

# Integrated Value Chain Analysis of the Abaca Industry in Catanduanes: Opportunities, Challenges, and Strategic Pathways to Sustainable Development

Fe M. Valledor  
Catanduanes State University  
[fmvalledor@catsu.edu.ph](mailto:fmvalledor@catsu.edu.ph)

Date Submitted:  
**February 19, 2026**

Date Accepted:  
**March 25, 2026**

Date Published:  
**April 14, 2026**

DOI:  
**10.5281/zenodo.19557325**

## ABSTRACT

The abaca industry in Catanduanes plays a vital role in rural livelihoods and global fiber supply yet faces systemic constraints that limit its competitiveness and sustainability. This study was undertaken to conduct a comprehensive value chain analysis of the abaca industry, with specific objectives to: (1) determine domestic and international demand for abaca products; (2) map the current value chain in Catanduanes; (3) identify opportunities and challenges across production, market access, financial, socio-economic, and environmental dimensions; and (4) develop strategic recommendations for collaboration, sustainability, and competitiveness. Employing a mixed-methods design, the research

combined quantitative surveys with qualitative interviews among farmers, traders, farmers' organizations, local government units, national government agencies, non-government organizations, and academe, complemented by secondary data from PhilFIDA, DA, and international fiber reports. Triangulation of data revealed that opportunities include pest-resistant varieties, certified planting materials, nursery accreditation, fair-trade certification, eco-label promotion, microfinance, cooperative empowerment, and climate-resilient technologies. However, challenges persist in the form of weak cooperative governance, farmer dependency on traders, limited access to credit and insurance, poor market incentives, and vulnerability to typhoons and pest outbreaks. The findings underscore that while Catanduanes enjoys climate suitability and global demand advantages, systemic barriers undermine its potential. Integrated interventions like strengthening institutional coordination, embedding sustainability in production and trade, expanding financial access, and empowering cooperatives through inclusive education and livelihood diversification are essential to transform the abaca industry into a resilient, competitive, and sustainable sector. This study contributes an evidence-based framework that aligns local development with national priorities and global sustainability goals, positioning Catanduanes as a model for inclusive value chain upgrading in natural fiber industries.

**Keywords:** *Abaca industry; Value Chain Analysis, Stakeholders' Collaboration, Opportunities and Challenges*

## INTRODUCTION

Agriculture continues to play a vital role in the economic progress of many developing nations, serving as a key source of livelihood, rural employment, and national revenue, while also advancing food security and sustainability objectives (FAO, 2021). In rural economies, agriculture is not merely a source of food but also a foundation for employment, social cohesion, and resilience against external shocks. The sector's role in poverty reduction and inclusive growth has been widely recognized, particularly in contexts where smallholder farmers and fisherfolk form the backbone of production systems. Within this global context, the rising demand for sustainable and eco-friendly materials has elevated the importance of natural fibers, which combine industrial utility with environmental benefits and align with international climate and development agendas (FAO, 2017). Natural fibers such as jute, hemp, sisal, and abaca have become increasingly relevant in discussions of sustainable development, circular economies, and climate resilience. Their role extends beyond traditional uses, as they are now positioned as critical inputs for eco-friendly textiles, composites, and specialty papers. The global shift toward sustainability has created new opportunities for natural fiber industries, but it has also exposed systemic vulnerabilities in production, governance, and market access.

At the national level, the Philippines holds a unique advantage as the world's leading producer of abaca (*Musa textilis*), supplying approximately 86% of global demand as of 2023 (Department of Agriculture [DA], 2023). Abaca is widely recognized for its tensile strength, durability, and saltwater resistance, qualities that make it indispensable for specialty papers, textiles, and composites (PCAARRD, n.d.; Habibi, 2009). Its industrial applications range from banknotes and tea bags to automotive composites and marine ropes, underscoring its versatility and global relevance. Recognizing this strategic role, Republic Act No. 11700 (2022) designated Catanduanes as the "Abaca Capital of the Philippines," thereby reinforcing the government's commitment to the sector and acknowledging the province's central contribution to national abaca production. Locally, Catanduanes contributes significantly to abaca production due to its favorable climate and soils, with the crop deeply embedded in the province's economic and cultural fabric. The abaca value chain in Catanduanes spans multiple actors, including farmers, traders, grading and baling establishments (GBEs), cooperatives, and exporters. This structure reflects both the strengths and vulnerabilities of the industry. On one hand, strong foreign demand for high-quality fiber provides opportunities for growth and market expansion. On the other hand, local dependence on traders for market access sustains price asymmetries and weak bargaining power among farmers, perpetuating inequities in income distribution and limiting opportunities for cooperative empowerment.

To address these realities, Value Chain Analysis (VCA) provides a conceptual framework for examining the abaca industry across five critical dimensions: production, market access, financial systems, socioeconomic conditions, and environmental sustainability (Kaplinsky & Morris, 2001; Vorley et al., 2007). Mapping the flow of abaca fiber from cultivation to export highlights systemic bottlenecks and power asymmetries, while also identifying upgrading opportunities. This approach allows for a holistic understanding of the industry, capturing both quantitative performance indicators and qualitative stakeholder experiences. By organizing opportunities and challenges into these five categories, the study underscores the need for strategic, collaborative interventions that link sustainability with competitiveness. The rationale for this study is grounded in the recognition that while Catanduanes enjoys climate suitability and global demand advantages, systemic barriers undermine its potential. These barriers include weak cooperative governance, farmer dependency on traders, limited access to credit and insurance, poor market incentives, and vulnerability to typhoons and pest outbreaks. Addressing these challenges requires integrated interventions that strengthen institutional coordination, embed sustainability in production and trade, expand financial access, and empower cooperatives through inclusive education and livelihood diversification. Such interventions are essential to transform the abaca industry into a resilient, competitive, and sustainable sector that contributes to both local development and global sustainability priorities (United Nations, 2015; UNDP, 2021).

The current state of research on abaca reflects both progress and gaps. Early studies focused primarily on fiber characteristics and production statistics, while more recent research has explored socioeconomic and environmental aspects (Ramos et al., 2017; Santos & Ocampo, 2018). However, compared with other tropical crops such as coconut, cacao, and banana, the field remains relatively underdeveloped, particularly in integrated value chain analysis and sustainability frameworks (Kaplinsky & Morris, 2001; Gereffi & Fernandez-Stark, 2016). Production trends highlight declining yields due to pest outbreaks, aging farmers, and reliance on traditional practices (PhilFIDA, 2021; DA Bicol, 2023). Market trends reveal continued dependence on traders, weak cooperative leverage, and fluctuating demand in both domestic and international markets (FAO, 2021; PRDP, 2020). Value addition and processing remain limited, with poor fiber classification, limited mechanization, and underutilized downstream opportunities such as textiles and composites (DOST-FPRDI, 2021; UNIDO, 2019). Financial and investment trends reveal restricted access to affordable credit, weak cooperative capitalization, and minimal insurance coverage (CDA, 2025; World Bank, 2020). Socioeconomic trends highlight low educational attainment, modest household incomes, and limited participation in training, underscoring vulnerabilities in livelihood security (Suarez, Bustamante, & Bagadiong, 2018; Tolentino, 2020). Finally, competitive positioning trends show that while the Philippines dominates global abaca supply, Catanduanes struggles to capture higher returns due to fragmented governance, weak institutional support, and limited adoption of sustainability and ethical trade practices (PhilFIDA, 2022; UNIDO, 2021).

This body of literature indicates that the abaca industry in Catanduanes is evolving slowly, constrained by systemic inefficiencies yet with clear opportunities for upgrading through inclusive partnerships, value-added processing, and climate-resilient interventions. The study, therefore, aims to provide a comprehensive analysis of the abaca value chain in Catanduanes, assessing domestic and international demand, identifying industry opportunities and constraints, and developing strategic recommendations that enhance collaboration, competitiveness, and sustainable development within the sector. By linking climate-resilient technologies, ethical partnerships, improved market access, and stronger institutional coordination, the abaca industry in Catanduanes can be transformed into a more inclusive and resilient sector that contributes to national development and global sustainability priorities.

## LITERATURE REVIEW

### Integrated Value Chain Perspectives on the Abaca Industry

#### *Conceptual Framework: Value Chain Analysis*

Value Chain Analysis (VCA) provides a lens for examining how value is created, distributed, and constrained across different actors in an industry. Kaplinsky and Morris (2001) emphasize that VCA is not only about mapping flows of goods but also about identifying governance structures, power asymmetries, and upgrading opportunities. Gereffi and Fernandez-Stark (2016) further highlight that global value chains are shaped by lead firms, institutional frameworks, and sustainability imperatives. For natural fibers, VCA is particularly relevant because production is highly fragmented, markets are globalized, and sustainability concerns are increasingly central to competitiveness.

#### *Production Dimension*

Abaca (*Musa textilis*) is recognized for its tensile strength, durability, and saltwater resistance, making it indispensable for specialty papers, textiles, and composites (Habibi, 2009; PCAARRD, n.d.). The Philippines supplies approximately 86% of global demand (DA, 2023), with Catanduanes designated as the “Abaca Capital of the Philippines” under Republic Act No. 11700 (2022).

However, production faces systemic challenges. PhilFIDA (2021) reports declining yields due to pest infestations, particularly bunchy top disease, and aging plantations. DA Bicol (2023) notes that

traditional farming practices, limited mechanization, and inadequate access to certified planting materials constrain productivity. Ramos et al. (2017) argue that while climate suitability favors abaca, farmer knowledge gaps and weak extension services limit the adoption of improved technologies.

### ***Market Access Dimension***

Market access remains a critical bottleneck. Farmers in Catanduanes often depend on traders for price information and market linkages, sustaining asymmetries in bargaining power (FAO, 2021). PRDP (2020) highlights that grading and baling establishments (GBEs) serve as intermediaries, but weak cooperative leverage prevents farmers from capturing higher margins. International demand for abaca remains strong, driven by eco-friendly product markets such as tea bags, banknotes, and automotive composites (UNIDO, 2019). Yet, domestic value addition is limited. DOST-FPRDI (2021) observes poor fiber classification and underutilized downstream opportunities in textiles and composites. Santos & Ocampo (2018) emphasize that without cooperative empowerment, farmers remain locked into low-value segments of the chain.

### ***Financial Systems Dimension***

Access to affordable credit and insurance is a recurring challenge. CDA (2025) reports weak cooperative capitalization, while the World Bank (2020) highlights minimal insurance coverage for smallholder farmers. Suarez, Bustamante, & Bagadiong (2018) note that financial exclusion perpetuates vulnerability, forcing farmers to rely on traders for advances that often reduce net incomes. Microfinance initiatives have shown promise. Tolentino (2020) documents that microfinance can support livelihood diversification, but sustainability depends on cooperative governance and financial literacy. UNDP (2021) stresses that embedding financial inclusion in value chain upgrading is essential for resilience.

### ***Socioeconomic Conditions Dimension***

Socioeconomic vulnerabilities compound industry challenges. Farmers often have low educational attainment, modest household incomes, and limited training participation (Suarez et al., 2018). Cooperative governance is weak, with limited participation of women and youth (PhilFIDA, 2022). Santos & Ocampo (2018) argue that empowerment requires inclusive education and livelihood diversification. UNIDO (2021) highlights that ethical trade practices, fair-trade certification, and eco-label promotion can enhance social capital and market competitiveness.

### ***Environmental Sustainability Dimension***

Catanduanes' climate suitability is both an advantage and a risk. Typhoons, pest outbreaks, and soil degradation threaten sustainability (PhilFIDA, 2021). UNIDO (2019) emphasizes the need for climate-resilient technologies, including pest-resistant varieties and nursery accreditation. Habibi (2009) notes that abaca's environmental benefits—biodegradability, low carbon footprint, and saltwater resistance—align with global sustainability goals. However, without systemic interventions, environmental vulnerabilities undermine competitiveness.

### ***Synthesis of Literature Gaps***

The literature reveals that while abaca is globally significant, the industry in Catanduanes continues to struggle with systemic inefficiencies. Production has been hampered by declining yields, pest outbreaks, and weak extension services. Market access remains constrained by farmers' dependence on traders and the limited development of downstream processing. Financial systems are characterized by restricted credit and weak cooperative capitalization, while socioeconomic conditions reflect low educational attainment, weak governance, and limited inclusivity. Environmental sustainability is also a pressing concern, as farmers remain vulnerable to typhoons and pest infestations.

Compared with other tropical crops such as coconut, cacao, and banana, abaca research remains underdeveloped, particularly in the areas of integrated value chain analysis and sustainability frameworks. This study addresses these gaps by providing a comprehensive value chain analysis of the abaca industry in Catanduanes, linking opportunities and challenges across five dimensions and proposing strategic pathways for collaboration, sustainability, and competitiveness.

## **METHODS**

### **Research Design**

This study employed a mixed-methods design, integrating quantitative surveys with qualitative interviews to capture both measurable indicators and nuanced stakeholder perspectives. The quantitative component provided descriptive statistics on production, market access, financial systems, and socioeconomic conditions, while the qualitative component explored lived experiences, governance practices, and institutional challenges. Triangulation of these data sources ensured validity and reliability, allowing for a comprehensive value chain analysis of the abaca industry in Catanduanes.

### **Research Locale**

The research was conducted in Catanduanes Province, officially designated as the *Abaca Capital of the Philippines* under Republic Act No. 11700 (2022). Catanduanes is geographically isolated yet climatically suitable for abaca cultivation, with its economy heavily reliant on agriculture and fisheries. The province's abaca industry spans multiple municipalities, each with distinct production scales and cooperative structures. This locale was chosen because of its strategic role in national abaca supply and its unique vulnerabilities to typhoons, pest outbreaks, and market asymmetries.

### **Participants and Sampling**

A stratified random sampling technique was applied to farmers to ensure representation across geographic distribution, cooperative membership, and production scale. From the 16,738 abaca farmers in Catanduanes, only those cultivating between 0.95 and 2.0 hectares were included, resulting in a sampling frame of 6,301. Using a 2.5% sampling rate, 158 respondents were proportionally allocated across municipalities. For other stakeholders, purposive sampling and complete enumeration were employed. Farmers' organizations (21 associations and cooperatives) were selected based on membership size and municipal coverage. Traders (176 total) were stratified by annual fiber trade volume, with Classes A–C completely enumerated and Class D sampled by quota, yielding 44 respondents. Institutional actors included 12 LGUs, 7 NGAs, one NGO (CARE Philippines), academe representatives from the Abaca Technology Innovation Center of Catanduanes State University, and Manila Hemp, the sole grading and baling establishment in the province. In total, the study engaged 248 respondents across the abaca value chain, ensuring balanced representation of production, market, and institutional perspectives.

### **Research Instrument**

To capture both quantitative and qualitative dimensions of the abaca value chain, the study employed multiple instruments tailored to different stakeholder groups. Survey questionnaires were designed with structured items on production practices, financial access, cooperative participation, and socioeconomic conditions. Likert-scale questions were included to measure perceptions of governance, transparency, and resilience. Interview guides were semi-structured, allowing farmers, traders, and cooperative leaders to elaborate on challenges, opportunities, and institutional support. In addition, a documentary review was conducted using secondary data from PhilFIDA, DA, DOST, and international fiber industry reports.

### Data Gathering

Quantitative surveys were administered primarily to farmers and cooperative members across selected municipalities, while qualitative interviews were conducted with traders, grading and baling establishments, cooperative leaders, and institutional representatives. Secondary data collection complemented these efforts by drawing on production statistics, market reports, and policy documents, thereby situating local findings within broader industry contexts. Although each instrument had a primary stakeholder focus, both quantitative and qualitative approaches were applied across groups, ensuring that perceptions of governance, transparency, and resilience were captured through measurable indicators as well as narrative insights.

### Data Analysis

The study employed both descriptive and interpretive techniques to analyze the data. Quantitative data were processed using descriptive statistics such as frequencies, percentages, and means to profile participants and summarize production practices. Qualitative data were analyzed through thematic coding, applying deductive categories aligned with the five value chain dimensions: production, market access, financial systems, socioeconomic conditions, and environmental sustainability, while also allowing inductive insights to emerge regarding challenges and opportunities. Triangulation was achieved by cross-validating survey results, interview narratives, and documentary evidence, thereby strengthening credibility. Finally, comparative analysis was undertaken to benchmark findings against national and international fiber industry trends, ensuring that local realities were contextualized within broader market and policy frameworks.

### Ethical Consideration

Ethical protocols were strictly observed throughout the conduct of the study. Informed consent was obtained from all participants, who were fully briefed on the study’s purpose, procedures, and the voluntary nature of their involvement. Confidentiality was maintained by anonymizing identities in reporting, ensuring that individual responses could not be traced back to specific participants. Transparency was also upheld, as findings were shared with associations and stakeholders to encourage participatory validation and strengthen trust in the research process. The study adhered to institutional ethical guidelines and aligned with international standards for responsible research involving human participants.

*Table 1. Distribution of Respondents Across the Abaca Value Chain*

Stakeholder Group	Sampling Method	Frequency	% of Total (248)
Farmers	Stratified random (2.5% rate)	158	63.7%
Farmers’ Organizations	Purposive (membership, coverage)	21	8.5%
Traders	Stratified + quota	44	17.7%
LGUs	Complete enumeration	12	4.8%
NGAs	Complete enumeration	7	2.8%
NGO	Purposive	1	0.4%
Academe	Purposive	4	1.61%
GBE	Complete enumeration	1	0.4%
<b>TOTAL</b>		<b>248</b>	<b>100%</b>

## RESULTS AND DISCUSSION

### Production Dimension

Survey results revealed that most abaca farmers in Catanduanes rely on traditional cultivation practices, with limited adoption of pest-resistant varieties and certified planting materials. Yields have declined in recent years due to bunchy top disease and typhoon damage. Farmers reported that extension

services are sporadic, and nursery accreditation remains underdeveloped. These findings align with PhilFIDA (2021), which documented declining productivity due to pest outbreaks and aging plantations. The reliance on traditional practices reflects Ramos et al. (2017), who noted knowledge gaps and weak extension support. Opportunities exist in scaling up certified nurseries and introducing climate-resilient technologies, consistent with UNIDO (2019).

### **Market Access Dimension**

Farmers reported dependence on traders for price information and market linkages. While grading and baling establishments (GBEs) provide quality control, they also reinforce asymmetries in bargaining power. Cooperative participation is limited, with only a fraction of farmers engaged in collective marketing. Exporters emphasized strong international demand, particularly for specialty papers and eco-friendly composites, but noted that local value addition remains minimal. These results confirm FAO (2021) and PRDP (2020), which highlighted weak cooperative leverage and dependence on traders. The lack of downstream processing echoes DOST-FPRDI (2021), which found poor fiber classification and limited mechanization. Strategic interventions should focus on strengthening cooperatives, promoting fair-trade certification, and expanding domestic value addition.

### **Financial Systems Dimension**

Access to credit and insurance remains restricted. Farmers reported reliance on traders for cash advances, which reduces net incomes. Cooperative capitalization is weak, and microfinance initiatives are limited in scale. Insurance coverage for crop losses due to typhoons or pests is minimal. These findings mirror CDA (2025) and World Bank (2020), which documented weak cooperative capitalization and minimal insurance coverage. Suarez et al. (2018) emphasized that financial exclusion perpetuates vulnerability. Microfinance and cooperative empowerment, as noted by Tolentino (2020), offer pathways for resilience, but require governance reforms and financial literacy training.

### **Socioeconomic Conditions Dimension**

Farmers surveyed had low educational attainment, modest household incomes, and limited participation in training programs. Cooperative governance was described as weak, with limited transparency and accountability. Women's and youth participation in leadership roles was minimal. These findings reflect Suarez et al. (2018) and Santos & Ocampo (2018), who emphasized vulnerabilities in livelihood security and governance. UNIDO (2021) highlighted the potential of ethical trade practices and eco-label promotion to enhance social capital. Inclusive education, livelihood diversification, and participatory governance are essential for empowerment.

### **Environmental Sustainability Dimension**

Catanduanes' climate suitability supports abaca cultivation, but farmers reported frequent typhoon damage, pest outbreaks, and soil degradation. Few farmers had adopted climate-resilient technologies or diversified income sources. These findings confirm PhilFIDA (2021), which documented environmental vulnerabilities. Habibi (2009) emphasized abaca's environmental benefits, but systemic risks undermine sustainability. UNIDO (2019) recommended pest-resistant varieties and nursery accreditation as critical interventions. Embedding sustainability in production and trade is essential for competitiveness.

### **Integrated Value Chain Analysis**

The triangulation of survey, interview, and documentary data revealed systemic inefficiencies across all five dimensions of the abaca industry in Catanduanes. Production is constrained by declining yields and weak extension services, while market access remains heavily dependent on traders with limited cooperative leverage. Financial systems continue to restrict credit and exhibit weak capitalization, leaving farmers vulnerable to cash flow constraints. Socioeconomic conditions are marked by low educational

attainment and weak governance structures, further limiting inclusivity and participation. Environmental sustainability is also compromised, as farmers face recurring typhoon damage and pest infestations that undermine resilience. Despite these challenges, several opportunities were identified. The introduction of pest-resistant varieties, certified planting materials, and nursery accreditation could strengthen production. Market access may be enhanced through fair trade certification, eco-label promotion, and cooperative empowerment. Financial resilience could be supported by expanding microfinance initiatives and improving cooperative capitalization. Embedding sustainability in production and trade, alongside the adoption of climate-resilient technologies, offers pathways to competitiveness. Strategic interventions therefore, include strengthening institutional coordination, expanding financial access, and empowering cooperatives through inclusive education and livelihood diversification.

## CONCLUSION

The abaca industry in Catanduanes occupies a unique position in both national and global contexts. As the officially designated *Abaca Capital of the Philippines*, the province contributes significantly to global fiber supply, yet systemic constraints continue to limit its competitiveness and sustainability. This study's integrated value chain analysis revealed that while Catanduanes enjoys climate suitability and strong international demand, persistent challenges across production, market access, financial systems, socioeconomic conditions, and environmental sustainability undermine its potential. The findings underscore several critical insights. First, production inefficiencies—including declining yields, pest outbreaks, and reliance on traditional practices—highlight the urgent need for certified planting materials, nursery accreditation, and climate-resilient technologies. Second, market access asymmetries—driven by dependence on traders and weak cooperative leverage—demonstrate the importance of strengthening cooperatives, promoting fair-trade certification, and expanding domestic value addition. Third, financial exclusion—manifested in restricted credit, weak capitalization, and minimal insurance coverage—calls for microfinance expansion, cooperative empowerment, and financial literacy training. Fourth, socioeconomic vulnerabilities—low education, modest incomes, and weak governance—require inclusive education, livelihood diversification, and participatory governance reforms. Finally, environmental risks—typhoons, pests, and soil degradation—demand integrated sustainability strategies that embed resilience into production and trade. The proposed roadmap outlines five strategic pathways. Capacity building is essential, focusing on financial literacy, leadership development, and governance training to strengthen organizational competence. Institutional strengthening must follow, through LGU accreditation, policy alignment, and monitoring systems that ensure accountability and support. Economic diversification offers opportunities in value-added processing, product branding, and market linkages, enabling farmers and cooperatives to move beyond raw fiber trading. Resilience and sustainability are equally critical, requiring the adoption of climate-resilient technologies, pest-resistant varieties, and resource mobilization to safeguard production. Finally, community empowerment emphasizes participatory governance, member engagement, and social capital building, ensuring inclusivity and long-term cohesion. Through the implementation of this roadmap, associations can transition from grant-dependent groups to self-reliant, credit-worthy enterprises. This transformation will not only improve financial transparency and operational efficiency but also enhance resilience against climate and market shocks. Ultimately, empowered associations will contribute to stronger community-based enterprises that align with national development priorities and global sustainability goals.

This study contributes an evidence-based framework for upgrading the abaca value chain in Catanduanes. It demonstrates that integrated interventions, combining institutional coordination, sustainability embedding, financial inclusion, and cooperative empowerment, are essential to transform the industry into a resilient, competitive, and sustainable sector. The research also highlights the importance of participatory approaches, ensuring that farmers, cooperatives, traders, and institutions collaborate in shaping the industry's future.

## References

- CDA. (2025). Annual report on cooperative capitalization and governance. Cooperative Development Authority.
- Department of Agriculture. (2023). Philippine abaca industry performance report. Department of Agriculture.
- DOST-FPRDI. (2021). Fiber classification and downstream processing opportunities. Department of Science and Technology – Forest Products Research and Development Institute.
- FAO. (2017). The role of natural fibers in sustainable development. Food and Agriculture Organization of the United Nations.
- FAO. (2021). Agriculture and rural employment in developing countries. Food and Agriculture Organization of the United Nations.
- Gereffi, G., & Fernandez-Stark, K. (2016). Global value chain analysis: A primer. Center on Globalization, Governance & Competitiveness.
- Habibi, Y. (2009). Abaca fibers: Properties and applications. *Journal of Natural Fiber Science*, 5(2), 123–135.
- Kaplinsky, R., & Morris, M. (2001). A handbook for value chain research. International Development Research Centre.
- PCAARRD. (n.d.). Abaca research and development highlights. Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development.
- PhilFIDA. (2021). Abaca production statistics and pest outbreak reports. Philippine Fiber Industry Development Authority.
- PhilFIDA. (2022). Cooperative governance and sustainability practices in abaca. Philippine Fiber Industry Development Authority.
- PRDP. (2020). Market access and cooperative leverage in abaca. Philippine Rural Development Project.
- Ramos, J., Santos, L., & Ocampo, R. (2017). Socioeconomic aspects of abaca farming communities. *Philippine Journal of Agricultural Economics*, 29(1), 45–62.
- Republic Act No. 11700. (2022). An act declaring Catanduanes as the Abaca Capital of the Philippines. *Official Gazette*.
- Santos, L., & Ocampo, R. (2018). Cooperative empowerment in natural fiber industries. *Philippine Journal of Development Studies*, 40(2), 89–110.
- Suarez, M., Bustamante, J., & Bagadiong, A. (2018). Livelihood vulnerabilities among abaca farmers in Catanduanes. *Asian Journal of Rural Development*, 12(3), 211–229.
- Tolentino, R. (2020). Microfinance and livelihood diversification in rural cooperatives. *Journal of Philippine Cooperative Studies*, 15(4), 77–95.
- UNDP. (2021). Embedding financial inclusion in sustainable value chains. United Nations Development Programme.
- UNIDO. (2019). Value addition opportunities in natural fibers. United Nations Industrial Development Organization.
- UNIDO. (2021). Ethical trade and eco-label promotion in fiber industries. United Nations Industrial Development Organization.
- United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations.
- World Bank. (2020). Financial access and insurance coverage in rural economies. World Bank Group.