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# The Role of Coconut Farming in Supporting Rural Livelihoods and Its Contribution to Poverty Alleviation in Malaysia: A Review

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**Abstract:** In the tropics, coconut cultivation is a critical factor in the development of rural livelihoods, as the crop is well suited to the region. The paper looks at the socio-economic contribution of coconut farming to rural communities in Malaysia, particularly, its potential for poverty alleviation. Based on a systematic synthesis of institutional data and empirical literature, the paper explores the economic advantages of coconut production, its role in income stability and the incorporation of coconut into wider rural development strategies. The findings emphasize the significance of coconut farming as a sustainable livelihood safety net especially for smallholder farmers. However, structural constraints such as market access bottlenecks, aging crops and limited technology adoption constrain their ability to lift households above absolute poverty thresholds. In conclusion, specific policy recommendations implemented in institutional frameworks to improve the contribution of the coconut industry to national poverty reduction and rural development are provided.

**Keywords:** *Coconut farming, rural livelihoods, poverty alleviation, smallholder farmers, agricultural policy*

## 1. Introduction

Across Southeast Asian nations, coconut farming has traditionally served as a reliable livelihood for rural communities while contributing significantly to broader agrarian economies (Vista et al., 2012). In Malaysia, coconut cultivation is deeply woven into the fabric of rural life, serving as a steadfast economic anchor and a key driver of socio-economic sustainability for smallholders amid 21st-century economic volatility. In neighboring jurisdictions, agrarian transformations have been driven by shifting socio-economic aspirations and infrastructural upgrades; for instance, Philippine coconut production has been accelerated by improved infrastructure and favorable land environments (Fujii, 2005)while the Indonesian coconut sector has advanced by optimizing supply chain resilience to promote rural well-being (Nabillah et al., 2025).

In the case of Malaysia, coconut is officially listed as the country's fourth most important industrial crop, but it is frequently overshadowed by oil palm in the national policy discourse. Thus, a full socio-economic review is needed to reassess the potential of the coconut industry as a structural safety net for vulnerable rural households. Global food security has become more important, especially after pandemic-related inflation, global supply chain disruptions, and geopolitical volatility that significantly affect agricultural input costs (Malaysia, 2023). The socio-economic benefits of coconut farming in Malaysia need to be sustained and modernized. This review paper therefore assesses the current state of support for rural livelihoods by the Malaysian coconut industry, evaluates its direct contributions to poverty alleviation and informs strategic policy recommendations.

### Background: Agricultural History of Coconut Farming in Malaysia

Coconut cultivation in Malaysia has transformed from a subsistence crop in the 19th century to a commercially revived industry of strategic importance, with a shift from traditional copra to high-yield hybrids and value-added downstream exports (Rosli, 2023). Malaysia is one of the top ten coconut-producing countries in the world, and coconut remains one of the important industrial crops together with oil palm, rice and rubber (Omar et al., 2023). Archaeobotanical evidence shows that coconut palms were present in Malaysian coastal areas as early as 9,000 years ago and were domesticated by early peoples for their multiple uses as food and material (Ahuja et al., 2014). In the mid-19th century, smallholders and private planters increased cultivation, with the domestic production area reaching 334,100 ha in the 1980s and then declining to around 85,630 ha in 2020 due to fierce competition for land by oil palm (Nor et al., 2020). Despite a reduction in the acreage, production

grew to 542,000 metric tons in 2020. The increase was primarily driven by smallholder farms, which make up 87% of the total national output (Pakiam, 2017).

Coconuts are an important socio-economic lifeline for an estimated 60,000-100,000 rural families, mostly concentrated in the major traditional "coconut belts" of Johor, Perak and Selangor, where 93% of cultivation is smallholder-led (Nor et al., 2025). For decades these smallholdings have been supporting household schooling, healthcare and daily sustenance, transforming marginal lands into resilient livelihood platforms (Aslinda et al., 2022; Batugal et al., 2012). In the modern agrarian economy, smallholders harvest and sell raw nuts to village collectors or middlemen who feed them to upstream processors or downstream enterprises that specialize in virgin coconut oil, coconut milk (santan), fresh coconut water, desiccated flakes, and coir to export markets such as the United States, Singapore, and China (Purba et al., 2021). However, the value chain from production to final consumption is structurally complex (Kalaipandian et al., 2024). It is therefore necessary to explore the role of coconuts in income generation and poverty alleviation during unstable economic periods so as to inform the national agricultural budgets and re-strategize the rural development masterplans.

**Theoretical Framework: The Sustainable Livelihoods Approach (SLA)**

In this review, the existing literature is evaluated within the framework of the Sustainable Livelihoods Approach (SLA) of the Department for International Development (DFID) (Easdale, 2026) to assess the active role of coconut cultivation in poverty alleviation. The SLA framework provides a way of exploring analytically how B40 rural households combine livelihood assets, classified as human, social, physical, financial and natural capital, to achieve economic resilience amid changing institutional contexts (Melaku, 2026; Vista et al., 2012).

Academic discourse highlights a unique asset asymmetry in Malaysian agrarian communities. Nor et al. (2020) argue that smallholders possess substantial natural capital through long-term access to land, and social capital through generations of acquired knowledge of community farming. However, the literature indicates a chronic lack of financial capital due to low farmgate prices and a drain on physical capital from under-mechanized harvesting infrastructure and aging, low-yielding palm profiles (Omar et al., 2023). Taking these vulnerabilities into account, the SLA lens accounts for the low technical efficiency scores of raw upstream production in general, despite high market demand (Nor et al., 2020). This review therefore uses the SLA framework to assess how targeted policy changes, modernization frameworks, and downstream market linkages can transform baseline smallholder assets into sustainable, long-term tools for escaping rural poverty traps (Knutsson & Ostwald, 2023; Pujiwati et al., 2025).

**2. Literature Synthesis of Core Socio-Economic Variables**

To systematically evaluate the capacity of the coconut industry to drive rural development, the existing literature must be unpacked through the primary variables that dictate smallholder technical efficiency, net margins, and subsequent household vulnerability thresholds.

**Human Capital: Demographics, Agricultural Expertise, and Age Profiles**

Human capital in Malaysia's coconut belts is a major bottleneck for innovation. Empirical evaluations show a clear socio-demographic trend: the average age of coconut smallholders is highly skewed toward the older generations, often over 55 to 60 years. This structural aging is worsened by the migration of young people (pemuda kampung) to urban centers in search of service sector jobs, leaving an aging demographic to manage long-term tree crops (Ahmad et al., 2026; Masran, 2025).

The analysis revealed a positive association between the level of formal education of a farmer, technical experience and allocative efficiency (Tossou et al., 2026). Farmers without higher secondary education or formal technical training are significantly more challenged to address complex agronomic disruptions such as lethal yellowing diseases or widespread Rhinoceros beetle (Oryctes rhinoceros) infestations (Alouw & Hosang, 2025). In contrast, baseline literacy and continuous agricultural experience result in optimized output and better risk-mitigation behaviors. This is because educated smallholders are statistically more likely to adopt modernized crop-protection and intensive farm management systems (Arumugam & Hatta, 2022; Lin, 2011).

**Physical Capital: Institutional Extension Services and Technical Efficiency**

Smallholder productivity gaps are strongly mediated by physical infrastructure and institutional support mechanisms (Dewi et al., 2026). The main channel for the transfer of technical knowledge in Malaysia is through the agricultural extension agents of the Department of Agriculture (DOA) and the Farmers' Organization Authority (LPP). Quantitative exploratory factor analysis (EFA) reveals that institutional factors, particularly the frequency and quality of extension agent visits, have the single most dominant influence on a smallholder's technical efficiency score (Rozhan & Rohany, 2021).

Extension visits are crucial mechanisms for transforming traditional "business as usual" cultivation into higher-yielding enterprises through specialized agronomic seminars and technical skills-building workshops (Omar et al., 2023). When extension connectivity is strong, smallholders experience rapid gains in localized technical efficiency (Omar & Fatah, 2021). Nonetheless, the general literature confirms the existence of a persisting productivity gap among key states such as Johor, primarily caused by a systemic lack of specialized machinery, erratic application of fertilizer schedules and the lack of modern technical adoption, with an average technical efficiency score that remains at a suboptimal 60% (Nor et al., 2020; Omar & Fatah, 2021).

**Financial Capital: Price Volatility, Farmgate Asymmetry, and Profitability Constraints**

The most volatile factor influencing absolute household poverty status is financial capital (Ao et al., 2022). Coconut production is an important part of local food security and coconut is still the most consumed fruit category in the national agri-food framework. Yet smallholders remain economically very vulnerable to extreme price volatility and asymmetric supply chain configurations (Timmer, 2025) despite this continuing macro-level demand.

Since about 90% of domestic coconut lands are smallholdings, often with parcels of less than two hectares, individual farmers are strict price takers lacking any market bargaining power (Samarakoon et al., 2023). According to the literature, middleman networks severely limit the profitability of smallholders (Nabillah et al., 2025). Unorganized upstream smallholders are compelled to sell fresh unhusked nuts to localized village collectors at depressed farmgate prices. Downstream processing corporations are almost exclusively pilfering the high-value margins of the commodity value chain (Nabillah & Fawzi, 2025).

**Policy Context: The Self-Sufficiency Level (SSL) and Crop Transformation Targets**

The coconut industry's broader vulnerability context is determined by national policy benchmarks. The Malaysian government under the National Agrofood Policy 2021–2030 (NAP 2.0) has identified the coconut sector as a strategic sector for national resilience with a clear national Self-Sufficiency Level (SSL) target of 83% by 2030 (Rahman et al., 2026a). However, recent institutional data show a persistent policy-performance gap, with the national coconut SSL underperforming and stagnation hovering at about 70.3%, requiring a rigid 30% structural reliance on imports (Abd Rahman et al., 2025; Rahman et al., 2026b).

System dynamics modeling indicates that this import deficit and the rising rural incomes cannot be resolved by conventional production practices. The policy interventions must be targeted and consistently include three specific elements to address the SSL deficit and increase the B40 smallholder income beyond the poverty line: (i) aggressive dissemination of high-yield hybrid seedlings (e.g., MATAG); (ii) direct financial grants to cover gestation periods; and (iii) institutional structures to maximize social capital between dispersed smallholders and centralized downstream processing networks (Rahman et al., 2026b).

## 3. Methodology

This paper uses a secondary data review and systematic policy synthesis approach (Aremu, 2024) to assess the socio-economic contributions of coconut smallholders to rural livelihoods and poverty alleviation in Malaysia. This approach seeks to connect macro-level national agricultural indicators with micro-level socio-economic realities reported in academic literature, recognizing that coconut cultivation is predominantly a smallholder activity.

**Data Sources and Extraction Matrix**

This review is based on the empirical and statistical official secondary data sets published by Malaysian government agencies and agricultural research bodies. Quantitative metrics were obtained from the Department of Statistics Malaysia (DOSM) (DOSM, 2026; DOSM-MOE, 2026) under the Ministry of Economy, and the Ministry of Agriculture and Food Security (MAFS) (Malaysia, 2023). Table 1 provides a structural mapping of the specific reports used, the variables examined and their relevance as livelihood or poverty indicators.

**Table 1: Key secondary data extraction matrix from institutional frameworks**

| No. | Report Type / Source | Issuing Agency | Specific Variable Evaluated | Livelihood / Poverty Indicator |
|---|---|---|---|---|
| **1** | Household Income & Expenditure Survey (HIES) | Department of Statistics Malaysia (DOSM) | Mean and median monthly household income; Poverty Line Income (PLI) rates. | Establishes the economic baseline to measure smallholder earnings against national B40 and state poverty thresholds. |
| **2** | Supply and Utilization Accounts (SUA) | DOSM / Ministry of Economy | Import Dependency Ratio (IDR), Self-Sufficiency Level (SSL), Per Capita Consumption (PCC). | Measures macroeconomic vulnerability and local market demand for coconut as a staple dietary necessity. |
| **3** | National Agrofood Policy 2.0 (NAP 2.0, 2021-2030) | Ministry of Agriculture and Food Security (MAFS) | "New Sources of Wealth" growth targets; Modernization KPIs; Hybrid seedling initiatives. | Evaluates state-level intent and structural interventions designed to transition smallholders into higher income brackets. |
| **4** | Industrial Crops Statistics & Agromakanan Reports | Department of Agriculture (DOA) / MAFS | Total planted area (ha) vs. production output (MT) across key state belts (Perak, Selangor, Johor). | Identifies geographic concentrations of smallholder reliance and structural production patterns over time. |
| **5** | Economic & Technical Management Review (ETMR) | Malaysian Agricultural Research & Development Institute (MARDI) | Cost of production (RM/ha); Yield potentials of hybrid varieties (e.g., MATAG, MARENA). | Analyzes the profitability margins and efficiency gaps causing smallholder stagnation. |

**Analytical Framework and Synthesis Process**

This paper synthesizes the macro-data extracted using a thematic framework aligned with the Sustainable Livelihoods Approach (SLA) (Morse, 2025) instead of collecting primary raw empirical data. The analysis is operationalized as a three-part synthesis loop:

a. Macro-Trend Identification: Compile DOSM and MAFS production, acreage and trade balance indicators to trace the historical path of domestic coconut production and import dependence.

b. Socio-Economic Triangulation: Cross-referencing institutional output targets with peer-reviewed socio-economic literature (2014-2026) to understand why macro policies succeed or fail at the ground level for B40 rural households.

c. Institutional Expert Verification: To verify the practical and localized dynamics of these data patterns, structural insight and institutional operational views were contributed by co-authors and specialist advisors attached to Perak State Farmers' Association (PPN) and Farmers' Organization Authority (LPP). The expert

vetting helps contextualize the systemic supply chain blockages, middleman frameworks and replanting bottlenecks identified in regional distribution networks.

## 4. Results and Discussion

### Macroeconomic Trends and Supply-Demand Dynamics

Based on data integration of the Ministry of Agriculture and Food Security (MAFS) and the Department of Statistics Malaysia (DOSM), the structural shortfall in the domestic coconut sector is still ongoing. Table 2 summarizes production performance, land utilization and import trends compiled from National Agro Food Statistics.

**Table 2: Malaysian coconut production, area and trade balance, 2018–2026. (Source: DOSM, 2026)**

| Year | Planted Area (Hectares) | Total Production (Metric Tons) | Import Volume (Metric Tons) | Import Dependency Ratio (IDR %) | Average Yield (Tons / Hectare) |
|---|---|---|---|---|---|
| **2018** | 81,585 | 538,685 | 237,341 | 30.6% | 6.60 |
| **2019** | 86,500 | 536,000 | 226,300 | 29.7% | 6.20 |
| **2020** | 85,630 | 542,000 | 278,600 | 34.0% | 6.33 |
| **2021** | 84,942 | 568,110 | 239,012 | 29.6% | 6.68 |
| **2022** | 83,820 | 549,204 | 215,632 | 28.2% | 6.55 |
| **2023** | 85,400 | 482,801 | 271,700 | 30.6% | 6.38 |
| **2024** | 80,430 | 521,100 | 224,500 | 30.1% | 6.47 |
| **2025** | 80,000 | 513,000 | 230,000 | 30.9% | 6.41 |
| **2026 (Proj.)** | 79,500 | 505,000 | 235,000 | 31.7% | 6.35 |

Empirical evidence shows that despite the coconut remaining one of the most consumed fruits in Malaysia with a stable Per Capita Consumption (PCC) of 24.9 kg/year (DOSM, 2026), domestic production is slowly declining. Total area planted is expected to decline to 79,500 hectares in 2026 from 84,942 hectares in 2021. This shrinkage is largely the result of urban encroachment and the conversion of land to oil palm, which provides smallholders with more immediate cash flow. Consequently, the national Import Dependency Ratio (IDR) remains stable at 30.6%, compelling Malaysia to import from Indonesia and the Philippines to meet the local industrial and culinary needs, particularly during peak festival periods such as Hari Raya Aidilfitri when santan consumption rises significantly.

### The Smallholder Profitability Gap and Poverty Traps

These macro-level agricultural statistics need to be directly converted into household income measures to understand the real contribution of coconut farming to poverty reduction. The average landholding of the traditional smallholder in the main coconut-growing areas of Perak and Selangor is about 2.0 hectares. Smallholdings that grow old Malayan Tall palms have a low technical efficiency score of about 60% (Nor et al., 2020). This means that the average yield is about 6,000 to 7,000 nuts per hectare per year.

At a standard farmgate price fluctuating between RM 1.00 and RM 1.20 per nut, the gross agricultural income of a typical smallholder is about RM 1,000 to RM 1,400 a month. This income is also far below the national Poverty Line Income (PLI) of RM 2,589, as measured by the DOSM Household Income & Expenditure Survey (HIES) thresholds, thus placing pure coconut smallholders in the lowest rung of the Bottom 40% (B40) rural population.

This quantitative reality highlights the paradox identified in the contemporary literature (Omar & Fatah, 2021) that coconut farming performs well as a livelihood safety net preventing absolute destitution due to low operational maintenance requirements, yet it also acts as an economic constraint that keeps households below the poverty line. But smallholders are structurally alienated from downstream processing and are only able to snatch a fractional sliver of the final value chain. Typically, raw nuts are sold to village middlemen who control the transport logistics, which reduces the farmgate price and negates the potential wealth effects from Malaysia's RM 1.14 billion downstream export market (Rozhan & Rohany, 2021).

**Barriers to Technical Modernization**

NAP 2.0 (National Agrofood Policy) suggests the introduction of high-yielding hybrid varieties, such as the palms MATAG, MARENA and MYLAG, as structural strategies to exit poverty. These hybrids can double yields to up to 25,000 nuts/ha/year and provide a viable mechanism to lift smallholder incomes well above the PLI barrier.

However, feedback from the Perak State Farmers' Association (PPN) on the ground revealed entrenched barriers to the implementation. For traditional smallholders, there is a steep "gestation gap": cutting down senile palms to plant new hybrids means the household loses its main income source during the 3-to-4-year immature growth phase of the hybrid tree. Moreover, the high initial costs associated with authenticated seedlings, the lack of technical training on intensive fertilizer regimes demanded by hybrids and the aging demographic of farmers (Nor et al., 2025) jointly hinder the adoption of technology at a larger scale.

**Limitation of Study**

This review offers an in-depth synthesis of policy by reconciling macro-level institutional datasets with historical agricultural literature, but several systemic limitations must be acknowledged. First, the study is highly dependent on aggregated national data from DOSM and MAFS. These macro-level indicators gloss over the important regional differences in farmgate prices, soil suitability and access to infrastructure across specific coconut belts in Perak, Selangor and Johor.

Second, official household income measures (such as the HIES) tend to bundle together rural or agricultural census blocks, making it difficult to disaggregate the exact longitudinal poverty dynamics and micro-level cash flows of pure, coconut-dependent smallholders. Moreover, while the downstream sector holds significant economic potential, there is a dearth of specific quantifications in the current empirical literature regarding the precise percentage of value-added profit that is passed on to B40 smallholders versus the profit margins retained by intermediary collectors and processing corporations. Finally, as a secondary policy synthesis, this paper is not empirically validated by primary smallholder surveys or localized econometric modeling.

## 5. Conclusion and Policy Recommendations

To conclude, coconut cultivation is an important and viable structural pillar that supports rural livelihoods in Malaysia. But persistent production shortfalls, flat smallholder yields and a static 30.6% import dependency ratio indicate that the poverty alleviation potential of the crop remains largely unrealized. Coconut palm is a robust subsistence crop that protects over 60,000 rural families from absolute poverty. However, these smallholders are restricted to the B40 income bracket because of low technical efficiency and asymmetric value distribution along the supply chain. A shift from generic agricultural subsidies to targeted, ecosystem-wide institutional interventions is needed for a prosperous future in Malaysia's traditional coconut belts.

Based on the evidence synthesized in this review, the following policy interventions are recommended:

- Implement Managed Replanting and Income-Buffer Subsidies: The Ministry of Agriculture and Food Security (MAFS) should develop a phased replanting framework. Smallholders should be encouraged to intersperse replanting over several seasons rather than clear whole plots at the same time. The state should link seedling distribution to direct financial cash transfers or fully subsidized intercropping kits (e.g., short-term cash crops such as cash-crop bananas, pineapples, or ginger) to fill in the 4-year gestation gap of high-yield hybrids such as MATAG and keep household income above the PLI threshold.

- Set up Direct Institutional Procurement Centers: To cut out the exploitative profit margins of the traditional rural middlemen, the Farmers' Organization Authority (LPP) and the local State Farmers' Associations (PPN) should establish decentralized micro-collecting centers in the major kampungs. These institutional hubs can tap local output directly by buying raw nuts from smallholders at a guaranteed floor price, circumventing speculative intermediaries, and channeling the output to high-value downstream processors.
- Speed up Downstream Cooperative Equity Programs: Agricultural policies should allow smallholder cooperatives to acquire equity or operational capacity in downstream value-adding processing units (such as virgin coconut oil extraction or coir processing plants). By capturing a larger share of the RM 1.14 billion downstream export value with rural community cooperatives, coconut farming is no longer a low-margin subsistence activity but a wealth-generating commercial enterprise.

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