

Article

Empowering Madurese Women Through Social Entrepreneurship: The Influence of Environmental Munificence

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Abstract

Women's empowerment through social entrepreneurship has become an important strategy for promoting social inclusion and sustainable rural development, particularly in culturally distinctive communities. However, limited evidence explains how individual and environmental factors encourage women to transform social entrepreneurial intentions into concrete actions. This study aims to investigate the determinants of social entrepreneurial behaviour among entrepreneurs committed to empowering Madurese women. It examines the moderating role of environmental munificence in the relationship between social entrepreneurial intention and behaviour. A quantitative approach was employed using partial least squares structural equation modelling (PLS-SEM) to analyse survey data collected from 143 entrepreneurs on Madura Island, Indonesia. The findings indicate that empathy and self-efficacy positively influence social entrepreneurial intention, whereas moral obligation has no significant effect. Social entrepreneurial intention significantly predicts social entrepreneurial behaviour, and environmental munificence strengthens this relationship by providing supportive conditions for entrepreneurial action. These findings highlight the importance of combining individual capabilities with enabling social environments to foster women's empowerment. The study contributes to research on gender, rural development, and social entrepreneurship by providing evidence from an underexplored cultural context and offering practical implications for policymakers and community development initiatives.

Keywords: environmental munificence; rural development; social entrepreneurship; social entrepreneurial behaviour; women's empowerment



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1. Introduction

Addressing persistent socioeconomic inequalities and achieving gender-inclusive development have become global priorities for governments, businesses, and communities, particularly in developing countries where poverty, unemployment, and unequal access to economic opportunities continue to constrain social progress [1]. In recent years, women's empowerment has received increasing scholarly and policy attention because

empowering women contributes not only to individual welfare but also to community resilience, inclusive economic growth, and sustainable development. Within this context, social entrepreneurship (SE) has emerged as an effective mechanism for generating social value by integrating entrepreneurial activities with community-oriented missions rather than focusing solely on financial profit [2]. Individuals who recognise social problems and mobilise entrepreneurial resources to create sustainable solutions are commonly referred to as sociopreneurs [3,4]. Their initiatives are reflected in social entrepreneurial behaviour (SEB), which encompasses entrepreneurial actions intended to create measurable social impact while simultaneously strengthening community welfare [5]. Consequently, understanding how SEB develops has become increasingly important for researchers and policymakers seeking practical approaches to women's empowerment, poverty reduction, and sustainable societal transformation.

Despite the growing body of literature on social entrepreneurship, previous studies have predominantly concentrated on identifying the antecedents of social entrepreneurial intention (SEI), which is widely recognised as the immediate predictor of entrepreneurial behaviour. However, relatively limited attention has been devoted to explaining why strong SEI does not always translate into actual entrepreneurial behaviour [3]. As a result, the contextual conditions that facilitate or constrain the transformation of intention into behaviour remain insufficiently understood [6]. This limitation is inconsistent with the Theory of Planned Behaviour (TPB), which acknowledges that behavioural performance is influenced not only by individual intentions but also by external conditions that determine behavioural control. Similarly, the Entrepreneurial Event Model (EEM) argues that entrepreneurial behaviour is stimulated by precipitating events and subsequently strengthened by facilitating events that enable entrepreneurial action [7,8]. In this regard, environmental munificence (EMF), defined as the availability of supportive physical and non-physical resources that encourage entrepreneurial activities [9], represents an important contextual factor that may strengthen the conversion of SEI into SEB, particularly in rural communities experiencing rapid socioeconomic and digital transformation.

These theoretical issues are particularly relevant in rural areas, where entrepreneurship often functions as a community-based strategy for reducing poverty, improving livelihoods, and promoting inclusive local development [10]. Madura Island, located in East Java Province, Indonesia, covers approximately 5422 square kilometres and is geographically separated from the Java mainland [11]. The island possesses distinctive cultural traditions and its own local language that differentiate Madurese society from other communities in East Java [12,13]. Nevertheless, Madura continues to experience persistent socioeconomic challenges, including relatively high poverty and unemployment compared with other regions in the province [10,14,15]. According to regional statistical reports, all four regencies record poverty rates above the East Java provincial average of 10.49%, with Sampang (21.61%) and Bangkalan (19.44%) representing the highest proportions of residents living below the poverty line [15,16]. As shown in Table 1, although unemployment rates vary across regencies, Bangkalan also records the highest unemployment rate at 8.05%, highlighting the continuing socioeconomic vulnerability faced by local communities [17,18].

Table 1. Poverty and Unemployment Rates in Madura Island.

Regions	Poverty Rate (%)	Unemployment Rate (%)
Bangkalan	19.44	8.05
Sampang	21.61	3.45
Pamekasan	13.93	1.40
Sumenep	18.76	1.36

Source: [17,18].

Despite these socioeconomic constraints, the Madurese community is widely recognised for its entrepreneurial spirit, resilience, and willingness to undertake business risks [19,20]. Entrepreneurial values are transmitted across generations, creating strong family- and community-based business networks [21,22]. At the end of 2023, Madura had a population of 4,099,070 people, including 2,089,615 women, who constitute more than half of the island's population [23]. Besides fulfilling their traditional family roles, Madurese women actively contribute to household livelihoods through family enterprises and independent businesses while maintaining important social functions within their communities [24–26]. Nevertheless, they continue to face structural barriers, including early and arranged marriages, unequal participation in decision-making, and limited socioeconomic opportunities [27,28]. These challenges highlight the need for collaborative empowerment involving governments, communities, entrepreneurs, and other stakeholders to promote inclusive rural development and gender equality [1,26,29,30]. Thus, this study investigates entrepreneurs whose activities contribute to women's empowerment [29,30].

Alongside women's empowerment, digital technology (DT) has become an important enabler of rural entrepreneurship. The Fourth Industrial Revolution and the COVID-19 pandemic have accelerated digitalisation, encouraging businesses to adopt digital technologies to enhance competitiveness and sustainability [31–34]. Digital tools improve market access, operational efficiency, financial inclusion, and business development through innovations such as QR-code payments and social media platforms [35–38]. Although Madura remains one of East Java's less-developed regions, local entrepreneurs have increasingly adopted DT in their business activities [39]. Hence, *what are the predictors for social entrepreneurial intention (SEI), and does environmental munificence (EMF) influence the conversion of SEI to social entrepreneurial behaviour (SEB)?* Accordingly, this study aims to examine the determinants of SEI and the moderating role of EMF in transforming intention into actual behaviour among entrepreneurs committed to empowering Madurese women in the face of digital technology. By integrating the TPB with the facilitating-event perspective of the EEM, this study extends existing theory while providing evidence to support policies promoting women's empowerment, community development, and social entrepreneurship by demonstrating how individual and contextual factors of environmental munificence influence socially oriented entrepreneurial behaviour within a culturally distinctive rural setting of Madura Island.

2. Theoretical Framework

Social entrepreneurship promotes women's empowerment, social inclusion, and sustainable community development by creating social value through entrepreneurial activities [3,5]. However, while previous studies have extensively examined the antecedents of social entrepreneurial intention (SEI), limited evidence explains how SEI translates into social entrepreneurial behaviour (SEB) under different environmental conditions [40]. Therefore, this study integrates the Theory of Planned Behaviour (TPB), the Social Entrepreneurial Intention Model (SEIM), and the Entrepreneurial Event Model (EEM) to explain the formation of SEI and its conversion into SEB among entrepreneurs empowering Madurese women through digital technology.

2.1. Theory of Planned Behaviour and Social Entrepreneurial Intention Model

The Theory of Planned Behaviour (TPB) proposes that behavioural intention is determined by attitude towards the behaviour, subjective norms, and perceived behavioural control. These three determinants have been widely applied to explain entrepreneurial decision-making because intention is generally regarded as the most immediate predictor of behaviour. Specifically within social entrepreneurship, the Social Entrepreneurial Intention

Model (SEIM) adapts these dimensions into empathy (EM), moral judgement, self-efficacy (SEFF), and perceived social support [5]. Following [41], the present study employs moral obligation (MO) instead of moral judgement because it better reflects individuals' ethical responsibility to contribute to social welfare. Consequently, empathy represents the attitudinal component of TPB [3,5], moral obligation reflects subjective norms [42], and self-efficacy represents perceived behavioural control.

Previous empirical evidence generally supports these relationships; however, findings remain inconsistent across cultural settings. Empathy significantly predicts SEI in Scandinavia but not in the United States [41], while the effects of moral obligation and self-efficacy vary across Indonesia, the Philippines, Brazil, and Hong Kong [42–44]. These inconsistencies indicate that contextual and sociocultural conditions influence psychological determinants of SEI. Within Madura Island, where women continue to encounter social and economic barriers, understanding these psychological factors is particularly important because they may encourage entrepreneurs to participate in initiatives that strengthen women's empowerment and community development.

2.2. Entrepreneurial Event Model and Environmental Munificence

Although TPB and SEIM effectively explain the psychological formation of entrepreneurial intention, they provide only a limited explanation regarding the transition from intention to actual behaviour [40]. The Entrepreneurial Event Model (EEM) complements these theories by proposing that entrepreneurial action is stimulated by precipitating events and strengthened by facilitating events that enable individuals to implement their intentions [7,8]. Accordingly, entrepreneurial behaviour depends not only on internal motivation but also on external conditions that either facilitate or constrain entrepreneurial action.

Based on this perspective, environmental munificence (EMF) is conceptualised as a contextual condition reflecting the availability of supportive resources, institutional assistance, market opportunities, and favourable socio-economic environments that encourage entrepreneurial activities [45,46]. Such environmental support includes access to training, financial and non-financial assistance, public policies, digital infrastructure, and community networks that enable entrepreneurs to implement socially oriented initiatives [47,48]. Previous studies demonstrate that environmental munificence contributes more strongly to entrepreneurial behaviour than entrepreneurial intention [9], while financial support and facilitating events significantly strengthen the conversion of SEI into SEB [40,49]. Therefore, within rural communities such as Madura Island, supportive environments are expected to play an essential role in enabling entrepreneurs to transform social intentions into concrete actions that contribute to women's empowerment.

2.3. Integrated Conceptual Framework

Drawing upon TPB, SEIM, and EEM, this study proposes an integrated conceptual framework explaining the development of social entrepreneurial behaviour among entrepreneurs committed to empowering Madurese women. Empathy, moral obligation, and self-efficacy are proposed as psychological antecedents shaping social entrepreneurial intention [3,5]. Subsequently, SEI is expected to influence social entrepreneurial behaviour, while environmental munificence functions as a moderating variable that strengthens the intention–behaviour relationship by providing favourable external conditions [7,8,50,51]. This integrated framework combines individual cognitive factors with contextual environmental support, providing a comprehensive explanation of how social entrepreneurial activities contribute to women's empowerment within rural communities. The proposed

research model is illustrated in Figure 1 and forms the basis for the hypotheses developed in this study.

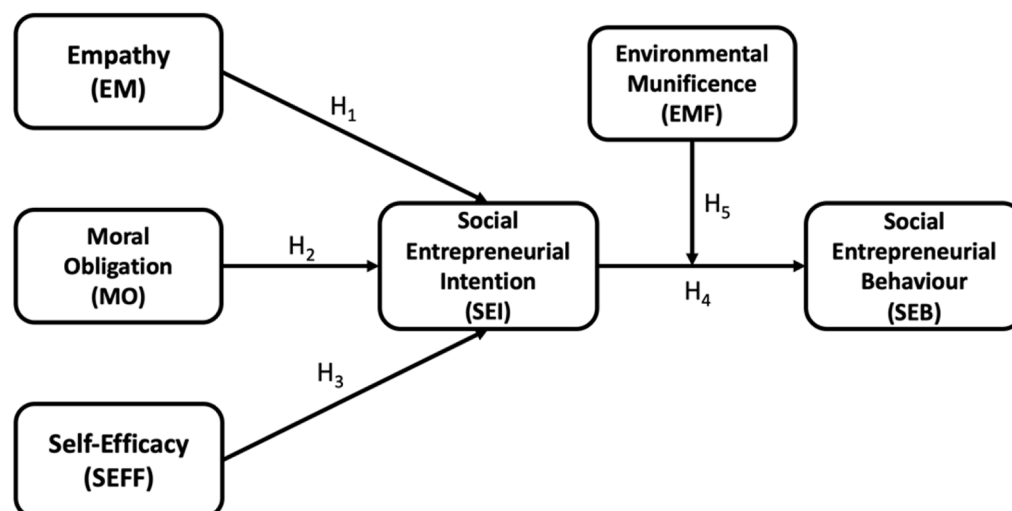


Figure 1. Proposed Research Model.

2.4. Hypothesis Development

2.4.1. Empathy and Social Entrepreneurial Intention

Empathy represents an individual's ability to recognise and understand the needs of others, thereby encouraging concern for social welfare beyond economic gain [5,24,41,52]. Although previous findings remain mixed across countries [6,41,42,53], empathy is expected to motivate entrepreneurs to participate in initiatives supporting the empowerment of Madurese women through digital technology.

H1. *Empathy positively affects the social entrepreneurial intention of local entrepreneurs in Madura Island.*

2.4.2. Moral Obligation and Social Entrepreneurial Intention

Moral obligation reflects an individual's perceived ethical responsibility to contribute to society and address social problems [5,41,54]. Although previous studies report inconsistent findings across different countries [41–44,55,56], it remains an important psychological determinant of social entrepreneurial intention.

H2. *Moral obligation positively affects the social entrepreneurial intention of local entrepreneurs in Madura Island.*

2.4.3. Self-Efficacy and Social Entrepreneurial Intention

Self-efficacy refers to individuals' confidence in their ability to establish and manage social ventures successfully [5]. It enhances entrepreneurial decision-making, opportunity recognition, and confidence in creating social value [52,54,57,58]. Previous studies consistently identify self-efficacy as one of the strongest predictors of SEI despite several contextual differences [41,44,59,60].

H3. *Self-efficacy positively affects the social entrepreneurial intention of local entrepreneurs in Madura Island.*

2.4.4. Social Entrepreneurial Intention and Social Entrepreneurial Behaviour

Social entrepreneurial intention represents individuals' commitment to creating social value and is generally regarded as the immediate antecedent of entrepreneurial behaviour [5,57,61,62]. Nevertheless, empirical evidence explaining the intention–behaviour relationship remains limited and inconsistent [3,40,63,64].

H4. *Social entrepreneurial intention positively affects the social entrepreneurial behaviour of local entrepreneurs in Madura Island.*

2.4.5. Moderating Role of Environmental Munificence

Environmental munificence reflects the availability of external resources and opportunities supporting entrepreneurial activities [45,46,48]. Consistent with the Entrepreneurial Event Model, favourable environmental conditions are expected to facilitate the translation of entrepreneurial intention into behaviour [7,8,40]. Previous studies demonstrate that environmental munificence, financial support, and facilitating events strengthen entrepreneurial implementation [9,48,49,61].

H5. *Environmental munificence positively moderates the conversion of social entrepreneurial intention into social entrepreneurial behaviour among local entrepreneurs on Madura Island.*

3. Materials and Methods

3.1. Research Design and Data Collection

This study employed a quantitative cross-sectional survey design within a positivist paradigm to examine the psychological and contextual factors influencing women's empowerment through social entrepreneurship among entrepreneurs on Madura Island, Indonesia [65]. The respondents were not limited to Madurese women entrepreneurs because empowering women requires the active participation of entrepreneurs, community members, and other stakeholders who possess the resources and social commitment to support inclusive development [29]. Accordingly, entrepreneurs operating businesses across Madura Island constituted the target population.

As no official statistics are available regarding the number of entrepreneurs in Madura, the sample size followed Roscoe's guideline recommending between 30 and 500 respondents for behavioural research [66,67]. Respondents were selected using purposive and snowball sampling techniques. These techniques are appropriate for fulfilling the research objective. However, they have a statistical limit for the generalisability of the findings, since they are not random and referrals tend to share similar views. Data were collected through face-to-face surveys between mid-February and early April 2024. A screening question ensured that participants demonstrated commitment to women's empowerment activities. Of the 155 questionnaires collected, 12 were excluded because of incomplete responses, resulting in 143 valid observations for analysis.

3.2. Measurement of Variables

The questionnaire was adapted from established measurement scales to ensure theoretical consistency and construct validity [5,41]. Measurement items for Empathy (EM), Moral Obligation (MO), Social Entrepreneurial Self-Efficacy (SEFF), Social Entrepreneurial Intention (SEI), and Social Entrepreneurial Behaviour (SEB) were contextualised to reflect women's empowerment and social entrepreneurial activities within the socio-cultural setting of Madura. Environmental Munificence (EMF) items were adapted to capture respondents' perceptions of local institutional support, resource availability, and favourable entrepreneurial conditions. Prior to data collection, all items were reviewed by experts

in social entrepreneurship and the Madurese context. The complete measurement items are provided in the Appendix A. Responses were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

3.3. Reliability, Validity, and Statistical Analysis

A pilot study was conducted in Pamekasan Regency, which has the lowest poverty rate among the four regencies of Madura, indicating relatively favourable socioeconomic conditions. Pilot data were analysed using SPSS version 25. Corrected item–total correlation values exceeded the recommended threshold of 0.30 [68], confirming satisfactory item validity. Cronbach’s alpha values for all constructs (EM = 0.953; MO = 0.970; SEFF = 0.972; SEI = 0.970; EMF = 0.962; SEB = 0.969) were above the recommended cut-off value of 0.60, demonstrating excellent internal consistency despite the high reliability commonly observed in context-specific measurement scales [69,70].

The main dataset was analysed using SmartPLS version 3.2.9 to estimate the Partial Least Squares Structural Equation Model (PLS-SEM), while SPSS version 25 was used for preliminary analyses. PLS-SEM was considered appropriate because it accommodates complex latent-variable models, relatively small samples, and non-normal data distributions [70]. Following the recommended two-stage procedure, the measurement model was evaluated before assessing the structural model and the proposed hypotheses [71,72]. SmartPLS provides a reliable platform for conducting such analyses [73].

3.4. Ethical Considerations

Participation was voluntary, and informed consent was obtained from all respondents before data collection. Ethical review was waived because the study involved anonymous adult participants, posed minimal risk, and did not collect sensitive personal information.

4. Results

4.1. Respondents’ Profile

The respondents were predominantly Madurese women entrepreneurs (97.20%). Based on age, 31.47% were 41–50 years old, followed by 29.37% aged 21–30 years, 18.18% aged 31–40 years, 13.97% aged 51–60 years, and 7.01% were either above 60 years or below 20 years. Regarding educational background, 53.15% had completed senior high school, 32.17% held higher education qualifications, and 14.68% had less than a senior high school education. In terms of entrepreneurial experience, 38.46% had operated their businesses for less than five years, 29.37% for five to ten years, and 32.17% for more than ten years, indicating a relatively balanced representation of both emerging and established entrepreneurs.

4.2. Descriptive Statistics

Descriptive statistics were computed to summarize respondents’ evaluations of each construct prior to the measurement model assessment. As shown in Table 2, Empathy (EM), Moral Obligation (MO), Self-Efficacy (SEFF), Social Entrepreneurial Intention (SEI), and Social Entrepreneurial Behaviour (SEB) had mean values above 4.00, indicating that respondents generally agreed with the measurement items. At the same time, Environmental munificence (EMF) obtained a mean score of 3.84, reflecting a tendency toward agreement on the five-point Likert scale. Standard deviations ranged from 0.416 to 0.639, indicating relatively consistent responses. Following [72], skewness and kurtosis values between -1 and $+1$ indicate normality. Although the skewness values of MO and EMF and the kurtosis values of EM and SEFF exceeded the recommended range, the data were

considered non-normal; therefore, the use of PLS-SEM was appropriate for subsequent analyses [72].

Table 2. Descriptive Statistics.

Constructs	No. of Items	Mean	Standard Deviation	Skewness		Kurtosis	
				Statistic	Std. Error	Statistic	Std. Error
EM	4	4.39	0.416	−0.917	0.274	1.478	0.483
MO	6	4.15	0.630	−1.517	0.274	−0.662	0.483
SEFF	6	4.08	0.639	−0.653	0.274	−1.323	0.483
SEI	6	4.19	0.628	−0.645	0.274	−0.340	0.483
SEB	6	4.07	0.637	−0.550	0.274	−0.573	0.483
EMF	5	3.84	0.528	−1.579	0.274	−0.421	0.483

4.3. Measurement Model Assessment

The measurement model was evaluated to verify the reliability and validity of the reflective constructs before testing the structural relationships [72,74]. Following the guidelines of [72], the assessment consisted of convergent validity and discriminant validity analyses. Convergent validity was examined using outer loadings, Average Variance Extracted (AVE), Cronbach's alpha, and Composite Reliability (CR), while discriminant validity was evaluated using the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT).

4.3.1. Convergent Validity

Table 3 presents the convergent validity results for all constructs. The outer loadings for all indicators exceeded the recommended threshold of 0.70, indicating satisfactory reliability of the indicators [75]. Likewise, all AVE values exceeded the minimum criterion of 0.50, indicating that each construct explained more than half of the variance in its indicators [72].

Table 3. Measurement Model.

Variables/Items	Outer Loading	AVE	Cronbach's Alpha	CR	Variables/Items	Outer Loading	AVE	Cronbach's Alpha	CR
EM		0.711	0.867	0.907	EM		0.808	0.941	0.950
• EM-1	0.725				• EM-1	0.907			
• EM-2	0.896				• EM-1	0.859			
• EM-3	0.894				• EM-3	0.933			
• EM-4	0.846				• EM-4	0.879			
MO		0.594	0.863	0.897	SEI		0.722	0.923	0.940
• EM-1	0.721				• EM-1	0.797			
• EM-2	0.747				• EM-2	0.891			
• EM-3	0.742				• EM-3	0.842			
• EM-4	0.855				• EM-4	0.878			
• EM-5	0.780				• EM-5	0.829			
• EM-6	0.772				• EM-6	0.857			
SEFF		0.598	0.870	0.899	SEB		0.679	0.906	0.927
• EM-1	0.756				• EM-1	0.734			
• EM-2	0.834				• EM-2	0.763			
• EM-3	0.832				• EM-3	0.832			
• EM-4	0.741				• EM-4	0.885			
• EM-5	0.757				• EM-5	0.873			
• EM-6	0.713				• EM-6	0.848			

Internal consistency reliability was also established. Cronbach's alpha values for every construct exceeded the recommended value of 0.80 [76], while Composite Reliability (CR) values were higher than the minimum threshold of 0.70 [72]. Collectively, these findings demonstrate that all constructs satisfied the requirements for internal consistency reliability and convergent validity.

4.3.2. Discriminant Validity

Discriminant validity was assessed using both the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT). As shown in Table 4, the square roots of the AVE for each construct exceeded the corresponding inter-construct correlations, satisfying the Fornell–Larcker criterion. Similarly, all HTMT values presented in Table 5 were below the recommended cut-off value of 0.85, indicating that each construct was empirically distinct from the others. The combined evidence from both assessments confirms that discriminant validity was successfully established.

Table 4. Fornell–Larcker Criterion.

	EM	MO	SEFF	SEI	SEB	EMF
EM	0.843					
MO	0.442	0.771				
SEFF	0.503	0.614	0.773			
SEI	0.438	0.366	0.420	0.850		
SEB	0.360	0.381	0.469	0.375	0.824	
EMF	0.154	0.078	0.115	0.024	0.432	0.899

Table 5. Heterotrait–Monotrait Ratio (HTMT).

	EM	MO	SEFF	SEI	SEB	EMF
EM						
MO	0.505					
SEFF	0.556	0.714				
SEI	0.449	0.399	0.440			
SEB	0.412	0.432	0.533	0.406		
EMF	0.173	0.105	0.133	0.116	0.441	

Collectively, the Fornell–Larcker and HTMT results confirm that all constructs exhibit adequate discriminant validity. Since each construct is empirically distinct from the others, the measurement model meets the recommended validity criteria and can be used to assess the structural model [72,73].

4.4. Structural Model Assessment

The structural model was evaluated to assess the significance of the hypothesized relationships and its explanatory and predictive capabilities. Following the five-stage PLS-SEM assessment procedure proposed by [72], the evaluation included assessment of collinearity, hypothesis testing, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and moderation analysis. The analyses were conducted using SMART PLS version 3.2.9 with the bootstrapping procedure, whereas predictive relevance was assessed using the blindfolding technique [72].

4.4.1. Collinearity Assessment

Prior to hypothesis testing, collinearity among the predictor constructs was examined using the Variance Inflation Factor (VIF) [72,77]. The VIF values for Empathy (EM = 2.272),

Moral Obligation (MO = 3.509), Self-Efficacy (SEFF = 3.228), Social Entrepreneurial Intention (SEI = 3.483), Social Entrepreneurial Behaviour (SEB = 3.077), and Environmental Munificence (EMF = 3.817) were all below the recommended threshold of 5.00, indicating that multicollinearity was not a concern in the structural model [72].

4.4.2. Hypothesis Testing

The structural relationships were estimated using the bootstrapping procedure. As reported in Table 6, Empathy exerted a positive and statistically significant influence on Social Entrepreneurial Intention ($\beta = 0.284$, $p = 0.011$), supporting H1. Likewise, Self-Efficacy positively influenced Social Entrepreneurial Intention ($\beta = 0.207$, $p = 0.008$), supporting H3. In contrast, Moral Obligation did not significantly influence Social Entrepreneurial Intention ($\beta = 0.114$, $p = 0.053$). Consequently, H2 was not supported.

Table 6. Direct Path Coefficient Assessment.

Relationship	Beta	T _{Value}	p _{Value}	Result
H ₁ : EM → SEI	0.284	2.556	0.011	Significant
H ₂ : MO → SEI	0.114	1.431	0.053	Insignificant
H ₃ : SEFF → SEI	0.207	2.668	0.008	Significant
H ₄ : SEI → SEB	0.380	3.063	0.002	Significant

Critical Value: $T_{\text{value}} \geq 1.960$ and $p_{\text{value}} \leq 0.05$ [68].

Social Entrepreneurial Intention significantly predicted Social Entrepreneurial Behaviour ($\beta = 0.380$, $p = 0.002$), providing initial support for H4 before incorporating the moderating variable. The coefficient of determination indicated that Empathy, Moral Obligation, and Self-Efficacy jointly explained 35.2% of the variance in Social Entrepreneurial Intention ($R^2 = 0.352$). Furthermore, Social Entrepreneurial Intention explained 41.2% of the variance in Social Entrepreneurial Behaviour ($R^2 = 0.412$), indicating moderate explanatory power.

4.4.3. Effect Size

The effect size (f^2) was assessed to determine the contribution of each exogenous construct to the endogenous variables beyond their shared variance [72]. According to the classification proposed by [78], f^2 values of 0.35, 0.15, and 0.02 represent large, medium, and small effects, respectively.

The results indicated that Empathy (H1) and Self-Efficacy (H3) exerted small effects on Social Entrepreneurial Intention, with f^2 values of 0.077 and 0.032, respectively. Moral Obligation (H2) showed a trivial effect ($f^2 = 0.010$), while the relationship between Social Entrepreneurial Intention and Social Entrepreneurial Behaviour (H4) demonstrated a medium effect size ($f^2 = 0.299$). Overall, these findings suggest that although several relationships were statistically significant, their practical contributions varied across the structural model [79].

4.4.4. Predictive Relevance

The predictive relevance of the model was evaluated using the blindfolding procedure to obtain Stone–Geisser's Q^2 values [72]. A Q^2 value greater than zero indicates that the exogenous constructs possess predictive capability for the endogenous variables. The results showed that SEI achieved a Q^2 value of 0.268, while SEB recorded a Q^2 value of 0.172. Since both values exceeded zero, the structural model demonstrated adequate predictive relevance for both endogenous constructs [72].

4.4.5. Moderation Analysis

The moderating role of Environmental Munificence (EMF) on the relationship between Social Entrepreneurial Intention (SEI) and Social Entrepreneurial Behaviour (SEB) was assessed using the interaction term generated in SMART PLS version 3.2.9. The moderation effect was evaluated using a bootstrapping procedure, following the recommendations of [72].

As presented in Table 7, the interaction effect between EMF and SEI was positive and statistically significant ($\beta = 0.285$, $t = 2.421$, $p = 0.016$), indicating that EMF strengthened the positive relationship between SEI and SEB. Furthermore, the direct relationship between SEI and SEB remained positive and significant after including the moderator ($\beta = 0.421$, $t = 5.514$, $p = 0.001$). Accordingly, both H4 and H5 were supported.

Table 7. Moderation Effect Evaluation.

Relationship	Beta	T _{Value}	p _{Value}	Result
H ₄ : SEI → SEB	0.421	5.514	0.001	Significant
H ₅ : EMF*SEI → SEB	0.285	2.421	0.016	Significant

Critical value: $T_{value} \geq 1.960$ and $p_{value} \leq 0.05$ [70].

5. Discussion

The findings demonstrate that the interaction between individual psychological capacities and supportive social environments shapes women's empowerment through social entrepreneurship. While the proposed relationships generally support the TPB, the EEM, and the SEIM, the results also reveal that the cultural and social context of rural Madura strongly influences the development of social entrepreneurial behaviour. Rather than merely explaining entrepreneurial intention, the findings illustrate how socially oriented entrepreneurship functions as a mechanism for strengthening women's participation, community resilience, and inclusive rural development through the utilisation of digital technology.

Empathy emerged as the strongest predictor of social entrepreneurial intention, reinforcing the proposition that emotional concern for social problems constitutes a fundamental driver of social entrepreneurship [2,40,72]. Although previous studies reported inconsistent findings across different countries [41–43,79–81], the present study indicates that empathy plays an especially important role in motivating Madurese women entrepreneurs to create social value. Consistent with [5], empathy appears to exceed the threshold required to stimulate social entrepreneurial intention. More importantly, empathy encourages entrepreneurs to perceive poverty, gender inequality, and limited economic opportunities as collective challenges rather than individual problems. This orientation strengthens community solidarity and motivates entrepreneurial activities that seek not only financial sustainability but also broader social inclusion and the empowerment of women through digitally supported business initiatives.

Unlike empathy, moral obligation did not significantly influence social entrepreneurial intention, confirming the findings of [42] while differing from those of [41,58]. According to TPB, moral obligation reflects perceived social pressure to perform prosocial behaviour [52]. However, in the Madurese context, social commitment appears to originate less from externally perceived obligations than from deeply embedded cultural and religious values characterised by solidarity, mutual support, and independence [82,83]. This finding suggests that community-oriented values have become internalised as part of everyday social life, reducing the direct influence of moral obligation as an independent psychological determinant. Consequently, women's participation in social entrepreneurship is better understood as an expression of culturally embedded responsibility than as compliance with external social expectations.

The positive effect of self-efficacy on intention further confirms that confidence in one's capability facilitates engagement in social entrepreneurship [57,62]. Nevertheless, empathy exerted a stronger influence than self-efficacy, contrasting with the argument that perceived capability should dominate entrepreneurial decision-making because social problems are inherently complex [41,60]. This finding suggests that Madurese entrepreneurs generally possess sufficient confidence to initiate entrepreneurial activities, reflecting their long-recognised characteristics as resilient risk-takers despite limited resources [20,81]. More importantly, self-efficacy enables women not only to establish social ventures but also to expand their economic participation and leadership within rural communities, thereby strengthening women's agency in local development.

The significant relationship between social entrepreneurial intention and behaviour confirms that socially oriented intentions are effectively translated into entrepreneurial action, supporting TPB, EEM and SEIM [5,7,8], while corroborating findings from Uganda and Indonesia [40,64]. The moderating effect of environmental munificence further demonstrates that supportive external conditions facilitate this transformation, consistent with [40,48], as well as TPB and the facilitating-event perspective of EEM [7,8]. Although Madurese entrepreneurs are widely recognised for their independence [83], the findings indicate that accessible digital infrastructure, institutional support, business networks, and resource availability remain essential for converting social intentions into sustainable entrepreneurial action. These conditions enable women entrepreneurs to expand social participation, strengthen community collaboration, and improve local economic resilience through digitally enabled enterprises.

Overall, this study contributes not only to the refinement of SEIM by demonstrating the dominant role of empathy within a culturally distinctive entrepreneurial setting but also to the broader literature on women's empowerment and rural social development. The findings suggest that strengthening women's entrepreneurship requires an integrated approach combining individual capabilities with supportive social ecosystems. Accordingly, policy-makers, local governments, and entrepreneurship support institutions should prioritise programmes that cultivate empathy-driven social innovation while simultaneously improving digital infrastructure, mentoring, collaborative networks, and access to entrepreneurial resources. Although the findings are grounded in the Madurese context, they provide valuable insights for other developing regions characterised by strong communal cultures and ongoing digital transformation. Future research should employ longitudinal and cross-cultural designs and incorporate additional contextual variables, such as digital capability and institutional support, to further explain how social entrepreneurial intentions evolve into sustained social action across diverse societal settings.

6. Conclusions

This study demonstrates that social entrepreneurship serves as an important mechanism for empowering rural women by fostering social inclusion, strengthening community resilience, and promoting sustainable local development. Focusing on Madurese entrepreneurs operating in the digital technology era, the findings reveal that empathy and social entrepreneurial self-efficacy significantly strengthen social entrepreneurial intention. In contrast, moral obligation does not significantly influence intention, suggesting that socially oriented entrepreneurial action is driven more by intrinsic cultural and personal values than by perceived moral pressure. Furthermore, social entrepreneurial intention significantly predicts social entrepreneurial behaviour, while environmental munificence reinforces the conversion of intention into action by providing supportive resources, opportunities, and institutional conditions. These findings highlight that women's empowerment

is shaped not only by individual psychological capabilities but also by enabling social environments that facilitate meaningful entrepreneurial engagement.

This study contributes to the broader literature on women's empowerment, community development, and social entrepreneurship by demonstrating how individual and contextual factors of environmental munificence jointly influence socially oriented entrepreneurial behaviour within a culturally distinctive rural setting of Madura Island. The findings suggest that governments, community organisations, women's associations, and entrepreneurship support institutions should collaborate to strengthen digital inclusion, improve access to entrepreneurial resources, expand community networks, and create supportive ecosystems that enable women to participate more actively in local socioeconomic development. Future research should validate this framework across different cultural and institutional contexts using longitudinal or comparative designs while incorporating additional social factors, such as gender norms, social capital, community participation, and institutional support, to provide a more comprehensive understanding of how women's empowerment can be sustained through social entrepreneurship.

7. Limitations & Future Research Directions

Firstly, the external variables moderating the relationship between SEI and SEB may be either support factors or hindrances. However, this research only focuses on the supportive aspects reflected in the questionnaire items (Appendix A). Thus, the hindrance elements are not empirically validated. Subsequently, since this study uses a self-reported questionnaire in a specific context, it is subject to possible bias, which limits the generalizability of its results. Secondly, although the sample size of 143 meets Roscoe's guidelines for behavioral studies, it is not large enough to be considered a medium or large sample, which may alter the findings. Hence, this sample size may not fully reflect the characteristics of the broader population. Finally, social entrepreneurship aims to create social innovation that benefits both the community and the social entrepreneurs themselves. This study has not measured the impact of social entrepreneurs conducting SEB. Hence, future research should include the hindrance dimensions of moderating constructs in the SEI-to-SEB conversion process, as well as the outcomes of SEB for the community and social entrepreneurs.

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Abbreviations

The following abbreviations are used in this manuscript:

DT	Digital Technology
EEM	Entrepreneurial Event Model
EM	Empathy
EMF	Environmental Munificence
MO	Moral Obligation
PLS-SEM	Partial Least Squares Structural Equation Modelling
SE	Social Entrepreneurship
SEB	Social Entrepreneurial Behaviour
SEFF	Social Entrepreneurial Self-Efficacy
SEI	Social Entrepreneurial Intention
SEIM	Social Entrepreneurial Intention Model
TPB	Theory of Planned Behaviour

Appendix A. Questionnaire Items

The questionnaire items used in this study were adapted from previously validated instruments and modified to fit the context of women's empowerment through social entrepreneurship and digital technology in Madura Island.

Table A1. Measurement items used in the questionnaire.

Variables (Coding)	Questionnaire Items	Reference
Empathy (EM)	What do I feel about the less fortunate women's community?	
	a. Compassion	[41]
	b. Concern	[41]
	c. Sensitive	[41]
Moral Obligation (MO)	d. Unsettled	[84]
	I feel very responsible to help in solving the women's community issues of:	
	a. Poverty	[41]
	b. Unemployment	[14]
	c. Gender Inequality	[28]
	and empower their potential of:	
	a. Resilience	[19]
Self-Efficacy (SEFF)	b. Hardworking	[19]
	c. Active	[19]
	I am sure that I can help in solving the women's community issues below and implement digital technology:	
	a. Poverty	[41]
	b. Unemployment	[14]
	c. Gender Inequality	[28]
	and empower their potential of:	
	a. Resilience	[26]
	b. Hardworking	[26]
	c. Active	[26]

Table A1. Cont.

Variables (Coding)	Questionnaire Items	Reference
Social Entrepreneurial Intention (SEI)	I had deep intentions to build social projects to solve the women's community issues below and implement digital technology:	
	a. Poverty	[41]
	b. Unemployment	[14]
	c. Gender Inequality	[28]
	and empower their potential of:	
	a. Resilience	[28]
Social Entrepreneurial Behaviour (SEB)	b. Hardworking	[26]
	c. Active	[26]
	I have put a serious effort into easing the women's community issues below through my business with the implementation of digital technology:	[84]
	a. Poverty	[9]
	b. Unemployment	[14]
	c. Gender Inequality	[25]
Environmental Munificence (EMF)	and empower their potential of:	
	a. Resilience	[26]
	b. Hardworking	[26]
	c. Active	[26]
	Madura Island has sufficient resources below to facilitate social business activities:	
	a. Supportive Government Policy	[9,85]
	b. Ease of Business Regulation	
	c. Physical and Digital Infrastructure	
	d. Access to Financial Support	
	e. Training and Mentoring	

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