

# MAXIMIZING VALUE CREATION: UNVEILING THE POTENTIAL OF LIGHT INDUSTRY CONCEPTS IN HOUSEHOLD FARMING SYSTEMS IN LAO PDR

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DOI: 10.55662/AJMRR.2023.4603

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## ABSTRACT

This research delves into the intricate strategies employed by farmers in a specific study area to create and enhance value within the agricultural sector, with a particular emphasis on coffee production. The findings underscore the vital role of the agricultural sector in sustaining global economies and livelihoods. The farmers exhibit commendable strategies, including the transition to organic production, diversification, advanced storage practices, adoption of cutting-edge technologies, and integration with tourism.

The study focuses on the Coffee Producers Cooperative (CPC) and its deliberate shift to organic production, aligning with global trends favoring sustainability. This transition not only emphasizes environmental stewardship but strategically positions CPC to meet the rising demand for organic coffee. The economic advantages of this shift are highlighted, providing financial stability and empowerment to small-scale farmers.

Diversification strategies, such as transforming suboptimal goods into marketable products, showcase resourcefulness and empower farmers by granting greater control over market interactions. This aligns with the versatility associated with light industry concepts, emphasizing innovation and value addition.

The research also explores strategic green coffee bean storage for premium roasted coffee sales, emphasizing the importance of low-humidity storage to preserve the quality of green beans.

[Asian Journal of Multidisciplinary Research & Review \(AJMRR\)](#)

ISSN 2582 8088

Volume 4 Issue 6 [November December 2023]

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The integration of a dual business model, combining roasted coffee sales with a homestay venture, adds layers of diversification, broadening revenue streams and enhancing enterprise resilience.

Strategic coffee storage practices during periods of heightened demand showcase the importance of adept storage methodologies, aligning with light industry practices. The adoption of smartphones for decision-making reflects a forward-looking approach to enhancing market intelligence, aligning with technology-driven agriculture.

The paper also delves into the strategic transformation of coffee cultivation into agritourism, adding substantial value to coffee products. This integration with tourism aligns with light industry concepts, providing unique experiences for consumers and contributing to the dynamic growth of the agritourism sector.

**Keywords:** Agricultural Innovation, Organic Production, Value Addition, Agritourism, Light Industry Concepts



Asian Journal of  
Multidisciplinary  
Research & Review

## INTRODUCTION

In the agrarian landscape of Lao's People Democratic Republic (Lao PDR), household farming plays a pivotal role, making significant contributions to the nation's economy and sustenance (Asian Development Bank, 2018). However, this sector faces multifaceted challenges, including economic constraints and environmental pressures, hindering its growth and impacting the well-being of farming communities. In the pursuit of sustainable agricultural development, the concept of value creation emerges as a key driver for transforming traditional farming systems into economically viable and resilient models (Onphanhdala, 2022).

The integration of value chains in the light industry sector holds immense potential for household farming systems in Lao PDR, offering solutions to enhance productivity, improve rural incomes, reduce poverty, ensure food security, and address climate change (Asian Development Bank, 2018). Concepts such as on-farm processing, direct marketing, and product differentiation can enable farmers to create value from their agricultural products and generate additional income streams. Light industry concepts also provide avenues to reduce post-harvest losses, increase the shelf life of produce, and enhance market opportunities and profitability (Borsellino et al., 2020).

The potential of light industry concepts in household farming systems is influenced by various factors identified in the literature. Newby et al. (2013) emphasizes the diversity of production systems and household livelihood strategies, suggesting that research and extension efforts should recognize this diversity. Lienhard et al. (2006) highlights the importance of local agro-ecological situations and market access in shaping household responses to markets. Hepp et al. (2019) underscores the role of infrastructure development and accessibility in driving the transition towards commercialized market-oriented systems.

Despite the importance of household farming, farmers in Lao PDR face obstacles such as limited access to resources, market inefficiencies, and susceptibility to climatic uncertainties. To address these challenges, a focused exploration into the potential of Light Industry Concepts becomes imperative.

Value creation in Lao PDR's light industry holds the key to unlocking the untapped potential of household farming systems. The study by Onta (2018) emphasizes the significance of smallholder mixed-farming practices in contributing to poverty alleviation and economic development. By improving livestock management practices, diversifying agricultural

activities, and promoting policy measures that support market integration, policymakers can create an enabling environment for the growth of household farming. This approach can lead to increased income generation, job creation, and overall improvement in the livelihoods of rural communities.

Opportunities for off-farm employment, including skills training and entrepreneurship development programs, should be explored to provide additional income sources and contribute to poverty reduction. Rural infrastructure development, such as road networks and irrigation systems, can enhance market access and improve productivity in household farming systems (Alexander et al., 2020). A holistic approach considering various dimensions of value creation in household farming systems is crucial for unlocking the full potential of Lao PDR's light industry and promoting inclusive growth.

To maximize value creation, a comprehensive approach should address challenges and opportunities within household farming systems. Literature from various studies, including (Candemir et al., 2021; Daood & Menghwar, 2017; Klein et al., 2022; Sadovska et al., 2020) provides insights into factors influencing value creation, sustainability, and the role of cooperatives in agriculture. These studies underscore the complexity of sustainable value creation, emphasizing collaboration, communication, knowledge, production, diversification, entrepreneurship, funding, policies, and inclusiveness.

In conclusion, the integration of light industry concepts in household farming systems in Lao PDR holds great potential for sustainable development. By addressing challenges and leveraging the insights from existing literature, policymakers and stakeholders can create an environment that maximizes value creation, leading to a thriving rural economy, increased food security, and improved well-being for the country's population.

## **RESEARCH OBJECTIVES**

This research aims to address the identified challenges and unlock the latent potential within household farming systems in Lao PDR. The specific objectives are:

- To assess the current state of household farming in Lao PDR, examining existing practices and identifying areas for improvement.
- To explore the potential of Light Industry Concepts in enhancing value creation within the context of household farming in Lao PDR.

- To provide actionable recommendations for policymakers, farmers, and communities to maximize value creation, fostering a more sustainable and economically viable agricultural sector in Lao PDR.

## LITERATURE REVIEW

### *Historical Perspective of Agriculture in Lao PDR*

The agricultural history of Lao PDR is intricately tied to the nation's economic development and cultural heritage, primarily characterized by subsistence farming practices centered around rice cultivation. Understanding the challenges faced by contemporary household farmers in Lao PDR requires delving into the historical evolution of shifting cultivation practices (Phengsavanh et al., 2017). This exploration offers valuable insights into the dynamic interplay between traditional agricultural methods and changing socio-economic conditions.

The agricultural sector in Lao PDR has witnessed significant changes, transitioning towards modernization and market-oriented production (Alexander et al., 2020). However, this shift has posed challenges, particularly for dryland farmers in the southern and central regions, contending with poor soils and rainfall dependence (Somanje et al., 2021). Upland smallholder farmers have also adapted to new agricultural technologies and policies, with their productivity linked to land and forest biodiversity (Alexander et al., 2009). Despite its prevalence, shifting cultivation is associated with high poverty rates and marginalization (Ducourtieux, 2006). Farmer decision-making amid these challenges is influenced by factors like government agendas, development projects, and socio-ethnic hierarchy (Lai et al., 2015).

Agriculture has been a foundational element of the Lao People's Democratic Republic for centuries, playing a pivotal role in economic development and the population's livelihoods. Traditionally characterized by subsistence farming and reliance on small-scale production, the sector's evolution has been shaped by historical factors, including geographical and political influences. Laos' diverse ethnolinguistic groups and historical events like colonization and conflicts have further molded its agricultural development. Despite challenges such as conflicts and population displacement, agriculture remains vital, with most households relying on subsistence farming, maintaining herds crucial for manure production, crop cultivation, and occasional income (Windsor et al., 2021).

Recognizing the need for economic development, the Lao government has implemented policies promoting cash crops like rubber, coffee, and bananas, along with modern farming techniques. These initiatives aim to enhance food security, increase farmers' incomes, and contribute to overall economic growth. Despite the historical shifts towards commercial agriculture, subsistence farming methods persist, underlining agriculture's enduring significance in sustaining livelihoods and contributing to economic development in Lao PDR.

### ***Past Research on Agricultural Value Creation***

Examining the importance of value creation in agriculture, Duflo et al. (2011) highlight the need to improve value chains for the well-being of smallholder farmers. Their focus includes strategies like encouraging fertilizer use. Additionally, Hazell & Roell (1983) provide insights into rural growth linkages, revealing household expenditure patterns that shed light on economic dynamics within agricultural systems. These studies collectively emphasize the necessity of holistic approaches that consider the socio-economic context and the multifaceted nature of agriculture.

Several dimensions of value creation in agriculture have been explored in prior studies. Sadvovska (2020) identifies nine clusters of value-creating factors, emphasizing the need for a reassessment of value creation in response to sustainability goals. Jayashankar et al. (2019) focuses on co-creating value-in-use in the digital agriculture sector, highlighting the role of big data technology and the potential for value co-destruction. Giner (2009) proposes new avenues for value creation and capture in the agro-food sector, recognizing evolving consumer and societal expectations. Ohal (2015) discusses the value creation approach in agricultural marketing, emphasizing the role of marketing in creating, communicating, and delivering value to customers. These studies collectively underscore the complexity and evolving nature of value creation in agriculture, emphasizing the need for further research in this area.

Studies on value creation in agriculture aim to understand how agricultural enterprises and the sector as a whole can generate and enhance value. This encompasses factors such as collaboration, communication, knowledge sharing, production methods, diversification strategies, entrepreneurial initiatives, funding mechanisms, policy environment, and market orientation. Researchers strive to identify and analyze practices, strategies, and interventions contributing to sustainable value creation in agriculture. Additionally, studies highlight the

significance of agricultural extension training, co-creation strategies, and innovation in value creation. These investigations stress the importance of inclusiveness, considering the interests of smallholders, large commercial entities, communities, and society in value creation efforts. In conclusion, prior studies on value creation in agriculture underscore the importance of collaboration, communication, knowledge sharing, diversification, innovation, and sustainability for achieving sustainable value creation in the agricultural sector. They address global challenges such as food security, nutrition, and environmental sustainability (Sadovska et al., 2020).

### ***Implementation of Light Industry Concepts in Global Agricultural Settings***

In addition to energy-intensive industries, there exists a multitude of smaller and less energy-intensive, commonly known as light, industries. These encompass sectors such as food processing, metal engineering, and electronics, where energy typically forms a modest portion of overall production costs. Within these industries, a diverse range of processes is employed, with a significant portion of energy dedicated to space heating, cooling, motor operations (including fans and compressed air), and boilers. Industrial boilers play a crucial role in generating steam or heating water for both space and process heating, as well as for the production of mechanical power and electricity, with some serving a dual function by facilitating the cogeneration of steam and electricity. The primary sectors utilizing industrial boilers, based on capacity, include paper, chemical, food production, and petroleum industries (Worrell, 2004).

On a global scale, the incorporation of Light Industry Concepts into agriculture has shown the potential to revolutionize traditional farming practices. Precision farming technologies, as explored by Gebbers & Adamchuk (2010), represent a paradigm shift in optimizing resource use through data-driven decision-making. Malcolm (2011) discuss the integration of agro-processing facilities at the community level, signaling a move towards decentralized value addition. These global examples inspire exploration into how Light Industry Concepts can be adapted and implemented within the specific context of household farming systems in Lao PDR.

As the demand for sustainable agricultural practices increases, light agro-industry concepts emerge as potential solutions, utilizing innovative technologies and processes to enhance

productivity, reduce environmental impact, and promote economic sustainability. Examples include vertical farming, hydroponics, precision agriculture, and drone usage in farming operations. Vertical farming involves growing crops in stacked layers or structures indoors, using artificial lighting and controlled environments. Hydroponics entails growing plants in nutrient-rich water solutions without soil. Precision agriculture employs advanced technologies like GPS, sensors, and data analytics to optimize resource use. Drones are increasingly utilized for tasks such as crop monitoring, aerial spraying, and precision seeding.

These light agro-industry concepts have the potential to revolutionize agricultural practices by maximizing productivity, minimizing resource use, and reducing environmental impact. By incorporating them, agricultural settings can become more sustainable in terms of productivity, resource efficiency, and environmental impact. Furthermore, these concepts contribute to rural development by providing new economic opportunities and employment in agricultural areas, diversifying agricultural businesses, and creating new revenue streams. In summary, light industry concepts in global agricultural settings are innovative approaches utilizing technologies and processes to enhance productivity, reduce environmental impact, and promote economic sustainability, creating new opportunities for farmers and contributing to rural development (Côte et al., 2022; Kalwar et al., 2019; Sadovska et al., 2020).

### ***Light Industry Concepts in Household Farming***

The potential of light industry concepts to significantly elevate value creation within household farming systems is noteworthy. Introducing small-scale processing and manufacturing activities empowers farmers to augment the value of their agricultural produce and cultivate additional income streams. These concepts encompass on-farm processing of agricultural products, direct marketing, and product differentiation (Javaid et al., 2022).

The implementation of these concepts offers manifold advantages. Firstly, it allows farmers to seize a larger share of the value chain by enhancing the value of their products, leading to heightened profits and increased economic resilience. Secondly, light industry concepts contribute to job creation and rural development by diversifying activities and providing additional employment opportunities for farmers and their communities. Thirdly, these concepts assist in reducing post-harvest losses and enhancing food security by processing and preserving agricultural products on-farm, curbing spoilage, and prolonging the shelf life of



produce. Moreover, they contribute to diminishing food waste and improving access to nutritious foods (Liu et al., 2023).

Light industry concepts in household farming systems have the potential to optimize value creation by adding value to agricultural produce, generating supplementary income streams, creating job opportunities, minimizing post-harvest losses, improving food security, and fostering rural development (Asian Development Bank, 2020, pp. 2019–2024). Additionally, these concepts can promote sustainability and resilience in household farming systems. By leveraging local resources and creating value-added products, farmers can reduce dependence on external inputs, cultivating a more sustainable farming system.

In the context of our rapidly changing world, precise weather forecasts play a pivotal role in agriculture. Farmers depend on accurate weather predictions to make informed decisions regarding planting, harvesting, and other agricultural activities. Precise weather forecasts facilitate optimal resource allocation, minimize input costs, and mitigate risks associated with adverse weather conditions.

Further enhancing the environmental sustainability of farming systems, the integration of green innovations into farm practices is crucial (Lioutas & Charatsari, 2018). Green innovations work to reduce the environmental impacts of agriculture, enhance resource management, and promote ecosystem services. Additionally, these innovations aid farmers in adapting to climate change and building resilience in the face of increasingly unpredictable weather patterns.

The integration of light industry concepts and green innovations into household farming systems holds the potential to maximize value creation by boosting productivity, generating supplementary income streams, fostering economic resilience, and enhancing environmental sustainability.

## **RESEARCH METHODOLOGY**

The research methodology was grounded in observation, drawing insights from a household survey conducted by the FATE project in the Bolaven plateau across six villages in three districts spanning two provinces. The survey encompassed 719 households, revealing that nearly 80% of them sold their coffee products as raw red curry without adding specific value. Consequently, our focus shifted to households with the potential to add value to their coffee

products, forming the basis for a thorough investigation into the integration of light industry concepts within agricultural practices in Lao PDR.

Table 1: Case Studies Conducted in Study Villages

Provinces	Districts	Villages	Case study
Champasak	Parksong	Lak 35	Roasted coffee and agritourism
		Sedkhod	Coffee storage
		Lak 12	Coffee house and agritourism
	Bachiang	Mak Ngew	agritourism
Salavanh	Lao Ngam	Phorkhem	Coffee storage
		Dong	

**Interviews:** Semi-structured interviews were undertaken with key stakeholders, including farmers, agricultural experts, policymakers, and industry professionals. These interviews yielded qualitative insights into socio-economic factors, cultural considerations, and potential barriers related to the adoption of light industry concepts.

**Case Studies:** Extensive case studies were conducted on specific households or communities that successfully incorporated light industry concepts into their farming practices. These detailed examinations provide a nuanced understanding of the implementation process, challenges encountered, and the impact on value creation.

**Qualitative Data Analysis:** Thematic analysis was employed to identify recurring themes and patterns in interview transcripts and qualitative data gathered from case studies. This qualitative analysis offers nuanced insights into the socio-cultural and economic dimensions of integrating light industry concepts.

**Limitations:**

The study recognizes potential limitations, including concerns about the representativeness of the sample, the dynamic nature of agricultural systems, and the contextual specificity of findings. To address these limitations, the research design incorporates robust methodologies and employs triangulation of data to enhance the reliability and validity of the study's outcomes.

## RESEARCH FINDING

The research findings highlight the intricate strategies employed by farmers in the study area to create and enhance value in the agricultural sector, particularly focusing on coffee

production. These strategies align with the broader understanding that the agricultural sector plays a vital role in sustaining economies and livelihoods globally. The farmers exhibit commendable and varied strategies, including organic production, diversification, advanced storage practices, the adoption of cutting-edge technologies, and integration with tourism.

### ***Transitioning to Organic Production by Coffee Producers Cooperative (CPC)***

In Dong, Phorkhem, and LaoNgam villages, the Coffee Producers Cooperative (CPC) operates, representing a notable model of collaboration among small-scale farmers. Established in 2007 with support from the Lao government and the French Development Agency (AFD), the CPC, formerly known as AGPC, has experienced significant growth, incorporating approximately 1,855 households engaged in coffee cultivation across 55 villages. In a pivotal achievement, the CPC exported 603 tons of green coffee in 2012, earning acclaim from the Lao government as the "Laos Best Coffee Exporter 2012" for exceptional prices and quality. Currently, the cooperative continues its expansion, annually exporting over 1,000 tons of green coffee. Members adhering to CPC's production rules, particularly the stipulation for products to be organic, benefit from technicians and various inspection tools ensuring compliance (visit <https://www.cpc-laos.org/>).

The transition to organic production marks a strategic move by the CPC, aligning with global trends favoring organic and sustainable practices. This shift not only reflects a commitment to environmental stewardship but also positions CPC members to cater to a growing market demand for organic coffee. The stringent adherence to organic production rules, facilitated by technical support and inspections, enhances the credibility of CPC's organic offerings, potentially commanding premium prices in the market.

Moreover, the guaranteed rates ranging from 2,200 to 2,600 LAK/Kg for CPC members underscore the economic advantages of organic coffee production. This commitment to better prices aligns with the broader narrative of empowering small-scale farmers and ensuring their economic sustainability. While there is a limited quota for selling to CPC, the ability of households to sell surplus to traders or external markets enhances their overall income and reinforces the economic benefits associated with CPC membership.

In essence, the CPC's transition to organic production not only positions its members as key players in the organic coffee market but also demonstrates a strategic approach to sustainable agriculture, fostering economic resilience among local farming communities.

### ***Diversification Strategies - Dry Curry and Green Bean Coffee***

A notable revelation emerges from farmers' adoption of diversification strategies aimed at increasing value in their agricultural practices. This strategic shift involves the ingenious transformation of defective goods into marketable products, highlighting a resourceful approach to extracting value from imperfect produce. The noteworthy transition from selling raw fruit to producing fruit coffee represents a value-added methodology, not only enhancing the quality of the product but also opening up new avenues in the market.

However, the widespread reluctance of many individuals to embrace this practice stems from the perceived barriers associated with the costs of milling coffee. This includes expenses related to hiring milling services or acquiring the milling machine, both of which can be relatively high. This economic consideration poses a significant obstacle to the widespread adoption of such value-added strategies.

Upon closer analysis of the calculation that equates one kilogram of green coffee beans to five kilograms of red curry beans, the perceived added value in terms of both time and transformation costs appears relatively modest. For example, while green coffee beans may command a price range of 12,500-15,000 LAK/kg, red curry beans are valued at 2,000-2,500 LAK/kg. Despite this apparent economic trade-off, the process of producing dry coffee and green beans emerges as a strategic risk-reduction measure against potential exploitation by middlemen. In embracing this approach, coffee farmers not only mitigate risks but also gain the flexibility to determine when and whether to sell their produce. This empowerment provides them with greater control over their market interactions, showcasing the multifaceted considerations involved in the adoption of value-added practices within the agricultural sector (Wongpit et al., 2023).

### ***Strategic Green Coffee Bean Storage for Premium Roasted Coffee Sales:***

This case study illuminates the proactive endeavors of a Dong village family, particularly a determined female resident aspiring to establish a roasted coffee business. The current

production of 100-200kg of roasted coffee, primarily distributed to relatives in France, marks a modest start. However, she envisions broadening her market reach and acknowledges the necessity of investing in a dedicated roasted coffee machine.

Conversely, Lak 35 village presents a case involving an English teacher from the local secondary school who strategically focuses on the storage of green coffee beans. These beans undergo meticulous storage in a low-humidity environment before being roasted for sale, targeting tourists. Notably, this entrepreneur transforms her residence into a homestay business, showcasing a multifaceted business approach.

The weekly routine involves the English teacher visiting the agriculture center office to root the coffee, emphasizing a commitment to sustainable and locally rooted practices. Economic dynamics come into play when considering the pricing structure. While green coffee beans fetch a standard price of 12,500 LAK, the roasted variant, after incurring a 5,000 LAK roasting fee, commands a selling price of 45,000 LAK. However, operational constraints emerge, such as the dependence on a district agricultural office's roaster and restricted access to the machine. A deeper analysis unveils the strategic implications of this storage and roasting approach. The emphasis on low-humidity storage aligns with preserving the quality of the green beans, contributing to the distinctive flavor profile of the roasted coffee. Furthermore, the dual business model of combining roasted coffee sales with a homestay venture adds layers of diversification to the overall strategy.

However, the reliance on external roasting machinery introduces dependencies and limitations, underscoring the importance of acquiring a dedicated roasting machine. This strategic investment not only ensures autonomy in the roasting process but also positions the entrepreneur to scale operations and explore broader market opportunities.

In essence, this case study underscores the intricate balance between resourceful entrepreneurship, strategic planning, and the need for targeted investments in the pursuit of sustainable and lucrative ventures in the coffee industry.

### ***Strategic Coffee Storage: A Key Advantage for Coffee Farmers***

Storing coffee strategically during periods of heightened demand or increased market prices provides coffee farmers with a notable advantage, although it remains a skill mastered by only a select few. This endeavor demands access to a suitable storage facility, specifically equipped

with a coffee bean moisture meter, and a comprehensive understanding of storage methodologies. The importance of adept coffee storage extends beyond mere preservation, encompassing the retention of the aromatic profile—a foundational attribute that profoundly influences coffee quality.

Examining a case in point, within the village of Porkhem, an individual has become proficient in the intricacies of long-term coffee storage. Actively engaging in training sessions and knowledge-sharing initiatives facilitated by the coffee association and affiliated organizations, this individual has acquired the nuanced expertise essential for meticulous coffee storage. Currently, occupying the role of a raw coffee buyer, he transforms the beans into green coffee, strategically stockpiling it for sale during seasons characterized by elevated coffee prices. This multifaceted approach not only highlights the practical implications of strategic storage but also underscores the role of knowledge acquisition and adaptive strategies in the dynamic coffee market.

### ***Market Intelligence and Decision Making***

The adoption of smartphones for decision-making represents a recent and evolving trend among farmers in Lao PDR. Currently, there is a noticeable shift as farmers increasingly turn to smartphone apps, including those developed by the FATE-LAO project (visit [www.laocoffeeproductprice.la](http://www.laocoffeeproductprice.la) for more information), to inform their production decisions. These apps, featuring functionalities like coffee price in the world market, weather forecasting and information sharing across regions, empower farmers with the ability to make rapid and well-informed decisions, thereby mitigating investment risks.

A noteworthy aspect of this emerging practice is the integration of technology beyond localized decision support. Farmers in the study area are utilizing apps to track global market prices, showcasing a forward-looking approach to market intelligence. This not only demonstrates an openness to technological advancements but also signifies a proactive engagement with broader economic trends. Moreover, the use of weather forecasts in decision-making underlines the seamless integration of technology into agricultural practices, aligning decisions with the prevailing environmental conditions.

In essence, this growing reliance on smartphone apps for decision-making reflects a broader trend toward technology-driven agriculture, indicating a positive shift towards more informed, efficient, and risk-mitigated farming practices in the region.

### ***Transformation of Branding and Tourism***

In 2022, the Ministry of Agriculture and Forestry collaborated with international organizations to issue certification for Bolaven Plateau coffee. Acquiring origin coffee certification not only serves as a means of establishing a brand but also weaves a compelling narrative, adding substantial value to Bolaven plateau coffee products. This announcement not only fosters community pride but also strategically positions the brand for potential competitive advantages in the global market.

Delving beyond its agricultural role, the region showcases breathtaking natural scenery, enticing entrepreneurs and plantation owners with significant capital to reimagine traditional coffee cultivation as agritourism. This strategic shift involves showcasing coffee production as a central attraction, visible from the main road. Exemplifying this trend are specific ventures:

- **Paksong Highland:** A sprawling coffee plantation recognized as a landmark in the Paksong area (visit <http://www.paksong-highland.com/> for more information). This not only adds aesthetic value but also beckons tourists seeking an immersive coffee farm experience, potentially boosting visits and coffee sales.
- **Tat Fan Waterfall:** This site, featuring zipline activities and the unique experience of sipping coffee while on the zipline, caters to the thrill-seeking preferences of both domestic and international tourists. This innovative approach not only elevates the value of the activities but also enhances the allure of the coffee drinks, providing a distinct and memorable experience.
- **Coffee Sinuk:** A renowned coffee house serving as a serene resting spot, strategically leveraging the Bolaven plateau coffee name to attract visitors and patrons. The establishment skillfully blends the prestige of a famous coffee brand with a peaceful ambiance, creating a compelling destination for coffee enthusiasts and tourists. This multifaceted approach not only elevates the intrinsic value of the coffee but also positions it as part of a larger, experiential offering in the burgeoning agritourism sector.

## DISCUSSION

The research findings illuminate the sophisticated strategies implemented by farmers in the study area to create and enhance value in the agricultural sector, with a specific focus on coffee production. These discoveries harmonize with the overarching acknowledgment of the pivotal role played by the agricultural sector in sustaining economies and livelihoods globally. This underscores the imperative need to comprehend how farmers navigate challenges and employ innovative approaches for heightened productivity, economic resilience, and sustainability.

### *Transitioning to Organic Production by Coffee Producers Cooperative (CPC)*

The transition to organic production, as highlighted in the findings, can be seen as a form of light industry within agriculture. It involves a deliberate and strategic move to adopt sustainable and environmentally friendly practices. The meticulous adherence to organic standards reflects a commitment to producing high-quality products, which is a characteristic aspect of light industry concepts (Worrell, 2004).

The shift to organic production by the Coffee Producers Cooperative (CPC) signifies a purposeful and strategic alignment with prevailing global trends favoring organic and sustainable practices within the agricultural sector (Király et al., 2022). By meticulously embracing and adhering to stringent organic production standards, the CPC not only emphasizes its commitment to environmental stewardship but also strategically positions its members to meet the increasing market demand for organic coffee.

This significant shift transcends a mere commitment to sustainable agricultural practices; it represents a proactive measure to ensure compliance through meticulous technical support and inspections. This rigorous approach not only bolsters the credibility of CPC's organic offerings but also reinforces its standing as a key player in the burgeoning organic coffee market.

The economic benefits stemming from this transition are manifold, with guaranteed rates for CPC members providing financial stability and empowerment to small-scale farmers. This multifaceted strategy not only secures a prominent role for CPC members in the organic coffee market but also contributes significantly to fostering economic resilience within local farming communities. The positive outcomes extend beyond individual farmers, echoing sentiments discussed by (Alexander et al. (2020) and Király et al. (2022)), emphasizing the transformative impact of such initiatives on the broader agricultural landscape.



In essence, CPC's strategic shift towards organic production exemplifies a forward-thinking approach that aligns not only with global sustainability trends but also serves as a catalyst for positive economic and environmental change within the local context.

### ***Diversification Strategies - Dry Curry and Green Bean Coffee***

The adoption of diversification strategies, such as the transformation of defective goods into marketable products, aligns with the versatility often associated with light industry. Farmers are not solely focusing on traditional methods but are innovating and adding value to their produce, showcasing adaptability—a key feature of light industry (Worrell, 2004).

The integration of diversification strategies, exemplified by the transformation of suboptimal goods into marketable products, signifies a resourceful approach aimed at extracting value from imperfect produce. While there may be perceived economic trade-offs related to the costs associated with coffee milling, the process of generating dry coffee and green beans emerges as a strategic measure to mitigate risks and guard against potential exploitation by middlemen (Wongpit et al., 2023). This approach not only empowers coffee farmers by affording them greater control over their market interactions but also illuminates the nuanced considerations involved in the adoption of value-added practices within the agricultural sector.

### ***Strategic Green Coffee Bean Storage for Premium Roasted Coffee Sales***

The case studies conducted in Dong village and Lak 35 village shine a spotlight on the proactive endeavors undertaken by individuals who aspire to establish thriving roasted coffee businesses. Their strategic emphasis on low-humidity storage, as extensively discussed by Lioutas and Charatsari (2017), aligns seamlessly with their commitment to preserving the impeccable quality of green beans, a crucial factor contributing to the distinctive and superior flavor profile of the roasted coffee produced.

The incorporation of a dual business model, seamlessly blending the sale of roasted coffee with a homestay venture, introduces additional layers of diversification into their overarching business strategy. This multifaceted approach not only broadens revenue streams but also enhances the resilience of their enterprises by tapping into varied market segments.

However, amidst these commendable initiatives, a critical consideration surface. The reliance on external roasting machinery introduces dependencies that warrant careful consideration.

This dependency underscores the paramount importance of acquiring a dedicated roasting machine, a strategic investment that promises autonomy in the roasting process, scalability in production capabilities, and the potential to explore and seize broader market opportunities. The acquisition of such a dedicated roasting machine becomes not just a means of ensuring operational self-sufficiency but also a catalyst for transformative growth and innovation within the context of their burgeoning roasted coffee businesses.

### ***Strategic Coffee Storage: A Key Advantage for Coffee Farmers***

Strategic storage practices, as discussed in the findings, can be considered a facet of light industry. The emphasis on meticulous storage methods and the use of technology, like coffee bean moisture meters, align with efficient and modernized practices commonly associated with light industry approaches (Lopes & Steidle Neto, 2020).

Strategic coffee storage during periods of heightened demand or increased market prices provides coffee farmers with a notable advantage, showcasing the importance of adept storage methodologies and knowledge acquisition. This multifaceted approach not only highlights the practical implications of strategic storage but also underscores the role of knowledge acquisition and adaptive strategies in the dynamic coffee market (Yüksel et al., 2020).

### ***Market Intelligence and Decision Making***

The findings highlight the adoption of cutting-edge technologies, particularly the use of smartphone apps for decision-making and market intelligence. This aligns with the tech-savvy and modernized approach often seen in light industry, where technology plays a pivotal role in enhancing efficiency and decision-making processes (Jamil, 2013).

The adoption of smartphones for decision-making marks a burgeoning trend observed among farmers in Lao PDR, indicating a proactive and forward-looking approach to enhancing market intelligence. Utilizing smartphone apps for various purposes such as tracking global market prices, accessing real-time weather forecasts, and facilitating seamless information sharing has become a pivotal aspect of this transformative shift. As discussed by Sadovska (2020), this technological integration empowers farmers, providing them with the capabilities to make swift and well-informed decisions, thereby effectively mitigating potential investment risks.

This growing reliance on smartphones for decision-making represents not only a practical adaptation to modern tools but also an embodiment of a more sophisticated and informed agricultural landscape. By harnessing the power of technology, farmers are not only streamlining their decision-making processes but also contributing to the evolution of a more efficient and risk-mitigated farming paradigm in the region. This positive trend towards technology-driven agriculture signifies a broader shift towards modernization and signifies a trajectory towards more sustainable, resilient, and knowledge-intensive farming practices.

### ***Transformation of Branding and Tourism***

The integration of agriculture with tourism, as evidenced by ventures like coffee plantations becoming tourist attractions, is a strategic move that aligns with light industry concepts. This goes beyond traditional farming practices and adds value by creating unique experiences for consumers (Worrell, 2004).

The strategic transformation of coffee cultivation into agritourism constitutes a pivotal shift, introducing substantial value to Bolaven plateau coffee products. This deliberate move, underscored by Proença et al. (2022) in the discussion of origin coffee certification, strategically positions the brand to gain potential competitive advantages in the expansive global market. The innovative integration of coffee production with captivating tourist attractions, exemplified by noteworthy destinations like Paksong Highland, Tat Fan Waterfall, and Coffee Sinuk, showcases inventive approaches designed not only to enhance the intrinsic value of coffee but also to craft memorable and immersive experiences for visitors.

This multifaceted strategy extends beyond the conventional boundaries of coffee production, actively contributing to the dynamic growth of the agritourism sector. As the research findings conclude, farmers in the study area exhibit a commendable and varied range of strategies to create and augment value within the agricultural sector. These encompass organic production, diversification, advanced storage practices, the adoption of cutting-edge technologies, and the seamless integration of agricultural practices with tourism initiatives. This holistic and adaptive approach illuminates their capacity to address challenges and capitalize on emerging opportunities within the coffee industry, positioning them at the forefront of a modern and progressive agricultural landscape.

## RECOMMENDATION

### *Promote Sustainable Practices:*

- Encourage and support farmers in adopting sustainable and organic farming practices.
- Government agencies and NGOs can provide technical assistance, training, and incentives to facilitate the transition to organic production.

### *Facilitate Access to Milling Services:*

- Address perceived barriers associated with the costs of milling coffee.
- Provide financial support, cooperative milling facilities, or shared community milling services to incentivize more farmers to adopt value-added practices.

### *Invest in Roasting Infrastructure:*

- Encourage and support entrepreneurs, such as the determined female resident in Dong village, to invest in dedicated roasting machines.
- Enhance autonomy, scalability, and the overall quality of roasted coffee products.

### *Enhance Storage Facilities and Knowledge:*

- Promote knowledge-sharing initiatives and training sessions on strategic coffee storage.
- Improve access to suitable storage facilities and equipment, such as coffee bean moisture meters, to enable more farmers to benefit from strategic storage practices.

### *Expand Technology Adoption:*

- Support initiatives like the FATE-LAO project and other technology-driven solutions.
- Ensure widespread access to smartphone apps that provide information on coffee prices, weather forecasting, and regional information sharing.

### *Encourage Agritourism Ventures:*

- Collaborate with entrepreneurs and farmers to further develop agritourism ventures showcasing the unique aspects of Bolaven Plateau coffee.
- Attract tourists, create additional revenue streams, and contribute to the economic development of the region.

### *Facilitate Branding Initiatives:*

- Encourage the acquisition of origin coffee certification.

- Support branding initiatives that highlight the unique qualities of Bolaven Plateau coffee, enhancing market competitiveness and increasing the perceived value of the coffee products.

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Volume 4 Issue 6 [November December 2023]

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[Asian Journal of Multidisciplinary Research & Review \(AJMRR\)](#)

ISSN 2582 8088

Volume 4 Issue 6 [November December 2023]

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