



Fostering forest-positive and climate-resilient cashew and cassava value chains

CAMBODIA



Key messages

- ▶ Cashew and cassava are crucial cash crops for Cambodia, the second-largest producer of raw cashew nuts in Southeast Asia and the world's second-largest exporter of cassava. In Stung Treng, the cultivation of cashew and cassava increased exponentially, with planted areas increasing by 594 percent and 133 percent respectively, between 2018 and 2023.¹
- ▶ Rapid agricultural expansion is a major driver of internal migration and deforestation, while many farmers are impoverished as climate change impacts cashew and cassava crop yields.
- ▶ Cashew and cassava value chains can be strengthened and become more sustainable through a multi-pronged approach combining public-private partnerships, sustainable farming practices and market support.
- ▶ De-risking private sector investment is crucial to enhancing the sustainability of cashew and cassava value chains through public-private partnerships. Within these frameworks, the public sector can provide concessional loans, grants, and guarantees, and invest in public infrastructure, while the private sector can process raw products locally, improve traceability and promote regenerative agriculture.
- ▶ Transitioning from individual farming to traditional agricultural cooperatives and modern agricultural cooperatives will help farmers achieve economies of scale and access higher value markets through collective management of the supply chain.
- ▶ Sustainable farming practices and climate adaptation strategies such as soil conservation, intercropping and agrochemical management can prevent further deforestation and help farmers build resilience against climate shocks.

¹ Ministry of Agriculture, Forestry and Fisheries (MAFF). (2023). Annual Report of Agriculture Forestry and Fisheries 2022 and Direction 2023. Phnom Penh: Ministry of Agriculture Forestry and Fisheries.

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INTRODUCTION

Cambodia, home to the largest tropical forests in mainland Southeast Asia, is facing alarming deforestation, with forest cover declining from 73 percent in the 1960s to 47 percent in 2018.² Rapid agricultural expansion is largely driven by the sector's importance to the country's economy and employment. More than 5 million people in Cambodia still depend on agriculture and fishing for their livelihoods, income and food security. The percentage of total employment in agriculture has fallen from 73 percent in 2000 to 35 percent in 2019.³ The agriculture sector is dominated by smallholder farmers. Agricultural production remains highly concentrated in rice and cassava. However, Cambodian farmers are highly vulnerable to climate-change-induced droughts and floods, while low productivity and debt often push them to clear forest land for cash crops.⁴

Cambodia has a strong climate action framework, including the Cambodia Climate Change Strategic Plan, which underpins its Nationally Determined Contributions (NDCs) and National Adaptation Plan (NAP). The Royal Government of Cambodia (RGC) has incorporated agriculture and forestry into major national policies, such as the Pentagonal Strategy - Phase I and the National Agricultural Development Policy (2022–2030). This comprehensive framework, along with commitments on both agriculture and forestry through NDCs 1.0, 2.0, and 3.0 and a NAP submitted to the United Nations Framework Convention on Climate Change (UNFCCC), demonstrates Cambodia's commitment to integrating climate action into its national development. Cambodia's 'National Reducing Emissions from Deforestation and Forest Degradation Strategy' aims to decrease greenhouse gas emissions (GHG), while building the local adaptive capacity for the development of sustainable forestry and continuing to improve the livelihoods of local communities. However, the country still needs a more holistic, forest-positive agricultural strategy to meet international export standards for its agricultural products.

The [Scaling up Climate Ambition on Land Use and Agriculture through NDCs and NAPs \(SCALA\)](#) programme supports the Royal Government of Cambodia's efforts to build local adaptive capacity for the development of sustainable forestry, improve livelihoods of local communities and reduce GHG emissions. Funded by the German Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (BMUKN), the SCALA programme is designed to support 12 countries in Africa, Asia, and Latin America to build adaptive capacity and reduce GHG emissions to meet targets set out in their NAPs and NDCs. Its main objective is to help partner countries translate their NDCs and NAPs into practical and transformative climate solutions in land use and agriculture, with multistakeholder collaboration.

A review of the NDC and NAP, conducted using SCALA's [Climate Action Review Tool](#), identified 28 priority actions in the agriculture and land-use sectors as potential entry points for transformative change. Among these, the priority "Promoting sustainable forest management" emerged as the action with the greatest transformative potential. Building on these findings, SCALA undertook a systems-level assessment (SLA) of the cassava and cashew value chains in Stung Treng province of Cambodia, two major cash crops identified as significant drivers of deforestation and land degradation, while also being highly vulnerable to climate-related shocks. The assessment identified strategic

² Ministry of Environment. (2018). Cambodia Forest Cover 2016. Phnom Penh: Ministry of Environment.

³ MAFF. (2020). Agriculture Strategic Development Plan 2019-2023. Phnom Penh: Ministry of Agriculture, Forestry and Fisheries.

⁴ Muñoz, V. H., *et al.* (2023). Climate Change Vulnerability Assessment Stung Treng Ramsar Site, Cambodia. Bangkok: IUCN Asia Regional Office.

opportunities to advance forest-positive practices that enhance climate resilience, strengthen rural livelihoods and enable sustainable market access.

Based on the findings of the SLA, a study was conducted to assess private sector engagement opportunities in the cassava and cashew value chains in the Stung Treng province. The report examined barriers to effective private sector participation and gender and social inclusion to provide a roadmap for private sector engagement in climate-smart cassava and cashew value chains in Cambodia.

METHODOLOGY

The SLA was undertaken to identify high-risk agricultural commodities contributing to deforestation and forest degradation in Stung Treng. It sought to map their value chains and identify opportunities to transition towards forest-positive practices that strengthen climate resilience, enhance livelihoods and promote sustainable market access. The assessment also aimed to strengthen collaboration between public institutions, private investors, and local communities.

The process began with a desk review of official reports and literature to identify commodities linked to deforestation and better understand the agroecological and socio-economic conditions in Stung Treng. The resulting shortlist of priority agricultural commodities was then validated by 11 stakeholder consultations and key informant interviews conducted in coordination with the Royal University of Agriculture.

Following the participatory selection of cassava and cashew as priority forest-risk commodities, data were collected for an in-depth analysis of their value chains. Participatory mapping was conducted to assess expansion projections, production impacts on forests, and resilience potential. A value chain analysis mapped key actors, identified challenges and opportunities related to climate resilience and gender responsiveness, considering economic, social and governance dimensions, and drawing on remote sensing and literature reviews.

The process involved 35 meetings engaging 97 participants, of whom 35 were women, across local and provincial government officials, non-governmental organizations (NGOs), financial institutions, and private sector actors across the value chains, including suppliers, processors, farmers and agricultural cooperatives.

The methodology for the private sector engagement study used a combination of comprehensive research and direct stakeholder consultations. A desk review of reports and studies examined national climate priorities and identified key issues in Cambodia's agricultural value chains. Existing development projects related to climate-smart agriculture in the province were mapped, and a desk-based analysis was conducted to prioritize climate adaptation strategies for private sector engagement. The assessment validated findings and co-designed solutions through a two-day multi-stakeholder workshop in Stung Treng attended by around 40 participants and supplemented by farmer focus groups and targeted interviews, to refine barriers, incentives, and de-risking options for private sector engagement.

RESULTS

Background and context

Cambodia has the largest area of tropical forests in mainland Southeast Asia. Between 2000 and 2022, Servir-Southeast Asia estimated that Cambodia lost over three million hectares of forest, representing a significant reduction in its total forest cover.⁵ Cambodia's agriculture sector, dominated by smallholder farmers, is centered on rice and cassava production. Recent agricultural developments have increased both emissions and climate risks due to rapid rates of deforestation caused by the expansion of agricultural lands. Data from the Climate Analysis Indicators Tool, which is based on the RGC's emissions inventories, shows that the land use, land-use change, and forestry (LULUCF) sector was the greatest contributor to GHG emissions in 2019, accounting for 44 percent of gross emissions.⁶ Agriculture was the second largest source of GHG emissions in 2019, contributing 30 percent of the gross total GHG emissions.⁷ At the same time, Cambodia's agriculture sector is significantly affected by climate change. The country ranks 25th globally among those most affected by extreme weather events, in terms of human and economic losses, for the period 1993–2022.⁸ In contrast, the country is ranked 149th for its readiness to leverage private and public sector investment for adaptation.⁹

The Stung Treng province is a unique landscape with diverse ecosystems and a rich network of rivers, making it one of the most valuable riverine wetlands for biodiversity in Cambodia. Although conditions are less favorable for rice cultivation, the province is well-suited for agro-industrial crops like cashew and cassava. Stung Treng was chosen as a focus area for this study because of its socio-economic vulnerability. The province's economy is heavily reliant on agriculture, which contributes about 67–69 percent of its gross domestic product (GDP) annually, with 85 percent of the population dependent on farming for their livelihoods. The province is also highly vulnerable to climate change, experiencing unpredictable weather that causes alternating severe droughts and intense rainfall. Frequent droughts and storms have resulted in low river levels, threatening local livestock, fish and crops, causing property damage and health issues, and significantly reducing local income.¹⁰ Domestic migration to Stung Treng for agricultural land has led to forest encroachment. Low agricultural yields and a lack of developed value chains have resulted in widespread forest conversion and degradation. Education levels are low, with 68 percent of the population having only a primary education, which limits the adoption of modern technologies and sustainable farming methods. Although agro-processing centers could increase profitability and connect farmers to markets, most existing centers are focused on rice, with few options for other crops. Many farmers rely on chemical pesticides and fertilizers, although some are beginning to use natural fertilizers.

⁵ Tenneson, K. *et al.* (2021). *Commodity-Driven Forest Loss: A Study of Southeast Asia*. Washington DC.

⁶ The World Bank Group. (2023). [Cambodia – Country Climate and Development Report](#). Washington DC: The World Bank Group.

⁷ Ibid.

⁸ Adil L. *et al.* (2025). *Climate Risk Index 2025 – Who suffers most from extreme weather events?* December 2025.

⁹ Notre Dame Global Adaptation Initiative (2022). [Country Index](#). Accessed on 8 March 2026.

¹⁰ Muñoz, V. H., *et al.* (2023). *Climate Change Vulnerability Assessment Stung Treng Ramsar Site, Cambodia*. Bangkok: IUCN Asia Regional Office.

In Stung Treng, forest cover drastically decreased from 647,646 hectares in 2000 to 381,952 hectares in 2023, a 41 percent loss. During the same period, plantation lands expanded by 76 percent, and other land uses also increased, with paddy fields rising by 71 percent and settlements by 52 percent. These trends indicate that agricultural expansion has been a major contributor to deforestation in the province. Addressing these challenges in Stung Treng will require solutions that balance sustainable agricultural development with the protection of its vital forest ecosystems.

In the Stung Treng province, cashew and cassava are the two main crops, with cultivation areas increasing by 594 percent and 133 percent respectively, between 2018 and 2023.¹¹ This rapid expansion, driven by rising demand, is a major cause of deforestation in the region. Cassava, in particular, is a primary driver of forest loss because it thrives in poor soil with minimal inputs, providing a quick cash crop after land clearing. However, after a few harvest cycles, declining soil fertility forces farmers to clear new forest areas. This often leads to a shift to cashew, a more resilient and longer-term crop. However, these cashew monocultures, often accompanied by chemical fertilizers, also contribute to soil degradation over time. As cashew yields eventually diminish, farmers often revert to clearing additional forest areas for cassava, reinforcing a cycle of agricultural expansion and deforestation.

Overview and challenges of the cassava value chain

Cassava is one of Cambodia's oldest cultivated crops and a major export commodity, with the country ranking as the world's second-largest exporter of cassava in 2023. The value chain in Stung Treng is short, with farmers selling raw roots to local collection centres called "Sailo." However, farmers often face financial losses due to post-harvest degradation and a 20-percent weight deduction imposed by dealers. To avoid these issues, many farmers are now processing the cassava into dried chips, a labour-intensive task predominantly performed by women. Nearly all the final product is exported to Viet Nam, as there are no local processing facilities. Within the value chain, men are primarily responsible for land preparation, planting, and transport, while women are key to the collection and processing of cassava into chips.

Despite its potential as a cash crop, low and declining soil fertility compels farmers to clear additional forest land, leading to environmental degradation. At the same time, farmers are highly vulnerable to climate risks like unpredictable rainfall and extreme heat, which impact yields and increase production costs and household debt. The influx of migrants for cassava farming also leads to strained governance and unclear land tenure. Other challenges include a shortage of labour and equipment, continued reliance on traditional farming methods, and the lack of local processing infrastructure. As a result, farmers remain heavily dependent on export markets, with prices determined by traders based in Viet Nam.

¹¹ Ministry of Agriculture, Forestry and Fisheries (MAFF). (2023). Annual Report of Agriculture Forestry and Fisheries 2022 and ... Direction 2023. Phnom Penh: Ministry of Agriculture Forestry and Fisheries.



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Photo 1. Cashew tree in bloom and bearing fruit.

Overview and challenges of the cashew value chain

Cashew is a resilient crop primarily cultivated by smallholder farmers in Cambodia. The country has become a major global producer, with a national policy aiming to make it the world's leading supplier. However, in 2023, only 18,131 tonnes, representing just three percent of that year's harvest, were processed domestically, highlighting significant room for expansion in local processing capabilities. In Stung Treng province, cashew is an important crop, with farmers relying on local input providers who offer "buy now, pay later" schemes. A major challenge, however, is the lack of by-product utilization: farmers discard cashew apples and other by-products, selling only the raw nuts to collectors for export to Viet Nam. Although there is strong potential for value-added products, this opportunity remains largely untapped.

As a long-term investment crop, cashew cultivation requires significant initial capital and years of care before becoming profitable. Climate conditions, such as cold weather, can delay flowering and fruiting, impacting harvest. Farmers also suffer from a lack of effective agricultural extension services, which fosters reliance on input suppliers and overuse of expensive agrochemicals. These unsustainable practices harm the environment and human health. Increasing land pressure from immigration, coupled with weak governance and unclear land tenure, intensifies competition for land and contributes to forest encroachment. The most significant economic obstacle is the lack of capital and local processing infrastructure, which forces farmers and small businesses to sell to Vietnamese dealers at volatile prices and prevents them from adding value locally.



Photo 2. Women manually sort cashew apples and separate the nuts.

Gender and social inclusion in cashew and cassava value chains in Cambodia

The cashew and cassava value chains in Cambodia have a distinct gender-based division of labour and women play a significant but often undervalued role.

In cassava farming, they handle labour-intensive post-harvest tasks such as washing, peeling, and drying. This work is sometimes performed communally.

In the cashew value chain, men are typically responsible for land clearing, applying fertilizers, and managing the sale and transport of raw cashew nuts. Women constitute a substantial portion of the workforce, particularly in harvesting and processing, performing labour-intensive tasks such as collecting, peeling, and sorting.

Despite their critical contributions, women have limited ownership rights, less involvement in business negotiations, and a minimal voice in household and community decisions. Women are often underrepresented in decision-making roles and have limited access to training and formal trading opportunities. However, they are highly involved in managing household finances, and microfinance institutions often require both spouses to sign loan agreements.

Climate adaptation and financial landscape in Cambodia

Cambodia is actively addressing deforestation and promoting sustainable agriculture through a combination of legal frameworks, enforcement, and multistakeholder programmes. The government has a strong legal foundation, including its Pentagonal Strategy and the National Agricultural Development Policy (2022–2030), which are backed by regular patrols to prevent illegal land clearing. To support farmers, various organizations are providing agricultural extension services that introduce new crop varieties and techniques for cover cropping and water conservation. Market-based approaches are being implemented, including the Sansom Mlup Prey (SMP) programme, which provides premium prices for organic rice, and Handcraft Cashew Stung Treng's contract farming model, which incentivizes deforestation-free practices.

Financial solutions, such as loan products from legal banks, are also being offered to help farmers avoid unofficial lenders. Formal financial services, including microfinance institutions (MFIs) and banks, have recently expanded into Cambodia's rural areas. Several large MFIs that have converted to banks, such as ACLEDA, Amret, and LOLC, account for a significant portion of the country's microloan market and are active even in remote villages. Farmers can also access loans through their local cooperatives or informal Village Savings and Loan Groups. Additionally, the Agricultural and Rural Development Bank (ARDB), a state-owned policy bank, provides various financial products, including special agriculture credit schemes for priority agricultural value chains like cashew, and on-farm investment loans to support farmers' needs for machinery, irrigation, and other essential investments.

A number of international impact funds are exploring the Cambodian market, offering equity and debt to agricultural small- and medium-sized enterprises. These include Bamboo Capital, Insitor Partners, and ADB Venture, among many others. In addition, Cambodia's agricultural insurance sector is in its pilot phase, led by Forte Insurance Company. Forte, in partnership with the Cambodian government and organizations like the Asian Development Bank (ADB), has expanded its coverage and offers pilot insurance products for cassava and cashew, distributed through microfinance institutions and agricultural cooperatives. Forte has also invested in the Japanese startup Agribuddy, a digital platform that assists with credit scoring and crop disease monitoring for farmers.

Despite the rapid growth of Cambodia's microfinance sector, access to finance remains a significant challenge for most smallholder farmers. Formal financial institutions are often hesitant to give loans due to the high risk and volatile nature of agriculture, leading farmers to rely on unofficial moneylenders. This lack of access to financing prevents them from investing in essential climate-smart technologies like irrigation systems and disease-free planting materials, which are crucial for strengthening the climate resilience of their livelihoods. The promotion of domestic processing is crucial for Cambodia's agricultural sector, which currently lacks sufficient investment from the local private sector due to its perceived risks and complexity.

RECOMMENDATIONS

Climate adaptation solutions for cassava

► **Agroecology for soil conservation**

The adoption of agroecological practices, which can improve soil health and yields, such as the use of cover crops (Vetiver grass, *Paspalum atratum*, or lemongrass) or mulching, is limited in Cambodia due to small farm sizes and reliance on hired machinery operators who often overlook these conservation methods. Targeted training is needed for both men and women to effectively promote techniques like minimal tillage and intercropping cassava with legumes. Investment is required for specialized agricultural service providers who can afford to buy tractors or small tractors equipped with soil cultivators, land levelers, roller crimpers, and no-till planters. Agricultural cooperatives could invest in these machines and provide their services for hire to cassava farmers who want to implement these agroecology approaches.

► **Intercropping in cassava cultivation**

Intercropping in cassava farming systems is a key strategy for improving ecosystem services, from enhancing land-use efficiency and controlling pests to managing soil and water. By increasing crop diversity, this practice helps farmers cope with market fluctuations and climate-related issues, leading to greater profitability and resilience. It also benefits women by reducing their time spent on weeding and pest control and allows them to make decisions about which food or income-generating crops to plant alongside cassava. Annuals, perennial grasses, shrubs, and trees can potentially be used for intercropping with cassava plantations.

Climate adaptation solutions for cashew

► **Agrochemical management**

The use of agrochemicals is a significant challenge for Cambodian cashew farmers, especially those with larger landholdings. These chemicals, used to increase productivity and control pests, are expensive and can severely harm the environment by contaminating soil and water. To address this issue, regulations and guidelines should be developed for safe chemical application, with strict rules for compliance. The capacity of input suppliers should be strengthened through regular training and certification on agrochemical literacy and climate information. The government can create a centralized digital database of registered agrochemicals and inputs and allocate a budget for regular spot checks and field inspections. A dedicated digital platform, such as a Telegram group, can ensure efficient and accurate information flow across all levels of the input supply chain, from producers to local technical officers.

► **Agroecology for soil conservation**

Zero tillage and cover cropping are increasingly recognized as sustainable practices in cashew farming. These methods, which involve leaving the soil undisturbed and planting grasses or legumes, improve soil health, water retention, and reduce the need for chemical inputs. These practices have been piloted in Stung Treng province and align with global trends toward a more resilient and sustainable agricultural system.

► **Intercropping and agroforestry in cashew cultivation**

Intercropping and agroforestry are key strategies for Cambodian cashew farmers to improve land use and resilience. Intercropping, which involves planting crops like cassava, rice, or mung beans between young cashew trees, helps to maximize land use and provides farmers with additional income streams, which act as a buffer against market fluctuations. Agroforestry systems further diversify farms by integrating livestock, such as cattle and pigs, for fertilizer and pest control, and even beekeeping for both pollination and honey production. These multi-layered systems enhance biodiversity, improve soil health, and provide diversified income streams. For instance, in regions such as Phnom Kulen National Park, where the use of chemical fertilizers is restricted, farmers are required to adopt alternative sustainable farming techniques. In response, the Ministry of Environment has encouraged farmers to rear wild and hybrid pigs alongside cashew cultivation, providing a quick source of income with returns of up to US\$ 100 per piglet. In the Kosal Farm in Preah Vihear province, beekeeping has been successfully combined with organic cashew farming. The cashew trees offer dual benefits in this system: their flowers are an excellent source for honey production, and the bees, in turn, facilitate better pollination for the cashew trees as well as other food crops. The farm produces a variety of organic products, including roasted cashews and cashew oil, diversifying income sources and enhancing sustainability.

Creating an enabling environment for marketing and private sector engagement for cassava and cashew

The current dependence on traders in Viet Nam hinders the economic growth of farmers whose livelihoods rely on cash crops like cassava and cashew, highlighting the need for an innovative approach to market integration. In the cashew industry, specifically, diversifying markets and providing financial incentives for local companies and cooperatives can help domestic products access global markets. The Ministries of Commerce, Economy and Finance should provide incentives, such as soft loans and other financing, to encourage local investment in value-added cashew processing and production. These companies can work with producers, cooperatives, and the government to ensure that domestic raw and processed products reach domestic, regional and global markets. This approach would benefit producers and encourage them to protect the forests they depend on. The following three areas of intervention were identified as key to ensuring stable and inclusive markets for farmers in Stung Treng.

► **Promoting domestic processing through public-private partnerships**

A public-private partnership (PPP) model can attract investment in domestic agricultural processing, where the government provides support and access to green loans, while private investors co-finance processing plants, and agricultural cooperatives supply the workforce. The approach focuses initially on semi-processing to stabilize the supply chain, establishing a unique "Cambodia brand" for its products. Through improved processing capacities, the range of final products can be diversified into feed, starch, alcohol, or juice, for instance, targeting premium domestic and international markets. This strategy is not intended to compete with Viet Nam, which has a more developed processing sector, but rather to foster a more robust, integrated and sustainable market. Local industry can encourage sustainable sourcing in supply chains, without relying on complex cross-border transport. It also has the potential to support the development of incentive structures for accountability and traceability.

► **Enhancing existing agricultural cooperatives (AC) and promoting modern agricultural cooperatives (MACs) with technical assistance and access to finance**

To attract higher-quality traders and achieve economies of scale, farmers should be supported to form MACs. This collaborative model enables them to leverage innovative technology, collectively manage the supply chain and make it more efficient for agricultural extension services to provide support. By showcasing the success of a few cooperatives, this approach can be scaled up, while also building financial institutions' confidence to provide green loans.

► **Fostering land-use registration with traceability to access certification schemes and standards**

To meet international standards such as the European Union Deforestation Regulation (EUDR), cassava and cashew farms must have clear land tenure and traceable production systems. For cassava, which is more challenging to monitor, the initial step is to implement Good Agricultural Practices (GAP) before pursuing EUDR certification. Complying with these standards not only ensures market compliance but also creates opportunities for value-added products in markets such as China and attracts committed investors. A crucial step is to register all cashew-planted areas and farmer profiles, facilitating certification and building trust with international partners.

ROADMAP FOR PRIVATE SECTOR ENGAGEMENT OPPORTUNITIES IN THE CASHEW AND CASSAVA VALUE CHAINS

Prioritizing adaptation options with the highest potential for impact and scalability through private sector engagement

Three priority adaptation options, selected for their climate resilience potential, alignment with business incentives, and overall feasibility, can be implemented in parallel to foster private sector engagement. In this strategy, the private sector acts as a key driver, supported by government and development partners who help de-risk investments and facilitate implementation. The key entry points for private sector engagement are:

1. Developing processing capacity with contract farming

Investment in domestic processing plants and contract farming represents a crucial entry point for private sector engagement in Cambodia. This approach incentivizes farmers to adopt sustainable, deforestation-free practices, while directly addressing their vulnerability to volatile market prices. It also adds significant value locally by creating stable incomes and jobs, particularly for women. This strategy has two main entry points for private sector involvement: direct engagement of agro-industrial partners to establish or expand processing plants for cashew and cassava, and the mobilization of private funding to meet the significant working capital needs. A successful approach must also be gender-responsive, ensuring women are included in farmer organizations and benefit from decent-paying jobs in processing plants. Contract farming schemes secure guaranteed buyers for farmers and provide a platform to introduce climate-smart practices, such as the use of drought-tolerant varieties or improved post-harvest handling. Despite its clear benefits, this strategy faces challenges such as farmer side-selling, limited infrastructure, such

as roads and electricity, and underutilized factory capacity. However, a profitability analysis shows that processing cashews in Cambodia is an attractive business, with a Kernel Outturn Ratio (KOR) of 27 percent, which surpasses regional competitors. At a national level, this could generate an additional US\$ 0 to 30 million in value annually. While capital-intensive, a new plant can potentially recover its investment in less than two years, contributing millions more in annual value at the national level.

To de-risk these investments, the public sector can provide crucial support through concessional loans, grants, and guarantees for working capital, along with investments in public infrastructure. Key partners include investors, such as the Handcrafted Cashew Nuts Stung Treng (HCST) and the Cambodian Agricultural Cooperative Corporation (CACC), financial institutions, such as the Agricultural and Rural Development Bank (ARDB), Wing Bank and Credit Guarantee Corporation of Cambodia (CGCC), and technology providers such as Greenovator.

2. Scaling regenerative agriculture

Regenerative agriculture can foster climate resilience in Cambodia's agricultural sector. It involves promoting practices like cover cropping, crop diversification, and the use of organic and bio-fertilizers, which improve soil health and help farmers withstand climate shocks. Profitability assessments confirm that both cashew and cassava production become more profitable when these practices are applied. To support adoption, recommended actions include providing training and extension for smallholder farmers and input providers, supporting the deployment of a digital platform to track and share these practices, and leveraging blended finance and technical assistance for microfinance providers to encourage green microfinance. Contract farming schemes can be used to introduce these methods by providing farmers with incentives, such as premium prices for their products. While these practices offer long-term benefits, such as stabilized yields and reduced input costs, their adoption faces barriers including the lack of upfront capital, limited technical knowledge and an absence of market incentives.

The private sector can help address these challenges through a multipronged strategy that engages multiple stakeholders:

- **Processors and exporters:** Companies involved in contract farming, such as HCST and the CACC, are key drivers. They can offer farmers incentives, such as a premium price for their products, in exchange for adopting regenerative practices.
- **Financial service providers:** Local microfinance institutions such as AMK, LOLC, and ACLEDA are well-positioned to offer green microfinance products with flexible terms to help farmers finance the initial costs.
- **Carbon credit projects:** Private companies can fund and partner with carbon credit projects, generating revenue that can be used to subsidize training and offer a premium to farmers who adopt deforestation-free practices. Private companies like Everland and Midori Climate Partners are emerging as carbon project developers, helping to generate carbon credits from sustainable forestry and soil practices. These credits can be sold on the voluntary market, generating revenue that can be funnelled back to farmers to finance training or provide a premium on their products.
- **Input and service providers:** Companies like HUSK Ventures, which produces bio-fertilizers, and Smart Agro supply essential inputs and technical training. Additionally, mobile apps such as Mekong Farm offer digital extension services to help farmers quickly adopt new techniques.

3. Enhancing traceability and quality

Increasing traceability and quality in Cambodia's agricultural value chains is crucial for preventing deforestation and accessing high-value, premium markets. Many international markets, including the European Union and the United States, require proof of sustainable sourcing. By implementing traceability systems, Cambodian producers can attract premium prices, ensuring compliance with future regulations and turning sustainability into a competitive advantage. This is particularly important for products like cashew and cassava to meet international standards such as EUDR. While the fragmented nature of the value chains, limited digital infrastructure, and high upfront costs are significant challenges, the private sector can play a key role in driving this change.

The strategy proposes three entry points for private sector engagement:

- **Processors and exporters:** Companies can use traceability as a core part of their brand strategy, offering farmers premium prices for certified products.
- **Technology firms:** Agritech companies such as Greenovator and the developers of the SrokYeung app can provide digital solutions to simplify data collection and management.
- **Engaging all value chain stakeholders:** Success requires participation from all actors, from farmers to processors, which can be encouraged through financial incentives.

Promoting a gender-responsive approach

Ensuring a gender-responsive approach is essential for the success of sustainability practices and private sector engagement. This requires the inclusion of women in farmer organizations and the protection of their rights within contract farming schemes. Interventions should focus on creating quality, decently paying jobs for women in processing plants to ensure they benefit from the value addition, while also facilitating their participation in extension, financial services and trainings, which should be tailored to their schedules and specific needs. Strengthening women's land rights and access to finance can enhance their involvement in agricultural activities. For example, financial institutions can offer flexible credit with legal support to protect women's land rights. In addition, digital platforms should include features that encourage women's engagement and provide relevant services, for instance, through family accounts and women-only groups. Monitoring indicators should track women's participation in training, access to loans, and registration in digital platforms.

A gender-responsive approach is also essential to ensure that women are fully engaged in traceability management and that benefits are distributed equitably. Key partners include processors like the Cambodia Cashew Federation (CAC), technology providers, and certification agencies such as EcoCert.

Implementing policy-level de-risking strategies

To de-risk investments, the public sector can provide support through cost-sharing, financial incentives for farmers, and investments in rural infrastructure. It can also help develop a national minimum quality standard to guide value chains and ensure compliance with sustainable sourcing practices.

- **Incentivizing private investment and price stability for market stability:** To encourage private processing and stable sourcing from farmers, the government should focus on reducing market volatility and lowering costs for investors. A guaranteed selling price for processors is critical to maintain a floor price for farmers, while limiting financial losses for processors in

the event of a market downturn. This should be complemented by policy incentives to foster processing activities, leveraging existing government programmes such as tax holidays and import duty waivers for machinery, to reduce production costs and simplify procedures for new and existing agro-processors.

- **Increasing public investment in regulatory standards and traceability:** The private sector expects public investment in essential shared infrastructure to support quality control and traceability. The government should also fund laboratories and certification bodies, such as ISC and CamControl, to simplify compliance and testing for exporters. Furthermore, establishing a national traceability system is essential, as only the government can develop a verifiable, interoperable platform recognized by international customs and buyers, potentially building on existing programmes such as the 'Sustainable Assets for Agriculture Markets, Business And Trade' (SAAMBAT) programme. To ensure a level playing field and predictability, the government must take the lead in setting clear rules and establishing clear traceability and quality standards, such as a national farm registry, lot codes, and certification for safe production. This helps compliant companies avoid being undercut by informal actors and align with international regulations, including the EU's food safety rules.
- **Developing resilient infrastructure and digital ecosystems:** Investing in public physical infrastructure, such as improved road quality and affordable electricity, and digital infrastructure, including rural internet and satellite geolocation, is key to creating an enabling environment for private investors and processors. The long-term sustainability of digital platforms for good agricultural practices requires the government to analyse the business case and define whether an annual public contribution is necessary to maintain the platform's economic viability.

This assessment took place as part of the Scaling up Climate Ambition on Land Use and Agriculture through Nationally Determined Contributions and National Adaptation Plans (SCALA) programme, jointly led by the Food and Agriculture Organization of the United Nations (FAO) and the United Nations Development Programme (UNDP). SCALA aims to strengthen the evidence base for transformative climate action in agriculture and land use in more than a dozen countries in Africa, Asia–Pacific, and Latin America. SCALA is supported by the German Federal Ministry for the Environment, Climate Action, Nature Conservation, Nuclear Safety (BMUKN) through the International Climate Initiative (IKI).

Food and Agriculture Organization of the United Nations

www.fao.org/in-action/scala/en

United Nations Development Programme

www.adaptation-undp.org/scala

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