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Institutional Support and Women's Economic Resilience: A Sequential Capability-Building Model

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ABSTRACT

Women play an important role in domestic enterprises in the fishing sector, but the mechanisms through which institutional support contributes to sustainable livelihoods remain poorly understood. This study aims to develop and validate a sequential capability-building model explaining how institutional support contributes to livelihood resilience among women operating household-based smoked fish enterprises in Indonesia. The study uses a consistent research design of mixed methods combining historical analysis and structural equation modeling using the partial least squares (PLS-SEM) method. The study analyzed materials from 2014-2024 from 40 documentary sources and 20 interviews, and surveyed 368 women employed in domestic enterprises in Tegalsari, Central Java. The results showed that institutional support positively affects women's economic agency ($\beta = 0.697$, $p < 0.001$) and entrepreneurial orientation ($\beta = 0.164$, $p = 0.005$). Women's economic agency enhances entrepreneurial orientation ($\beta = 0.727$, $p < 0.001$) and the ability to market innovation ($\beta = 0.444$, $p < 0.001$), but it has no statistically significant direct impact on the sustainability of livelihoods ($\beta = 0.138$, $p = 0.149$). Entrepreneurial orientation has the strongest direct impact on livelihood sustainability ($\beta = 0.588$, $p < 0.001$), while market innovations also have a significant impact ($\beta = 0.203$, $p = 0.005$). The results obtained confirm a consistent process of opportunity formation, in which institutional support is transformed into sustainable livelihoods primarily through women's economic agency, entrepreneurial orientation, and the ability to innovate in the market.

KEYWORDS: Entrepreneurship, Women's Entrepreneurship, Entrepreneurial Practice, Gender Equality, Household Economics, Small Business, Indonesia

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Институциональная поддержка и экономическая устойчивость женщин: последовательная модель формирования потенциала

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АННОТАЦИЯ

Женщины играют важную роль в домашних предприятиях рыбного сектора, однако механизмы, посредством которых институциональная поддержка способствует устойчивости средств к существованию, остаются недостаточно изученными. Цель исследования — разработать и валидировать последовательную модель формирования возможностей, объясняющую, каким образом институциональная поддержка способствует устойчивости средств к существованию женщин, занятых в домашних предприятиях по переработке копченой рыбы в Индонезии. В исследовании использован последовательный исследовательский дизайн смешанных методов, объединяющий исторический анализ и моделирование структурными уравнениями методом частичных наименьших квадратов (PLS-SEM). Исследование включало анализ материалов за 2014–2024 гг. на основе 40 документальных источников и 20 интервью, а также опрос 368 женщин, занятых в домашних предприятиях в Тегалсари, Центральная Ява. Результаты показали, что институциональная поддержка положительно влияет на экономическую агентность женщин ($\beta = 0.697$, $p < 0.001$) и предпринимательскую ориентацию ($\beta = 0.164$, $p = 0.005$). Экономическая агентность женщин усиливает предпринимательскую ориентацию ($\beta = 0.727$, $p < 0.001$) и способность к рыночным инновациям ($\beta = 0.444$, $p < 0.001$), однако ее прямое влияние на устойчивость средств к существованию статистически незначимо ($\beta = 0.138$, $p = 0.149$). Предпринимательская ориентация оказывает наиболее сильное прямое влияние на устойчивость средств к существованию ($\beta = 0.588$, $p < 0.001$), тогда как влияние рыночных инноваций также является значимым ($\beta = 0.203$, $p = 0.005$). Полученные результаты подтверждают последовательный процесс формирования возможностей, в рамках которого институциональная поддержка трансформируется в устойчивость средств к существованию преимущественно через экономическую агентность женщин, предпринимательскую ориентацию и способность к рыночным инновациям.

КЛЮЧЕВЫЕ СЛОВА: предпринимательство, женское предпринимательство, предпринимательская практика, гендерное равенство, экономика домохозяйств, малый бизнес, Индонезия

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INTRODUCTION

Small-scale fisheries are among the world's most important socio-economic sectors, supporting food security, employment, and livelihood sustainability for millions of coastal households, particularly in developing countries (Baremore et al., 2021; Owusu & Adjei, 2021). Beyond capture fisheries, household-based fish processing and value-added activities have become increasingly important for generating income, creating employment opportunities, and strengthening the resilience of coastal economies amid environmental, economic, and market uncertainty (Amadu et al., 2021; Fabinyi et al., 2022; Warren & Steenbergen, 2021). Women play indispensable roles throughout these fisheries value chains as processors, traders, entrepreneurs, and household financial managers whose decisions directly influence production continuity and family welfare. Despite these substantial contributions, women operating small-scale fisheries enterprises continue to face persistent institutional barriers, including limited access to financial resources, entrepreneurial training, market information, and formal support systems, which constrain their ability to expand businesses and sustain resilient livelihoods (Harper et al., 2020; Macusi et al., 2023). These challenges suggest that strengthening livelihood resilience requires not only greater economic participation but also a deeper understanding of how institutional support can progressively develop women's entrepreneurial capabilities within household-based fisheries enterprises.

Previous studies have consistently demonstrated that institutional support enhances women's participation in fisheries value chains through capacity-building programs, financial inclusion, and market facilitation (Ayilu et al., 2023; Freeman & Svels, 2022; Garza-Gil et al., 2020), while other studies have shown that women's economic agency contributes positively to household welfare, enterprise development, and community resilience (Hossein, 2021; Malhotra et al., 2024). Likewise, entrepreneurial orientation and innovation capability have been recognized as important drivers of competitiveness and business performance among micro- and small-scale enterprises (Adetoyinbo et al., 2025; Golla & Rao, 2020). However, most existing studies have adopted cross-sectional approaches that examine these factors as independent or partially connected determinants at a single point in time. Consequently, limited attention has been devoted to understanding how women's economic roles have evolved historically and how long-term institutional transformations shape entrepreneurial capability and livelihood resilience within women-led fisheries enterprises (Barrios et al., 2020; Nhiwatiwa & Matanzima, 2023; Thomas et al., 2021).

From a theoretical perspective, previous research has predominantly relied on individual theoretical lenses to explain women's participation and livelihood development in small-scale fisheries. Institutional Theory primarily emphasizes how formal institutions influence access to resources and support systems (Fauzi & Sheng, 2022; Khattak et al., 2021), whereas Women's Economic Agency Theory focuses on women's autonomy in economic decision-making and control over productive resources (Hing et al., 2022; Rodríguez-Satizábal et al., 2025). Entrepreneurial Orientation Theory explains how innovativeness, proactiveness, and risk-taking enhance enterprise performance (Alnoor et al., 2024; Bouguerra et al., 2023; Gali et al., 2024), while the Sustainable Livelihood Framework emphasizes the interaction between livelihood assets, vulnerability contexts, and livelihood outcomes (Fahad et al., 2023; Tabares et al., 2022). Although each perspective contributes valuable insights, these perspectives have rarely been integrated into a unified framework that explains how institutional support is progressively transformed into livelihood resilience through the sequential development of women's economic agency, entrepreneurial orientation, and market innovation capability. As a result, the capability-building mechanisms underlying resilient livelihood formation remain insufficiently explained (Gomese et al., 2025; Harper et al., 2020; Ramoni-Perazzi et al., 2026).

Despite the growing body of literature, important methodological limitations remain. Most previous studies have relied on either cross-sectional surveys or qualitative case studies, providing only a partial understanding of both the historical evolution of women's economic roles and the mechanisms through which institutional support contributes to livelihood resilience. This study aims to develop and validate a sequential capability-building model explaining how institutional support contributes to livelihood resilience among women operating household-

based smoked fish enterprises in Indonesia. Building upon these empirical, theoretical, and methodological gaps, this study reconstructs the historical transformation of women's economic agency in household-based smoked fish enterprises between 2014 and 2024 and subsequently validates a sequential capability-building model linking Institutional Support, Women's Economic Agency, Entrepreneurial Orientation, Market Innovation Capability, and Livelihood Resilience using Partial Least Squares Structural Equation Modeling (PLS-SEM). By integrating historical inquiry with quantitative model validation through a mixed-methods sequential exploratory design, this study offers a more comprehensive explanation of how institutional transformation progressively translates into resilient livelihood outcomes. The findings offer both methodological and practical contributions by providing an evidence-based framework to support integrated institutional, entrepreneurial, and market development strategies for strengthening the long-term resilience of women-led small-scale fisheries enterprises.

METHODOLOGY

This study employed a mixed-methods sequential exploratory design, integrating historical inquiry with quantitative model validation, to examine the development of women's economic agency and its relationship to livelihood resilience in household-based smoked fish enterprises in Tegalsari, Tegal City, Central Java, Indonesia. The research was conducted in two sequential phases. Phase I (Historical Inquiry) reconstructed the evolution of women's economic roles and enterprise conditions between 2014 and 2024 using the classical historical research process of heuristic, verification, interpretation, and historiography (Pike et al., 2024; Stacey et al., 2021). This phase established the historical and contextual foundation for understanding changes in institutional support, women's economic participation, entrepreneurial practices, market adaptation, and livelihood conditions over the study period. The historical evidence was subsequently organized into four analytically distinct periods: 2014–2016, 2017–2019, 2020–2021, and 2022–2024, based on documented changes in institutional arrangements, women's economic roles, enterprise practices, market conditions, and major contextual developments rather than on arbitrary chronological divisions. Phase II (Quantitative Validation) used the contextual insights generated from the historical inquiry to examine the proposed capability-building relationships through Partial Least Squares Structural Equation Modeling (PLS-SEM) (Cheng, 2023; Hair et al., 2021). This sequential design enabled the study to connect the historical transformation of women's economic roles with empirically tested relationships among institutional support, economic agency, entrepreneurial orientation, market innovation capability, and livelihood resilience.

Table 1 presents the integrated research design linking the historical inquiry and quantitative validation phases.

Table 1. Integrated research design and methodological framework

Research component	Purpose / theoretical basis	Main procedures and data	Expected output
Theoretical foundations	The study integrates Institutional Theory (Fauzi & Sheng, 2022; Khattak et al., 2021), Women's Economic Agency Theory (Hing et al., 2022; Rodriguez-Satizabal et al., 2025), Entrepreneurial Orientation Theory (Alnoor et al., 2024; Bouguerra et al., 2023; Gali et al., 2024), Innovation Capability Literature (Goni & Van Looy, 2022; Mendoza-Silva, 2020), and the Sustainable Livelihood Framework (Fahad et al., 2023; Tabares et al., 2022).	The theoretical perspectives are integrated to explain the relationships among institutional support, women's economic agency, entrepreneurial orientation, innovation capability, and livelihood resilience.	Conceptual basis for the historical inquiry and subsequent empirical model.

Phase I. Historical inquiry (2014-2024): Heuristic	Reconstruct the historical evolution of women's economic roles in household-based smoked fish enterprises.	Systematic collection of historical evidence from archives, official documents, statistics, community records, and oral histories.	Initial historical evidence base.
Phase I. Verification	Assess the reliability and credibility of historical evidence.	Source criticism and evaluation; assessment of authenticity, credibility, consistency, and relevance; triangulation across multiple sources.	Verified historical evidence.
Phase I. Interpretation	Identify changes in institutional support, women's roles, entrepreneurial practices, market conditions, and livelihood outcomes.	Interpretation of historical patterns and identification of causal sequences and turning points.	Explanation of the evolution of women's economic activities and their institutional context.
Phase I. Historiography	Develop a coherent historical interpretation of the observed changes.	Synthesis of verified evidence into a historical narrative; periodization into 2014-2016, 2017-2019, 2020-2021, and 2022-2024.	Contextual understanding of the evolution of women-led enterprises.
Historical evidence base	Provide empirical support for Phase I.	40 documentary sources and 20 oral-history interviews. Informants included women smoked fish processors (12), community/ cooperative leaders (3), fisheries officials (3), and MSME officials (2).	Triangulated qualitative and historical evidence.
Contextualized conceptual model and instrument development	Translate historical findings into empirically testable constructs and indicators.	Historical insights are used to contextualize constructs, refine measurement items, and develop the survey questionnaire.	Context-specific conceptual model and quantitative research instrument.
Phase II. Instrument development	Ensure measurement validity and contextual relevance.	Items adapted from validated scales and refined through expert review and a pilot test (n = 30).	Final survey instrument.
Phase II. Data collection	Empirically test the proposed model.	Cross-sectional survey using purposive sampling of eligible women entrepreneurs in Tegalsari, Tegal City. Valid responses: 368.	Quantitative dataset for model estimation.
Phase II. PLS-SEM analysis	Assess the measurement properties and test the proposed structural relationships.	Measurement model assessment, structural model assessment, and hypothesis testing, including direct and indirect effects.	Estimates of structural relationships and mediation effects.
Phase II. Quantitative validation	Validate the conceptual model derived from the historical inquiry.	Evaluation of relationships among Institutional Support, Women's Economic Agency, Entrepreneurial Orientation, Market Innovation Capability, and Livelihood Resilience.	Empirically validated model explaining sequential capability-building relationships.
Integrated research design	Link historical context with quantitative hypothesis testing.	Historical Inquiry -> Contextualized Conceptual Model & Instrument Development -> Quantitative Validation (PLS-SEM).	Integrated mixed-stage research framework combining contextual explanation and empirical validation.

Note: compiled by the authors

The study involved two complementary phases of evidence selection and participant recruitment corresponding to the mixed-method sequential exploratory design. In Phase I (Historical Inquiry), the authors purposively selected historical evidence covering 2014–2024 from 40 documentary sources and 20 oral-history interviews. The documentary sources comprised 8 fisheries statistics and production reports, 8 municipal and government records, 7 fisheries and MSME policy documents, 6 MSME development reports, 5 local administrative records, and 6 community or cooperative records. These sources were selected based on their temporal coverage of the study period, institutional provenance, relevance to household-based smoked fish enterprises, and ability to provide evidence of changes in institutional conditions, women's economic roles, entrepreneurial practices, market development, and livelihood conditions. The oral-history component included 20 purposively selected informants: 12 women smoked fish processors, 3 community or cooperative leaders, 3 fisheries officials, and 2 MSME officials. Informants were selected based on their direct involvement in smoked fish processing, institutional responsibility for fisheries or enterprise development, or long-term knowledge of socio-economic changes in the study area during 2014–2024.

In Phase II (Quantitative Validation), the target population comprised women engaged in household-based smoked fish processing enterprises in Tegalsari, Tegal City, Central Java, Indonesia. The quantitative survey was conducted from May to July 2026. Researchers recruited potential participants through direct identification and contact with eligible household-based smoked fish processors, supported by local fisheries and MSME networks and community contacts. Because no comprehensive sampling frame existed for this specialized population, the study used criterion-based purposive sampling.

A total of 400 questionnaires were distributed to potential participants during the survey period, of which 390 were returned. After screening, 12 questionnaires were excluded due to missing or incomplete responses, and 10 were excluded because they did not meet the predefined eligibility criteria. Consequently, 368 valid questionnaires were retained for the final analysis, representing 92.0% of all questionnaires distributed.

Table 1 presents the demographic characteristics of the final 368 respondents.

Table 1. Demographic characteristics of respondents

Characteristics	Category	N	%	Characteristics	Category	N	%
Age	20–29 years	48	13.04%	Business ownership status	Owner	143	38.86%
	30–39 years	125	33.97%		Co-owner (family business)	116	31.52%
	40–49 years	124	33.70%		Worker/processor	109	29.62%
	≥50	71	19.29%	Participation in government training	Never	91	24.73%
Education level	Primary school	82	22,28%		Once	103	27.99%
	JHS	109	29,62%		2-3 times	111	30.16%
	SHS	132	35,87%		>3times	63	17.12%
	Diploma/Bachelor	45	12,23%	Digital marketing usage	Never	67	18.21%
Business experience	<5 years	57	15,49%		Occasionally	119	32.34%
	5–10 years	118	32,07%		Frequently	131	35.60%
	>10 years	193	52,45%		Very frequently	51	13.86%

Note: compiled by the authors

The authors developed the quantitative instrument during Phase II by integrating insights from the historical inquiry with measurement scales established in previous empirical studies. The historical findings contextualized the measurement items so the instrument reflected the institutional conditions, women's economic roles, entrepreneurial practices, market adaptations, and livelihood conditions identified in household-based smoked fish enterprises. Measurement items were adapted from previously validated scales while retaining their original conceptual meaning to ensure theoretical consistency and content validity.

Three experts in entrepreneurship, fisheries economics, and quantitative research reviewed the preliminary questionnaire to assess the clarity,

relevance, and contextual appropriateness of the items. A pilot study involving 30 women engaged in smoked fish processing was then conducted to identify ambiguous wording and improve the questionnaire's readability and contextual suitability before the main survey. All constructs were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The final instrument comprised five latent constructs: Institutional Support, Women's Economic Agency, Entrepreneurial Orientation, Market Innovation Capability, and Livelihood Resilience. Their dimensions and indicators were adapted from established literature and refined to reflect the historical and contemporary context of women-led household-based smoked fish enterprises. Table 2 presents the measurement dimensions, indicator codes, and supporting references.

Table 2. Measurement constructs for coastal women's fisheries enterprises

Construct	Dimension	Item	References
Institutional Support (INS)	Training Support, Financial Support, Market Support, Information Support, Regulatory Support	INS1–INS5	(Chambon et al., 2024; Freeman & Svels, 2022; Macusi et al., 2023)
Women's Economic Agency (WEA)	Decision-making, Resource Control, Entrepreneurial Autonomy, Business Participation, Future Orientation	WEA1–WEA5	(Hing et al., 2022; Pedroza-Gutiérrez et al., 2024; Rodríguez-Satizábal et al., 2025).
Entrepreneurial Orientation (ENO)	Innovativeness, Proactiveness, Risk-taking, Opportunity Seeking	ENO1–ENO4	(Alnoor et al., 2024; Bouguerra et al., 2023; Gali et al., 2024)
Market Innovation Capability (MIC)	Product Innovation, Branding, Digital Marketing, Customer Engagement, Market Adaptation	MIC1–MIC5	(Goni & Van Looy, 2022; Mendoza-Silva, 2020)
Livelihood Resilience (LR)	Adaptive Capacity, Income Stability, Economic Recovery, Resource Flexibility, Business Continuity	LR1–LR5	(Fabinyi et al., 2022; Fahad et al., 2023; Tabares et al., 2022).

Note: compiled by the authors

Data analysis followed the two sequential phases of the research design. In Phase I (Historical Inquiry), the researchers analyzed documentary and oral-history evidence using the classical historical research procedure of heuristic, verification, interpretation, and historiography (Pike et al., 2024; Stacey et al., 2021). Documentary evidence was organized chronologically and thematically according to institutional conditions, women's economic roles, entrepreneurial practices, market adaptation, and livelihood changes. Oral-history interviews were transcribed and coded thematically, after which recurring accounts were compared across informant groups and cross-checked against documentary evidence to identify convergent and divergent evidence. Source verification considered the provenance, temporal relevance, consistency, and corroboration of available evidence, while discrepancies were examined by comparing it with other documentary and oral-history sources. This interpretive process identified four historical periods—2014–2016, 2017–2019, 2020–2021, and 2022–2024—based on converging evidence of substantive changes across these dimensions rather than predetermined chronological divisions. The resulting historical narrative provided the contextual foundation for the quantitative model and informed the contextualization of the measurement instrument.

In Phase II (Quantitative Validation), the survey data were analyzed using SmartPLS 4 following the PLS-SEM procedures (Al-Fraihat et al., 2020; Daryono et al., 2024; Sarstedt et al., 2020). The analysis comprised two stages. First, the measurement model was evaluated for indicator reliability, internal consistency reliability, convergent validity, and discriminant validity using outer loadings, Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and the heterotrait–monotrait ratio (HTMT). Second, the structural model was assessed through collinearity, path coefficients, coefficients of determination (R^2), effect sizes (f^2), predictive relevance (Q^2), and standardized root mean square residual (SRMR). Hypothesis testing examined the proposed direct and indirect relationships to

determine the sequential mechanisms linking institutional support with livelihood resilience. This analytical sequence enabled the study to integrate historically reconstructed transformations with empirical evidence on the proposed capability-building relationships.

RESULTS

The historical inquiry reconstructed the evolution of women's economic agency in household-based smoked fish enterprises in Tegalsari, Tegal City, Central Java, from 2014 to 2024. The study examined documentary and oral-history evidence across changes in institutional conditions, women's participation in enterprise activities, entrepreneurial practices, market adaptation, and livelihood conditions. The evidence was not treated as a series of isolated events; instead, recurring changes across documentary records and oral-history accounts were compared and interpreted to identify periods when women's economic roles and enterprise practices underwent substantive transformation. This process produced four historically distinct phases: 2014–2016, 2017–2019, 2020–2021, and 2022–2024. The periodization reflects the convergence of changes in institutional engagement, women's participation in decision-making, enterprise development, market adaptation, and broader contextual conditions.

As shown in Figure 2, women's economic roles evolved progressively from traditional processing activities toward entrepreneurial participation, market innovation, and stronger livelihood resilience between 2014 and 2024.

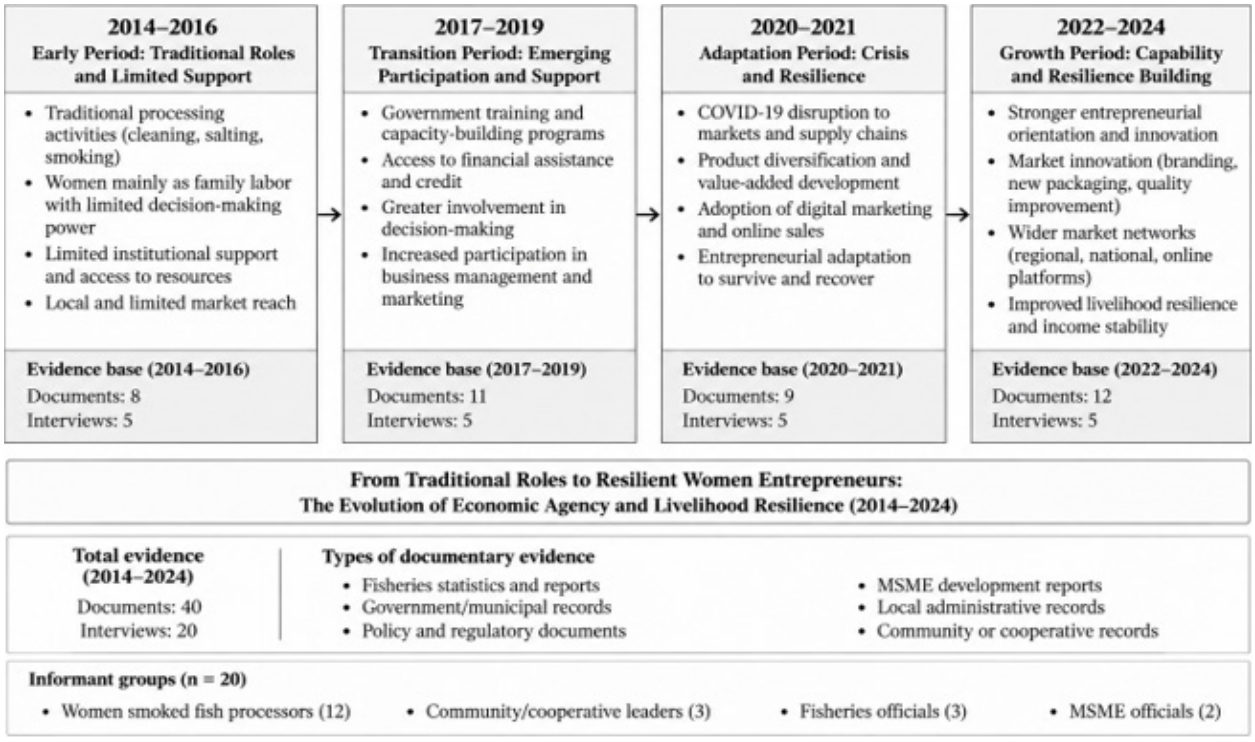


Figure 2. Evolution of women's economic agency and livelihood resilience for 2014–2024

During 2014–2016, women's economic participation was primarily concentrated in processing and other routine production activities. The available evidence indicates relatively limited institutional engagement and market facilitation, which constrained opportunities for women to participate in broader enterprise management and strategic decision-making. Their contribution remained economically important to household production and income maintenance, but their role was predominantly operational rather than managerial. This period therefore represents the initial production-oriented stage of the historical trajectory, providing the baseline against which subsequent changes in women's economic agency can be understood.

The 2017–2019 period marked a transition toward greater institutional engagement and

broader economic participation. Documentary evidence concerning training, financial assistance, business facilitation, and enterprise development, together with oral-history accounts, indicates that women increasingly participated in production planning, financial management, and marketing activities. The expansion of these roles suggests that institutional engagement was associated with greater opportunities for women to exercise economic decision-making beyond routine processing. Entrepreneurial practices also began to develop as women became more involved in managing and expanding household enterprises. This period is therefore interpreted as an institutional engagement stage, in which women's economic agency became more visible within enterprise decision-making and business development.

A distinct transformation occurred during 2020–2021, when the COVID-19 pandemic disrupted established market and enterprise conditions. Rather than maintaining previous operating practices unchanged, women increasingly responded through product diversification, alternative marketing practices, and the development of new customer connections. The oral histories and documentary evidence indicate that these responses reflected a shift toward more active adaptation to external market disruption. Women's roles consequently became increasingly connected with entrepreneurial problem-solving and business continuity rather than being limited to production activities. This period is therefore characterized as a crisis-adaptation stage, in which disruption accelerated the development of entrepreneurial responses and adaptive enterprise practices.

During 2022–2024, the historical trajectory moved toward stronger market-oriented and strategic roles. Evidence indicates increasing involvement in enterprise management, alongside greater attention to branding, digital marketing, market innovation, and broader market linkages. Importantly, these practices can be interpreted as a continuation and consolidation of capabilities developed during the preceding period rather than as an entirely new transformation. Women's economic agency increasingly involved decisions concerning market positioning, customer engagement, and enterprise development, while improved business continuity contributed to more resilient livelihood conditions. This period therefore represents the market-oriented capability stage of the historical trajectory.

Table 3 summarizes the evidence base and interpretation underlying the four historical phases.

Table 3. Historical phases and evidence of women's economic transformation in household-based smoked fish enterprises for 2014–2024

Historical phase	Institutional context	Women's economic role	Entrepreneurial/ market development	Evidence base	Historical interpretation
2014–2016	Relatively limited institutional engagement and market facilitation	Predominantly involved in processing and routine production activities	Limited entrepreneurial and market-oriented practices	Fisheries statistics and production reports; municipal and local administrative records; community/cooperative records; oral-history accounts from women processors and community/ cooperative leaders	Initial production-oriented stage, with women's economic contribution concentrated primarily at the operational level
2017–2019	Increasing training, financial assistance, and business facilitation	Greater participation in production planning, financial management, and marketing	Emerging entrepreneurial practices and broader market participation	Fisheries and MSME policy documents; MSME development reports; municipal/government records; fisheries statistics; oral-history accounts from women processors, community/cooperative leaders, fisheries officials, and MSME officials	Institutional engagement stage, characterized by expanding economic agency and participation in enterprise management

2020–2021	Pandemic-related disruption and changing institutional and market conditions	Increasing involvement in adaptive business decisions	Product diversification, alternative marketing practices, and development of new customer connections	Fisheries statistics and production reports; government and municipal records; MSME reports; relevant policy documents; oral-history accounts from women processors, community/cooperative leaders, and relevant officials	Crisis-adaptation stage, in which external disruption stimulated stronger entrepreneurial responses and adaptive business practices
2022–2024	Increasing market facilitation, digitalization, and enterprise development support	Greater involvement in enterprise management and strategic decision-making	Branding, digital marketing, market innovation, and broader market linkages	MSME development reports; fisheries and MSME policy documents; municipal/government records; community/cooperative records; oral-history accounts from women processors, community/cooperative leaders, fisheries officials, and MSME officials	Market-oriented capability stage, characterized by stronger entrepreneurial and market capabilities associated with improved business continuity and livelihood resilience

Note: compiled by the authors

Taken together, the four periods demonstrate a cumulative transformation of women's economic agency from predominantly production-oriented participation toward decision-making, entrepreneurial engagement, and market-oriented enterprise management. The historical evidence suggests that this transformation occurred through successive changes in institutional conditions and enterprise practices rather than through a single intervention or abrupt organizational shift. The trajectory also provides important context for the relationships examined in the subsequent quantitative phase: institutional engagement created conditions for broader economic participation, while entrepreneurial adaptation and market-oriented practices became increasingly prominent as women responded to changing enterprise conditions. However, this historical reconstruction does not establish causal relationships among these capabilities; rather, it provides the empirical and temporal context for the structural relationships subsequently tested using PLS-SEM.

As illustrated in Figure 3, all measurement indicators exhibited standardized outer loadings exceeding the recommended threshold of 0.70, confirming that each indicator adequately represented its corresponding latent construct.

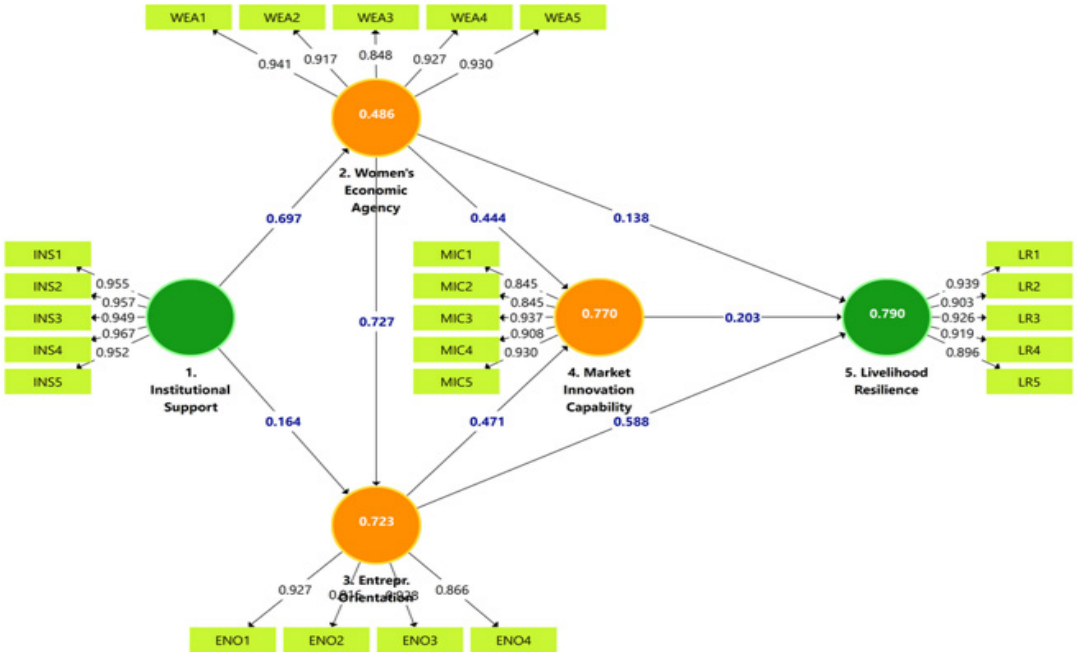


Figure 3. Proposed structural model of livelihood resilience among women in small-scale smoked fish enterprises

The highest outer loading was observed for INS4 under the Institutional Support construct (λ = 0.967), indicating that this indicator best represented institutional support perceived by women engaged in smoked fish processing enterprises. Conversely, MIC1 had the lowest loading within the Market Innovation Capability construct (λ = 0.845). Nevertheless, this value remained substantially above the acceptable criterion, indicating satisfactory indicator reliability across all five constructs.

Discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT), as recommended by Hair and Alamer (2022). Table 4 presents the results of the discriminant validity assessment.

Table 4. Discriminant validity assessment using the fornell–larcker criterion and HTMT ratio

Constructs	INS	WEA	ENO	MIC	LR
INS	0.956	0.537	0.523	0.497	0.549
WEA	0.697	0.913	0.771	0.768	0.727
ENO	0.672	0.842	0.910	0.779	0.799
MIC	0.639	0.840	0.844	0.894	0.743
LR	0.615	0.803	0.875	0.815	0.917

Note: compiled by the authors

Discriminant validity was assessed using the combined Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT), as recommended by Hair and Alamer (2022). As presented in Table 4, the square root of the Average Variance Extracted (AVE) for each construct, reported on the diagonal, was consistently greater than the corresponding inter-construct correlations reported below the diagonal, thereby satisfying the Fornell–Larcker criterion and confirming adequate discriminant validity. Furthermore, all HTMT values reported above the diagonal ranged from 0.497 (Institutional Support–Market Innovation Capability) to 0.799 (Entrepreneurial Orientation–Livelihood Resilience), remaining well below the conservative threshold of 0.85. These findings indicate that each latent construct captured a distinct conceptual domain and was empirically distinguishable from the others, confirming that the proposed measurement model possesses satisfactory discriminant validity and is appropriate for subsequent structural model evaluation.

Table 5 presents the structural model's explanatory power, effect sizes, and predictive relevance.

Table 5. Explanatory power, effect size, and predictive relevance of the structural model

Endogenous	Power		Effect size			Predictive	
	R^2	Interpretation	Exogenous	f^2	Size	Q^2	Interpretation
WEA	0.486	Moderate	INS	0.945	Large	0.398	Large
ENO	0.723	Substantial	INS	0.050	Small	0.592	Large
			WEA	0.981	Large		
MIC	0.770	Substantial	WEA	0.250	Medium	0.611	Large
			ENO	0.281	Medium		
LR	0.790	Substantial	WEA	0.021	Small	0.656	Large
			ENO	0.374	Large		
			MIC	0.045	Small		

Note: compiled by the authors

As presented in Table 5, the model demonstrated moderate explanatory power for Women's Economic Agency (R^2 = 0.486) and substantial explanatory power for Entrepreneurial Orientation (R^2 = 0.723), Market Innovation Capability (R^2 = 0.770), and Livelihood Resilience (R^2 = 0.790), indicating that the proposed model effectively explains the formation of livelihood resilience among women in small-scale smoked fish enterprises. The effect size analysis further revealed that Institutional Support exerted a large effect on Women's Economic Agency (f^2 = 0.945), Women's Economic Agency had a large effect on Entrepreneurial Orientation (f^2 = 0.981), while Entrepreneurial Orientation produced a large effect on Livelihood Resilience (f^2 = 0.374), whereas the remaining direct relationships exhibited small to medium effect sizes. Furthermore, all endogenous constructs produced positive Q^2 values ranging from 0.398 to 0.656, substantially exceeding the recommended threshold of zero and indicating strong predictive relevance of the proposed model. Among the endogenous constructs, Livelihood Resilience achieved the highest predictive relevance (Q^2 = 0.656), suggesting that the sequential relationships among Institutional Support, Women's Economic Agency, Entrepreneurial Orientation, and Market Innovation Capability provide substantial predictive capability in explaining livelihood resilience. Overall, these findings confirm that the structural model possesses satisfactory explanatory power, meaningful effect sizes, and strong predictive relevance for understanding livelihood resilience among women engaged in small-scale fisheries.

The significance of the hypothesized direct relationships was evaluated using the bootstrapping procedure, and the results are presented in Table 6.

Table 6. Direct and indirect effects of the proposed structural model

Hypothesis	Structural Path	$\beta_{\text{-value}}$	$t_{\text{-value}}$	$\rho_{\text{-value}}$	Effect strength	Decision
H1	INS → WEA	0.697	14.990	<0.001	Strong	Supported
H2	INS → ENO	0.164	2.792	0.005	Weak	Supported
H3	WEA → ENO	0.727	14.212	<0.001	Strong	Supported
H4	WEA → 4. MIC	0.444	7.094	<0.001	Moderate	Supported
H5	WEA → LR	0.138	1.446	0.149	Weak	Not supported
H6	ENO → 4. MIC	0.471	7.116	<0.001	Moderate	Supported
H7	ENO → LR	0.588	7.591	<0.001	Strong	Supported
H8	MIC → LR	0.203	2.851	0.005	Weak	Supported
H-M1	INS → WEA → ENO → LR	0.298	5.870	<0.001	Significant sequential	Supported
H-M2	INS → WEA → LR	0.096	1.424	0.155	Not significant	Not supported
H-M3	INS → ENO → MIC → LR	0.016	1.832	0.068	Not significant	Not supported
H-M4	WEA → ENO → LR	0.427	6.210	<0.001	Significant	Supported
H-M5	ENO → MIC → LR	0.095	2.575	0.010	Significant partial	Supported

Note: compiled by the authors

Seven of the eight direct hypotheses were supported, indicating that Institutional Support significantly enhanced Women's Economic Agency and Entrepreneurial Orientation, while Women's Economic Agency positively influenced Entrepreneurial Orientation and Market Innovation

Capability. Entrepreneurial Orientation also had significant positive effects on both Market Innovation Capability and Livelihood Resilience, and Market Innovation Capability also contributed significantly to Livelihood Resilience. However, the direct relationship between Women's Economic Agency and Livelihood Resilience (H5) was not statistically significant ($\beta = 0.138$, $\rho = 0.149$), indicating that women's economic agency alone was insufficient to directly strengthen livelihood resilience. These findings suggest that women's economic agency contributes primarily through other strategic capabilities rather than directly.

The indirect effect analysis revealed that the proposed mediation pathways contributed differently to the structural model. As presented in Table 6, significant indirect effects were identified for Institutional Support → Women's Economic Agency → Entrepreneurial Orientation → Livelihood Resilience (H-M1), Women's Economic Agency → Entrepreneurial Orientation → Livelihood Resilience (H-M4), and Entrepreneurial Orientation → Market Innovation Capability → Livelihood Resilience (H-M5), whereas the mediation pathways through Women's Economic Agency alone (H-M2) and through Entrepreneurial Orientation and Market Innovation Capability without Women's Economic Agency (H-M3) were not statistically significant. Among the significant mediation effects, the pathway from Women's Economic Agency through Entrepreneurial Orientation to Livelihood Resilience (H-M4) showed the largest indirect effect ($\beta = 0.427$), indicating that Entrepreneurial Orientation is the dominant capability through which women's economic agency translates into sustainable livelihood outcomes. These findings demonstrate that entrepreneurial capability, rather than economic agency alone, constitutes the principal mechanism underlying livelihood resilience among women engaged in household-based smoked fish enterprises. Figure 4 shows the overall structural mechanism underlying the proposed sequential capability-building process, including the significant and non-significant direct and indirect pathways leading to Livelihood Resilience. The figure highlights the progression from Institutional Support through Women's Economic Agency and Entrepreneurial Orientation toward Market Innovation Capability and ultimately Livelihood Resilience, while also distinguishing the supporting mediation pathways and the non-significant direct relationship between Women's Economic Agency and Livelihood Resilience.

DISCUSSION

The findings show that Institutional Support is a key catalyst for strengthening Women's Economic Agency among women engaged in household-based smoked fish enterprises. Institutional interventions, including entrepreneurial training, financial assistance, market facilitation, information access, and regulatory support, create enabling conditions for women to participate more actively in business decision-making, control productive resources, and engage in enterprise management. From the perspective of Institutional Theory, such support reduces structural barriers and facilitates access to economic opportunities (Fauzi & Sheng, 2022; Khattak et al., 2021). The present finding is consistent with previous studies showing that institutional support strengthens women's economic participation and empowerment in fisheries and other coastal livelihood sectors (Chambon et al., 2024; Freeman & Svels, 2022; Harper et al., 2020). These findings suggest that institutional support functions not merely as an external resource provider but as a strategic enabler that facilitates women's transition from passive participants to active economic actors within small-scale fisheries enterprises.

A central finding of this study is that Women's Economic Agency did not directly enhance Livelihood Resilience but exerted its strongest influence through Entrepreneurial Orientation. Women's decision-making authority, control over productive resources, entrepreneurial autonomy, and active participation in household enterprises therefore appear insufficient to strengthen livelihood resilience unless they are translated into entrepreneurial behaviours such as innovativeness, proactiveness, opportunity seeking, and calculated risk-taking. This finding differs partly from previous studies that reported a more direct positive relationship between women's economic empowerment and livelihood resilience (Fabinyi et al., 2022; Malhotra et al., 2024; Rodríguez-Satizábal et al., 2025), suggesting that empowerment itself is often considered sufficient to improve household welfare. At the same time, it is consistent with research showing that entrepreneurial orientation

enhances the adaptability, competitiveness, and resilience of micro and small enterprises under uncertain economic conditions (Alnoor et al., 2024; Bouguerra et al., 2023; Gali et al., 2024).

The findings reveal that Market Innovation Capability functions as a strategic capability that strengthens the contribution of Entrepreneurial Orientation to Livelihood Resilience among women operating household-based smoked fish enterprises. Women with stronger entrepreneurial orientation were more likely to introduce product innovations, develop distinctive branding strategies, adopt digital marketing practices, strengthen customer engagement, and adapt to changing market conditions, thereby improving the sustainability of their businesses and household livelihoods. This finding is consistent with previous studies reporting that innovation capability enhances the competitiveness, adaptability, and long-term sustainability of small-scale enterprises operating under dynamic market conditions (Goni & Van Looy, 2022; Mendoza-Silva, 2020). Similarly, recent studies have emphasized that market-oriented innovation enables fisheries enterprises to respond more effectively to changing consumer preferences, technological developments, and economic uncertainty (Ramoni-Perazzi et al., 2026; Stacey et al., 2021). These findings indicate that innovation capability plays a crucial role in enabling women-led fisheries enterprises to transform entrepreneurial initiatives into adaptive market responses that support sustainable livelihood outcomes.

Despite its significant contribution, the direct effect of Market Innovation Capability on Livelihood Resilience was weaker than that of Entrepreneurial Orientation, suggesting that innovation alone is insufficient to sustain resilient livelihoods without a strong entrepreneurial foundation. This finding implies that the success of innovation depends on entrepreneurs' ability to recognize opportunities, proactively respond to market changes, and mobilize available resources to implement innovative business strategies. Rather than functioning as an independent driver, Market Innovation Capability complements Entrepreneurial Orientation by facilitating the commercialization of entrepreneurial ideas through product differentiation, branding, digital marketing, and market adaptation. Consequently, this study extends the innovation capability literature by positioning Market Innovation Capability as a complementary capability within a broader sequential capability-building process, where innovation reinforces, but does not replace the central role of Entrepreneurial Orientation in strengthening livelihood resilience among women-led small-scale fisheries enterprises.

This study contributes to the literature by integrating Institutional Theory, Women's Economic Agency Theory, Entrepreneurial Orientation Theory, and the Sustainable Livelihood Framework into a unified capability-building model for women-led small-scale fisheries enterprises. While previous studies have generally examined institutional support, women's empowerment, entrepreneurship, or livelihood resilience as separate determinants, this study shows that these constructs operate through a sequential, interdependent process. In particular, the findings extend Women's Economic Agency Theory by showing that economic agency alone does not directly strengthen livelihood resilience; rather, its influence is realized through the development of entrepreneurial orientation and supported by market innovation capability. This sequential mechanism advances the Sustainable Livelihood Framework by positioning entrepreneurial capability as the key intermediary that transforms institutional resources and women's economic agency into resilient livelihood outcomes. Accordingly, the study provides a more comprehensive theoretical explanation of how capability development, rather than isolated resource provision, underpins livelihood resilience in women-led small-scale fisheries.

The findings offer several practical implications for policymakers and development agencies seeking to strengthen the sustainability of women-led fisheries enterprises. Government interventions should move beyond conventional financial assistance and technical training by adopting integrated programs that simultaneously enhance women's economic agency, entrepreneurial orientation, and market innovation capability. Capacity-building initiatives should prioritize entrepreneurial mentoring, business incubation, digital marketing adoption, product diversification, and market networking, enabling women processors to transform institutional support into sustainable business growth and resilient livelihoods. Furthermore, fisheries cooperatives, MSME development agencies, and local governments should collaborate to establish innovation-oriented

support systems that facilitate continuous learning, market adaptation, and knowledge exchange among women entrepreneurs. Such integrated policy approaches are expected to improve not only household economic resilience but also the long-term competitiveness and sustainability of small-scale fisheries in coastal communities.

CONCLUSION

This study integrated historical inquiry and Partial Least Squares Structural Equation Modeling (PLS-SEM) to explain how institutional support contributes to livelihood resilience among women engaged in household-based smoked fish enterprises. The historical reconstruction revealed that women's economic roles evolved progressively between 2014 and 2024, shifting from traditional production activities toward entrepreneurial leadership and market-oriented business development. Quantitative analysis confirmed these historical patterns, showing that Institutional Support strengthens Women's Economic Agency, which in turn enhances Entrepreneurial Orientation and Market Innovation Capability before ultimately improving Livelihood Resilience. The findings further indicate that Women's Economic Agency alone does not directly generate livelihood resilience; instead, its contribution is realized through the development of entrepreneurial capability and market innovation. Collectively, these results demonstrate that resilient livelihoods emerge through a sequential capability-building process, in which institutional interventions progressively develop women's entrepreneurial capacities and adaptive market capabilities rather than producing immediate livelihood outcomes.

This study contributes by proposing and empirically validating a sequential capability-building model that integrates historical transformation with contemporary causal relationships, thereby providing a more comprehensive explanation of women's economic development in small-scale fisheries. The findings suggest that policies for women-led fisheries enterprises should move beyond conventional financial assistance by strengthening institutional ecosystems that simultaneously promote women's economic agency, entrepreneurial capability, and market innovation. Such integrated interventions are expected to enhance the long-term resilience, competitiveness, and sustainability of coastal household enterprises. Although the study provides robust evidence by integrating historical and quantitative approaches, it was conducted within a single smoked fish processing cluster in Indonesia, which may limit the transferability of the findings to other fisheries sectors or regional contexts. Future research is therefore encouraged to validate the proposed capability-building model across different fisheries industries and countries using longitudinal mixed-method designs to better capture how institutional change and entrepreneurial capability co-evolve over time.

AUTHOR CONTRIBUTIONS

Conceptualization and theory: IS and HR; research design: IS, ES and HR; data collection: IS, ES and HR; analysis and interpretation: IS and ES; writing draft preparation: IS, ES and HR; supervision: HR; correction of article: IS, ES and HR; proofread and final approval of article: IS, ES and HR. All authors have read and agreed to the published version of the manuscript.

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