

## Literature Review: The Role of Literacy in Market Opportunity Recognition For Non-Timber Forest Products

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### Abstrak

Hasil Hutan Bukan Kayu (HHBK) memiliki potensi besar dalam mendukung perekonomian, namun banyak produk HHBK masih berada pada rantai nilai yang rendah. Saat ini masih sedikit kajian yang mengintegrasikan literasi digital, pasar, keuangan, dan kewirausahaan dalam menjelaskan kemampuan mengenali peluang pasar HHBK. Oleh karena itu, penelitian ini bertujuan mensintesis peran berbagai dimensi literasi dalam mendukung pengenalan peluang pasar pada komunitas, kelompok usaha, dan koperasi HHBK. Pertanyaan penelitian utama adalah bagaimana literasi mempengaruhi kemampuan pelaku HHBK dalam mengenali dan memanfaatkan peluang pasar? Penelitian ini menggunakan pendekatan *Systematic Literature Review* (SLR) berdasarkan pedoman PRISMA 2020. Sebanyak 44 artikel yang terindeks Scopus dianalisis melalui sintesis tematik. Hasil penelitian menunjukkan bahwa literasi digital meningkatkan akses informasi dan pemasaran daring, literasi pasar memperkuat pemahaman terhadap kebutuhan konsumen, literasi keuangan mendukung pengambilan keputusan usaha, dan literasi kewirausahaan mendorong inovasi serta penciptaan nilai tambah. Selain itu, efikasi diri dan perilaku manajerial berperan sebagai mediator penting, sedangkan gender dan infrastruktur digital bertindak sebagai faktor kontekstual. Kebaruan penelitian ini adalah pengembangan kerangka konseptual Pengenalan Peluang Pasar HHBK berbasis Literasi yang menempatkan literasi sebagai kapabilitas strategis dalam transformasi HHBK dari produk subsisten menjadi produk bernilai pasar dan berkelanjutan.

**Kata kunci:** Pengenalan Peluang Pasar, Literasi Digital; Literasi Keuangan; Literasi Kewirausahaan; Literasi Pasar;

### Abstract

*Non-Timber Forest Products (NTFPs) have significant potential to support rural economic, however, many NTFP products remain trapped in low-value chains. Currently, there are still limited research has integrated digital, market, financial, and entrepreneurial literacy to explain market opportunity recognition in the NTFP context. This study aims to synthesize the role of these literacy dimensions in supporting market opportunity recognition among communities, business groups, and NTFP cooperatives. The main research question is: how does literacy influence the ability of NTFP actors to recognize and utilize market opportunities? This study employs a Systematic Literature Review (SLR) guided by PRISMA 2020. A total of 44 Scopus-indexed articles were analyzed through thematic synthesis. The findings show that digital literacy improves access to market information and online marketing; market literacy strengthens understanding of consumer demand; financial literacy supports risk management and business decision-making; and entrepreneurial literacy promotes innovation and value creation. Self-efficacy and managerial behaviour serve as key mediating mechanisms, while gender and digital infrastructure act as contextual factors. The novelty of this study lies in developing the Literacy-Based Market Opportunity Recognition for NTFPs framework, which positions literacy as a strategic capability for transforming NTFPs from subsistence products into market-oriented and sustainable value-added products.*

**Keywords:** Digital Literacy; Market Literacy; Financial Literacy; Entrepreneurial Literacy; Market Opportunity Recognition.

## Introduction

Non-Timber Forest Products (NTFPs) are forest resources that play a strategic role in supporting rural economic development, increasing the income of forest-dependent communities, and promoting the more sustainable utilization of natural resources. Various NTFPs, such as forest honey, rattan, resin, agarwood, medicinal plants, and forest fruits, offer significant economic opportunities without increasing timber exploitation. Previous studies have shown that NTFPs contribute to rural productivity, sustainable livelihoods, and local development based on forest resources (Rao & Rao, 2025; Rosenfeld et al., 2024). Nevertheless, most NTFPs are still marketed as raw materials with low added value, and their economic potential has therefore not been fully developed into broader market opportunities (Meinhold et al., 2022; Nguyen et al., 2025).

The literature indicates that limited access to market information, low levels of digital capability, weak financial management, and inadequate entrepreneurial capacity are the primary factors hindering the development of NTFP-based enterprises. Studies on NTFP value chains and marketing reveal that producers frequently face constraints related to price information, buyer access, quality standards, and market negotiation capabilities (Magry et al., 2023; Meinhold

et al., 2022). On the other hand, digital literacy has been shown to expand access to information and strengthen farmers' entrepreneurial behavior (Bai et al., 2023; Zhou et al., 2024), while financial literacy and financial management behavior contribute to the ability to recognize business opportunities (Kang & Park, 2024). Furthermore, entrepreneurial literacy promotes innovation, leadership, and sustainable business development (Polas et al., 2022; Taleb et al., 2023).

Nevertheless, previous studies still exhibit several limitations. Most studies examine literacy as a standalone concept or focus on specific NTFP-related aspects such as value chains, livelihoods, conservation, and market access. The concept of market opportunity recognition is often addressed only indirectly through studies on commercialization, innovation, value addition, entrepreneurial behavior, and value chain development (Li et al., 2021; Taleb et al., 2023; Herlina et al., 2025). Consequently, there is still a lack of a comprehensive synthesis explaining how digital, market, financial, and entrepreneurial literacy collectively contribute to market opportunity recognition in the NTFP context. Another gap concerns the limited understanding of the mechanisms through which literacy is translated into the capability to recognize

market opportunities, although several studies have highlighted the roles of self-efficacy, financial behavior, social capital, and community capacity as important underlying mechanisms (Herlina et al., 2025; Indrawan et al., 2025; Kang & Park, 2024; Tavares & Burns, 2023).

Based on these gaps, this study aims to synthesize the literature on the roles of digital literacy, market literacy, financial literacy, and entrepreneurial literacy in supporting market opportunity recognition for NTFPs among forest-dependent communities, business groups, and cooperatives. Specifically, this study seeks to address three main research questions: (1) which forms of literacy are most relevant to the development of market opportunities for NTFPs; (2) how literacy contributes to the ability of NTFP actors to recognize and capitalize on market opportunities; and (3) which factors function as mediating mechanisms and contextual conditions in the relationship between literacy and market opportunity recognition. These questions are particularly relevant because previous studies have demonstrated that digital, financial, and entrepreneurial literacy influence entrepreneurial behavior, creativity, and business performance, yet these relationships have rarely been examined in an integrated manner within

the context of NTFP-based cooperatives and communities (Hasan et al., 2024; Kumar et al., 2025; Zada & Erokhin, 2025). The primary contribution of this study is the development of an integrative literacy-based conceptual framework for NTFP Market Opportunity Recognition, which positions literacy as a strategic capability in transforming NTFPs from subsistence products into market-oriented products with added value. This framework integrates digital, market, financial, and entrepreneurial literacy with mediating mechanisms such as self-efficacy, financial management behavior, community capacity, and social capital, as well as contextual factors including gender, institutional support, and digital infrastructure (Aristei et al., 2024; Bansal & Choudhary, 2024; Heena & Nidhi, 2022; Zaman et al., 2025). Accordingly, this study contributes theoretically to the advancement of the literature on NTFPs and rural entrepreneurship while also offering practical implications for strengthening the capacity of NTFP-based communities and cooperatives.

### **Research Method**

This study employed a Systematic Literature Review (SLR) approach using the PICO framework to define the scope of the review, develop the search strategy, and establish the inclusion and exclusion criteria

for article selection. In terms of the population (P), the review encompassed forest-dependent communities, rural households, forest farmers, micro, small, and medium enterprises (MSMEs), cooperatives, business groups, Indigenous communities, and forest-based entrepreneurs involved in the management of Non-Timber Forest Products (NTFPs). This scope also included small and medium forest enterprises across various developing countries. In addition, the population was selectively extended to studies on rural and local resource-based enterprises that were relevant to explaining the role of literacy in opportunity recognition.

For the intervention (I) component, the study focused on literacy as a key capability comprising four dimensions: digital literacy, market literacy, financial literacy, and entrepreneurial literacy. These four forms of literacy were conceptualized as capabilities that facilitate access to information, market understanding, business management, and product innovation. Furthermore, the SLR also considered capacity-building initiatives, such as training programs, mentoring, and institutional support provided to NTFP actors.

The comparison (C) component of this review was conceptual in nature, given that most of the included studies did not employ

experimental designs. Comparisons were made among actors or communities with varying levels of literacy, digital access, access to finance, and market capacity.

Meanwhile, the primary outcome (O) was market opportunity recognition, defined as the ability to identify, evaluate, and exploit business opportunities. This outcome was further extended to related dimensions, including market access, product commercialization, value addition, innovation, business performance, and the economic sustainability of communities. This approach enabled a more comprehensive analysis of the role of literacy in transforming the potential of NTFPs into viable economic opportunities.

### **Literature Search**

The literature search process in this study was conducted systematically to ensure that all publications relevant to the topics of literacy and market opportunity recognition were comprehensively identified. The search process began with the selection of core keywords representing the main concepts of the study, namely "literacy" and terms associated with opportunity recognition, such as "opportunity recognition." These keywords were subsequently combined using Boolean operators (AND, OR) to construct search strings capable of capturing variations in terminology used across previous studies.

The search query used in the Scopus article search was as follows :

("non-timber forest product\*" OR NTFP OR "non wood forest product\*" OR "forest-based enterprise\*" OR "small and medium forest enterprise\*" OR "community enterprise\*" OR "rural enterprise\*" OR "cooperative\*" OR "rural household\*" OR "forest community") AND ("digital literacy" OR "financial literacy" OR "market literacy" OR "entrepreneurial literacy" OR "business literacy" OR "marketing skill\*" OR "financial behaviour" OR "financial behavior" OR "entrepreneurial knowledge" OR "digital capability") AND ("opportunity recognition" OR "market opportunity" OR "business opportunity" OR "market access" OR commercialization OR "value addition" OR innovation OR "entrepreneurial performance" OR "business performance" OR livelihood\*).

In conducting this Systematic Literature Review (SLR), inclusion and exclusion criteria were established to ensure that only relevant studies providing empirical support for the research focus were selected for further analysis. The inclusion criteria were designed to identify studies examining the relationship between various forms of literacy—such as digital literacy, market literacy, financial literacy, and

entrepreneurial literacy—and the process of opportunity discovery, represented by variables including opportunity recognition, opportunity identification, entrepreneurial alertness, and entrepreneurial capability. The selected literature consisted of articles published between 2021 and 2025, indexed in Scopus, and available through open-access sources. In addition, only studies employing quantitative or mixed-methods approaches and reporting statistical test results were included, enabling the identification of both significant and non-significant relationships among the variables under investigation. The exclusion criteria were applied to eliminate studies that were not aligned with the objectives of this review. Articles were excluded if they did not explicitly examine literacy-related variables or variables associated with opportunity recognition. Studies using purely qualitative approaches, descriptive analyses without reporting statistical significance, or focusing on unrelated topics, such as general agriculture, livestock production, value chains, or non-entrepreneurial social issues, were also excluded from the analysis. The following PRISMA 2020 flow diagram illustrates the publication selection process used to identify the literature included in this SLR.

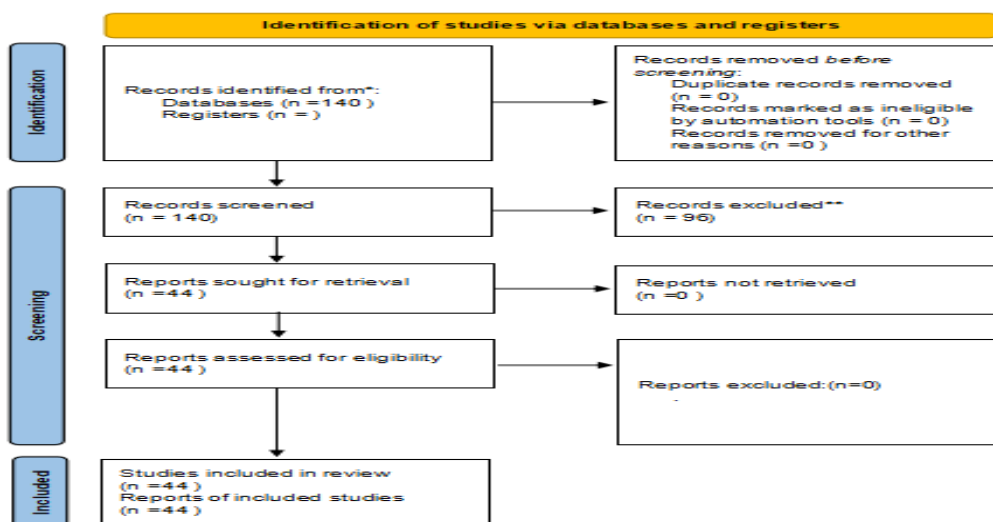


Figure 1. PRISMA Flow Diagram

### Conceptual Framework

The conceptual framework presented in Figure 2 illustrates that literacy—comprising digital literacy, market literacy, financial literacy, and entrepreneurial literacy—serves as a set of core capabilities that enables NTFP actors to recognize market opportunities. The influence of literacy may occur both directly and indirectly through several mediating mechanisms, including self-efficacy as a psychological factor, financial and entrepreneurial behavior as behavioral factors, and social capital and community

capacity as social factors. Furthermore, the relationship between literacy and market opportunity recognition may be strengthened or weakened by moderating factors such as gender, educational attainment, digital infrastructure, and institutional support. Accordingly, the model suggests that the ability of NTFP actors to identify market opportunities is determined not only by individual knowledge and competencies but also by behavioral attributes, social networks, and enabling environmental conditions.

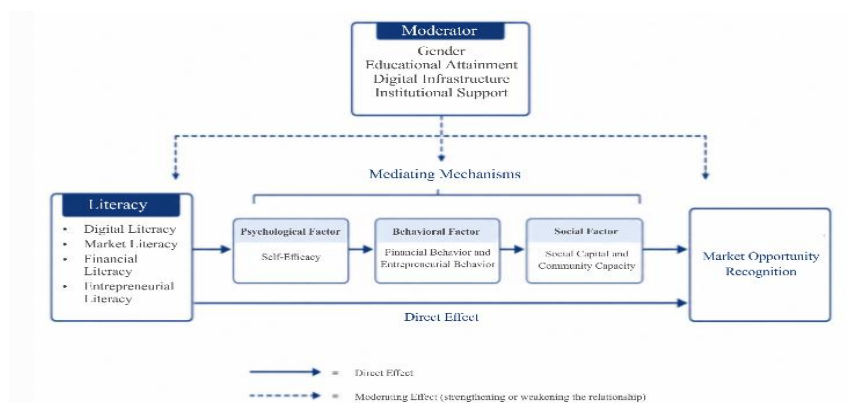


Figure 2. Conceptual Framework

## Results and Discussion

### Literature Synthesis

The results of the literature synthesis indicate that literacy serves as a cognitive foundation in the process of market opportunity recognition. In the context of entrepreneurship and the development of local resource-based enterprises, literacy is not merely understood as the ability to read or acquire information, but also as the capacity to access, interpret, evaluate, and utilize information for economic decision-making. Accordingly, literacy constitutes a critical prerequisite that enables entrepreneurs, communities, and cooperatives to interpret environmental changes, understand market signals, and identify previously untapped business opportunities.

The literature reviewed demonstrates that four forms of literacy are particularly relevant to market opportunity recognition: digital literacy, market literacy, financial literacy, and entrepreneurial literacy. Digital literacy enables entrepreneurs to obtain market information through the internet, social media, e-commerce platforms, and other digital channels. This capability is increasingly important because market opportunities are now largely shaped by digital information flows, changing consumer preferences, and access to broader buyer networks. Bai et al. (2023)

found that digital literacy can promote farmers' entrepreneurial behavior, while Ji et al. (2024) emphasized that digital capabilities are associated with the ability of rural communities to utilize information in adapting to changes in the business environment.

Market literacy plays a crucial role in helping actors understand pricing, product quality, consumer preferences, market segmentation, quality standards, and distribution channels. In the context of NTFPs, market literacy is particularly important because many products are still sold as raw materials, resulting in a greater share of value addition being captured by downstream actors within the value chain. A study by Meinhold et al. (2022) demonstrated that the successful integration of baobab products into global markets depends not only on product availability but also on the ability of producers and supporting institutions to understand quality standards, consumer demand, regulations, and market networks. Similar findings were reported by Magry et al. (2022), who showed that limited market information and the weak bargaining position of upstream actors can reduce the economic benefits received by NTFP collectors.

Financial literacy was also identified as a critical factor in business opportunity recognition. Actors with higher levels of

financial literacy are generally better equipped to assess business feasibility, evaluate risks, manage capital, and plan product development more rationally. Kang and Park (2024) demonstrated that financial literacy and financial management behavior are associated with the ability to recognize entrepreneurial opportunities. In the context of small forest-based enterprises, Zada et al. (2021) emphasized that financial management practices play an important role in the development of forestry-based small and medium-sized enterprises. These findings suggest that opportunity recognition requires not only the ability to interpret market signals but also the capacity to evaluate whether a given opportunity is financially viable.

Entrepreneurial literacy strengthens the ability of individuals to connect market information with entrepreneurial action. The entrepreneurship literature emphasizes that opportunity recognition is closely associated with entrepreneurial alertness, creativity, innovation, risk-taking ability, and networking capacity. Taleb et al. (2023) demonstrated that opportunity recognition and innovation capability constitute important mechanisms underlying entrepreneurial success. In the context of rural communities and women's groups, Polas et al. (2022) and Kavuma et al. (2022) found that entrepreneurial literacy can

enhance entrepreneurial intention, economic empowerment, and the capacity to develop economic activities based on local potential.

In addition to the direct relationship between literacy and opportunity recognition, the literature also highlights the presence of mediating factors that explain how literacy is translated into economic action. Self-efficacy, financial behavior, social capital, community capacity, and business networks emerge as important mechanisms in this process. Self-efficacy enables individuals to feel capable of identifying, evaluating, and exploiting opportunities. Financial behavior assists actors in managing risks and resources effectively. Social capital and community capacity strengthen access to information, institutional support, and market networks. Therefore, market opportunity recognition is influenced not only by literacy as a form of knowledge but also by the psychological readiness, behavioral attributes, and social support systems surrounding entrepreneurs. These findings suggest that literacy should be understood as a multidimensional capability in the development of NTFPs. Across many studies on NTFPs, the primary challenge is not merely the limited availability of natural resources or low production levels, but rather the limited capacity of actors to transform products into

market opportunities. NTFPs may be available in sufficient quantities; however, without digital literacy, producers face difficulties in accessing market information; without market literacy, they struggle to understand consumer needs; without financial literacy, they are unable to assess business feasibility; and without entrepreneurial literacy, they find it difficult to innovate and develop effective commercialization strategies.

An important interpretation emerging from this synthesis is that market opportunity recognition does not occur automatically. Market opportunities arise when actors are able to interpret environmental signals, connect information with consumer needs, evaluate risks, and transform knowledge into entrepreneurial action. Therefore, literacy functions as a bridge between the potential of NTFPs and the creation of economic value. In the context of NTFP-based cooperatives and producer groups, literacy can also strengthen collective capabilities in negotiating with buyers, setting prices, developing value-added products, and accessing more profitable markets.

This synthesis also demonstrates that the four forms of literacy do not operate independently. Digital literacy provides access to information, market literacy facilitates the interpretation of that

information, financial literacy enables the assessment of opportunity feasibility, and entrepreneurial literacy fosters the willingness and capability to act upon identified opportunities. Therefore, literacy in the context of NTFPs should be understood as an integrated capability system. Deficiencies in any single dimension of literacy may hinder the overall process of market opportunity recognition.

In the context of forest-dependent communities, mediating factors such as self-efficacy, financial behavior, social capital, and community capacity play a critical role. This finding suggests that improving literacy cannot rely solely on technical training programs. Literacy enhancement initiatives should be accompanied by business mentoring, institutional strengthening, improved access to finance, the expansion of market networks, and efforts to build the confidence of actors in making business decisions. Through such an approach, literacy can evolve from individual knowledge into a collective capability of communities and cooperatives.

Based on this synthesis, this article conceptualizes literacy as the primary foundation of a literacy-based framework for NTFP market opportunity recognition. The framework positions digital literacy, market literacy, financial literacy, and

entrepreneurial literacy as cognitive and strategic assets that enable NTFP actors to identify opportunities, create added value, expand market access, and enhance business sustainability. The principal contribution of this discussion lies in demonstrating that NTFP development should not be focused solely on increasing production. Rather, it should also prioritize strengthening the literacy capacities of NTFP actors, enabling them to identify and capitalize on market opportunities in a sustainable manner.

### Methodological Synthesis

The methodological synthesis of the 44 articles analyzed indicates that research on literacy, market opportunity recognition, entrepreneurship, and NTFP development employs a wide range of methodological approaches. This diversity reflects the multidisciplinary nature of NTFP-related research, which lies at the intersection of rural economics, entrepreneurship, literacy, value chains, livelihoods, and sustainable development. Nevertheless, a common

pattern emerges in that the majority of studies adopt quantitative survey-based approaches, particularly to examine the relationships among literacy, business behavior, market access, entrepreneurial performance, income generation, and business sustainability.

Overall, the methods employed in the reviewed studies can be classified into six main categories: quantitative survey-based research, qualitative case study research, mixed-methods research, systematic or bibliometric reviews, value chain and market analyses, and conceptual or policy studies. The distribution of these methodologies suggests that quantitative approaches remain the dominant research design because they are considered effective for testing relationships among variables in a measurable manner, particularly the relationships between literacy and outcomes such as opportunity recognition, financial behavior, innovation, market access, and business performance.

**Table 1.** Summary of Research Methods Used in the Reviewed Articles

No.	Method Category	Percentage	Main Characteristics	Examples of Research Focus
1	Quantitative Survey-Based Research	41.7%	Utilizes questionnaires and data collected from households, farmers, MSMEs, cooperatives, or entrepreneurs; analyzed using regression, SEM, PLS-SEM,	Financial literacy, digital literacy, entrepreneurial behavior, NTFP income, market access, business performance

			logit, tobit, or other multivariate techniques.	
2	Qualitative Research / Case Studies	18.8%	Employs in-depth interviews, observations, focus group discussions, institutional analysis, and contextual narratives.	NTFP value chains, community institutions, women's roles, marketing strategies, cooperative dynamics
3	Mixed-Methods Research	12.5%	Combines quantitative surveys with interviews, observations, participatory mapping, or SWOT analysis.	Agroforestry development, product transformation strategies, community capacity, NTFP markets
4	Systematic Reviews / Bibliometric Studies	12.5%	Applies PRISMA, bibliometric analysis, thematic analysis, or literature synthesis.	Mapping research on NTFPs, agribusiness, market opportunities, livelihoods, poverty, and sustainability
5	Value Chain, Market, and Economic Evaluation Analyses	10.4%	Uses margin analysis, value-added analysis, marketing channel analysis, price analysis, cost-benefit analysis, or business feasibility assessment.	NTFP value chains, baobab products, herbal products, marketing, value addition, market access
6	Conceptual and Policy Studies	4.1%	Based on document analysis, theoretical frameworks, policy analysis, or conceptual models.	NTFP governance, forestry policies, community development, forest-based markets

Based on Table 1, quantitative survey-based research represents the most frequently employed methodological approach. The dominance of this method can be attributed to the fact that most studies seek to measure relationships among latent constructs, such as literacy, self-efficacy, financial behavior, entrepreneurial capability, opportunity recognition, and business performance. These constructs cannot be observed directly and therefore require the use of

indicators, measurement scales, and multivariate analytical techniques.

Within the group of quantitative studies, the most commonly applied analytical techniques include linear regression, logistic regression, Tobit regression, quantile regression, Structural Equation Modeling (SEM), Partial Least Squares–Structural Equation Modeling (PLS-SEM), and Confirmatory Factor Analysis (CFA). SEM and PLS-SEM are widely utilized

because they enable the examination of both direct and indirect relationships among variables. These techniques are particularly relevant to studies on literacy and opportunity recognition, as the relationship between literacy and entrepreneurial outcomes is often complex rather than straightforward, being mediated by psychological, behavioral, and institutional factors such as self-efficacy, financial behavior, community capacity, social capital, and innovation.

The predominance of SEM and PLS-SEM in studies of literacy and entrepreneurship can be attributed to three main reasons. First, constructs such as literacy, self-efficacy, financial behavior, and opportunity recognition are latent variables that require measurement through multiple indicators. Second, relationships among variables in literacy research frequently involve mediating and moderating mechanisms. For example, financial literacy may influence opportunity recognition through financial behavior, while digital literacy may affect business performance through self-efficacy and innovation. Third, PLS-SEM is particularly suitable for socio-economic research involving complex models, relatively small sample sizes, and a predictive orientation. Consequently, this method is widely adopted in studies that seek to explain the

relationships among individual capabilities, business behavior, and entrepreneurial outcomes.

Although quantitative approaches offer significant advantages in testing relationships among variables, they also have several limitations. Most quantitative studies employ cross-sectional designs and are therefore unable to adequately explain changes in literacy capacity and opportunity recognition over time. Furthermore, literacy is often measured through respondents' self-reported perceptions, making the results susceptible to subjective bias. Another limitation is that many quantitative studies provide only limited insights into local contexts, institutional dynamics, power relations within value chains, and the role of culture in the decision-making processes of NTFP communities.

On the other hand, qualitative approaches and case studies provide a deeper understanding of the social, institutional, and cultural contexts of forest-dependent communities. These methods are capable of explaining why certain communities face difficulties in accessing markets, how women are positioned within NTFP value chains, and how relationships among collectors, traders, cooperatives, and buyers influence the distribution of value addition. However, the primary limitation of qualitative approaches lies in the limited

generalizability of their findings, as they are typically focused on specific geographical or contextual settings.

Mixed-methods approaches occupy an important position because they combine the strengths of both quantitative and qualitative methodologies. In NTFP research, mixed methods are particularly relevant for measuring relationships among variables while simultaneously explaining the underlying social contexts. For example, surveys can be used to assess the influence of literacy on business performance, whereas interviews and focus group discussions can provide insights into why certain forms of literacy do not always lead to successful market opportunity recognition. Therefore, mixed-methods research represents a promising approach for future studies on literacy and market opportunities in the NTFP sector.

This methodological synthesis indicates that the existing literature still exhibits several methodological limitations. First, most studies remain sector-specific and have not explicitly examined the integrative relationships among digital literacy, market literacy, financial literacy, and entrepreneurial literacy within a single conceptual model. Second, there is a limited number of longitudinal studies capable of explaining changes in literacy capabilities and opportunity recognition over time.

Third, studies that explicitly position market opportunity recognition as the primary outcome within the context of NTFPs remain scarce. Fourth, relatively few studies have examined the moderating roles of gender, digital infrastructure, and cooperative institutions in the relationship between literacy and market opportunities.

### **Theoretical Foundation**

The examination of the role of literacy in market opportunity recognition for Non-Timber Forest Products (NTFPs) requires a theoretical foundation capable of explaining cognitive processes, behavior, human resources, social networks, and the institutional capacities of communities. In the context of NTFPs, market opportunities are determined not only by the availability of forest products but also by the ability of actors to access information, interpret market signals, assess risks, build self-confidence, leverage social networks, and transform knowledge into entrepreneurial action. Therefore, this review draws upon several complementary theoretical perspectives, namely Cognitive Theory, Social Cognitive Theory, Behavioral Theory, Human Capital Theory, the Resource-Based View (RBV), and Social Capital Theory.

Market opportunity recognition in the NTFP sector can be explained through the integration of these complementary

theoretical perspectives. From a cognitive perspective, opportunity recognition is understood as a mental process involving the search, processing, and interpretation of information that ultimately leads to economic decision-making. In the context of NTFPs, literacy serves as a fundamental capability that enhances actors' ability to identify market potential arising from forest resources. Without adequate literacy, products such as honey, rattan, and medicinal plants are likely to be perceived merely as raw commodities rather than as opportunities for value creation. Accordingly, digital, market, financial, and entrepreneurial literacy strengthen the cognitive capacity to transform information into valuable business ideas.

Furthermore, Social Cognitive Theory emphasizes that literacy alone is insufficient to enhance knowledge; it must be accompanied by self-efficacy, defined as the confidence of individuals or groups in their ability to recognize and capitalize on opportunities. In the context of NTFPs, which is often characterized by limited market access and business experience, self-efficacy becomes a critical factor bridging knowledge and action. Actors who possess literacy but lack confidence are less likely to exploit available opportunities. Conversely, within cooperatives and business groups, self-efficacy can evolve

into collective efficacy through shared experiences, training, and social support. This highlights the importance of mentoring and social learning in strengthening the impact of literacy.

From the perspective of Behavioral Theory, this study argues that literacy does not automatically lead to economic improvement unless it is accompanied by changes in business behavior. Knowledge of finance, markets, or entrepreneurship generates meaningful outcomes only when it is applied in everyday practices, such as financial record-keeping, business planning, price negotiation, and risk management. In the NTFP sector, many actors continue to sell products based primarily on short-term needs rather than sound economic considerations. Therefore, financial and entrepreneurial behaviors serve as key mechanisms linking literacy to market opportunity recognition. This perspective also helps explain why literacy training programs often yield limited results when they are not accompanied by changes in business practices and supportive environmental conditions.

Human Capital Theory reinforces the finding that literacy constitutes an important form of human capital investment that enhances productivity and improves the quality of decision-making. Many forest-dependent communities possess abundant

NTFP resources but remain unable to optimize their utilization due to limitations in knowledge and skills. Various forms of literacy enable actors to process products, improve quality, establish market networks, and create added value. In the context of cooperatives, improving members' literacy is essential for developing more adaptive and competitive business strategies. Consequently, literacy contributes not only to individual development but also to organizational performance.

Meanwhile, the Resource-Based View (RBV) positions literacy as a strategic resource capable of generating competitive advantage. NTFPs often possess unique local characteristics and high ecological value; however, these advantages can only be effectively leveraged when supported by the ability to manage market information, maintain product quality, and implement appropriate marketing strategies. Market, digital, financial, and entrepreneurial literacy enable actors to transform these potentials into competitive economic value. Within cooperatives, literacy can evolve into a collective capability through management systems, quality standardization, and product innovation, thereby strengthening their position within the value chain.

Finally, Social Capital Theory highlights the importance of social networks, trust, and

collaboration in strengthening the relationship between literacy and market opportunity recognition. Access to information and markets is determined not only by individual capabilities but also by the extent of an actor's integration within economic and institutional networks. Communities with strong social capital are better positioned to access market information, establish partnerships, and enhance their bargaining power. In contrast, isolated actors tend to rely heavily on intermediaries and face more limited opportunities. Social capital also helps explain variations in outcomes among communities that possess similar levels of literacy.

Overall, this discussion demonstrates that literacy constitutes a fundamental foundation for NTFP market opportunity recognition; however, its impact depends largely on its interaction with self-efficacy, business behavior, human capital, organizational resources, and social capital. The integration of these theoretical perspectives underscores that literacy enhancement should be approached holistically, not merely as an effort to increase knowledge, but also as a process that promotes behavioral change, strengthens collective capacity, and fosters a supportive ecosystem that enables NTFP

actors to identify and capitalize on market opportunities effectively.

### **Synthesis Across Theories**

The six theories complement one another in explaining the relationship between literacy and market opportunity recognition in the NTFP sector. Cognitive Theory explains how literacy enables actors to process information and recognize opportunity signals. Social Cognitive Theory explains why self-efficacy is necessary for transforming knowledge into the confidence required to take action. Behavioral Theory emphasizes that literacy must be translated into business practices, such as financial record-keeping, market information seeking, product innovation, and technology adoption. Human Capital Theory positions literacy as an investment in human resources. The Resource-Based View (RBV) explains how literacy can serve as a strategic resource for cooperatives and business groups. Meanwhile, Social Capital Theory highlights that networks, trust, and collaboration determine whether literacy can be effectively utilized at the collective level.

This synthesis demonstrates that no single theory can fully explain the relationship between literacy and market opportunity recognition in the NTFP context. Cognitive Theory and Social Cognitive Theory

provide stronger explanations of individual-level processes, whereas Social Capital Theory and the Resource-Based View are more effective in explaining collective and institutional dynamics. Human Capital Theory emphasizes the importance of enhancing human capabilities, while Behavioral Theory stresses that knowledge must be accompanied by action. Accordingly, NTFP market opportunity recognition can be understood as the result of interactions among knowledge capital, self-confidence, business behavior, organizational resources, and social networks.

Within the conceptual framework of this SLR, digital literacy, market literacy, financial literacy, and entrepreneurial literacy are positioned as forms of human capital and strategic resources. Self-efficacy, financial behavior, community capacity, and social capital are conceptualized as mechanisms through which literacy is translated into market opportunity recognition. Meanwhile, gender, digital infrastructure, market access, and institutional support are regarded as contextual conditions that may strengthen or weaken these relationships. Through this theoretical synthesis, NTFP development is viewed not merely as an issue of production and marketing, but as a process of building the cognitive,

behavioral, social, and institutional capabilities of forest-dependent communities.

### **Strengths and Limitations of the SLR**

This SLR possesses several key strengths. First, it draws upon high-quality articles indexed in Scopus, providing a comprehensive overview of the existing literature. Second, it examines not only direct relationships but also complex mechanisms involving mediation and moderation effects. Third, it integrates cognitive, behavioral, and social perspectives within a single analytical framework, thereby offering a more holistic understanding of the role of literacy in market opportunity recognition. However, several limitations should also be acknowledged. These include the predominance of cross-sectional research designs, which are unable to capture long-term dynamics; the widespread use of perception-based data, which may be subject to respondent bias; and the heterogeneity of socio-economic contexts across studies, which complicates the generalization of findings.

The practical implications of this SLR highlight the importance of strengthening literacy in ways that are specifically tailored to the needs of NTFP communities and cooperatives, taking into account the characteristics of forest

products and local contexts. Digital literacy is essential for accessing information and facilitating marketing activities; market literacy is necessary for understanding consumer needs and product standards; financial literacy supports business management and risk assessment; and entrepreneurial literacy fosters innovation and value addition. Consequently, development programs should not be limited to general training initiatives but should also incorporate contextualized practical mentoring that is aligned with product characteristics, market conditions, cooperative structures, gender considerations, infrastructure availability, and the local potential of forest-dependent communities.

This SLR also encourages future research to explore the influence of different forms of literacy within emerging hybrid contexts, such as rural digital ecosystems, climate change adaptation, and NTFP value chains. Future studies should simultaneously examine both mediating and moderating effects and expand existing models by incorporating additional factors, including economic resilience, family dynamics, and local social capital, to provide a more comprehensive explanation of the relationship between literacy and market opportunity recognition.

## Conclusion

This review concludes that the forms of literacy most relevant to the development of market opportunities for Non-Timber Forest Products (NTFPs) are the combined capabilities of digital literacy, market literacy, financial literacy, and entrepreneurial literacy, functioning as an integrated set of strategic competencies. Digital literacy facilitates access to information and market networks; market literacy enhances understanding of demand trends and product standards; financial literacy supports rational business decision-making and risk management; and entrepreneurial literacy promotes innovation and the willingness to capitalize on new opportunities. Together, these four dimensions complement one another in strengthening the readiness of NTFP actors to respond to market dynamics.

Literacy contributes to the ability of NTFP actors to recognize and exploit market opportunities by enhancing both cognitive and practical capacities, including the ability to search for and evaluate information, identify changes in market demand, assess business feasibility, and develop products that meet market needs. However, literacy does not operate automatically; its impact emerges only when knowledge is translated into adaptive and innovative business behavior.

The relationship between literacy and market opportunity recognition is mediated and influenced by several key factors. Self-efficacy, financial behavior, and social capital function as mediating mechanisms that may strengthen or weaken the effects of literacy. Meanwhile, contextual conditions such as institutional support, market access, digital infrastructure, social characteristics (including gender and education), and actors' positions within the value chain determine the effectiveness of literacy in facilitating opportunity recognition. Therefore, efforts to strengthen literacy among NTFP actors should be implemented through an integrated approach that combines literacy enhancement with business mentoring, institutional development, and improved market access.

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