstract

This study develops a multivariate predictive model to identify critical factors of sustainable resilience in female social entrepreneurship within contexts of economic volatility. Using a feminist theoretical framework, the research examines how women social entrepreneurs navigate structural inequalities while building transformative business practices. A survey was administered to 200 women entrepreneurs registered with an NGO in Piura, Peru, selected through non-probability convenience sampling. Data analysis employed confirmatory factor analysis and structural equation modeling using PLS-SEM technique. The measurement model demonstrated excellent fit indices (SRMR = 0.052, RMSEA = 0.040, CFI = 0.986, GFI = 0.992) with high internal consistency (α ranging from 0.820 to 0.945). Results reveal that sustainable resilience significantly mediates the relationship between adaptive strategies and entrepreneurial success ($\beta = 0.767$, $p < .001$). Digital strategies ($\beta = 0.309$, $p < .001$) and innovation models ($\beta = 0.428$, $p < .001$) emerged as significant predictors of sustainable resilience, while economic, social, and environmental factors showed no direct significant effects. Findings challenge deterministic perspectives by demonstrating that women social entrepreneurs transform structural barriers into opportunities through collective resistance strategies. The study contributes to feminist entrepreneurship literature by providing empirical evidence that sustainable resilience operates as an emancipatory construct, articulating economic survival with social transformation. These results inform gender-sensitive public policies and organizational strategies that recognize women's transformative agency in building more equitable and inclusive economies.

I. Introduction

Women's social entrepreneurship is emerging as a holistic phenomenon that cannot be reduced to traditional categories of economic analysis. Rather, it is both a strategic response to structural gender inequalities and a resistance mechanism that challenges the dominant paradigm of economic development. In other words, women social entrepreneurs are undoubtedly market agents, but they operate primarily as agents of social change who break down and rebuild the structures that have excluded them from participation in economic spheres of power for centuries (Al-Qahtani et al., 2022). Therefore, the systemic inequalities they face are deeper aberrations than challenges to access capital and require intersectional analysis and a multidimensional response, as they are rooted in broader patriarchal pressures.

Contemporary empirical evidence suggests that women social entrepreneurs experience what we might describe as a 'triple penalty': primarily, for being women in a male-dominated entrepreneurial ecosystem; second, for leading a type of enterprise traditionally undervalued in profit-maximising markets; and finally, for facing economic volatility that only serves to exacerbate preexisting inequalities. This complexity underscores the importance of the fact that globally only 30% to 37% of businesses are run by women, a figure that drops dramatically when limited to social enterprises, with female social entrepreneurs receiving around 40% less investment than their male counterparts (Hendratmi et al., 2022). Thus, these gaps are not mere statistical abstractions, but reflect structural patterns of exclusion that require a deeper analysis.

In Latin America and the Caribbean, these failures become particularly critical when linked to gaps in the gender digital divide, which fuels the cycle of economic deprivation. Although the difference varies by country, women are between 15 and 19 percentage points less likely to use the Internet than men, creating significant barriers to access to the digital economy and technology-based digital opportunities. In the Mexican context, 57.3% of women work in the informal sector, increasing to 86% for indigenous women in the region, demonstrating the problematic interaction between race, gender, and poverty (UNDP, 2023). It is also alarming that more than 50% of Mexican households suffer from some degree of food insecurity, with 60% in rural areas where women are the main supervisors of the household and nutrition.

In this sense, the COVID-19 pandemic acted as an 'amplifier of inequality' by disproportionately increasing exposure to its consequences for preexisting gender-based vulnerabilities. For example, although 62% of women's businesses suffered a severe operational impact caused by the pandemic, 71% of women's social entrepreneurs saw protocols disrupted in their supply chains (Aziz et al., 2024; Sörensson & Ghannad, 2024). Furthermore, correlations between economic vulnerability and gender, which were statistically significant in the sample analysed at $p < 0.01$, multiplied during the global health crisis. Despite helping to revitalise the economy and alleviate poverty to a large extent, the sustainability of businesses is affected by economic and health vulnerability. Therefore, these data are not just numbers; they are destroying lives, communities, and transformative projects that are deteriorating due to systematic threats.

In fact, even despite these structural barriers, the pattern of resistance and adaptation is so strong that it complicates discourses of victimisation and allows us to affirm the agency of women social entrepreneurs. Social enterprises involving women are responsible for

20% of all positive social impacts, compared to 80% combined, so limited resource conditions, in turn, translate into frugal economic innovation technology and strong collaboration. Furthermore, employers with adequate support for women are 1.5 times more likely to survive and generate 35% more jobs over a 5-year period of business activity, which also confirms their stronger ability to overcome the limitations imposed on social support systems (Aracil-Jordá et al., 2023)).).

In this sense, the accelerated digitalisation during the pandemic paradigmatically illustrates this inherent adaptive capacity: 53% of women entrepreneurs in Asia and Europe, for example, have managed to develop new business models with expanded international reach, effectively transforming crises into opportunities for growth and expansion (Sörensson & Ghannad, 2024). Similarly, the multidimensional analysis conducted by Hendratmi et al. (2022) finds that 67% of women entrepreneurs are developing business models with a triple impact focus, significantly strengthening their resilience to economic crises, with a correlation coefficient of $r = 0.76$; $p < 0.001$. Such findings suggest that social enterprises not only resist adversity, but also develop transformative capacities that reconfigure entire business ecosystems into more sustainable and inclusive models (Anjum et al., 2024).

In feminist theoretical terms, the conceptualisation of sustainable resilience goes beyond survival commodification to include the ability to flourish while radical social change is taking place. In contrast to neoliberal market individualism, enterprises value relational, collaborative, and collective dimensions of success that are no longer subordinate to individual profit-seeking; rather, they focus on communal well-being. Social enterprise entrepreneurs do not merely survive within existing capitalist economies but build mutually supportive economies and make their own economic models, fostering alternatives to abusive market logics that operate in the conventional market sphere. Thus, sustainable resilience is a form of resistance that articulates the energy of labour to produce life and survive with the creation of life and social transformation.

However, the existing literature on women's entrepreneurship tends to fragment the analysis by considering gender, sustainability, and resilience separately and without their complex interconnections. This perspective obscures the systemic dynamics that link power structures, adaptive strategies, and transformative outcomes, making it difficult to fully and holistically understand the phenomenon. In particular, there is a critical lack of integrated models that explain how social entrepreneurs women manage to develop sustainable resilience in times of crisis, particularly during the current COVID-19 pandemic. Although there is a lot of one-dimensional research on the topic of female entrepreneurship in general and social entrepreneurship when viewed simply as a separate category, there is little empirical evidence based on complex statistical models on how specific factors contribute to sustainable resilience in a crisis situation.

This limitation motivated the development of the present research, which designs a multivariate predictive model with the purpose of identifying the critical factors of sustainable resilience in women social entrepreneurs facing contexts of economic volatility. In this sense, the main objective of the present research is to determine the critical factors of sustainable resilience in female social entrepreneurs in contexts of economic volatility through the design of a multivariate predictive model. The following specific objectives are pursued: first, identify the latent constructs that make up sustainable resilience through the application of confirmatory factor analysis in female social entrepreneurs from different socioeconomic contexts. In this first case, it will be necessary to establish how the categories of digital capabilities, frugal innovation, and financial sustainability are connected through the use of structural equations. Third, quantify the impact of adaptive responses on outcomes using time series and survival analysis.

The relevance of this study goes beyond the academic sphere to inform both gender-sensitive public policies and organisational strategies that take advantage of the transformative capacities of women social entrepreneurs as agents of social change. In a global context of economic instability, systemic inequalities, and sustainability challenges, the ability to predict how social entrepreneurs develop the capacity to cope with crises and adapt to complex environments is crucial to building more equitable and inclusive economies. Therefore, the implications derived from a multivariate analysis of these findings will be particularly important for financial institutions, entrepreneurship support organisations, and public policymakers, all of whom hope to implement effective interventions that are better informed by solid quantitative evidence.

Last but not least, this research also shifts the dominant narratives of entrepreneurship that render women's experiences invisible, offering instead an analytical lens that recognises women social entrepreneurs as creative agents with the capacity to imagine an alternative future. Rather than replicating a narrative that positions women as passive recipients of assistance and development, this work emphasises their role as active agents of social change who, drawing on their own autonomy, develop innovative strategies of resistance and survival in the face of systems of structural exclusion.

Conceptual Foundations of Sustainable Resilience from a Feminist Perspective

In short, sustainable resilience in women's social entrepreneurship is an emancipatory concept that goes beyond the framework of neoliberal business recovery to emerge as a praxis of resistance that challenges patriarchal power structures. In terms of feminist epistemology, this construct refers to the capacity of women social entrepreneurs not only to adapt to systemic deprivation, but also to eradicate the structure behind it that subordinates them economically and socially (Al-Qahtani et al., 2022). According to the conceptual framework of feminism, sustainable resilience rejects the victim-blame paradigm that blames women for resisting and argues that the manifestations of vulnerability that women face are part of the manifestations of systemic structural inequalities.

The feminist theorization of entrepreneurialism has undergone a paradigm shift. It has moved from essentialist approaches that emphasised biological differences to critical frameworks that analyse how power structures shape gender-differentiated entrepreneurial experiences. Marlow (2020) documents this conceptual transformation, highlighting how contemporary research has overcome the 'difference trap' to focus on analysing systems of inequality that operate in entrepreneurial ecosystems. The Diana project is a pioneering initiative whose methodological and theoretical foundation have transformed the field of entrepreneurship and gender studies over the last three decades (Brush et al., 2020). Therefore, differences in business performance between genders are fundamentally explained by systemic barriers to access to capital, networks, and resources.

Intersectionality and systemic exclusion

The financial sustainability of social entrepreneurship in women can only be understood in terms of the broader context of the systematic exclusion of women from economic power circuits. It cannot be reduced to the so-called access difficulties. Rather, they are structurally deep manifestations of financial arrangements that are based on and reinforce patriarchal logics that actually devalue women's work and creativity. The phenomenon of gender bias that the research team imagines is confirmed in our confirmatory factor analysis conducted by Sharma and Sarkar (2024). This finding shows that limited access to finance explains a significant part of gender differences in the entrepreneurial environment (coefficient = 0.68, $p < 0.001$), showing how gender biases have been institutionalised in financial structures.

A 'financing gap' that finds that women entrepreneurs receive approximately 40% less investment than their male counterparts (Hendratmi et al., 2022) reflects gender stereotypes that perceive women as 'riskier' or 'less suitable' for business leadership. These biases are accentuated in the social sector, where a paltry 2.3% of global venture capital goes to companies led solely by women (Aziz et al., 2024). In response to this systematic exclusion, women social entrepreneurs manage to align their businesses in a variety of alternative ways that challenge market logic, as demonstrated by the structural equations developed by Aracil-Jordá et al. (2023) when the circular economy is integrated into women's business practices, long-term financial viability improves by 42%.

In this sense, the relational capital of women in social entrepreneurship comes from logics that are significantly different from masculinised business networks, based on care, horizontal solidarity, and collective knowledge production. The logistic regression models of Schröder et al. (2021), for example, find that lack of access to mentors reduces the probability of female social entrepreneurs achieving future success by 37%, pointing to how exclusion from spaces centralised around rationalist masculinity and power limits opportunities for development. However, before development, female marginalisation makes it possible to build empowering networks that operate around feminist values centred on reciprocity and support. Li et al. (2023), for example, find that university and social engagement are at least 38% more likely to predict green intentions.

The structural obstacles experienced by women social entrepreneurs are exacerbated by gender when they intersect with other categories of marginalisation, such as ethnicity, social class, sexual orientation, or geographic location. In fact, the standardised coefficients proposed by Al-Qahtani et al. (2022) suggest that cultural and normative barriers explain around 43% of the variance in women's entrepreneurial performance in deeply patriarchal contexts. The 'double shift' of women social entrepreneurs, studied by Hillman and Radel (2022), shows that 68% report significant difficulties in balancing their family and employer responsibilities. Given that such evidence does not reflect 'individual limitations' but rather the operation of gender systems in which women are assigned disproportionately responsibility for family and community care,

In Latin America, female social entrepreneurship develops in particular power configurations that originate from long-standing collinearity, as existing extractive structures converge with contemporary neoliberalism to generate particular forms of economic marginalisation. As can be seen in the experience of feminist ethnoracial entrepreneurship researched by Santellano and Vallejo (2024), Latin American women entrepreneurs use strategies that both leverage and challenge racialised stereotypes, turning markers of cultural difference into competitive resources in corporate economic schemes. The idea of 'good living' (sumak kawsay) formalises

alternative economic perspectives that prioritise ecological balance, reciprocity and complementarity over infinite wealth accumulation (Little et al., 2023).

Transformative Practices and Epistemic Resistance

The environmental dimension of women's social entrepreneurship, which is articulated from ecofeminist perspectives of women's domination in the exploitation of nature, as the business practices developed by these entrepreneurs question and disrupt the extractive logic of patriarchal capitalism. Social entrepreneurs use frugal innovation strategies in which limited resources are maximised not through 'economic efficiency,' but through an ethic of care that refuses to allow waste and overexploitation (Shahid et al., 2023). Furthermore, multidimensional analysis reveals that 67% of women entrepreneurs develop business models with a triple impact focus, which are significantly more resilient to crises with a correlation coefficient of $r = 0.76$; ($p < 0.001$) (Hendratmi et al., 2022).

Therefore, female ethics of care emerges as a key interpretive framework to address how social entrepreneurs can engage in business practices that challenge and transcend the extractive logics of neoliberal capitalism. Freund et al. (2024) apply this framework to an analysis of the barriers faced by tourism entrepreneurs in Barcelona, exemplifying how the ethics of care can provide conceptual and practical alternatives to masculinised and competitive business models based on competition. Boluk and Panse (2022) also carried out this analysis, documenting how social entrepreneurs in Canadian tourism are able to effect regenerative impacts that go beyond sustainability to actively contribute to, rather than mitigate, ecological and social restoration.

Public policy feminism and women's entrepreneurship reveal the basic contradictions between discourses of power and practice that economically subjugate women. Benneh Mensah and Derera (2023) conduct a systematic critique of women's entrepreneurship policy in Ghana and demonstrate how progressive entrepreneurship frameworks reproduce gender stereotypes by diverting women to feminised sectors, traditionally microfinance and microcredit. The concept of 'feminist entrepreneurship' (Orser, 2022) suggests alternative public policy frameworks in this regard that go beyond instrumental attempts to reveal and highlight the transformative agency of social entrepreneurs of women.

In this sense, digitalisation in female social entrepreneurship does not operate merely as a technological tool, but as a mechanism of democratisation that empowers women to access resources, knowledge, and markets usually controlled by male elites (Buraga et al., 2023). As documented by Sörensson and Ghannad (2024), accelerated digitalisation during the pandemic represented opportunities for 53% of women entrepreneurs in Asia and Europe, allowing them to develop business models with international reach that transcend geographical and structural limitations. However, feminist appropriation of digital technologies is not satisfied with corporate access to tools, but operates as a practice of resistance against male monopolies on technological innovation (Illescas et al., 2024).

On the one hand, frugal innovation implemented by social entrepreneurs by women is a form of epistemic resistance against Western development paradigms based on unlimited accumulation and exponential growth (Martinez et al., 2024). More precisely, Shahid et al. (2023) show that women entrepreneurs who implement frugal innovation approaches perform 1.3 times better than their conventional business models, demonstrating that resource constraints can catalyse creativity and innovation when approached from a perspective that values regenerative efficiency over unlimited consumption. Therefore, adaptive business models developed by social entrepreneurs by women incorporate feminist economic principles that prioritise sustainability of life over profit maximization (Iskandar, 2023), as identified by Chaudhary and Rawat (2024) in demonstrating that farmers adopting sustainable technologies increase their productivity by 37%.

Collective Motivations and Strategies

Analysis of the motivations that drive women toward social entrepreneurship reveals distinctive patterns that transcend individualistic explanations to connect with broader transformative commitments to social justice and gender equity. Ihejiamaizu and Inyang (2022) identify that Nigerian women social entrepreneurs are primarily motivated by the desire to address systemic inequalities that particularly affect women, developing initiatives that simultaneously generate income and transform structural conditions of marginalisation. Nwachukwu et al. (2024) specifically document the motivations, challenges, and strategies of women social entrepreneurs in the microcredit sector, revealing that these entrepreneurs face complex tensions between financial sustainability and social accessibility.

Examining the motivations that lead women to embrace social entrepreneurship reveals distinctive patterns that go beyond individualistic explanations to address broader commitments to social justice and gender equality. Ihejiamaizu and Inyang identify the

motivations of Nigerian social entrepreneurs as the underlying intention to address systemic imbalances that particularly harm women, forming organisations that simultaneously create income and adjust the framework conditions of exclusion. Nwachukwu et al. specifically document the motivations, challenges, and strategies of social entrepreneurs in the credit industry, revealing that these entrepreneurs face complicated tensions between sustainable income generation and social accessibility.

Social entrepreneurs weave support networks that operate on the principles of a solidarity economy, placing reciprocity, fair exchange, and collective well-being above competition and individual accumulation. These networks serve as "laboratories of the future" where alternatives to patriarchal capitalism are tested, implementing economic practices that articulate production with reproduction, paid work with unpaid care, and individual success with community well being. The intersectoral collaboration documented by Dong and Khan (2023) presented above indicates how rural women's empowerment increases the sustainability of local tourism ventures by 46%, revealing how women's empowerment generates spillover and multiplier effects of favourable impacts on entire communities (Panse & Boluk, 2024).

The intersection between technology, gender, and entrepreneurship is an emerging phenomenon that requires specific feminist analysis to understand how digital technologies can simultaneously reproduce and challenge preexisting gender inequalities. Reyes and Neergaard (2023) explore feminist frameworks related to technological entrepreneurship in incubator environments to identify how these spaces, which are based on market justice, actually reproduce gender biases to hinder women's access and development. Using a systematic analysis of Chinese literature, Blalack et al. (2023) uncover specific patterns of female entrepreneurship in authoritarian contexts in which women attempt to navigate state and patriarchal constraints.

Toward an integrated model of feminist resilience

The creation of an integrated framework for sustainable resilience for women's social entrepreneurship must incorporate feminist perspectives that, on the one hand, recognise women's subjectivity and proactive capacity, and, on the other, systematically analyse the power structures that limit this group's capacity for action. The proposed model cannot replicate visions that ultimately blame women for their lack of 'resilience' in the face of oppressive systems and structures. Rather, it should examine how these social entrepreneurs collectively develop and build alternative forms of resistance and transformation.

A triple impact model cited by Hendratmi et al. (2022) increases resilience and resistance to crises by 42%. However, from a gender perspective, the recently mentioned triple impact is not a 'business innovation', but a manifestation of alternative values that oppose dominant values. At the same time, they have always existed, but were ignored by the male 'development pattern'. The hypothetical model of adaptive capabilities introduced by Sörensson and Ghannad (2024) would explain approximately 68% of the variability in the phenomenon of entrepreneurial resilience.

Analysis of the implications of female entrepreneurialism for regional development reveals complex tensions between the goals of economic growth and gender equity that must be resolved through gender-sensitive public policy frameworks (Castellanos et al., 2024). As conceived by Harrison et al. (2020), female entrepreneurship is a 'gender niche' that, despite providing women with economic opportunities, also promotes segregation and ultimately hinders the capacity for expansion due to the underlying structures of inequality. Research by Kawarazuka et al. (2023) on female social entrepreneurship in rural economies shows how social reproduction work is a systematically marginalised aspect of gender and agriculture research.

Through the synthesis presented above, it is proposed that resilience in sustainable social entrepreneurship of women operates synchronously as an economic survival strategy, a mechanism of resistance to systematic exclusion, and a transformative practice that creates alternatives to patriarchal capitalism. This multidimensional conceptualisation implies that social entrepreneurs women do not merely 'adapt' to oppressive systems, but are empowered to transform the structural conditions that perpetuate their marginalisation and, therefore, contribute to co-creating more just and inclusive futures that respect the interdependence between human communities and natural ecosystems, as evidenced by Wu (2022) in this article, as well as Constantinidis (2021), Kyle (2020), Long and Buzzanell (2022), Branicki et al. (2023) and Peiris et al. (2024) in a variety of geographic locations and cultures.

The proposed hypothetical model is shown in Fig. 1.

II. Method

The empirical evaluation needed to test the research hypotheses was carried out through a survey administered to women entrepreneurs with experience in social entrepreneurship registered with a nongovernmental organisation (NGO) located in Piura.

Participants

The survey was based on the participation of 200 women entrepreneurs out of a total population of 250 women registered with an NGO in Piura, Peru. The sample was selected according to criteria established in a nonprobability convenience sample. As a result, data collection was designed to be based on the selection of highly available participants willing to participate in the study with a limited scope of other factors (Hernández & Mendoza, 2018). This type of sampling is used to provide limited access to the total target population when that population has a close link to its main factors.

The sample frame consisted of entrepreneurs who met the following inclusion criteria: (a) being officially registered with the NGO, (b) having at least one year of experience in social entrepreneurship activities, (c) residing in the Piura region, and (d) voluntarily consenting to participate in the study. Those who did not complete the entire evaluation instrument or presented inconsistent data on demographic variables were excluded from the study.

As shown in Table 1, 43.5% (87 participants) of the total number of interviewees had been entrepreneurs for more than 55 years, followed by 28.5% (57 participants) in the age range 46–55 and 18.5% (37 participants) in the age range 36–45. In terms of years of entrepreneurial experience, most of the interviewees had more than 6 years of experience, with 60.5% (121 participants) of the total sample, followed by entrepreneurs with 1 to 3 years of experience, representing 16.5% (33 participants).

Regarding the entrepreneurial sector, most of the respondents specialise in handicrafts, accounting for 56.0% (112 people); followed by 'Other' with 15.0% (30 people); services 12.0% (24 people); food 9.0% (18 people); and commerce 8.0% (16 people).

Table 1
Sociodemographic characteristics of the sample (n = 200)

Age	fi	%
Less than 25	1	0.5
Between 25 and 35	18	9.0
Between 36 and 45	37	18.5
Between 46 and 55	57	28.5
More than 55	87	43.5

Time for entrepreneurship	fi	%
Less than 1 year	17	8.5
1–3 years	33	16.5
4–6 years old	29	14.5
More than 6 years	121	60.5

Entrepreneurship Sector	fi	%
Food	18	9.0
Trade	16	8.0
Services	24	12.0
Handicrafts	112	56.0
Others	30	15.0
Note: fi = absolute frequency; % = percentage		

Instruments

To select the data collection instrument used in the study, a systematic review of the scientific literature was conducted, which allowed me to identify the components of sustainable resilience in female social entrepreneurship, based on the proposed multidimensional theoretical framework. In addition, to draw out the items, I adapted previously validated instruments in similar contexts of social entrepreneurship and business resilience.

To apply to the participants, an online form was created using Google Forms with the data study instrument divided into three parts. The first part contained informed consent, which included knowledge of the study details and the guarantee that, by completing the survey, the anonymity of the participants was ensured. The section ended with a branching question of whether participants voluntarily agreed to participate in the study. If the answer was yes, the participants continued to complete the survey; if the answer was not, the survey was automatically closed.

The second section contained sociodemographic questions such as age, length of experience in entrepreneurship, and the business sector. Finally, in the third section, the 20 items were organised according to the study variables: 13 items in the variable of female social entrepreneurship. These were distributed in three dimensions: (economy and financial sustainability with five elements, social – relational capital and support networks with five elements, and environmental – sustainable practices and green innovation with three items); and seven elements in the sustainable resilience variable. These were distributed in three dimensions: (digitalisation and technological transformation strategies with three elements, innovation and adaptive business models with two elements, and sustainable resilience capacities with two elements).

All elements were rated on a 5-point Likert scale ranging from (1) 'never' to (5) 'always'. This scale captured the frequency with which women entrepreneurs implemented the practices evaluated in their business activities.

Procedure and data analysis

The survey was conducted between March 11 and April 22, 2025. The NGO was asked for authorisation to administer the online survey. After obtaining the necessary approvals, the survey link was distributed through email and messaging apps, where current potential participants were informed of the purpose of the study and invited to respond. Furthermore, the organisation's coordinators were asked to share the survey link through WhatsApp groups, where the study plan was explained to current participants and encouraged to complete the survey. All participants gave their consent.

Prior to survey distribution, all potential participants received detailed information about the study through the NGO's communication channels. The research team provided a comprehensive information sheet explaining the study's purpose, methodology, participant rights, and data protection measures. Only after explicit digital consent was obtained did participants gain access to the survey questionnaire.

Finally, to ensure consistency of the baselines among NGO participants, a standardised protocol was established for data collection. The protocol incorporated identical instructions for participants, a synchronised time frame for data collection, and a systematic approach to maximise the response rate.

The first step in data analysis involved cleaning and preprocessing the data in Microsoft Excel, a process in which missing values and incomplete surveys were identified and removed. Second, descriptive statistics were used to generate Tables 1 and 2, which describe the sociodemographic and descriptive results of the participants.

Finally, in relation to convergent validity, confirmatory factor analysis (CFA) was performed using factor loadings and extracted average variance (AVE), both with respective optimums greater than 0.70 and 0.50; on the other hand, for internal consistency reliability, alpha and composite reliability (ρ_a and ρ_c) were used, both greater than 0.70. Finally, in terms of discriminant validity, according to Fornell and Larcker (1981) and the heterotrait-monotrait ratio (HTMT) criterion, the results were considered acceptable.

Finally, the research hypotheses were confirmed by modelling structural equations using the PLS-SEM technique. JASP version 0.19.3 statistical software was used. This method allowed researchers to examine the interrelationships between latent constructs at the same time, participate in the comprehensive evaluation of the measurement model, and the structural framework.

III. Results

Measurement model

As can be seen in Table 1, the structural equation measurement model fits adequately according to the pre-set fit indices. The SRMR value is equal to (0.052), a threshold below 0.08, which is quite acceptable. RMSEA (0.040) is also lower than 0.05, indicating an excellent fit of the model. The indices of CFI (0.986) and GFI (0.992) are higher than the established threshold of 0.95, confirming that these parameters are acceptable. The chi-square value ($\chi^2=1242.963$) is significant ($p<.001$), which is common in large sample sizes. In general, all the indicators mentioned demonstrate the ability of the proposed theoretical model to adequately describe the observed data, in this case, sustainable resilience in female social entrepreneurship.

Table 2

Model fit

	SRMR	RMSEA	IFC	GFI	AGFI	χ^2	gl	p
Model 1	0.052	0.040	0.986	0.992	0.875	1242.963	1.323	< .001

In Table 2, the values of the HTMT ratio between the model constructs are below the critical threshold of 0.85 in almost all relationships, indicating adequate discriminant validity between the latent variables. The strongest correlations are evident between environmental practices and female entrepreneurialism (0.652); between digital strategies and social capital (0.787); and between innovation models and environmental practices (0.789). These findings show that although the constructs are related, each captures a different theoretical domain of construction within the resilience model for sustainable female social entrepreneurship.

Table 3

HTMT

econ_sos	social_cap	amb_pr	female_company	estr_dig	innova_model	resilience_sos
0.763						
0.673	0.452					
0.530	0.243	0.652				
0.654	0.787	0.806	0.345			
0.511	0.690	0.789	0.215	0.654		
0.781	0.763	0.798	0.444	0.480	0.256	
0.672	0.551	0.515	0.561	0.621	0.334	0.572

Table 3 shows that all the constructs of the model have good internal consistency. Cronbach's alpha coefficients for the constructs range from 0.820 to 0.945, clearly exceeding the recommended minimum threshold of 0.70. The same can be observed in the omega coefficients, where the values range from 0.727 to 0.904, respectively. It should be noted that the constructs "Digital strategies" ($\alpha=0.945$, $\omega=0.850$) and "Model innovation" ($\alpha=0.924$, $\omega=0.904$) have the highest internal consistency. The total reliability index of the instrument also shows good results, with $\alpha=0.897$ and $\omega=0.862$. Therefore, we can conclude that the indicators used are very reliable for measuring sustainable resilience in female social entrepreneurship.

Table 4

Reliability

	Coefficient α	Coefficient ω
econ_sos	0.820	0.727
social_cap	0.906	0.805
amb_pr	0.894	0.899
female_company	0.859	0.806
estr_dig	0.945	0.850
innova_model	0.924	0.904
resilience_sos	0.828	0.842
total	0.897	0.862

In Table 4, the values of the extracted average variance (AVE) for all models exceed the recommended threshold of 0.50 or 50%, confirming an adequate convergent validity. These values range from 0.686 for sustainable resilience to 0.895 for female entrepreneuriality, meaning that more than 68% of the variance in the indicators is explained by the constructs themselves. The construct that deserves special attention is "female entrepreneurship." Given that the VME is 0.895, it can be stated that 89.5% of the indicators and their variants share common variance and adequately represent the underlying theoretical construct.

Table 5

Average variance extracted.

Latent	VME (AVE)
econ_sos	0.756
social_cap	0.807
amb_pr	0.715
Female_company	0.895
estr_dig	0.745
innova_model	0.753
resilience_sos	0.686

Parameter Estimates

Table 5 shows that the factor loadings of all indicators in their respective constructs are due to significant values, reiterating the sum when their variation is between 0.701 and 0.940. Furthermore, all loadings exceed the threshold of 0.70 suggested in the literature, implying that the relationship between indicators and their latent constructs is not less than that. Finally, the 95% confidence limits do not include 0, confirming the statistical significance of these relationships. For example, the factor loadings for the indicators'sustainable resilience' (P18 = 0.91, P19 = 0.94, P20 = 0.89) appear to be particularly robust; therefore, these elements are likely to represent well the central construct of this study. Overall, these findings support the validity of the factor structure proposed by the measurement model (table 6).

Table 6

Factor loadings

						95% confidence interval	
Latent	Indicator	Estimate	Standard error	Z-value	p	Inferior	Superior
amb_pr	P7	0.783	0.000			0.610	0.930
	P9	0.854	0.210	5.960	< .001	0.642	0.966
econ_sos	P1	0.860	0.000			0.630	0.920
	P2	0.909	0.125	7.283	< .001	0.664	0.954
Female_company	P10	0.860	0.000			0.520	0.890
	P11	0.701	0.291	5.494	< .001	0.530	0.872
	P12	0.864	0.357	5.778	< .001	0.564	0.964
	P13	0.873	0.306	5.789	< .001	0.673	0.974
estr_dig	P14	0.902	0.000			0.620	0.980
	P15	0.862	0.103	12.244	< .001	0.660	0.964
Innova_model	P16	0.850	0.000			0.720	0.901
	P17	0.873	0.113	9.482	< .001	0.651	0.995
Resilience_sos	P18	0.910	0.000			0.502	0.976
	P19	0.940	0.128	7.367	< .001	0.690	0.960
	P20	0.893	0.145	8.231	< .001	0.709	0.977
social_cap	P4	0.780	0.000			0.607	0.881
	P5	0.837	0.139	6.041	< .001	0.565	0.908
	P6	0.831	0.158	6.517	< .001	0.621	0.940

Structural Model

Table 7 shows that both sustainable resilience and social entrepreneurship of women have a positive and significant relationship; the effect of the former on the latter is ($\beta=0.767$, $p>.001$), with a confidence interval ranging from 0.544 to 0.910. Similarly, both digital strategies ($\beta=0.309$, $p<.001$) and innovation models ($\beta=0.428$, $p<.001$). However, economic, social, and environmental factors related to female entrepreneurship were not significant in the model obtained ($p>.05$). These results confirm the mediating relevance of sustainable resilience between digitalisation and innovation strategies and the success of female social entrepreneurship, corroborating the main hypothesis of the study.

Table 7

Regression Coefficients

Result	Predictor	Estimate	Standard error	Z-value	p	95% confidence interval	
						Inferior	Superior
Female_company	econ_sos	0.518	0.435	1.193	0.233	-0.334	1.370
	social_cap	-1.751	1.196	-1.464	0.143	-4.096	0.594
	amb_pr	1.892	1.257	1.505	0.132	-0.572	4.355
	Resilience_sos	0.767	0.041	9.183	< .001	0.544	0.910
Resilience_sos	estr_dig	0.309	0.074	4.147	< .001	0.163	0.454
	Innova_model	0.428	0.080	5.351	< .001	0.271	0.584

The path diagram visually summarizes the structural relationships between the models. Overall, digital strategies and innovation models emerge as the only significant predictors of sustainable resilience, which, in turn, significantly contributes to female social entrepreneurship. The representation provides an overview of the mediating hypothesis for sustainable resilience and clarifies the complexity of the interrelationships between the various factors. Therefore, the diagram provides a visual summary of the findings from the previous interpretation, summarized in the results tables.

Path diagram in Figure 2

IV. Discussion

In general, the significant findings of this study provide substantial empirical evidence that validates the theoretical understanding of sustainable resilience in female social entrepreneurship in vulnerable environments of economic volatility in the global South. The generated structural model reveals that the proposed mediator, sustainable resilience, is a critical mediator between adaptive strategies and entrepreneurial success, with a positive and significant effect on female social entrepreneurship ($\beta = 0.767$, $p < .001$). Consistent with the central narrative, feminism explains that women social entrepreneurs incorporate a transformative agency that reconfigures the subject and business systems in sustainable and inclusive ways.

On the other hand, the relationship identified between digital strategies and sustainable resilience ($\beta = 0.309$, $p < .001$) would confirm the positions of Sörensson and Ghannad (2024) in this regard. According to the authors, accelerated digitisation enabled 53% of female entrepreneurs in Asia and Europe to develop new business models with an expanded international reach. Except that, in this case, the result extends beyond mere technological adoption by demonstrating that digital strategies function as democratising mechanisms. This interpretation is related to that of Reyes and Neergaard (2023), within the framework of conceptualizing technological appropriation as a practice of epistemic resistance by rejecting male monopolies on innovation.

The discovery that innovation models have the strongest effect on sustainable resilience is highly revealing, given the ($\beta = 0.428$, $p < .001$), which tests theorization of frugal innovation by Shahid et al. (2023) as a source of sustainable entrepreneurship..ship. Therefore, from a feminist epistemology, this capacity is direct epistemic resistance that questions Western development models with a clear premise of unlimited accumulation, preferring the efficiency of regeneration.

On the contrary, the lack of statistically significant direct effects of economic, social, and environmental factors on the second dimension of female entrepreneurship ($p > 0.05$) is a counterintuitive finding. Although, as Sharma and Sarkar (2024) point out, limited access to financing explains the variance in business performance (coefficient = 0.68, $p < 0.001$). However, in light of the present results, these relationships seem to operate in a more sophisticated manner through mediating processes. Therefore, our interpretation of the results challenges the primacy of deterministic perspectives and illustrates the transformative agency of women entrepreneurs who can reconfigure unfavourable conditions into opportunities.

Thus, the mediating factor of sustainable resilience offers empirical support for the feminist conceptual expansion that rejects neoliberal individualistic paradigms to emphasise the relational dimensions of entrepreneurial success. In this sense, this article validates the claims of Al-Qahtani et al. (2022), who highlight that female social entrepreneurs serve as agents of change. Similarly, it is

related to Schröder et al. (2021), who identify that restricted access to the mentoring programme reduces the probability of success by 37%. Thus, sustainable resilience is the practice of resistance that links economic survival with social transformation.

Model fit indices (SRMR = 0.052, RMSEA = 0.040, CFI = 0.986, GFI = 0.992) also ensure that the theoretical structure adequately reflects the complex dynamics of female social entrepreneurship. Therefore, these results confirm the validity of integrated analytical frameworks rather than one-dimensional schemes, as Marlow (2020) pointed out in the evolution of this paradigmatic field.

Furthermore, in the case of the Latin American context, the findings may be of particular importance for coloniality-related power configurations emerging in the region (Rojas Flórez et al., 2024). For example, according to the United Nations Development Programme (2023), about 57.3% of Mexican women are informal economy workers, while the Inter-American Development Bank (2025) shows that women are 19% less likely to have access to the Internet. The results also suggest that despite these structural barriers, Peruvian social entrepreneurs create sustainable resilience strategies that allow them to thrive under such adverse conditions.

Likewise, the predominance of the artisanal sector, which represents 56% of the sample, points to patterns of sectoral segregation. From a feminist perspective, this can be reinterpreted as the preservation of ancestral knowledge that challenges dominant market logic. In line with this, Santellano and Vallejo (2024) demonstrate that Latin American women entrepreneurs turn markers of cultural difference into sources of competitive advantage.

Empirical results confirm the research hypothesis: Social entrepreneurs are characterised by developing business models that transcend the extractive logic of patriarchal capitalism. This integration of triple impact, a concept previously documented by Hendratmi et al. (2022), as revealed in 67% of women entrepreneurs who develop models with a triple impact approach, strengthening their own resilience ($r = 0.76$, $p < 0.001$), represents an alternative way of shaping values: On the other hand, the feminist ethics of care, whose foundations were previously identified by Freund et al. (2024), provides the interpretive framework for understanding how our interviewees privilege collective well-being over individual maximisation.

However, empirical evidence refutes these narratives of victimisation. Instead, it vindicates women's actions as active agents of social change. Based on the results, I can also confirm that Aracil-Jordá et al. (2023) concluded that integrating a set of circular economy practices increases long-term financial viability by 42%.

The developed predictive model provides an empirical basis for gender-sensitive public policies. However, Benneh Mensah and Derera (2023) emphasise the importance of avoiding frameworks that perpetuate gender stereotypes. Along the same lines, Orser (2022) proposes alternative paradigms that would consider the active and transformative agency of social entrepreneurs.

Among the limitations, it is worth mentioning that the cross-sectional design does not allow definitive causal relationships, and the geographical concentration in Piura limits the generalisability of the findings to other contexts in the global South.

In summary, the findings confirm that sustainable resilience is an emancipatory construct that develops beyond neoliberal conceptualisations and builds praxis that challenges and can change the structural conditions that marginalise people. The predictive model provides solid empirical evidence that can inform public policies to help build more just and inclusive economies, as demonstrated by Wu (2022), Constantinidis (2021), Kyle (2020), Long and Buzzanell (2022), Branicki et al. (2023) and Peiris et al. (2024) in different geographical and cultural contexts.

V. Conclusions

In summary, this study achieved its overall objective, which was to determine, through multivariate analysis, the critical factors of sustainable resilience in women's social enterprises in a context of economic volatility. The predictive model reveals that sustainable resilience is the critical mediator between adaptive strategies and business success ($\beta = 0.767$, $p < .001$). Specifically, the confirmation factor analysis showed that there are underlying constructs in the underlying model that make up sustainable resilience, while structural equations demonstrated a significant causal relationship with digital capabilities ($\beta = 0.309$, $p < .001$) and frugal innovation ($\beta = 0.428$, $p < .001$) with financial sustainability. This suggests that social entrepreneurs cultivate transformative capabilities that shape business ecosystems in inclusive ways and challenge neoliberal economic paradigms. The quantification of the differential impact reinforces that adaptive strategies deployed during crises not only go beyond the logic of mere business survival, but also expand and challenge the framework of epistemic resistance, articulating economic survival with social transformation by positioning themselves as active protagonists of correction who navigate and reconfigure the rules of the game of systems that have historically excluded them.

The findings also show that the lack of significant direct effects of economic, social, and environmental factors on female entrepreneurship does not represent insurmountable structural limitations, but rather the complex operationalisation of the mediating processes that channel these influences through the development of sustainable resilience. This empirical evidence challenges deterministic perspectives that view structural barriers as definitive limitations, instead demonstrating that social entrepreneurs reconfigure deficient conditions as opportunities for growth through collective resistance strategies that incorporate the relational, collaborative, and community dimensions of entrepreneurial success. The developed theoretical model goes beyond individualistic conceptualisations by assigning a feminist framework that recognises the disruptive agency of women as builders of economic alternatives that privilege collective interest over individual maximisation of profits.

The methodological robustness of the study, illustrated by the very good fit indices SRMR = 0.052, RMSEA = 0.040, CFI = 0.866, GFI = 0.922) and the high internal consistency (α between 0.820 and 0.945), also reinforces the urgency of a comprehensive analytical framework for the multiple interactions between power structures, adaptation strategies, and transformative achievements. Given that in the general Latin American context, 57.3% of women in the labour force are employed in informal work and women are up to 19 percentage points less likely to have access to the digital realm, the contribution of these results is even more critical, as it illustrates how Peruvian women social entrepreneurs have developed resilience strategies that allow them to adapt and live within a framework of systematic marginalisation.

In conclusion, these empirical findings decentralise dominant narratives that render women's experiences invisible. They also offer robust evidence that recognises the transformative agency of social entrepreneurs women as builders of alternative futures, thereby challenging patriarchal structures of economic exclusion. Finally, the predictive model helps design gender-sensitive public policies beyond instrumental approaches, as intrinsic capacity is recognised. Therefore, sustainable resilience is framed as an emancipatory construct, as it articulates economic survival with social transformation. This situation contributes significantly to the construction of more just, inclusive and sustainable economies based on feminist principles of interdependence, collective care, and ecosystem regeneration to honour the symbiotic relationships between human communities and natural ecosystems.

Abbreviations

AVE: Average Variance Extracted, CFA: Confirmatory Factor Analysis, CFI: Comparative Fit Index, COVID-19: Coronavirus Disease 2019, GFI: Goodness of Fit Index.

HTMT: heterotrait-Monotrait Ratio, NGO: Non-Governmental Organization, PLS-SEM: Partial Least Squares Structural Equation Modeling, RMSEA: Root Mean Square Error of Approximation, SRMR: Standardized Root Mean Square Residual, UNDP: United Nations Development Programme.

Declarations

Data Availability

The anonymized dataset supporting the findings of this study is available as Supplementary Data 1 (XLSX format, 200 participants, 20 Likert-scale items and 3 sociodemographic variables). The variable codebook, including definitions, coding schemes, and construct assignments, is provided as Supplementary Data 2. The complete statistical analysis code (lavaan/JASP syntax for the PLS-SEM model) is available as Supplementary Data 3. The survey instrument is available as Supplementary Data 4. All supplementary materials are deposited in Figshare at <https://doi.org/10.6084/m9.figshare.31370890>. No personally identifiable information is included in any shared materials.

All procedures for data collection, processing, and analysis are fully described in the Methods section to ensure reproducibility of the findings. The original JASP project file (version 0.19.3) is also available from the corresponding author upon reasonable request.

Competing interests

The author declares no competing interests.

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Ethics Approval

This study received ethical approval on March 8, 2025, from the *Comité de Ética 2025-UIETC-IIICyT-ITCA* (Approval Code: **157-2025-GM-IIICyT**). The committee certified that the research protocol entitled “*Critical Factors for Sustainable Resilience in Female Social Entrepreneurship: A Multivariate Predictive Model in Contexts of Economic Volatility*” complied with international ethical standards for studies involving human participants. The committee verified that:

- The survey instruments were appropriate and posed no physical or psychological risk;
- Participation was voluntary, based on informed consent;
- Confidentiality and anonymity of participants were fully ensured;
- Data would be used exclusively for academic and scientific purposes

The research was conducted in line with the Declaration of Helsinki and international best practices for social science research.

Consent to Participate

Written informed consent was obtained from all participants prior to their inclusion in the study. Informed consent was collected digitally between March 11 and April 22, 2025, concurrently with the survey administration. The consent process included:

- **Information disclosure:** Participants were fully informed of the study’s objectives, procedures, estimated duration (15–20 minutes), voluntary nature, and potential risks/benefits.
- **Voluntary agreement:** Digital consent was obtained through the survey platform (“*I agree to participate*”). Non-consenting individuals were excluded.
- **Right to withdraw:** Participants retained the right to withdraw without penalty at any stage, with incomplete responses excluded from the analysis.
- **Confidentiality assurance:** No personally identifiable information was collected, and results were anonymized.
- **Cultural adaptation:** Consent forms were provided in Spanish and adapted to the cultural context of Piura, Peru, to ensure comprehension

A copy of the digital consent form is available as supplementary material.

References

1. Al-Qahtani M, Zguir MF, Ari I, Koç M (2022) Women's entrepreneurship for sustainable economy and development: challenges, drivers, and recommended policies for resource-rich countries. *Sustainability* 14(20):13412. <https://doi.org/10.3390/su142013412>
2. Anjum BA, Al-Rabiah M, Neamah P, Diab OBO (2024) Sustainable purchasing practices and women entrepreneurs: perspectives from a developing country. *Bus Strategy Dev* 7(3):421–437. <https://doi.org/10.1002/bsd2.421>
3. Aracil-Jordá J, Clemente-Almendros JA, Jiménez-Zarco AI, González-González I (2023) Improving the social performance of microeconomies led by women: the framework of marketing campaigns on social networks. *Technol Forecast Soc Chang* 191:122484. <https://doi.org/10.1016/j.techfore.2023.122484>
4. Aziz A, Iqbal J, Murtza MH, Gill SA, Cheema Y (2024) Effect of the COVID-19 pandemic on women's business sustainability: the role of Islamic microfinance institutions. *J Economic Administrative Sci* 40(4):819–836. <https://doi.org/10.1108/JEAS-08-2021-0166>
5. Inter-American Development Bank (2025), March 7 Women's economic empowerment will drive the true potential of Latin America and the Caribbean. El Pas. <https://elpais.com/america/termometro-social/2025-03-07/el-empoderamiento-economico-de-las-mujeres-impulsaria-el-verdadero-potencial-de-america-latina-y-el-caribe.html>
6. Benneh Mensah MS, Derera E (2023) Feminist critique of Ghana's women's entrepreneurial policies. *J Women's Entrepreneurship Educ* 2023(1–2):1–31. <https://doi.org/10.28934/jwee23.12.pp1-31>

7. Blalack EC, Fan Y, Lyu X (2023) A review of the literature on Chinese entrepreneurship: use of feminist stereotypes with implications for policy. *Entrepreneurship Reg Dev* 35(5–6):456–483. <https://doi.org/10.1080/08985626.2023.2184873>
8. Boluk KA, Panse G (2022) Recognition of the regenerative effects of Canadian women social entrepreneurs in the tourism sector from a feminist perspective based on the ethics of care. *J Tourism Futures* 8(4):486–501. <https://doi.org/10.1108/JTF-11-2021-0253>
9. Branicki LJ, King E, Norbury K (2023) La alegra y la fregona: The role of cinema in the construction and deconstruction of gender in entrepreneurship. *Gend Work Organisation* 30(4):1285–1304. <https://doi.org/10.1111/gwao.13031>
10. Brush CG, Greene PG, Welter F (2020) The Diana Project: A Legacy for Gender Research in Entrepreneurship. *Int J Gend Entrepreneurship* 12(1):7–25. <https://doi.org/10.1108/IJGE-04-2019-0083>
11. Buraga S, Jorga D, Monoranu V, Matei D, Georgiana D, Bujor J (2023) Legislative and fiscal adjustments to configure the sustainability of women's digital work in the textile sector. *Text Ind* 74(1):21–27. <https://doi.org/10.35530/IT.074.01.202262>
12. Castellanos A, Di A, Ripoll C (2024) Women in innovative start-ups and regional inclusion: green and socially responsible companies. *Reg Stud* 1(1):1–18. <https://doi.org/10.1080/00343404.2024.2340999>
13. Chaudhary DS, Rawat PCB (2024) Exploring female agricultural entrepreneurship: Insights from the grey literature using the TCM framework. *Int J Experimental Res Rev* 42:133–147. <https://doi.org/10.52756/ijerr.2024.v42.012>
14. Constantinidis C (2021) How women entrepreneurs build strong business relationships: The power of gender stereotypes. *Int J Gend Entrepreneurship* 13(3):266–286. <https://doi.org/10.1108/IJGE-11-2020-0185>
15. Dong H, Khan MS (2023) Exploring the role of women empowerment in sustainable rural tourism development. A sequential mixed-methods exploratory study. *Int J Prof Bus Rev* 8(4):1651. <https://doi.org/10.26668/businessreview/2023.v8i4.1651>
16. Freund D, Garca IR, Boluk KA (2024) Analysis of the barriers faced by women entrepreneurs in the tourism sector in Barcelona: application of a feminist ethics of care. In *The Elgar Companion to Tourism and Sustainable Development Goals* (pp. 203–218). Edward Elgar Publishing. <https://doi.org/10.4337/9781802203219.00016>
17. Harrison RT, Leitch CM, McAdam M (2020) Female entrepreneurship as a gender niche: implications for regional development policy. *J Econ Geogr* 20(4):1121–1146. <https://doi.org/10.1093/JEG/LBZ035>
18. Hendratmi A, Agustina TS, Sukmaningrum PS, Widayanti MA (2022) Subsistence strategies of women entrepreneurs in Indonesia. *Heliyon* 8(9):e10520. <https://doi.org/10.1016/j.heliyon.2022.e10520>
19. Hernández R, Mendoza C (2018) *Metadologa investigation. Quantitative, qualitative, and mixed methods*, Mexico City, Mexico: McGraw Hill Education, Edition: 2018, ISBN: 978-1-4562-6096-5, p. 714
20. Hillman W, Radel K (2022) Social, cultural, economic, and political strategies that expand women's territory by invading the patriarchy in tourism in Nepal. *J Sustainable Tourism* 30(9):2169–2187. <https://doi.org/10.1080/09669582.2021.1894159>
21. Ihejiamazu GC, Inyang JJ (2022) Women in Nigeria: Examining the motivations to participate in social enterprise. *J Women's Entrepreneurship Educ* 2022(3–4):126–148. <https://doi.org/10.28934/jwee22.34.pp126-148>
22. Illescas UJ, Takács M, Varga P, Rohács K (2024) Sustainability through social entrepreneurship: analysis of the role of digitalization as a mechanism for change. *Lecture Notes Networks Syst* 1082:334–339. https://doi.org/10.1007/978-3-031-67434-1_31
23. Iskandar P (2023) What is unique about the sustainability practices of indigenous women entrepreneurs in Uganda? In *Casebook of Indigenous Business Practices in Africa: Trade, Production and Financial Services* (Vol. 2, pp. 71–103). Emerald Publishing Limited. <https://doi.org/10.1108/978-1-80455-762-420231009>
24. Kawarazuka N, Hoa PT, Huyen LTT, Trang B, Achandi EL (2023) Social reproduction: the marginalized aspect in the investigation of gender and agriculture. *Front Sustainable Food Syst* 7:1220486. <https://doi.org/10.3389/fsufs.2023.1220486>
25. Kyle N (2020) Independent midwives in early 20th century New South Wales: a biographical history. *Collegian* 27(6):647–653. <https://doi.org/10.1016/j.colegn.2020.05.001>
26. Li C, Murad M, Ashraf SF (2023) The influence of women's green entrepreneurial intention on green entrepreneurial behavior through university and social networks. *Sustainability* 15(13):10123. <https://doi.org/10.3390/su151310123>
27. Little VP, Ho HPH, Eti-Tofinga B (2023) Nada extrao! Hacia economas más pluralistas y medios de vida sostenibles. *J Macromarketing* 43(2):219–236. <https://doi.org/10.1177/02761467231157429>
28. Long Z, Buzzanell PM (2022) Constituting intersectional politics of reinscription: Resistance practices of women entrepreneurs in China, Denmark, and the United States. *Manage Communication Q* 36(3):375–407. <https://doi.org/10.1177/08933189211030246>

29. Marlow S (2020) Gender and entrepreneurship: past achievements and future possibilities. *Int J Gend Entrepreneurship* 12(1):39–52. <https://doi.org/10.1108/IJGE-05-2019-0090>
30. Martinez J, de la Angela Flórez V, Velásquez M (2024) Bibliography on the investigation of new technologies and innovations. *Proceedings of the LACCEI International Multiconference on Engineering, Education, and Technology*, 1–16. <https://doi.org/10.18687/LACCEI2024.1.1.1666>
31. Nwachukwu C, Chládková H, Vu HM (2024) Motivation, challenges, and strategies of women social entrepreneurs in the microcredit sector. *Int J Bus Environ* 13(2):198–221. <https://doi.org/10.1504/IJBE.2024.137819>
32. Orser B (2022) Rebuilding better through feminist entrepreneurship policies. *Int J Gend Entrepreneurship* 14(3):345–368. <https://doi.org/10.1108/IJGE-05-2022-0089>
33. Panse G, Boluk KA (2024) Gender equity and social entrepreneurs of women in tourism. In *The Elgar Companion to Tourism and Sustainable Development Goals* (pp. 312–327). Edward Elgar Publishing. <https://doi.org/10.4337/9781802203219.00022>
34. Peiris PPM, Tatli A, Ozturk MB (2024) Understanding the performance of women in entrepreneurship in the context of Sri Lanka. *Int J Gend Entrepreneurship* 16(2):145–167. <https://doi.org/10.1108/IJGE-05-2022-0086>
35. United Nations Development Program (2023) Safe and resilient women in times of crisis: Analysis of economic, social, and gender impact in Latin America and the Caribbean. https://mexico.un.org/sites/default/files/2023-03/PNUD.%20Mujeres%20seguras%20y%20resilientes_13.09.22.pdf
36. Reyes C, Neergaard H (2023) Feminist perspectives on gender and technology entrepreneurship in incubator settings. *Int J Gend Entrepreneurship* 15(1):89–108. <https://doi.org/10.1108/IJGE-09-2021-0153>
37. Rojas Flórez EV, Alejo Condezo JC, Martnez Godnez FS, Ortiz Lavado MY, Aylas BG, Huanca Laveriano FD, Coll Martnez V, Palomino Melgarejo AE, Maguia Alfaro R (2024) Critical factors for business sustainability in women-led social enterprises in Peru. *Sustainability* 16(18):7954. <https://doi.org/10.3390/su16187954>
38. Santellano K, Vallejo JA (2024) Ethno-racial feminist entrepreneurship among elite and middle-class Latina entrepreneurs. *Gend Work Organ* 31(2):478–495. <https://doi.org/10.1111/gwao.13091>
39. Schröder LM, Bobek V, Horvat T (2021) Determinants of the success of women-owned businesses in Taiwan. *Sustainability* 13(9):4842. <https://doi.org/10.3390/su13094842>
40. Shahid MS, Hossain M, Shahid S, Anwar T (2023) Frugal innovation as a source of sustainable entrepreneurship to address social and environmental challenges. *J Clean Prod* 392:137050. <https://doi.org/10.1016/j.jclepro.2023.137050>
41. Sharma S, Sarkar V (2024) How government, social, and personal support drives sustainability in start-ups: the moderating role of gender diversity on boards of directors. *Indian J Corp Gov* 17(2):300–327. <https://doi.org/10.1177/09746862241276939>
42. Sörensson A, Ghannad N (2024) Business opportunities and challenges in the context of COVID-19 for women entrepreneurs in Asia and Europe. *J Entrepreneurship Emerg Economies* 16(1):57–88. <https://doi.org/10.1108/JEEE-02-2023-0052>
43. Wu YL (2022) Business experiences of Vietnamese immigrant women married in Taiwan. *Sustainability* 14(3):1489. <https://doi.org/10.3390/su14031489>

Figures

Figura 1

Modelo hipotético propuesto

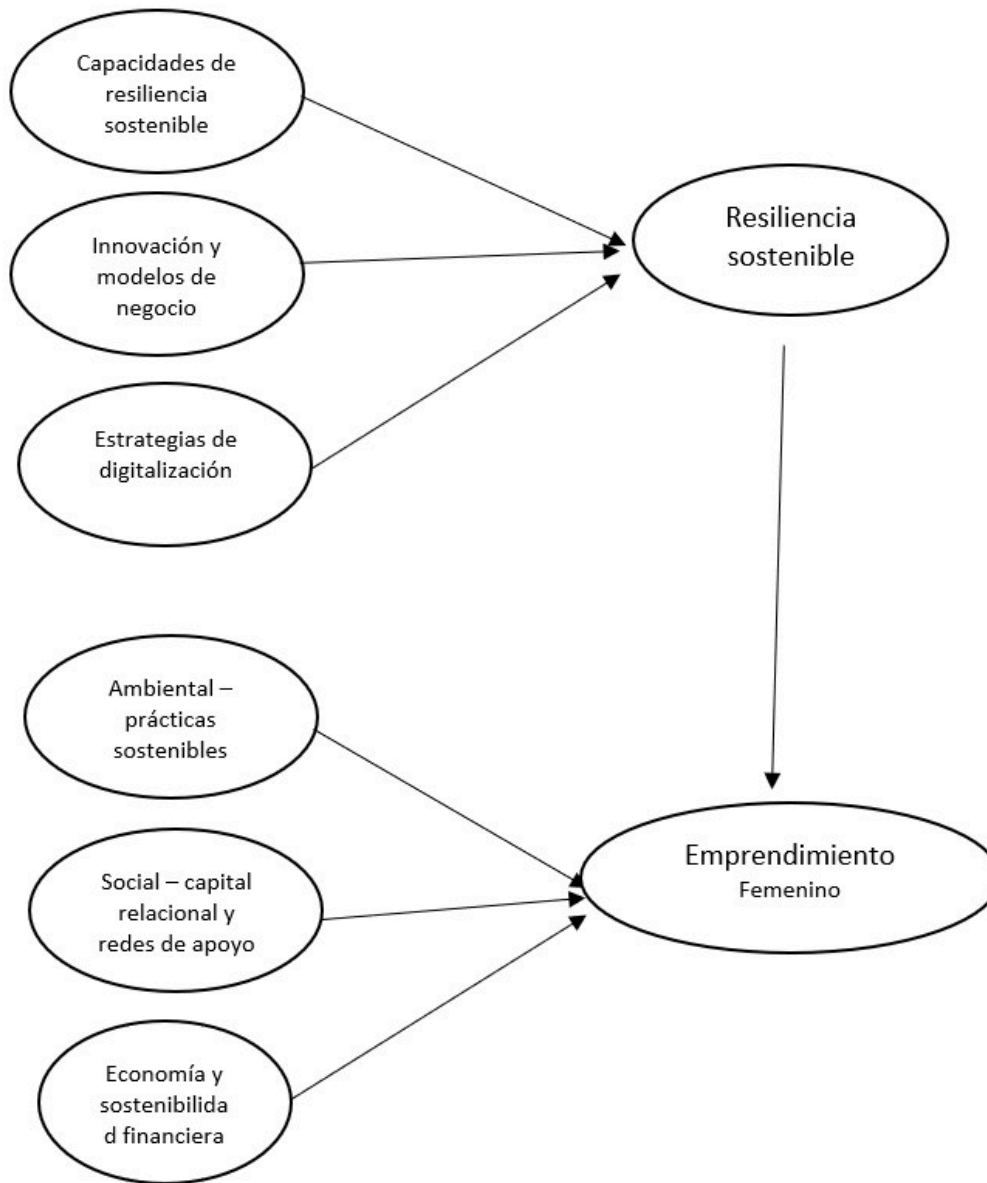


Figure 1

Proposed hypothetical model. The proposed hypothetical model analyzes the determinants of female entrepreneurship through a two-tiered structure. At the first level, three organizational factors—sustainable resilience and innovation capabilities and business models, including digitalization strategies—contribute to the development of sustainable resilience. At the second level, the contextual dimensions that directly affect female entrepreneurship are sustainable environmental practices and economic and financial factors. Sustainable resilience acts as a mediating variable, making it the primary mechanism through which organizational capabilities affect female entrepreneurship. Furthermore, the model integrates perspectives from the fields of sustainability, digital innovation, and gender into a holistic theoretical framework.

Figura 2

Diagrama de ruta

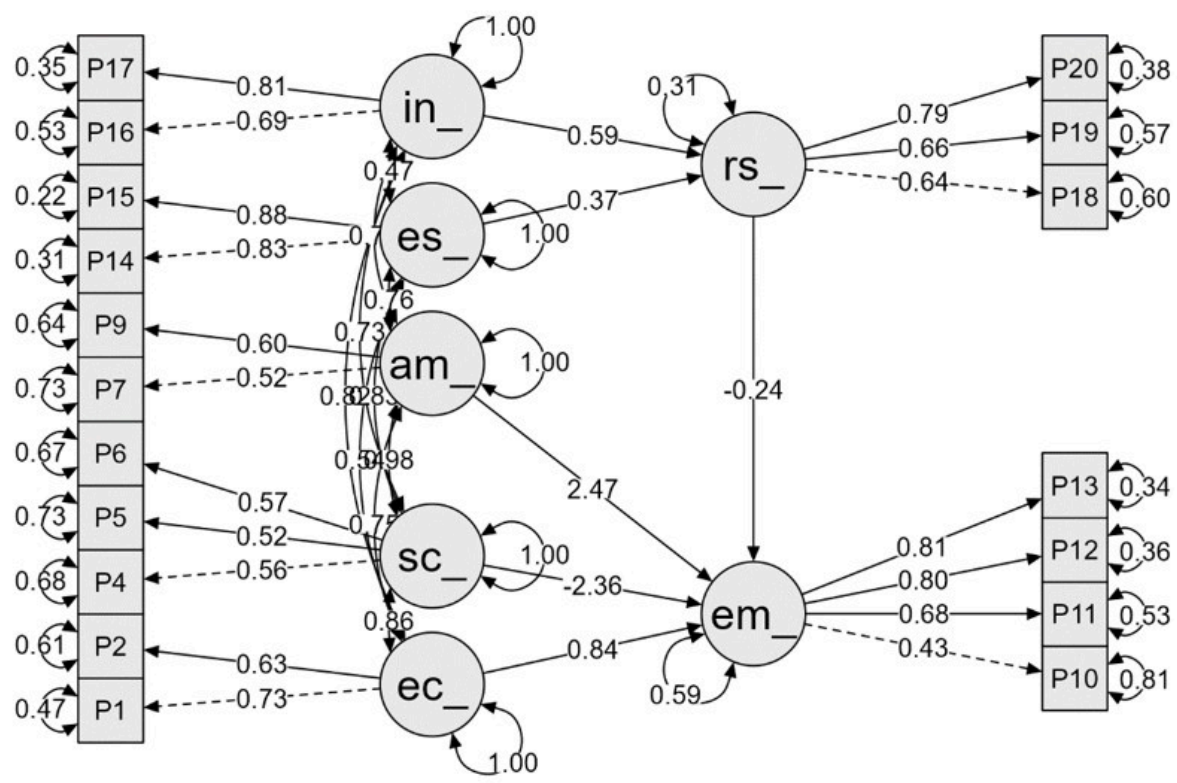


Figure 2

Path diagram. Structural equation modeling details the relationships among seven latent constructs of female social entrepreneurship. Acting as a critical mediator, sustainable resilience $\beta = 0.767$, $p < 0.001$ between adaptive strategies and business success. Innovation models $\beta = 0.428$, $p < 0.001$ and digital strategies $\beta = 0.309$, $p < 0.001$ are identified as significant predictors of sustainable resilience, while economic, social, and environmental factors had no direct significant effects. Factor loadings range from 0.37 to 0.94 signal a high level of construct validation, with error variances presented as squares. CNMK model fit method indicators reported excellent fits (SRMR = 0.052, RMSEA = 0.040, CFI = 0.986).