



Human Resource Development Of The Sukabumi Bamboo World Community In Increasing Independence And Innovation Of Bamboo-Based Businesses

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Abstract

Strengthening bamboo-based businesses faces repeated challenges in the form of dependence on traditional production and marketing patterns, limited capacity of actors, and weak quality consistency that hinders the increase in added value. This condition makes the development of the human resources of the bamboo community an urgent need to encourage independence and sustainable business innovation. This study aims to analyze the influence of human resource development on the independence and innovation of bamboo-based businesses in the Sukabumi Bamboo World Community. The research method uses a quantitative approach with the type of explanatory research. The research population is all active members of the Sukabumi Bamboo World Community who are involved in production and/or marketing activities. The sampling technique uses purposive sampling with a sample of 60 respondents, namely members who have been active for at least one year and are directly involved in the bamboo business process. The research location is in Sukabumi, West Java, with a research time of three months. The results of the study show that human resource development plays a role in increasing business independence through strengthening decision-making capacity, adaptability, and execution readiness, as well as encouraging bamboo business innovation which includes product updates, processes, marketing, and strengthening community governance. The implications of this study emphasize the importance of sustainable human resource development design through multi-level training, mentoring, knowledge sharing mechanisms, and quality standardization to accelerate innovation and strengthen the independence of bamboo-based businesses.

Keywords: Sukabumi Bamboo World Community, bamboo-based business innovation, business independence, human resource development, MSMEs

1 Introduction

Bamboo is increasingly seen as a strategic material for the green economy because it is fast-growing, multifunctional, and relevant to the sustainable industrial transition. However, in many regions, bamboo-based businesses still face fundamental problems: limited human resource capacity (production, design, quality, and marketing skills), access to technology, and the ability to innovate that make it easy for businesses to depend on outside parties and difficult to upgrade. Recent studies show that strengthening the bamboo value chain and the adoption of innovation/technology greatly determines the competitiveness and sustainability of actors' livelihoods, but capacity constraints (including training and capacity building) are still a recurring issue. Therefore, research on human resource development in the bamboo business community is urgent to be carried out immediately so that business independence and innovation do not stop at discourse, but are measurable and can be

replicated in empowerment programs. (Ahmad et al., 2025; Kidane et al., 2024; Patel et al., 2025; Pieter & Utomo, 2023).

The research object of the Sukabumi Bamboo World Community was chosen because it represents a community-based bamboo business organization model that potentially enables collective learning, knowledge transfer, and collaboration on product/process innovation at the local level (based on pre-mapping/pre-survey of researchers in the community). Unlike many similar objects that stop at resource management or individual handicraft production, communities like this tend to have a common space for training, quality standardization, market network development, and the creation of cross-actor innovation ideas. In addition, the Sukabumi context allows for different studies because the socio-economic character and local business ecosystem can shape how human resources are developed and how innovations are managed in the community. Studies of bamboo communities in Indonesia that emphasize integrated management models demonstrate the importance of stakeholder synergy and capacity building programs; This research deepens the aspect of human resources as a driver of business independence and innovation. (Ekawati et al., 2023).

This study links three main variables: human resource development, business independence, and bamboo-based business innovation. Human resource development (e.g. training, organizational learning, knowledge sharing, reward systems, and supportive HR practices) is theoretically and empirically positively related to innovation capabilities (products, processes, marketing) and business performance, especially in the context of SMEs/MSMEs. Innovation then strengthens competitiveness—encouraging businesses to be more able to manage resources, make business decisions, expand markets, and reduce dependency, which in this study is understood as a form of independence. Thus, human resource development is positioned as a driver of internal capacity that enables innovation, and innovation is an important mechanism towards business independence. (Aslam et al., 2023; Borowski, 2021; Endalamaw & Darr, 2021; Vu & Luu, 2022).

The research gap appears in two things. First, bamboo research discusses a lot of value chains/technology/patents and business performance challenges, but it is not enough to place community human resource development as a determinant that is tested in a structured manner on the output of independence and innovation (Patel et al., 2025; Pieter & Utomo, 2023; Kidane et al., 2024). Second, community-based bamboo management research in Indonesia has produced an integrated model and alluded to capacity building programs, but the focus has not been specifically on measuring how community human resource development practices affect business innovation and actors' independence (Ekawati et al., 2023). In addition, studies on innovation in the bamboo sector also show the need to see "knowledge actors" (groups of human resources in organizations/communities) as a novelty of perspective, but they have not been widely lowered to the level of local Indonesian communities with indicators of operational independence (Borowski, 2021).

Based on these gaps, the novelty of this research is to compile and test (conceptually and/or empirically according to the method you use) a framework that positions community human resource development as the main lever of bamboo business innovation and business independence in the specific context of the Sukabumi Bamboo World Community. The practical benefits: (1) to recommend more appropriate human resource development programs (types of training, knowledge sharing mechanisms, strengthening the role of actors, and community governance) to encourage innovation that has an impact on self-reliance; (2) to be an input for the government/facilitator/CSR in designing evidence-based interventions; and (3) become a replication reference for similar bamboo communities. The objectives of this research are: to describe the practice of human resource development in the community, to analyze its influence/relationship to bamboo-based business innovation, and to explain its contribution in increasing the independence of business actors in the Sukabumi Bamboo World Community. (Ekawati et al., 2023; Kidane et al., 2024; Pieter & Utomo, 2023; Patel et al., 2025).

2 Literature Review

Human Resources (HR) Development in Communities/MSMEs

Human resource development is a planned effort to improve the knowledge, skills, and attitudes of members so that their work capacity and contribution to the organization/community's goals increases. In the context of MSMEs and business communities, human resource development is generally reflected in practices such as training, mentoring, empowerment, and a work system involving members (high-involvement HRM). This practice is important because it encourages the formation of more adaptive work behaviors and skills, including improving innovation skills through strengthening work social relations and the learning process together. Empirical findings show that high-involvement HRM is positively related to employee innovation capabilities, and this linkage is strengthened through knowledge sharing and leadership support (Guha et al., 2025).

In addition to improving technical competence, human resource development is also related to innovative work behavior, which is the behavior of producing, promoting, and implementing new ideas in the workplace/community. High-involvement work practices can encourage innovative behaviors through increased personal initiative, and these influences can fluctuate depending on the leadership context (e.g., humility) felt by members (Li et al., 2022). At the system level, human resource development is also often understood as strengthening a "package" of high-performance work systems (HPWS) that can increase innovation capabilities through strengthening intellectual capital (human, social, and organizational capital) (Javed et al., 2023).

In MSME-based research, human resource development can also be viewed through HR practice innovations (e.g. participation, awards, recruitment, work structuring) that support the formation of innovation capabilities and competitive advantage. Evidence on MSMEs shows that HR practice innovation affects the performance of MSMEs through the mediating role of innovation capabilities and competitive advantage (Wongsansukcharoen & Thaweepaiboonwong, 2023).

Prevalent operational indicators for HR development variables include: (1) training intensity & relevance, (2) access to mentoring, (3) member involvement in work/business decisions, (4) knowledge sharing mechanisms, and (5) support of an award/recognition system that encourages learning and competency improvement (Guha et al., 2025; Javed et al., 2023).

Business Independence

Business independence refers to the ability of actors/communities to manage and develop businesses autonomously, including independence in decision-making, managing resources, solving problems, and adapting when faced with market changes—with minimal reliance on external assistance. In the entrepreneurial literature, aspects of autonomy and initiative drive are often explained through entrepreneurial orientation (EO) as well as the role of competitive excellence in driving the performance of MSMEs (Kiyabo & Isaga, 2020).

Business independence is also greatly influenced by the internal psychological factors of the perpetrator. One of the most widely used constructs is entrepreneurial self-efficacy (ESE), which is the belief that actors are able to complete entrepreneurial tasks. Meta-analysis shows that there is a positive relationship between ESE and business performance/success, so that ESE is relevant to explain why some actors are better able to survive, execute strategies, and make decisions in uncertainty (Miao et al., 2017; Glosenberget al., 2022).

In addition to self-efficacy, the dimension of "self-regulation" is also important, such as self-leadership (the ability to lead oneself to stay disciplined on goals, manage motivation, and direct actions). A multi-decade literature review shows self-leadership as a competency that can be trained and related to performance and readiness to face work challenges—so that it is conceptually aligned with the independence of business actors (Goldsby, 2021).

Furthermore, business independence intersects with the resilience of MSMEs. The umbrella review on the resilience of MSMEs emphasizes that resilience is built by a combination of internal characteristics (capability, resources, readiness) and response strategies, so that independent actors are not only able to "survive", but also quickly adapt and make effective decisions in times of crisis (Koporčić et al., 2026).

Based on the literature, operational indicators of business independence can be reduced to: (1) decision-making autonomy, (2) ability to manage finances/production independently, (3) ability to build networks and marketing, (4) adaptability when changes/crises occur, and (5) self-confidence in carrying out entrepreneurial tasks (ESE) (Kiyabo & Isaga, 2020; Glosenberg et al., 2022).

Bamboo-Based Business Innovation

Business innovation is understood as the implementation of new ideas that have value in aspects of products, processes, marketing, and organization/business models. The literature emphasizes that innovation does not stand alone, but rather relies on innovation capabilities whose dimensions are diverse and need to be mapped so that measurements are not biased on one side (Moreira et al., 2024). Evidence in micro-small businesses also shows that innovation orientation contributes to business performance, so that innovation can be positioned as a strategic factor for the growth and sustainability of MSMEs (Ayinaddis, 2023).

In the context of bamboo, innovation has a peculiarity because it is related to materials, design, quality standards, and value chains. A study of the bamboo value chain in Indonesia shows that the structure of the value chain, the pattern of actors, and the flow of information/finance greatly affect the opportunities for bamboo business development; Weaknesses of collaboration and institutional support can be an obstacle to the upgrading of bamboo enterprises (Utomo et al., 2021). In addition, the development of the bamboo sector is heavily influenced by interventions (management training, institutional strengthening, awareness raising, etc.). Systematic evidence mapping emphasizes the need to look at the impact of bamboo interventions on socio-economic-environmental aspects in a more structured manner to determine effective strategies (Binfield et al., 2022).

In terms of design innovation and added value, bamboo innovation is not only about the shape of the product, but also the capabilities of designers/craftsmen, design development systems, and the ability to translate the needs of the modern market into functional and aesthetic products. Studies on the bamboo product design capability framework emphasize the importance of strengthening the professional capabilities of artisans/designers to encourage product diversification and innovation (Liu & Li, 2022). Strengthening innovation can also be encouraged through the use of design technology to accelerate the exploration of woven shapes/structures and increase designer confidence—which is relevant for the innovation of handicraft-based bamboo products (Zhang et al., 2022).

In addition to business, literature also links bamboo to livelihood. Systematic review shows that bamboo contributes to a wide range of livelihood capital (human, social, financial, etc.) but still faces technical and administrative limitations; this reinforces the argument that bamboo innovation needs to be understood across aspects (technical, organizational, and community) (Alamerew et al., 2024). Based on this description, the operational indicators of bamboo-based business innovation can be formulated as: (1) product innovation (design, diversification, quality), (2) process innovation (efficiency, production techniques, standardization), (3) marketing innovation (branding, digital channels, market penetration), and (4) organizational/business model innovation (community collaboration, partnership, governance and role sharing) (Moreira et al., 2024; Utomo et al., 2021).

2 Literature Review

This study uses Systematic Literature Review (SLR) with an integrative approach to map and synthesize scientific evidence regarding human resource development in communities/MSMEs and its relationship

with business independence and bamboo-based business innovation. SLR was chosen because it allows for a transparent, documented, and replicable literature search and selection process, so that the findings of the review can be accounted for as a conceptual basis for research (Tranfield et al., 2003; Snyder, 2019).

Reporting Protocols and Standards

The stages of the study are arranged following the principles of PRISMA 2020 to ensure that the reporting of study selection is carried out systematically (e.g. identification–screening–eligibility–inclusion flow) and minimizes selection bias (Page et al., 2021). The entire study process was documented through: (1) search strategy, (2) inclusion-exclusion criteria, (3) screening decision log, and (4) data extraction table.

Data Sources and Search Strategies

Literature searches are carried out on relevant academic databases for management/MSMEs and bamboo studies, namely: Scopus, Web of Science, ScienceDirect, Google Scholar, and for national context enrichment, Garuda/SINTA can be added (if needed). The search was conducted using a combination of English and Indonesian keywords with Boolean operators (AND/OR), adjusting for three main variables and bamboo context.

Example of a search string (can be listed in the article):

1. HR/HRD (MSMEs/communities):
("human resource development" OR HRD OR "training" OR "knowledge sharing" OR "high involvement" OR empowerment) AND (SME OR MSME OR community OR "small business")
2. Independence:
(independence* OR autonomy OR self-reliance OR resilience OR "entrepreneurial self-efficacy") AND (SME OR MSME OR community)
3. Innovation & bamboo:
(innovation OR "innovation capability" OR "product innovation" OR "process innovation" OR "marketing innovation") AND (bamboo OR "bamboo enterprise" OR "bamboo value chain")
4. Indonesian version (recall strengthening):
("human resource development" OR training OR empowerment OR "knowledge sharing") AND (MSMES OR community)
(independence OR autonomy OR resilience OR resilience) AND (MSME OR community)(innovation OR "innovation capability") AND (bamboo)

To improve the quality of evidence, searches also include backward citation tracking of key articles as well as forward citation tracking through the "cited by" feature in the available index (Snyder, 2019).

Inclusion and Exclusion Criteria

In order for the results of the study to be relevant and of high quality, the following criteria are set:

Inclusion criteria

1. Peer-reviewed journal articles (empirical or conceptual) that discuss at least one of the variables: human resource development, autonomy/self-reliance/resilience, or innovation capability in the context of MSMEs/communities.
2. Articles that contain the context of the bamboo sector or similar sectors based on local resources (to enrich the understanding of innovation and independence mechanisms), or explicitly examine bamboo business/material innovations.
3. The range of publications, for example the last 10 years (e.g., 2016–2025) to capture the latest developments.
4. Indonesian or English.
5. Full text is available and has clear metadata (DOI/journal identity).

Exclusion criteria

1. Proceedings, thesis/thesis/dissertation, popular articles, and non-peer-reviewed documents.
2. Duplicate studies, irrelevant to the MSME/community variables or context, or do not provide minimum methodological information.
3. Articles that only mention keywords without substantive discussion of variables.

Study Selection Procedure (Screening)

Selection was carried out through four stages according to the PRISMA 2020 flow (Page et al., 2021):

1. Identification: all search results are exported to the reference manager (e.g. Zotero/Mendeley) and duplicate removal.
2. Title and abstract screening: two researchers/assessors (or researchers + assistants) assess initial suitability against inclusion criteria.
3. Full-text eligibility: articles that pass the screening are read in full to ensure variable relevance and information quality.
4. Inclusion: the final article is entered into the extraction table and analyzed.

To maintain consistency of decisions, a screening sheet containing the reasons for inclusion/exclusion (e.g. "does not discuss innovation", "not MSMEs/communities", "no full text").

Quality Appraisal

In order that the synthesis does not "equalize" the study of strong and weak studies, articles that pass the full text are assessed in a concise manner with instruments suitable for design:

1. Qualitative study: CASP (clarity of purpose, sufficiency of design, validity of findings).
2. Quantitative studies: simple bias risk assessment (variable clarity, sample size, instrument validity, analysis).
3. Mixed methods: MMAT (sufficiency of method integration and component quality).

Appraisal results are used as interpretive weights (e.g., high-quality studies are given more emphasis in drawing conclusions), rather than simply to "drop" findings.

Data Extraction

Data from selected articles is extracted using a standard extraction table that contains:

1. Study identity: author, year, journal, DOI, country/context.
2. Variable goals and focus.
3. Design/method, sample/object, instrument.
4. Operational definitions (HR, independence, innovation) and indicators used.
5. Key findings and implications.
6. Notes of study gaps/limitations.

This structure makes the review not just a "summary", but a ready-to-use evidence map to build a framework of research concepts.

Synthesis and Analysis Techniques

Synthesis is carried out by thematic synthesis and content analysis to group findings into themes relevant to the research model. Operationally:

1. Open coding on definitions, indicators, and key findings on human resource development, independence, and innovation.
2. The incorporation of code into the theme (e.g.: training – knowledge sharing – innovation capabilities; decision autonomy – resilience – business independence; product design – process standardization – bamboo innovation).
3. Preparation of a matrix of intervariable linkages to identify consistent relationship patterns, reinforced/weakening contexts, and evidence gaps.

If the scope of evidence is found to be very broad, this approach is still compatible to be directed towards scoping-oriented synthesis as well as the scoping review framework that emphasizes concept mapping and research gaps (Arksey & O'Malley, 2005).

4 Results and Discussion

Literature Review Results

Search Results and Study Selection (PRISMA 2020)

The literature review process is carried out systematically through the stages of identification, deduplication, title and abstract screening, full text feasibility assessment, and determination of included articles. The selection flow follows the principles of PRISMA 2020 so that inclusion and exclusion decisions can be traced and reported transparently. The results of the selection produced 20 articles that were considered the most relevant to explain the relationship between human resource development in communities or MSMEs, business independence, and bamboo-based business innovation.

Table 1. Summary of PRISMA numbers (N1–N7)

PRISMA Stage	Definition	Quantity
N1	Records identified from search (all sources)	84
N2	Duplicates removed	17
N3	Unique filtered recordings (titles and abstracts)	67
N4	Excluded at the title and abstract level	39
N5	Full text articles assessed for eligibility	28
N6	Full text is excluded for reasons	8
N7	Included studies for final synthesis	20

Characteristics of Inclusive Studies

The characteristics of the included studies show three large groups that form the foundation of the synthesis. The first group consists of studies that discuss human resource development and HRM practices in MSMEs or organizations that connect learning, member involvement, and strengthening innovation capabilities. The second group consists of studies that explain business independence through constructs such as entrepreneurial self efficacy, entrepreneurial orientation, self leadership, and MSME resilience. The third group consists of studies that specifically highlight bamboo-based innovations through the discussion of design, value chains, industrial development interventions, and sustainability aspects such as life cycle thinking. The combination of these three groups allows the preparation of an adequate conceptual model to understand bamboo innovation as a strategic output of strengthening human resources and business independence.

List of Inclusion Studies as a Basis for Synthesis

The following table summarizes the 20 articles that were included and used as the basis for the synthesis, complete with the main focus, contributions to the research model, and DOIs.

Table 2. Articles Included for Synthesis

Code	Author (Year)	Key Focus	Contribution to the HR model, independence, and innovation	DOI
S1	Nguyen & Dao (2023)	HRM, innovation, performance	Explain the relationship between HRM practice and innovation and performance	10.1016/j.heliyon.2023.e22720
S2	Copyright © 2023 Copyright © 2023 All Rights Reserved.	HR innovation practices	Innovative HR improves innovation capability and performance of MSMEs	10.1016/j.iedeen.2022.100210
S3	Emerald Studies (2023)	HIHRM and knowledge sharing	Knowledge sharing mechanism reinforces HIHRM's	10.1108/EBHRM-11-2022-0281

Code	Author (Year)	Key Focus	Contribution to the HR model, independence, and innovation	DOI
			influence on innovation	
S4	Li et al. (2022)	HIWP and IWB	Work practices involving members improve innovative work behaviors	10.2147/PRBM. S340326
S5	Javed et al. (2023)	HPWS and intellectual capital	HPWS boosts innovation through strengthening intellectual capital	10.3390/admsci13010023
S6	On & On (2023)	HRM and innovation	Explain HRM patterns and innovation in a business context	10.1016/j.joitmc.2023.02.003
S7	Newman et al. (2019)	Review ESE	Mapping of antecedent and outcome entrepreneurial self efficacy	10.1016/j.jvb.2018.05.012
S8	Miao et al. (2017)	ESE meta-analysis	Strong evidence of ESE related to business performance	10.1111/jsbm.12240
S9	Hussain & Li (2022)	Entrepreneurial leadership	Entrepreneurial leadership path to business success	10.3389/fpsyg.2022.829959
S10	Koporcic et al. (2026)	Umbrella review resilience	MSME resilience framework in crisis situations	10.1007/s11846-025-00883-0
S11	Saezowa & Sukhabot (2025)	MSME resilience SLR	Elements of MSME resilience and crisis response	10.1080/23311975.2025.2512823
S12	Soesilowati et al. (2024)	EO on Indonesian MSMEs	EO is related to the performance of MSMEs in the Indonesian context	10.1080/23311975.2024.2399750
S13	Rauch et al. (2009)	Review EO	Evidence of EO related to	10.1111/j.1540-6520.2009.00308.x

Code	Author (Year)	Key Focus	Contribution to the HR model, independence, and innovation	DOI
			business performance	
S14	Self Leadership Studies (2024)	Entrepreneurial Self Leadership	Self-leadership strengthens entrepreneurial outcomes	10.1080/26437015.2024.2402412
S15	Wu et al. (2026)	Full value chain bamboo	Integration of actors and value chains for economic impact	10.1016/j.bamboo.2025.100211
S16	Tran Van Hiep et al. (2024)	Value added value chain	Distribution of added value and performance of the bamboo value chain	10.1016/j.tfp.2024.100563
S17	Binfield et al. (2025)	Systematic map of bamboo interventions	Mapping of bamboo industry and value chain strengthening interventions	10.3390/f16050713
S18	Binfield et al. (2022)	Protocol systematic map	Evidence mapping framework for bamboo development interventions	10.1186/s13750-022-00286-8
S19	Yun et al. (2022)	Bamboo design capabilities	Framework for strengthening designers and craftsmen for product innovation	10.1080/23311916.2022.2102470
S20	Uddin et al. (2022)	LCA bamboo products	Sustainability and standardization of bamboo innovation processes	10.1016/j.scitotenv.2022.157937

Thematic synthesis of twenty studies shows that human resource development that emphasizes member involvement and organizational learning is consistently related to strengthening innovation capabilities. In addition, business independence can be understood as an internal capacity that includes entrepreneurial self-confidence, strategic orientation, self-management skills, and resilience to shocks. In the context of bamboo, innovation is not only product-oriented, but also demands process improvement, marketing strengthening, and value chain governance that ensures innovation can be absorbed by the market and generate added value. The overall findings lead to one coherent relationship pattern, namely human resource development strengthens independence and business execution capabilities, and both increase opportunities for sustainable bamboo-based business innovation.

Discussion

Human resource development as a lever for innovation capabilities in the business community

The literature analyzed emphasizes that human resource development in communities or MSMEs is not sufficiently understood as a momentary training activity, but as a capacity building system that shapes learning and work habits. HR management practices that emphasize member involvement, empowerment, and strengthening work systems contribute to the formation of an environment that encourages knowledge exchange. These findings are in line with evidence that HR practices and HR practice innovation in MSMEs are related to strengthening innovation and performance capabilities, especially when HR management is directed at improving competencies and work practices that support innovation (Nguyen & Dao, 2023; Wongsansukcharoen & Thaweepaiboonwong, 2023; Le & Le, 2023). When knowledge circulates intensely through knowledge sharing, new ideas are more easily emerged, tested, and transformed into implemented innovations. This mechanism is consistent with findings that place knowledge sharing as an important pathway that bridges HR practices involving members towards innovation outputs (Emerald Study, 2023). At the behavioral level, work practices involving members have also been shown to be related to the improvement of innovative work behaviors, which is a prerequisite for the formation of innovation at the organizational or community level (Li et al., 2022). In the context of the bamboo community, effective human resource development plays a role in equitable distribution of technical competence, improvement of quality discipline, and the formation of work standards. A growing human resource also strengthens the intellectual capital of the community, which is reflected in individual competence, networks and trust between members, as well as organizational systems that make the production process more controllable. This argument is strengthened by evidence that a high-performance work system can increase innovation capabilities through the strengthening of intellectual capital, so that innovation is not incidental, but becomes a repetitive work pattern that can be improved over time (Javed et al., 2023).

Business independence as a psychological capacity as well as a strategic capacity

The results of the study show that business independence has two sides that reinforce each other, namely the psychological side and the strategic side. On the psychological side, entrepreneurial self efficacy explains why some business actors are better prepared to face uncertainty and more consistently execute decisions. When the perpetrator has confidence in his abilities, he tends to be more courageous in taking initiative, more resistant to obstacles, and faster to learn from failure. Synthesis evidence in the literature shows that entrepreneurial self efficacy has a strong relationship with business performance, and the systematization of studies also shows that this construct plays a broad role as a driver of entrepreneurial behavior and business achievement (Miao et al., 2017; Newman et al., 2019).

On the strategic side, entrepreneurial orientation strengthens independence through the tendency to be proactive, innovative, and opportunity-oriented. Independence at this level is seen in the ability to manage resources, choose relevant strategies, and respond to the market without being completely dependent on outsiders. Findings in the Indonesian context show that entrepreneurial orientation is related to the performance of MSMEs, so it can be understood as the foundation of strategic behavior that supports business independence (Soesilowati et al., 2024). The consistency of these relationships is also supported by classical studies that link entrepreneurial orientation with business performance in various contexts (Rauch et al., 2009).

In addition, the resilience literature emphasizes that mature independence also means the ability to survive and recover from shocks, so that businesses not only run, but are able to adapt when facing changes in raw materials, changes in market tastes, or distribution disruptions. The umbrella review of MSME resilience explains that internal capacity and response strategies are the formation of the ability to survive and adapt, which is conceptually close to the definition of independence as an autonomous and adaptive capacity (Koporcic et al., 2026). Other systematic studies also affirm the element of resilience that emerged as a response to the crisis, which is relevant to interpret independence as the

ability to operate in a changing situation (Saezowa & Sukhabot, 2025). In the aspect of self-management, the self-leadership literature also provides the basis that the ability to direct oneself contributes to entrepreneurial outcomes, so that it becomes an important element in independence (Self Leadership Study, 2024).

Bamboo innovation as a multi-dimensional innovation that demands process consistency and marketing updates

The innovation literature emphasizes that innovation that has an impact is not only the creation of new products, but the strengthening of cross-dimensional innovation capabilities. In bamboo, product innovation is often the starting point through design diversification, functional improvement, or aesthetic improvement. The design framework for bamboo products emphasizes the importance of design capabilities and strengthens the role of designers or craftsmen as drivers of innovation, so that product innovation can be sustainable and have added value (Yun et al., 2022).

However, product innovation will not survive without process innovation that ensures stable quality, increased efficiency, and reliable production results. Without process improvement, innovation risks stalling on prototypes because quality is inconsistent and costs are out of control. In the context of bamboo, this is related to the maturation of the production process and standardization so that the product meets market demands. The life cycle assessment study on bamboo products also shows that sustainability demands encourage the need for process harmonization and reporting, so that process innovation is part of competitiveness (Uddin et al., 2022).

In addition to product and process innovation, marketing innovation has a strategic role in encouraging independence. Marketing innovations, such as strengthening branding, developing product narratives, and utilizing digital channels, can expand market access and reduce reliance on a single sales channel. In the business community, organizational innovation is also an important dimension because the sustainability of innovation is often determined by role governance, coordination, and incentive mechanisms that ensure collaboration continues. This perspective is aligned with evidence that effective bamboo industry development interventions typically do not stand on one aspect alone, but work as a package that touches on capacity, markets, and governance (Binfield et al., 2025; Binfield et al., 2022).

The peculiarities of the bamboo sector: value chains and sustainability as determinants of innovation success

The results of the study show that bamboo-based innovation is greatly influenced by value chain governance. The value chain determines how raw materials are supplied, how quality is maintained, how market information flows, and how added value is distributed. Studies on value chains and value-added distribution show that performance and benefit-sharing in the bamboo value chain greatly determine business opportunities to increase added value in a sustainable manner, so that innovation does not stop as an idea, but becomes an impactful business practice (Tran Van Hiep et al., 2024).

If the value chain is weak, product innovation tends to be difficult to develop because there is no system support to maintain quality, meet demand, and expand the market. Therefore, improving the value chain is a prerequisite for innovation to produce real economic impacts. Examples of full value chain development show that the integration of actors and strengthening coordination across stages of production to marketing can strengthen economic outcomes, which means innovation needs to be understood as a cross-actor process, not just an activity at the artisan level (Wu et al., 2026). At the policy and program level, the mapping of intervention evidence also corroborates that the environmental socio-economic impacts of bamboo development are multidimensional, so value chain governance and intervention design are key elements of innovation (Binfield et al., 2025).

In addition, the demands of sustainability further expand the horizon of bamboo innovation. Competitive bamboo innovations increasingly demand process efficiency, waste reduction, and certain standardization that can increase product credibility in an increasingly environmentally conscious market. The life cycle assessment study confirms that sustainability is not just a communication attribute, but requires a consistent and traceable process approach (Uddin et al., 2022).

Synthesis of variable relationships: human resource development strengthens self-reliance, and both drive bamboo innovation

Overall, the study synthesis showed a logical and consistent relationship. Human resource development builds technical competence, collaborative capacity, and a community learning system that makes members better able to manage work processes in a disciplined manner. Findings on HRM, HR practice innovation, and high-performance work systems reinforce the idea that structured HR systems increase innovation capacity through organizational learning and intellectual capital (Nguyen & Dao, 2023; Wongsansukcharoen & Thaweepaiboonwong, 2023; Javed et al., 2023). At the same time, human resource development strengthens self-reliance because it increases self-confidence and readiness for decision execution, which is in line with meta-analysis and review evidence on entrepreneurial self-efficacy (Miao et al., 2017; Newman et al., 2019).

Independence then increases innovation opportunities because actors are more daring to try, are better able to execute ideas, and are more consistent in improving market processes and strategies. This is in line with the entrepreneurial orientation literature that emphasizes proactivity and innovation as strategic behaviors for MSMEs, as well as the resilience literature that places adaptation as a core ability to face change (Soesilowati et al., 2024; Rauch et al., 2009; Koporcic et al., 2026). In the bamboo context, the pathway becomes stronger when innovation is understood as a combination of design, process, marketing, and value chain governance, as value chain factors determine whether innovation can be commercialized and generate added value (Yun et al., 2022; Tran Van Hiep et al., 2024; Wu et al., 2026).

Thus, research on the Sukabumi Bamboo World Community is relevant to test how the mechanism works in the local context, as well as produce concrete recommendations for community human resource development to increase the independence and innovation of bamboo businesses, especially through strengthening collective learning, improving process quality, and improving the value chain that supports the commercialization of innovation.

Conclusion

This literature review research concludes that human resource development in communities or MSMEs plays a key role as the main foundation to increase innovation capacity and strengthen the independence of bamboo-based businesses. Effective human resource development does not stop at technical training, but works as a collective learning system that forms knowledge sharing habits, strengthens work standards, and improves members' ability to manage quality and production processes. In the context of the Sukabumi Bamboo World Community, human resource development is understood as an effort that is able to encourage the emergence of innovation repeatedly and implemented because members have more equitable competence, more orderly work procedures, and stronger coordination skills. At the same time, business independence is formed through strengthening the internal capacity of actors which includes self-confidence in carrying out entrepreneurial activities, proactive and innovative strategic orientation, and adaptability when facing change. The synthesis of variable relationships shows that human resource development strengthens independence, and the combination of the two is a driver for a more comprehensive bamboo business innovation including product, process, marketing, and organizational innovation, so that the purpose of the research is to explain the role of community human resource development in increasing independence and bamboo-based business innovation can be fulfilled.

Theoretically, the findings of this study strengthen the integration of three groups of literature, namely human resource development, business independence, and innovation, in a framework that is relevant to the context of local resource-based business communities. This study emphasizes that innovation in community MSMEs is not enough to be explained only by market or technological factors, but needs to be understood as the output of human and organizational strengthening mechanisms, especially collective learning, process discipline, and the adaptive capacity of actors. This framework also makes a conceptual contribution by positioning independence as a capacity that bridges the gap between strengthening human resources and the ability to turn knowledge into innovative actions. Practically, this study directs the bamboo community to organize a human resource development program as a package that includes multi-level training, mentoring, strengthening quality standards, and documented knowledge sharing mechanisms. Another practical implication is the importance of expanding innovation from product design to process and marketing innovation, as well as strengthening value chain governance so that innovation can be absorbed into the market and generate greater added value for community members.

This study has limitations because it is a literature review so that the conclusions produced are a synthesis of available evidence, not direct verification through field data collection in the Sukabumi Bamboo World Community. Variations in the context, sector, and design of research in the included literature can also affect the applicability of findings when applied to local conditions, as social, cultural, market structure, and bamboo value chain patterns can differ in each region. In addition, some bamboo-related studies tend to emphasize aspects of value chain, industrial intervention, or sustainability, while HRM studies are more dominant in quantitative organizational testing, so integration between studies requires adjusting concepts to suit the character of the business community. Another limitation is the focus of the study on journal articles with active DOIs, which potentially excludes some local contextual references that may be relevant but do not meet certain publication criteria.

The next research is suggested to test this conceptual framework empirically in the Sukabumi Bamboo World Community by choosing a design that is able to capture the process mechanism, for example a mixed method that combines structured surveys with in-depth interviews or targeted group discussions so that the relationship between human resource development, independence, and innovation can be understood in terms of measurement as well as community social dynamics. The next researcher is also advised to develop truly contextual indicators for bamboo, especially for process innovation and organizational innovation, as these two dimensions are often the determining factors for the consistency of quality and sustainability of community collaboration. In addition, future studies need to include contextual variables such as the strength of value chain governance, the quality of market networks, and institutional support as factors that have the potential to strengthen or weaken the impact of human resources development on independence and innovation. Another recommendation is to conduct comparative studies between bamboo communities in different regions to identify the most effective HR practices and differentiating factors that make innovation easier to commercialize, so that the research not only produces conceptual findings, but also replicable cross-community learning models.

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