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Policy Brief

Financial Strategies for Mitigating Crop Burning in the ASEAN Region

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Key Messages:

- Innovative financial schemes for reducing crop burning should be expanded and strengthened across ASEAN.
- Effective private financial mechanisms must improve farmer livelihoods while reducing carbon emissions and pollutions.
- Financial policy instruments tools should complement wider initiatives in waste-to-value markets, research, and capacity development.
- A comprehensive, context-specific approach is essential and should reflect local farming systems.

Crop residue burning continues to pose major environmental, economic, and public health challenges in ASEAN. While the region has issued guidelines and advanced various initiatives, adoption of sustainable residue management practices remains uneven. Crop residues, however, are not merely a waste product – they are an underutilised resource with significant potential for creating new value chains, supporting rural incomes, and contributing to the region's climate, circular economy and inclusive energy transition.

A mix of public, private, and international financial mechanisms – ranging from incentives and concessional loans to carbon credits, private investment in infrastructure, and digital finance – can help small landholding farmers shift away from burning. Yet these measures require credible monitoring systems, stronger design, clearer time horizons, and better integration with technologies and market development. This brief outlines key financial strategies suited to ASEAN's diverse agricultural landscapes and provides policy recommendations to support a long-term transition away from crop burning.

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Introduction

Crop burning remains entrenched across many agricultural communities in ASEAN. Farmers often rely on burning because it is quick, inexpensive, and aligned with traditional farming practices. However, the consequences of this unsustainable practices are substantial: degraded air quality, transboundary haze, greenhouse gas emissions, and serious public health impacts. These effects undermine regional co-operation efforts for climate resilience and place a heavy burden on health systems and productivity.

ASEAN has already recognised the importance of reducing burning, including through its Guidelines on the Reduction of Crop Burning and its broader Strategy for Carbon Neutrality. Some AMS have begun integrating residues into biomass energy, mulching, or industrial feedstocks, while others are experimenting with mechanical harvesting and residue-based products. These advances show promise but have yet to achieve regional scale.

A central challenge is economic costs: the cost of collecting, transporting, and processing residues often outweighs the income generated by current financial markets. Without critical financial support or clear economic incentives for avoiding the crop burnings, farmers face little reason to shift practices. Strengthening the financial architecture around crop residue management is therefore essential for accelerating change.

Financial Strategies to Reduce Crop Burning

Financial mechanisms can help realign incentives and make sustainable residue management viable. The following innovative approaches are found to be particularly relevant for ASEAN.

1. Financial Incentives

Upfront financial incentives can offset the immediate direct costs farmers face when shifting away from crop residue burning. Evidence from behavioural economics suggests that direct, early payments are more

effective in encouraging transitions than delayed compensation (Jack et al., 2022).

Incentives can support mulching, composting, soil remediation, or participation in residue-collection schemes. They may be targeted to areas with high burning prevalence, to specific cropping systems, or to farmer groups testing new technologies.

2. Subsidies and Low-Interest Loans

The high cost of machinery remains a major barrier for crop residue management. Equipment such as balers, shredders, and in-situ soil incorporation tools is often unaffordable for smallholders. Subsidies and concessional loans can significantly reduce these upfront costs.

Countries that have paired subsidies with regulatory measures – such as restrictions on pre-harvest burning – have observed reductions in fire incidence (Talang et al, 2024). Cooperative-based financing, where groups receive higher subsidy rates, can be especially effective in regions characterised by small and fragmented farms.

3. Carbon Credits

Carbon crediting generates a new revenue stream for farmers who avoid burning and adopt soil-enhancing practices. Initiatives in Viet Nam demonstrate how farmers can shift toward composting or supplying residues to downstream users when supported by technical assistance and carbon financing (Anders and Lokuge, 2022).

International models, such as the Terraton Initiative (Indigo, 2024), demonstrate how large-scale agricultural crediting schemes can be applied to avoided crop burning. For ASEAN, embedding crop-burning avoidance in national and regional carbon markets could provide long-term financial incentives while contributing to climate goals. Credible measurement, reporting, and verification (MRV) systems will be essential.

4. Private Sector Finance and Value-Chain Development

Long-term change requires well-functioning markets for residue-based products. The private sector is crucial in converting residues into value – whether for energy, packaging, industrial materials, or soil amendments. Japan's feed-in tariff and premium schemes show how policy frameworks can stimulate private investment by recognising residues as eligible biomass (Miyatake et al, 2024).

Strengthening linkages between farmers and downstream processors can stabilise demand, create predictable income streams, and reduce reliance on burning. Private investment can also introduce contract farming models, long-term off-take agreements, or technology leasing arrangements.

5. Inclusive Digital Finance

Digital financial services expand credit access for smallholders and reduce transaction costs. Evidence from China suggests that improved access to digital finance supports machinery investment and reduces burning (Zhao et al., 2023).

For ASEAN, digital finance could support micro-leasing, community-based machinery pools, or mobile-based delivery of incentives. However, rural digital infrastructure gaps must be addressed to avoid reinforcing inequalities.

Strengthening Financial Schemes for Wider Adoption

Scaling financial mechanisms requires more than the expansion of individual schemes, whether public or private. System-level improvements – monitoring, design, and enabling conditions – are essential.

1. Monitoring and Transparency

Reliable monitoring strengthens credibility. Advances in satellite imagery, remote sensing, and open-source platforms make it possible to detect burning events in near-real time. Transparent monitoring helps prevent misuse of subsidies, supports MRV for carbon markets, and reinforces public trust.

Monitoring systems also provide feedback for adjusting financial schemes based on performance and emerging needs.

2. Designing Term-Appropriate Mechanisms

Financial tools differ in the timescales over which they are effective. Short-term incentives can attract early adopters, but long-term measures – such as tax breaks, stable residue product markets, and digital finance systems – support systemic change.

Table 1. Financial Schemes by Term and Target

Term	Scheme	Target
Short	Incentives	Early adopters, transition support
Mid	Tax breaks	Biomass power plants, industrial users
Mid	Subsidies	Machinery/equipment purchase
Long	Digital finance	Smallholder credit access, mechanisation
Long	Residue markets	Value-chain expansion, stable farmer income

Source: Modified after Shaikh (2023).

Aligning specific financial policy instruments with term-specific objectives ensures more efficient use of public resources and stronger market signals.

3. Managing Residue Supply and Market Stability

Residues are finite and seasonal. Large-scale use requires careful planning to avoid over-extraction, nutrient loss, price swings, or competition between energy and agricultural uses. Policymakers in ASEAN and East Asia should encourage diversified supply sources, promote soil-returning practices where necessary, and establish sustainability criteria for industrial users.

4. Bridging the Digital Divide

Without connectivity, digital finance cannot reach the farmers who need it most. Investments in rural digital infrastructure, farmer-friendly platforms, and literacy programmes are vital. Public-private partnerships may accelerate progress across AMS.

5. Climate Transition Bonds

Climate Transition Bonds are an emerging tool for financing decarbonisation across sectors, including agriculture. Japan's 2024 issuance of ¥20 trillion underscores the scale of potential investment (Enatsu, 2024). To integrate residue management or crop-burning reduction into such instruments, AMS will need expert-led criteria, safeguards, and pathways that link agricultural practices to overarching transition plans.

Policy Recommendations

A strategic combination of finance, technology, and policy reform can accelerate ASEAN's shift away from crop burning. Priority actions include:

1. Tailoring Schemes to Local Conditions

AMS vary widely in crop types, landholding structures, and labour availability. Financial schemes should reflect local realities rather than rely on uniform models.

2. Developing a Regional Taxonomy

A shared ASEAN taxonomy of financial schemes – covering incentives, carbon crediting, sustainable residue utilisation, and monitoring requirements – would help scale successful models and support regional alignment.

3. Ensuring Long-Term Orientation

Short-term incentives can enable transition, but durable change requires multi-year schemes with clear timelines and predictable phases. Policymakers should articulate long-term strategies and gradually adjust financial structures as markets mature.

4. Integrating Finance with Wider Support Systems

Financial tools are most effective when combined with R&D, extension services, and skills development. Governments and regional bodies should strengthen extension networks, improve access to machinery, and support innovation in residue-based industries.

5. Assessing Technology Transfer Feasibility

AMS should evaluate the cost-effectiveness and adaptability of new machinery or processes before large-scale adoption. Cooperative ownership models, local manufacturing, and knowledge exchange can improve feasibility and reduce costs.

6. Establishing Real-Time Evaluation Systems

Early detection systems, transparent reporting, and community-level information sharing enhance accountability and enable rapid response during burning seasons. Real-time evaluation also supports iterative improvements in financial scheme design.

Conclusion

Reducing crop burning is essential for ASEAN's environmental sustainability, public health, and climate commitments. It is also an economic opportunity: crop residues can underpin new industries, strengthen rural livelihoods, and contribute to the region's circular and low-carbon economy.

Financial strategies are central to this transition. When effectively designed and integrated with technology, markets, and monitoring, they can shift farmer behaviour, stimulate private investment, and unlock new value chains. With coordinated action, ASEAN can accelerate progress toward a cleaner, more resilient, and more sustainable agricultural future.

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