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OXFAM

Ecosystem and Women's Participation in the Implementation of Contract Farming in Cambodia: The Cases of Rice, Cashew, and Rubber

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Report on Ecosystem and Women's Participation in the Implementation of Contract Farming in Cambodia: The Cases of Rice, Cashew, and Rubber

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Acronyms and abbreviations

AC	Agricultural Cooperative
AFD	Agence Française de Développement
ARDB	Agricultural and Rural Development Bank
AUSAID	Australian Agency for International Development
BRS	Black Rubber Sheets
BMZ	Economic Cooperation and Development
CAPRED	Cambodia Australia Partnership for Resilient Economic Development
CARDI	Cambodian Agricultural Research and Development Institute
CAVAC	Cambodia-Australia Agricultural Value Chain Program
CCAPC	Coordination Committee for Agricultural Production Contract
CCC	Cambodia Competition Commission
CF	Contract Farming
CGCC	Cambodia Credit Guarantee Cooperation
CIRD	Cambodian Institute for Research and Rural Development
CIRAD	French Agricultural Research Centre for International Development
CRRI	Cambodian Rubber Research Institute
DAI	Department of Agro-Industry
DPs	Development Partners
EU	European Union
FGD	Focus Group Discussion
FNN	Nature Net Association
FO	Farmer Organization
GAP	Good Agricultural Practices
GDA	General Directorate of Agriculture
GDP	Gross Domestic Product
GDR	General Directorate of Rubber
GEI	Gender Equality Index
GIZ	German Development Agency
JICA	Japan International Cooperation Agency
KII	Key Informant Interview
MAFF	Ministry of Agriculture, Forestry and Fisheries
MEF	Ministry of Economy and Finance
MISTI	Ministry of Industry, Science, Technology, and Innovation
MOC	Ministry of Commerce
MOWRAM	Ministry of Water Resources and Meteorology
NGOs	Non-governmental Organizations
NR	Natural Rubber
SEZ	Special Economic Zone
SNR	Sustainable Natural Rubber
PDAFF	Provincial Department of Agriculture, Forestry and Fisheries
RSS	Rubber Smoke Sheet
USAID	United States Agency for International Development
WWF	World Wildlife Fund

Executive Summary

This study combines desk reviews and qualitative analysis to examine the current ecosystem of contract farming (CF) and the extent to which women participate in its implementation in Cambodia. The study specifically investigates the actors and their roles, the models and types of contract farming being implemented, the regulatory framework governing its implementation, the perceived benefits and costs to farmers (producers) and companies (buyers), mechanisms for dispute resolution, and the role of women in the ecosystem, particularly in the agricultural cooperatives. The report provides a comprehensive overview of the CF ecosystem and challenges in its implementation and offers practical recommendations to address the remaining binding constraints to strengthen the system and improve the confidence of involved stakeholders. The study focuses on three agro-industrial crops: rice (Battambang), cashew (Kompong Thom), and rubber (Mundul Kiri).

The implementation of contract farming involves multiple actors, with farmers at the center of the ecosystem. Farmers, buyers, agricultural cooperatives, and the Ministry or Provincial Department of Agriculture, Forestry and Fisheries are the main actors, participating directly in the implementation of contract farming. Other actors include government ministries and agencies, state-owned banks and credit guarantee schemes, private financial institutions, research institutions, development partners, input suppliers, and middlemen (for local processors and exporters and for buyers in Vietnam). Development partners have played an important role in providing technical and financial support to other actors in the ecosystem.

Contract farming involves a mix of the multipartite and intermediary models, more closely leaning toward the intermediary model. Farmers and buyers are engaged in both formal and informal contracts. Under the formal contract arrangement, buyers work with agricultural cooperatives on behalf of the farmers to determine terms and conditions of the contract. Once agreed upon, the parties need to apply to the Office of Agro-Industry, PDAFF, for certification. Under the informal contract, however, there is no involvement by PDAFF. The informality of contract farming remains prevalent.

Given the promise and potential benefits of contract farming to farmers, agricultural cooperatives, and buyers, the government has put in place the rules and regulations for the implementation of contract farming. Sub-Decree 36 and other related regulations are the main legal and regulatory documents governing the implementation of contract-based agricultural production. Conflicts, when they arise, are mainly dealt with outside of the formal mechanism, prior to mediations by PDAFF or MAFF.

Despite the perceived benefits to farmers and buyers, the implementation of contract farming has faced several challenges, mostly common to the three crops. First, the laws and regulations governing the implementation remain insufficient, constraining the competent authorities to exercise their roles and responsibilities. The process and procedures of conflict resolution remain ambiguous. Second, contract arrangements remain predominantly informal without involvement from representatives of the Office of Agro-Industry, PDAFF, or the Department of Agro-Industry, MAFF. Third, farmers and buyers continue to find it difficult to access sufficient capital with favorable terms and conditions. Collateralized lending remains prevalent even among state-owned banks (e.g., the Agricultural and Rural Development Bank). Fourth, farmers lack the technical know-how to mitigate production losses caused by pests, diseases, and climate-related risks (i.e., unpredictable rain falls, precipitation with a high level of salt content, and high temperatures). Farmers also lack proper knowledge on the use of fertilizer and pesticides, mainly following their peers.

Women have increasingly participated in CF implementation. Nonetheless, they are underrepresented in leadership and management roles, particularly at agricultural cooperatives. Women are given equal rights and opportunities to participate in CF implementation and in holding leadership and management roles. They, however, often shy away from such positions. Factors affecting women's underrepresentation include domestic work burden, low levels of education, lack of

confidence and safety, cultural and social norms that view men as breadwinners and are more suitable for the positions, migration, and lack of no financial incentives. Women often spend more time on unpaid care and domestic work than men, reflecting their cultural and social norms and constraining their participation.

To improve the implementation of contract farming, a multi-faceted intervention involving relevant stakeholders is needed. Below, we list recommendations for stakeholders.

Stakeholder	Policy and program interventions
Ministry or Provincial Department of Agriculture, Forestry and Fisheries	▪ Continue the effort to promulgate the law on contract farming is an example and is necessary for CF implementation. ▪ Amend Sub-Decree 36 on Contract Farming to include a representative from the Cambodia Competition Commission in the Coordination Committee for Agricultural Production Contract. ▪ Consider issuing Sub-degrees, directives, and circulars on how conflicts arising from CF implementation are dealt with. ▪ Consider increasing staff and financial support for the Office of Agro-Industry, Provincial Department of Agriculture, Forestry and Fisheries. This allows them to be more responsive to concerns and conflicts arising from CF implementation. ▪ Regulate retail and wholesale suppliers of fertilizers and pesticides, ensuring that they have proper licenses and knowledge. Bottles or containers of fertilizer and pesticides should be properly labelled in Khmer. ▪ Continue to encourage buyers, agricultural cooperatives, and farmers to engage in formal contract farming with MAFF or PDAFF as a signatory. ▪ Increase awareness-raising activities on contract farming and its implementation among farmers, agricultural cooperatives, and buyers. ▪ Continue extension services, particularly on production, the use of fertilizer and pesticides, and mitigation and adaptation strategies to climate change. ▪ Contribute to gender mainstreaming activities on equal rights and opportunities for women to participate in leadership and management roles. The campaign should target women and men.
State-owned banks and credit guarantee schemes	▪ Consider reducing collateral-based lending, particularly land, to improve access to finance by farmers, agricultural cooperatives, and buyers. ▪ Consider using contracted quantity certified by the Provincial Department of Agriculture, Forestry and Fisheries or inventories as collateral.

	▪ Contribute to gender mainstreaming activities on equal rights and opportunities for women to participate in leadership and management roles. The campaign should target women and men.
Ministry of Economy and Finance, Ministry of Commerce, National Bank of Cambodia, and	▪ Increase public funding for agricultural research and development, particularly on climate-resilient seeds and mitigation and adaptation strategies to climate change. ▪ Contribute to gender mainstreaming activities on equal rights and opportunities for women to participate in leadership and management roles. The campaign should target women and men.
Ministry of Water Resources and Meteorology (MOWRAW)	▪ Continue projects to expand and restore irrigation systems. This is particularly necessary for rice production to mitigate the impact of climate change.
Agricultural cooperatives and agricultural cooperative unions	▪ Continue to strengthen internal capacity in management and operations. ▪ Ensure that women and men have equal rights and opportunities to participate in the leadership and management roles of the ACs. ▪ Increase gender mainstreaming activities and continue to encourage women to participate.
Private financial institutions (e.g., commercial banks and MFIs)	▪ Contribute to gender mainstreaming activities on equal rights and opportunities for women to participate in leadership and management roles. The campaign should target women and men.
Development partners	▪ Continue to provide financial and technical support to farmers, agricultural cooperatives, buyers, and other relevant actors to further improve the implementation of contract farming. ▪ Contribute to gender mainstreaming activities on equal rights and opportunities for women and men to participate in leadership and management roles. The campaign should target women and men.
Public research institutions	▪ Increase agricultural research and development, particularly on climate-resilient seeds and mitigation and adaptation strategies to climate change. ▪ Incorporate a gender lens into the research agenda.

1. Introduction

1.1 Context

Agriculture has been an important sector for the Cambodian economy and people's livelihoods, with an average share of almost one-third of the total GDP in the last decade and employing more than 30 percent of the total national workforce. However, its important has declined from 44.4 percent in 1997 to 20.7 percent of the GDP in 2019, as compared to industry (34.2 percent) and services (38.8 percent). It has been estimated that the agricultural share of employment will further decline as the economy continues to transform and diversify (World Bank, 2022)[1].

Cambodia's agriculture remains at an early stage of its transformation, with low levels of value-added production compared to other developing countries (RGC, 2022). The competitiveness of the agricultural sector has been affected by low productivity, inconsistent quality, high investment and input costs, and its vulnerability to fluctuations in price and output, climate change, pest and disease outbreaks, and market access. Cambodian agricultural production and business are also fragmented. Linkages between producers and markets (domestic and international), access to technologies and affordable credits, assurance systems on quality and food safety standards, and fair trade between buyers and farmer communities have been identified as bottlenecks. Hence, to further promote agricultural transformation and sustainable development in Cambodia, there is a need for technical and institutional innovations and coherent policies and interventions to integrate various stakeholders into value chains and improve their efficiency and competitiveness.

Contract farming can be defined as a system for the production and supply of specific agricultural products in quantities and at quality standards determined by producers and contractors through written agreement or verbal understanding (Eaton and Shepherd, 2001; Bijman, 2008). It seems to be a mechanism that could help solve most, if not all, of the challenges, particularly supporting smallholders in agricultural production and the value chain.

The expected benefits of contract farming are (1) a means to solve the problem of access to agricultural inputs for smallholders when the agricultural extension services are relevant and useful, and (2) an effective approach to dealing with the price fluctuation of agricultural products (Reardon *et al.*, 2019). In the Cambodian context, CF is of policy relevance because it is included in the 2022–2030 Agricultural Development Policy. At the same time, there have been a limited number of empirical studies exploring the effectiveness of agricultural extension in Cambodia. That is mainly because of data limitations, which have made it difficult to gain more insights into the implementation of CF in Cambodia.

However, previous studies suggest that Cambodia's contract farming is far from complete. Cambodia's agricultural value chain is fragmented, and the markets for agricultural produce are still unreliable in terms of price and demand. For example, Sum and Khiev (2015) find that Cambodian smallholders were inferior to the contracting companies or buyers in terms of bargaining power and benefits generated from the CF scheme. Linked to this problem, collective actions among small-scale farmers through agricultural cooperatives—a vital mechanism supportive of CF—are not sustainable or prosperous because of funding and the capacity of lead farmers (Theng *et al.*, 2014). Chhim *et al*. (2021) qualitatively find that CF

[1] It has been estimated that the agricultural share of total employment would further decline to 23–25 percent by 2030 (Agricultural Development Policy Framework 2021–2030).

provided benefits to farmers as producers and buyers, but the common arrangements of Cambodia's CF were in the form of sale contracts and mostly informal.

Promoting gender roles and equality is crucial to helping reduce rural poverty, improve food security, and implement contract farming. The gender equality index in Cambodia has improved in almost all categories: economic participation and opportunity, educational attainment, health and survival, and political empowerment. According to the global gender gap index 2023 ranking based on four different subindexes such as economic participation and opportunities, educational attainment, health and survival, and political empowerment, Cambodia ranked 92nd out of 146 countries. This figure put the country ahead of some ASEAN countries (WEF, 2023a). Cambodia has been proactive in the areas of gender roles and equality. However, challenges remain, especially for the implementation of contract farming in rural communities. A further in-depth study on gender roles in CF is still necessary and relevant to further optimize the CF ecosystem and practices in Cambodia.

1.2 The research contribution

The contribution of this study is twofold. First, it provides an update about the ecosystem and implementation of contract farming of three agro-industrial crops in Cambodia, and perhaps could also be adopted and scaled up for the development of other agricultural commodities. Second, to the best of our knowledge, previous studies about Cambodia's contract farming have yet to investigate the roles women in the CF ecosystem. Thus, lessons learnt and recommendations of the study could help policymakers, development partners, NGOs, buyers, and other relevant actors better understand the current ecosystem, challenges, and solutions to improve the implementation.

1.3 Scope and objectives

The study focuses on three agro-industrial crops—rice, cashew, and rubber—which have great potential to encourage the cooperation between commercialized small-scale farmers and large agribusiness (i.e., exporters or processors) in Cambodia (MAFF, 2019; RGC, 2022). The main objectives of this study are to:

- examine the current ecosystem of the implementation of contract farming and the extent to which women participate in the system.

- document solutions that have been used by buyers and agriculture cooperatives to address challenges of the implementation of contract farming.

2. Methodology

The study combines desk reviews and qualitative analysis to answer the research questions. The qualitative approach analyses KII and FGD data from representatives of agricultural cooperatives, buyers, government ministries and agencies, development partners and other actors, directly or indirectly involved in the implementation of contract farming. Specifically, we conducted 6 FGDs with farmers and members of agricultural cooperatives who have engaged in CF implementation and 23 KIIs who have worked on the three crops (Table 1).

The desk review involved a literature review of previous studies related to contract farming in Cambodia and the region. This review focused on the benefits, implementation, challenges, conflict resolution mechanisms, and engagement of women. It also included an examination of government and development partner policies related to agricultural development, specifically contract farming, as well as other relevant sources of information.

The research design draws on qualitative analysis with multiple stakeholders and levels because the ecosystem of contract farming (CF) is a complex process involving numerous dimensions. It is difficult to examine one dimension in isolation (Jordaan, Grové, and Backeberg, 2014). This approach allows for in-depth observation of the situation by enabling the research team to directly engage with individuals and observe their activities within their context. In other words, it helps identify the complex interactions within the areas of interest (Creswell, 2012).

2.1 Conceptual framework

We utilize a multistakeholder framework to examine the ecosystem of contract farming and the extent to which each actor participates in the system (Figure 1). Farmers (producers) and companies (buyers) are the main parties in the contract. They negotiate and agree upon terms and conditions before entering into the contract. Once the contract is signed, both parties have binding obligations to abide by the terms and conditions. The framework also highlights the involvement of other actors at the onset of the implementation of contract farming, from agricultural cooperatives to government ministries and agencies to development partners (e.g., Barrett *et al.*, 2012; Sum and Khiev, 2015; Chhim *et al.*, 2021).

Below, we briefly explain the role of each actor.

- The first main actor in the ecosystem of contract farming is the farmer, who is often a smallholder with limited resources and knowledge. They enter into contracts with buyers to produce specific crops or products, which are then sold to the buyers at a predetermined price. Depending on the contract modality, the buyers could provide the farmers with inputs, technical assistance, and market access, which help them increase their productivity and income.

- Buyers are the other important player in the ecosystem of contract farming in Cambodia. They typically have more resources and expertise than the farmers, and they use contracts to secure a reliable supply of quality products at a competitive price. They also provide farmers with training and technical support, which helps improve the quality and quantity of the products.

- Government ministries and agencies play a critical role in the ecosystem of contract farming in Cambodia by providing policy support and regulatory frameworks to facilitate contract farming. They also provide technical assistance and training to farmers, which helps improve their productivity and income.

- Other actors in the ecosystem of contract farming include development partners, non-governmental organizations, research institutions, financial institutions, input suppliers, and middlemen. Development partners and NGOs provide technical and financial

assistance and support to farmers, while research institutions conduct research on contract farming and provide evidence-based recommendations to policymakers. Financial institutions provide loans and other financial services to farmers and agribusinesses, which help to improve their access to capital.

Another important aspect of the framework is the contract components, which are briefly explained below.

- *Contract farming arrangements*: This component involves the structure and terms of contract farming arrangements, such as, duration of contract, the roles and responsibilities of the parties involved, and the contract enforcement mechanism (Desiere and Weituschat, 2017). For instance, Narayanan (2013) finds that farmers' attrition (exit from contractual arrangements) is the policy concerns of CF effectiveness or success in India.

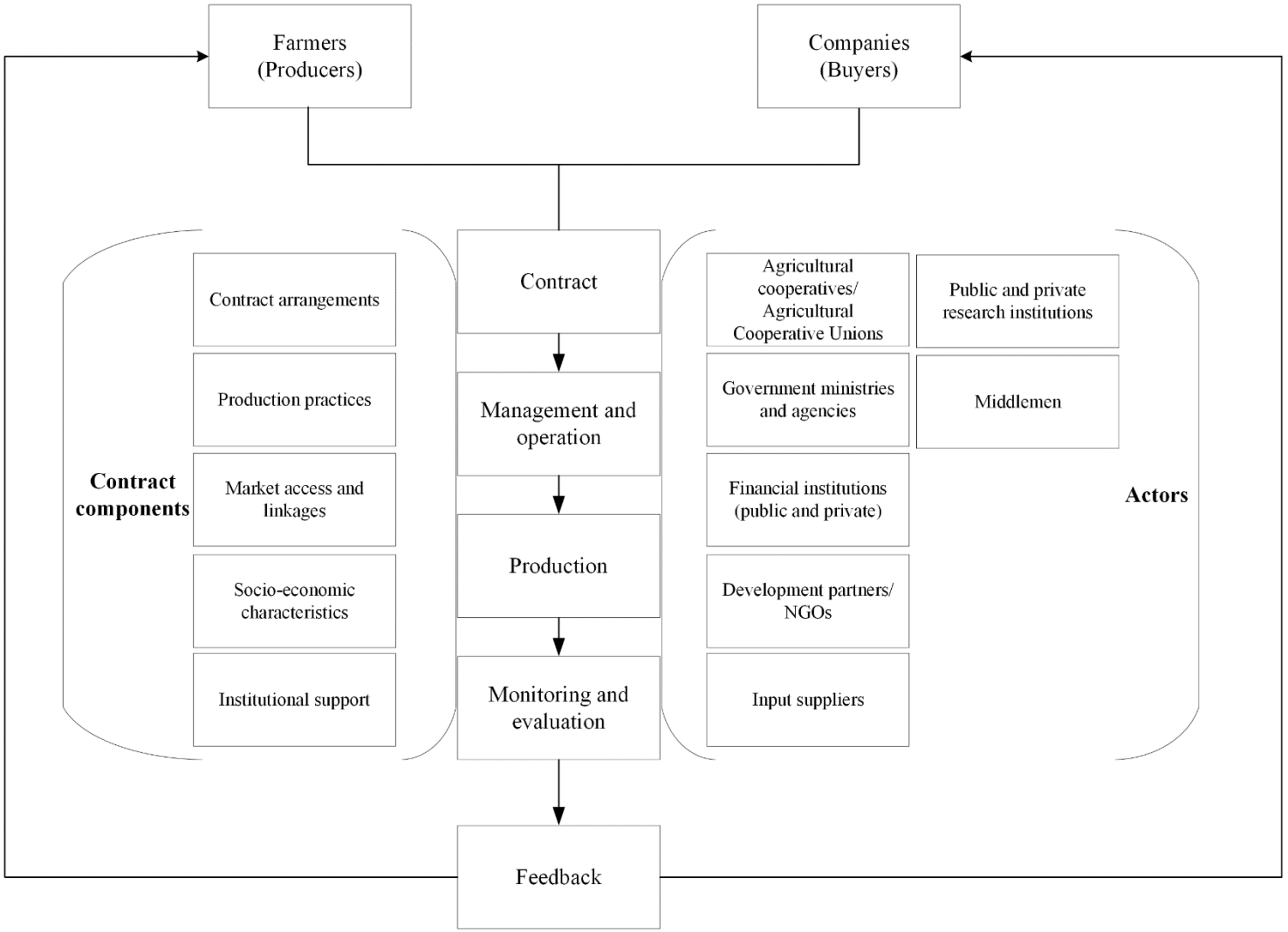
- *Production practices*: This component includes the production practices used by the farmers in the contract farming arrangements, such as the use of inputs, irrigation, and pest management. These practices may impact the quality and quantity of the crops produced and, therefore, the success of the contract farming arrangements (Reardon *et al.*, 2019). More specifically, the study focuses on how and whether the contracted farmers acquired some support from the contracting firms in terms of those production practices which are hypothesized to improve their farm productivity.

  Market access: This component includes the market access provided to the farmers through the contract farming arrangements, such as the type of markets, the prices offered and price setting, and the marketing channels. This may impact the farmers' income and the sustainability of the contract farming arrangements (Reardon *et al.*, 2019; Bellemare and Bloem, 2018).

- *Socio-economic characteristics*: It includes the socio-economic characteristics of farmers or producers such as age, gender, farm size, and education of farmers (Michelson, 2013) because a buyer or company is more likely to contract with farmers with low risk and profitable returns. These characteristics may impact the farmers' ability to participate in the contract farming arrangements and their level of engagement with the scheme. In this component, the study will focus more on the roles of women in the implementation of CF.

- *Institutional support*: This component includes the institutional support provided to the contract farming arrangements, such as the support provided by government agencies, NGOs, and other stakeholders. This may impact the success and sustainability of the contract farming arrangement (Reardon *et al.*, 2019; Wuepper and Sauer, 2016).

Figure 1: A multistakeholder framework for contract farming



Source: Adapted from Eaton and Sheperd (2001).

2.2 Site selection and data collection

Three contract farming communities of rice, cashew nuts, and rubber were selected: (1) a CF community for the sustainable rice platform (SRP) in Battambang, (2) a cashew nut CF community in Kampong Thom, and (3) a rubber cooperative in Mundul Kiri and Tbong Kmom.

The rice production community in Battambang has been actively involved in contract farming implementation for several years. This involvement has been supported by various projects aimed at promoting SRP for fragrant rice intended to export to the EU, upgrading local infrastructure, supporting innovative and climate-friendly farming practices, and establishing market linkages. We also included organizations that have taken the lead in providing research and technical support, with the knowledge and innovations having been piloted in complementary programs implemented by Water Resources Management and Agro-ecological Transition for Cambodia (WAT4CAM), a program co-funded by the Ministry of Economy and Finance, the European Union, and the Agence Française de Développement. These programs have also supported extension services and capitalized on existing knowledge and research. Given the success and the involvement of diverse stakeholders, this CF community serves as a good case study.

For cashew, farmer associations and agricultural cooperatives in Kampong Thom, particularly in Santuk and Prasat Sambo Districts, were selected for the study. Kampong Thom is known as the largest cashew production area in Cambodia, and several farmer associations, agricultural cooperatives, and business networks have been established with assistance from the government, development partners, and the private sector. Cashew is a significant cash crop in Cambodia, with a total export of 670,000 tons and valued of more than US$1 billion in 2022; and 98.5 percent being shipped to Vietnam (KT, 2023). However, the majority of exports is in the form of raw materials, with only a small fraction being processed.

Numerous initiatives have been implemented by various stakeholders. The government has recently formulated policies through the Ministry of Agriculture, Forestry and Fisheries and the Ministry of Commerce to address technical and market issues, including the enhancement of cashew nut contract farming. Development partners (e.g., USAID, GIZ, JICA, HEKS, and SwissContact) have engaged in cashew development activities for several years. These initiatives aim to tackle a wide range of issues, including production practices, climate resilience, Good Agricultural Practices, organic farming, access to technologies, market linkages, and providing grants and loans for business acceleration.

For rubber, we interviewed representatives of rubber associations and cooperatives in Mundul Kiri (Pechreada) and Tbong Kmom (Memot). It is probably one of the crop commodities where CF implementation would encounter significant challenges. Initial information obtained from the General Directorate of Rubber suggested that CF implementation for rubber used to receive support from the French Development Agency between 1999 and 2008, which focused mainly on the distribution of good-quality rubber clones, providing small credit, and other production techniques to smallholders. Another round of negotiation has been conducted to extend the project with a tentative loan for the rubber development program in Cambodia, undertaken between AFD and the Ministry of Economic and Finance. However, the agreement has yet to be finalized due to several challenges. A fraction of the government budget was also used to push some of these activities, mainly through the Cambodian Rubber Research Institute and the Department of Rubber Development. Recently, GDR and CRRI, in collaboration with the

NGO Forum on Cambodia, Oxfam Cambodia, and WWF Cambodia, have developed guidelines for Sustainable Natural Rubber Criteria and key indicators for Cambodia.

In each province, we selected two agricultural cooperatives that have been engaged in or promoting CF implementation. From the selected ACs, we chose respondents who are currently contracted farmers, AC management and members, and the contracting companies working with the ACs. The qualitative data were collected through key informant interviews and focus group discussions. KIIs were conducted with the management of ACs, contracting companies and associations at the field level, development partners, government agencies, and other relevant stakeholders. FGDs, on the other hand, were conducted with ACs' committee members and farmers. The tools used for the case study were semi-structured, with guided questions (Annex 1: Questions for KIIs and FGDs), but they were sometimes flexible to accommodate the interviewees' inputs.

2.3 List of KIIs and FGDs

Table *1* summarizes the number of focus group discussions and key informant interviews by crops and types of respondents. The stakeholders were targeted based on an initial stakeholder analysis and discussions with selected stakeholders and practitioners who have worked extensively in agriculture and on the three crops. The key informants were selected using a snowball approach, considering the availability of respondents and times. The KIIs were conducted through face-to-face interviews, phone calls, or video conferences, depending on what was appropriate. The lead questions for FGDs and KIIs can be found in Annex 1. Probing questions were also asked of respondents as necessary and appropriate during the interview.

Table 1: The number of KIIs and FGDs by crops and types of respondents

Stakeholder	Crop	Province	KIIs	FGDs
AC representative	Cashew	Kampong Thom	2	-
AC members/farmers	Cashew	Kampong Thom	-	2
PDAFF	Cashew	Kampong Thom	1	-
Input supplier	Cashew	Kampong Thom	1	-
NGOs	Cashew	Phnom Penh	2	-
Processor	Cashew	Kampong Thom	1	-
AC representative	Rice	Battambang	2	-
AC members/farmers	Rice	Battambang	-	2
PDAFF	Rice	Battambang	1	-
AC union representative	Rice	Battambang	1	-
Research institute	Rice	Battambang	1	-
Private sector	Rice	Battambang	1	
NGOs	Rice	Battambang	1	
AC representative	Rubber	Mundul Kiri		1
AC representative	Rubber	Tbong Kmom	1	1
AC members/farmers	Rubber	Tbong Kmom	2	
PDAFF	Rubber	Mondulkiri	1	
NGOs	Rubber	Mundul Kiri	2	
NGOs	Rubber	Tbong Kmom	2	
ARDB	-	Phnom Penh	1	-
			23	**6**

Source: Authors' preparation.

3. Results

3.1 Rice

3.1.1 Overview

Cambodia's agricultural development, which is dominated by rice farming in terms of output and cultivated land, requires further government interventions (RGC, 2022). The sector is vital as it employs approximately 43 percent of Cambodia's labor force, with crop farming centered around paddy rice[2]. The government recognizes that developing this sector can lead to inclusive poverty reduction. In this regard, the government established an ambitious goal for the development of the rice sector with the launch of the policy for the promotion of rice production and exports in 2010, aiming to export 1 million tons of milled rice annually (SNEC 2010).

Thirteen years after the launch and implementation of the policy, Cambodia has yet to achieve the goal of exporting one million metric tons of milled rice. This indicates that there are still significant binding constraints that need to be addressed. Despite the government's commitment and recognition of rice as a prioritized cash crop with contributions to economic growth, rural households' well-being, and food security, enthusiasm and progress towards the goal appear to have diminished. To revitalize the government's commitment toward agricultural development, the 2022–2030 Agriculture Development Policy outlines the government's vision to promote Cambodia's agriculture as a modern, competitive, inclusive, and sustainable sector that is resilient to climate change and can generate more income for rice farming households, given that rice farming dominates in terms of agricultural output and cultivated land. To achieve the desired agricultural development goals, the following constraints need to be addressed (ibid.):

- A shortage of working capital among rice millers, which hinders their ability to purchase paddy rice during peak harvest times in November and December.

- A lack of high-value-added rice seeds, which limits the potential for increased productivity and quality.

- Insufficient irrigation infrastructure, especially for dry season rice cultivation, poses a challenge to farmers.

- A lack of technical knowledge and expertise regarding plantation techniques and the proper use of seeds, chemical fertilizers, and pesticides.

3.1.2 Ecosystem

Based on the qualitative data, we summarize the roles of each major stakeholder in the ecosystem (Figure 2) of contract farming for rice in Cambodia as follows:

- **Smallholder farmers**: are at the center of the ecosystem. They cultivate rice on their land and enter into contracts with agribusiness companies to supply their produce.

[2] Authors' calculation using the data from NIS (2020).

However, it is important to note that there might be limited evidence from fieldwork indicating the extent to which they receive technical assistance, inputs, and financial support from these companies, which are typically expected in the context of contract farming. It should be noted that the core role of contract farming generally involves providing support to smallholder farmers (Bellemare and Bloem, 2018; Singh, 2005). This finding suggests that the core role of rice CF has yet to be fulfilled. It is further supported by previous studies conducted by Chhim *et al*. (2021) and Sum & Khiev (2015), which emphasize the need to identify potential areas for improvement or intervention to enhance the effectiveness and sustainability of the system.

- **The agricultural cooperatives, agricultural associations and federations**: AC plays a crucial role in the contract farming ecosystem for rice in Cambodia. Their responsibilities include surveying farmers to determine the quantity of rice they wish to contract with the buyer. Additionally, the cooperative informs farmers about the buyer's identity, the desired quantity of rice, and other essential contract conditions. If the terms are agreeable to the farmers, the cooperative acts as their representative and signs the contract on their behalf. This finding is line with some recent studies conducted in Cambodia including those by An and Culas (2015), Chhim *et al*. (2021), and Ngo and Khon (2023). The cooperative is established to facilitate collective sales for members who commonly grow rice.

- **Contracting companies (both exporters and processors)**: These companies play a crucial role in contract farming, though there is no evidence from the fieldwork showing that they provide farmers with seeds, fertilizers, pesticides, and other inputs. This limitation is in line with some recent studies conducted in Cambodia, including those by Chhim *et al*. (2021) and Ngo and Khon (2023). They often offer training and technical assistance to improve farming practices and encourage farmers to adhere to standard requirements with agreed-upon quantities determined in advance. These companies typically have processing facilities to mill and package the rice for export or domestic markets.

- **Ministry of Agriculture, Forestry and Fisheries is mainly represented by the Department of Agro-industry and PDAFF**. The government plays a regulatory and facilitative role in the ecosystem. They set policies and regulations to support contract farming (i.e., formal CF) and ensure fair practices. For instance, from KIIs with some officials in charge of CF at the provincial level, we find that under formal CF, buyers, and sellers, represented by the AC president, negotiate terms and conditions. According to the regulations outlined in Sub-Decree 36 on contract farming, MAFF holds the position of the chair for the Coordination Committee responsible for overseeing Agricultural Production Contracts.

- **Other government ministries and agencies**: As the national committee in charge of CF promotion, the CCPC contains seventeen other government ministries and agencies. Their role is crucial for the effective and timely coordination of the committee. Additionally, those Government agencies also provide development support to farmers and agribusiness companies.

- **Development partners**: Several development partners have extended both technical and financial assistance to the agriculture sector overall, with a particular focus on contract farming. One example is the support received by AC and farmers in

Battambang from development partners such as VSO, AFD, and the EU through the Water Resources Management and Agro-ecological Transition for Cambodia (WAT4CAM) Program.

- **Financial institutions:** The Agricultural and Rural Development Bank, commercial banks, and MFIs provide financial services to farmers, ACs, and contracting companies. They offer loans to support agricultural activities. However, most respondents reported that obtaining credits from the Agricultural and Rural Development Bank (ARDB) and other private creditors is difficult as most institutions require collateral. MFIs would charge about 1 percent per month. Although the interest rate charged by the ARDB is lower (about 70 percent lower), the process and procedures for loan applications remain unfavorable. The model does not cater to smallholder farmers and the AC, so this limitation presents an opportunity for the government to enhance credit access and support the implementation of CF in Cambodia. In this context, studies conducted in Thailand by Singh (2005) and Riboonchitta and Wiboonpoongse (2008) suggest that the government's role in CF is to encourage greater participation from the private sector, including financial institutions, and formulate policies that facilitate the establishment and growth of CF, leading to diversification and support for private sector activities in the country.

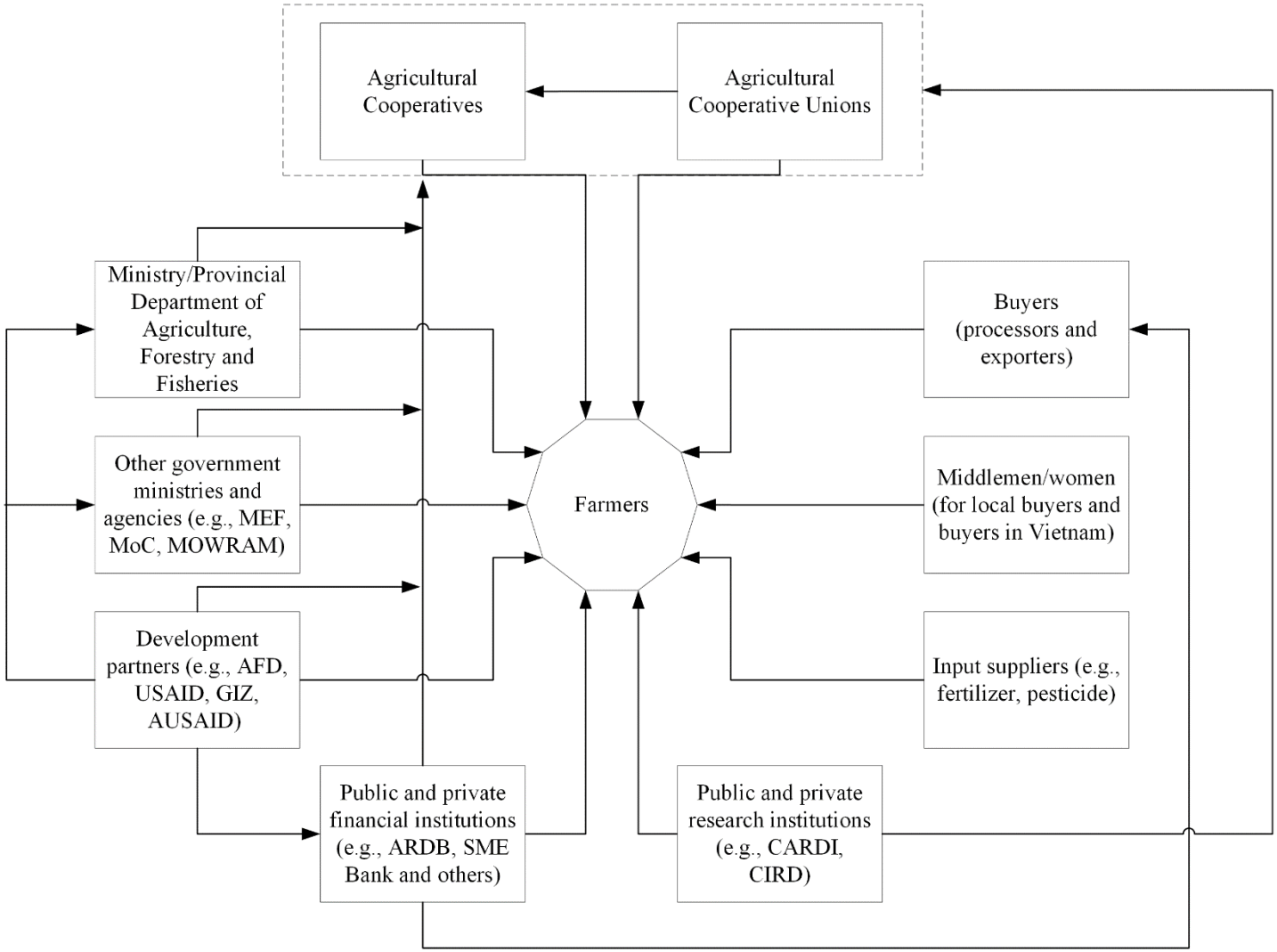
- **Input suppliers**: Companies that supply agricultural inputs such as seeds, fertilizers, and pesticides are an essential part of the ecosystem. Given the persistent high usage and lack of standardization in fertilizers and pesticides, the significance of input suppliers cannot be overstated. They play a vital role in providing quality input and disseminating accurate information regarding their proper utilization. In this regard, several studies conducted in Cambodia, such as those by Schleinemachers *et al*. (2017) and Chhim *et al*. (2013), emphasize the significant role of input suppliers in guiding farmers in the utilization of farm inputs.

- **Middlemen**: act as intermediaries between local companies or companies in Vietnam that purchase rice. ACs and farmers have the choice of selling their rice directly to these middlemen. However, the presence of middlemen brings both advantages and disadvantages to the effective execution of contract farming. For example, the middlemen have the market power to manipulate market prices, which induces cooperatives and farmers to sell to them, breaching the terms and conditions of the contract signed with the contract company. In some cases, farmers lack working capital to buy inputs, inducing them to borrow from the middlemen on the condition that they sell the produce to the middlemen, according to KIIs and FGDs with AC and farmers.

- **Public and non-government research institutions**: The Cambodian Agricultural Research and Development Institute, the General Directorate of Agriculture, and the French Agricultural Research Centre for International Development are research institutes in Cambodia that have the objective of assisting farmers in accessing superior and reliable seeds as well as providing technical assistance. These research institutions will play a crucial role in ensuring the availability of diverse and pure seed varieties as well as developing strategies to mitigate the adverse effects of climate change. For instance, some farmers indicated during the FGDs that obtaining pure seeds is crucial when farmers are engaged in CF. Without pure seeds, farmers would be unable to produce the high-quality rice demanded by the contracting company. Further, during the FGDs, farmers expressed their desire to acquire more knowledge regarding climate

change and diseases that affect rice farming. They recognized the role of research institutions in providing this information and addressing their concerns.

Figure 2: The Decagon ecosystem of contract farming of rice



Source: Authors' compilation from KII and FGD interviews.

3.1.3 Regulatory framework

A new law on contract farming has been drafted by the Ministry of Agriculture, Forestry, and Fisheries and is waiting for further legislative process, while the timeline for final approval has not yet been determined. Two existing regulatory documents in Cambodia are still being used, namely Sub-Decree 36 and Directive 136, which govern the operations and execution of contract farming. Sub-Decree 36 outlines the institutions and coordination mechanisms led by the Ministry of Agriculture, Forestry, and Fisheries (MAFF), which is responsible for facilitating communication, coordination, and offering technical guidance and services.

According to Sub-Decree 36, the Ministry of Agriculture, Forestry, and Fisheries issued Ministerial Circular 196 in 2017 to outline the conditions and procedures for implementing contract farming. To oversee contract farming, MAFF established a secretariat within the Department of Agro-Industry (Decision 560). Additionally, a contract farming sub-committee was formed in all 25 provinces with the provincial governor as the chairperson. It is important to mention that the law regarding contract farming is currently being drafted (Chhim *et al.*, 2021; Ngo and Khon, 2023).

Introduced in 2011, the Law on Agricultural Cooperatives is an essential legal document for the implementation of contract farming. This law has the objective of encouraging Cambodians who are primarily engaged in agricultural production, agro-industry, agri-business, or agricultural-related services to establish and enhance agricultural cooperatives. Its purpose is to enhance collective bargaining power and safeguard the interests of cooperative members. According to the law, MAFF is responsible for supporting and promoting the establishment, operation, and growth of agricultural cooperatives.

Several informants during the data collection emphasized the importance of not only having laws and regulations in place for contract farming implementation but also focusing on effective implementation. As a result, it is crucial for the government to consider the different challenges that arise during the implementation of contract farming.

3.1.4 Contract modality

Contract rice farming is governed by either a formal or informal contracting model. Overall, in line with what was found by Chhim *et al*. (2021), modality of CF for rice in Cambodia is that companies contract agricultural cooperatives or farmer organizations to produce agricultural products for local consumption or export.

Rice contract farming in Cambodia is regulated through either formal or informal contracting models. Similar to the findings of Chhim *et al*. (2021), we also find that the typical modality of rice contract farming in Cambodia involves companies entering into contracts with ACs or FOs to produce agricultural products for either local consumption or export.

In the formal contracting process, when buyers and sellers, represented by the president of the AC, agree on the terms and conditions, both parties are required to apply to the Ministry or Provincial Department of Agriculture, Forestry, and Fisheries through the General Department or Department/Office of Agro-Industry. It is common for the contracting parties to utilize the contract template provided by the Department or Office of Agro-Industry. The contract is then officially signed by representatives of the company and the AC, with the Ministry or Provincial

Department of Agriculture, Forestry, and Fisheries (MAFF or PDAFF) acting as a signatory. The involvement of district and commune chiefs is often necessary to solidify the obligations outlined in the contract. Once the contract is signed, all parties are legally bound to fulfill the agreed-upon terms and conditions. Any violation of these terms and conditions would initiate a series of mediation processes conducted by the government in collaboration with the contract parties. The signed contract is duplicated so that all stakeholders involved can retain a copy for documentation purposes.

The only distinction in the informal contract arrangement is the absence of government involvement as a signatory. In other words, under an informal CF, contracting companies directly work with agricultural cooperatives and sign the contract based on mutually agreed terms and conditions without notifying or involving MAFF or PDAFF. In such cases, MAFF and PDAFF typically do not have legal obligations to assist in resolving conflicts among the involved parties. Although this model is being implemented and is more common than the formal arrangement, several informants who are from the government stated that it is not a recommended channel. The formal and informal contract farming models for rice and cashew nuts are visually summarized in Figure 5, as these models of contract farming exhibit similarities.

Under both formal and informal contracts, several terms and conditions are stated, a few of which are crucial:

- *Unit price*: this could be a fixed or flexible price, depending on the discussion and agreement of the parties involved. A fixed price implies that the unit price stated in the contract has to be applied regardless of market conditions. However, flexible pricing applies to a price range within which prices can vary. That means the final unit price could be agreed upon at the time of buying and selling. Flexible pricing, one that is based on market prices, seems to be more common than fixed pricing. For instance, in Battambang, the buyer and AC mutually agree to determine the unit price of rice based on the prevailing market price during the harvest period. Subsequently, a markup of KHR30,000 per ton is applied to the market price. Out of the KHR30,000 markup, KHR20,000 per ton is allocated to the farmers, while KHR10,000 per ton is provided to the AC as compensation for its coordination efforts with the farmers. The informant expressed that basing the contract price on the market price provides more flexibility for both buyers and farmers. Although the fixed-price contract model might be good for farmers, their experience with fixed prices has not been good.

- *Quantity and quality of rice*: this involves stating grain size and length, chemical substances, and others. Some informants provided feedback regarding the challenges of enforcing quality requirements among farmers due to varying levels of knowledge and awareness. Meeting the purity requirement (88–89 percent) is often difficult, and some buyers may even demand a purity level as high as 95 percent. In this context, some rice farmers suggested that "*the contracting company should not be overly strict with the contract if farmers fail to meet the agreed-upon quantity*". This is important because farmers may be hesitant to enter into future contracts if they feel excessively penalized for not meeting the quantity requirements.

3.1.5 Benefits of contract farming

Numerous informants expressed optimism regarding the benefits that parties involved in contract farming, particularly farmers, can derive from such arrangements. This is especially true when there is no market manipulation by middlemen. The following are some of the listed benefits:

- *Better and guaranteed price*: agricultural cooperatives and farmers would receive a better and guaranteed price on their produce under contract farming. This happens either under a formal or informal contract arrangement.

- *Market access*: farmers would also benefit from knowing that there are buyers who will buy the produce at the agreed standard and quality.

- *Knowledge on production*: because standards are set for rice production, farmers gain production knowledge and learn how to produce with them. For example, ACs and farmers under the contract rice farming agreement agree to implement Sustainable Rice Platform (SRP), which regulate production techniques from seed to land preparation (field leveling), weed control, and the use of fertilizer and pesticides. Farmers could participate in training courses to further improve their knowledge. There are 41 points in Sustainable Rice Practices. SRP aims to standardize rice production and reduce the use of harmful fertilizer and pesticides.

- *Participation in training courses and workshops:* The AC management team and members receive training on other aspects (e.g., accounting and bookkeeping).

- Traceability: The contracting companies clearly know the source of the ingredients they use.

3.1.6 Challenges of contract farming implementation

Drawing on our qualitative data, rice farmers face several challenges, which can be classified as follows:

- *Production***:** Climate change has become a significant challenge for farmers, and they have been struggling to cope with its effects. While there has been an improvement in technical knowledge among farmers, particularly those who are members of ACs, the level of knowledge remains uneven. Only a few farmers are willing and motivated to expand their knowledge and stay updated with new production techniques that could potentially address production issues, either partially or entirely. For instance, the use of chemical fertilizers and pesticides was a common concern raised by all participants in the FGDs. The availability and distribution of knowledge in this area are limited and inconsistent, requiring collaborative efforts from all stakeholders to address them. As stated by a key informant interviewee from Battambang, “Having a proper irrigation system is necessary for farmers to mitigate the impacts of climate change.”

- *Lack of extension services***:** there is a need to disseminate information and raise awareness among agricultural cooperatives (ACs) and farmers regarding the implementation of contract farming. However, the Office of Contract Farming at the

Provincial Department of Agriculture, Forestry, and Fisheries lacks the necessary jurisdictional authorities, staff, and financial resources to effectively carry out this task. Currently, there are only seven staff members working at the Agro-Industry Office who are responsible for monitoring contract farming implementation in the province. This staffing level is inadequate, resulting in challenges and insufficiencies in monitoring and evaluation processes. According to KIIs with ACs, it was found that there is a need to raise awareness about how to effectively honor the contract, ensuring that each farmer has a better understanding of contract farming and its implementation.

- *Working capital*: the lack of capital by the AC to buy rice from farmers was raised and highlighted as another challenge in the rice value chain. The lack of capital also constrains farmers from selling to the AC or entering a formal contract with the AC, as they are more likely to sell to whoever could buy the produce when they need money to pay back the credit, either to the middlemen or other creditors. All respondents reported that obtaining credits from the Agricultural and Rural Development Bank and other private creditors is difficult as most institutions require collateral. MFIs would charge about 1 percent per month. Although the interest rate charged by the ARDB is lower (about 50 percent lower), the process and procedures for loan applications are difficult. The model is not appropriate for smallholder farmers and the AC. Consequently, middlemen can have the market power to manipulate market prices, which induces cooperatives and farmers to sell to them, breaching the terms and conditions of the contract signed with the contract company (FGDs in Battambang).

- *Lack of participation*, particularly from large firms Implementing contract rice farming can be costly and time-consuming, implying that rice millers or exporters who have more resources are in a better position compared to small and medium-sized companies. Nonetheless, not many large firms are involved in contract rice farming.

There was a negative experience when the company did not purchase the rice due to a significant price drop during that period. Consequently, farmers and AC developed a negative impression of the company that wanted to buy their produce using CF. The case study for that contracting company is presented in Box 1.

Box 1: A case study of a negative experience with a contracting company, Battambang

A failure case with a contracting company

The company's objective was to establish connections among key stakeholders in the agricultural value chain and provide funding, technical assistance, and market access. A contract was signed between the company and the AC for the purchase of paddy rice with a fixed unit price. However, during the harvest season, the company failed to fulfill its commitment to buy the rice as agreed upon. This situation caused great distress for both the AC and the farmers, as they needed the money to repay loans taken for production purposes. Despite numerous attempts by the AC and interventions from the Provincial Department of Agriculture, Forestry, and Fisheries, as well as senior representatives from the Ministry of Agriculture, Forestry, and Fisheries, the issue remains unresolved. Consequently, farmers' trust and confidence in contract farming have been severely undermined, with ripple effects impacting other reputable and responsible buyers. The lack of clarity in the conflict

resolution process and procedures has placed the AC and farmers in a disadvantageous position.

The participants in the FGDs and KIIs expressed their concerns, stating that if such cases remain unresolved, it would be challenging to promote and expand the implementation of contract farming in their neighborhood.

Source: KII and FGD interviews (Sangkae, Battambang)

3.1.7 Disputes and dispute resolution

The current regulations appear to be inadequate for the effective implementation of contract farming, indicating a potential need for a specific law on contract farming. However, it is crucial to emphasize that the implementation of existing regulations is of greater importance. Additionally, there is a lack of formal processes and procedures to address conflicts that may arise between the parties involved in contract farming. The Provincial Department of Agriculture, Forestry, and Fisheries primarily plays a facilitative role by organizing meetings and negotiations among the stakeholders. In cases where the department is unable to resolve the issue, it is then escalated to either the provincial or ministry level for further intervention.

Generally, when farmers are unable to fulfill the agreed-upon quantity of their produce, they have the option to report valid reasons to the agricultural cooperatives, who will then notify the company. However, these matters are typically addressed in a semi-formal manner, lacking a systematic conflict resolution mechanism. The case presented in Box 1 serves as a practical example, highlighting that there has been no resolution for the AC and farmers thus far, despite being referred through the formal mechanism.

The dispute settlement mechanism for formal contract types can be observed in Figure 6. However, our qualitative data suggests that major disputes in the implementation of rice contract farming have been rare, with most cases being resolved outside of formal mechanisms.

3.1.8 Support by stakeholders

Drawing from the qualitative data gathered during our fieldwork, we have compiled a summary of the support provided by stakeholders in Cambodia for rice contract farming as follows:

- The agricultural cooperatives play a crucial role in enhancing the bargaining power of their members, enabling them to secure better prices for their produce. This finding aligns with the empirical evidence presented in a study conducted by An and Culas (2015) in Cambodia. To provide a concrete example from our data, an AC has entered into a contract with a Rice Milling company in Kampong Cham to purchase 1,300 tons of Sen Kroob paddy rice. Furthermore, there is a potential opportunity to sign an additional contract with another contracting company to purchase Sen Kraob, Sra Ngae, or OM varieties of rice.

- Development partners and the Provincial Department of Agriculture, Forestry, and Fisheries assist in the establishment of ACs, which is in line with previous studies

conducted in Cambodia by Theng *et al*. (2014), An and Culas (2015), and Ngo and Khon (2023).

- ACs play a vital role in disseminating production knowledge to their members. For example, contracted farmers are provided training to cultivate high-quality rice in accordance with the guidelines of Sustainable Rice Platform. With the assistance of contracting companies, PDAFF, and NGOs, the ACs educate their members on the proper and compliant use of chemical fertilizers and pesticides, ensuring adherence to standard requirements. Additionally, they focus on producing seeds with the necessary level of purity.

- ACs in Cambodia primarily engage in providing loans to their members, according to our findings. This is consistent with a recent study by (Ngo and Khon, 2023) which reported that the majority of ACs (63 percent) offer credit services as their main activity. During our study, it was observed that when farmers need additional funding for farm inputs prior to harvest, they can obtain a short-term loan from the ACs without requiring collateral. These loans come with an interest rate of 3 percent and are typically utilized for a few months to overcome cash constraints. The interest accrued from these loans is either used for AC operations or added to the AC capital. As the AC's capital is limited, some farmers suggested that securing additional funding with lower interest rates would enable the ACs to provide loans to farmers when they need them, particularly before harvest.

3.1.9 Women participation

The data gathered from KIIs and FGDs indicates that women are provided with equal opportunities and are encouraged to assume management positions within the agricultural cooperatives. At the cooperative level, both women and men have equal opportunities to participate and compete for management roles on the Board. Recruitment is based on merit, and free and fair elections are conducted during the annual AC summit. For example, in an AC in Battambang, women hold 57.1 percent of the Board composition, including the position of vice president. Other positions held by women include finance and accounting, as well as secretary roles. Figure *3* illustrates and summarizes the organizational structure with respect to gender composition.

Despite the significant participation of women in CF implementation, they often encounter various constraints compared to men when it comes to holding management positions on the AC Board or participating in other activities.

- A low level of education can impact women's confidence in performing their job. For instance, the average education attainment for women in the FGDs is at the primary school level. The finding is line with the study conducted by Theng *et al*. (2014).

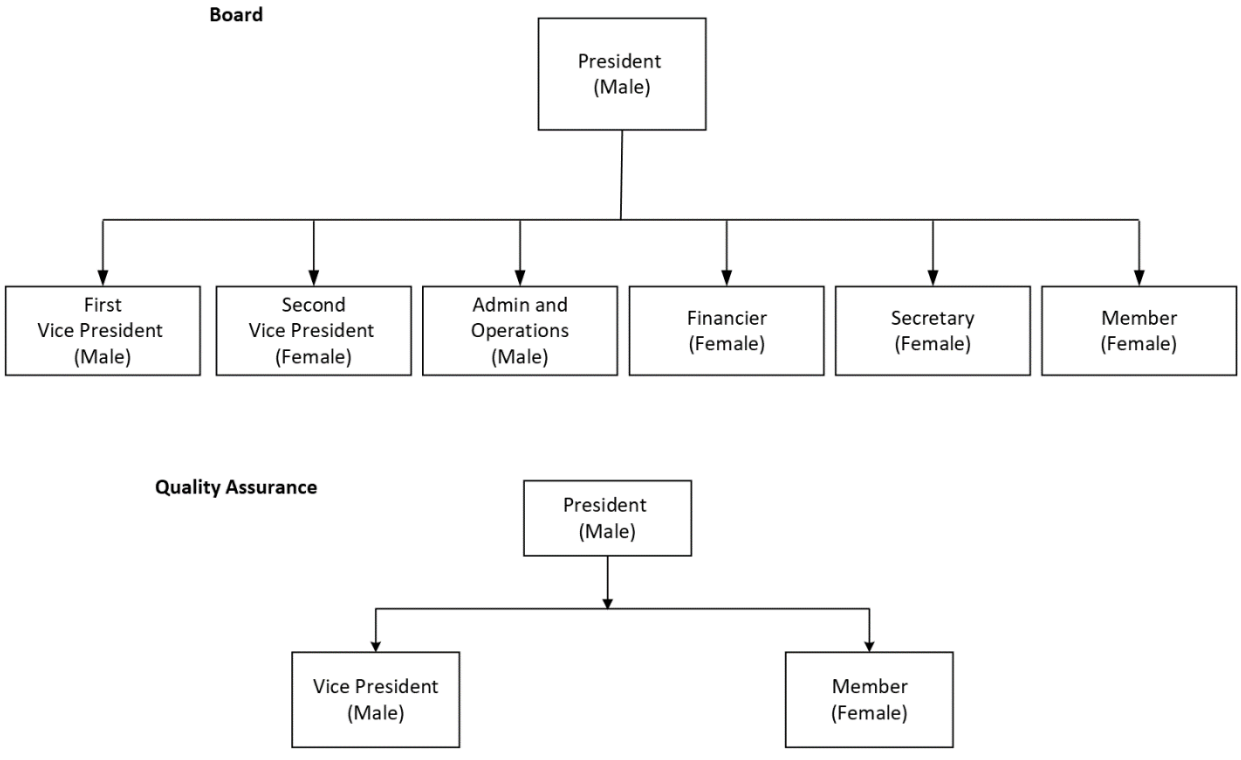
- The lack of financial incentives**,** as CF participation is completely voluntary, can be a significant factor hindering participation, especially among young individuals with relatively higher education levels. The absence of a salary and other compensations may lead them to seek paid employment opportunities either locally or elsewhere, such as in Phnom Penh or abroad.

- Women are often burdened with household chores and other daily economic activities, which can limit their availability for additional commitments. This situation is partially attributed to the lack of men's participation in sharing household responsibilities. In relation to this, some women expressed that "travels are common for AC representatives, which can be challenging for women."

- Women often lack decision-making power when it comes to the actual implementation of activities. For example, while there is an increasing number of women participating in various AC activities, they are often representing their husbands rather than having independent decision-making authority. During an FGD in Battambang, some women shared with us that “men were able to participate in seminars and workshops in other provinces, while women faced questioning and, at times, scolding from their husbands if they wanted to do the same.”

Furthermore, the results indicate that the ACs included in the KIIs and FGDs do not have an internal policy of implementing quotas for women in leadership positions, despite providing equal opportunities and encouragement for women to participate. Recruitment primarily relies on merit and the willingness of individuals to contribute to AC activities.

Figure 3: Organizational chart of an AC in Battambang



Source: KII and FGD interviews in Battambang

3.2 Cashew

3.2.1 Overview

Cultivated and harvested areas of cashew nuts have increased noticeably for the last five years, averaging 24.7 percent and 16.7 percent per annum, respectively, during 2015-2019. In 2021, for instance, the production covered 405,991 hectares with 275,679 hectares of harvested areas, resulting in 472,636 tons of yields (MAFF, 2022). Despite the increase, cashew production has faced several challenges in terms of production techniques, quality, disease-free, and climate-resilient seeds, harvest and post-harvest losses, processing and logistics, and human resources (RGC 2023).

Cashew is one of the agro-industrial crops prioritized for exports. Pursuant to the Agricultural Development Policy Framework (2021–2030), the government has launched the National Cashew Policy (2022-2027), laying out the roadmap to increase productivity and competitiveness of cashew production for local, regional, and global cashew markets. To achieve the vision and goals, the government sets three targets: (1) increase productivity and competitiveness; (2) promote industrialization to raise processing capacity by 25 percent by 2027 and by at least 50 percent by 2032; and (3) enhance exports through market diversification, inter-sectoral export linkages, trade facilitation, reductions in production costs, and market comparative advantage.

A range of activities are intended to improve production and productivity, one of which is to utilize the agricultural-based production contract (contract farming) to ensure quantity, quality, and other standards required for exports. The Ministry of Agriculture, Forestry and Fisheries, the Ministry of Commerce, other relevant ministries and agencies, and sub-national authorities are the main implementing actors to ensure that contract farming is effectively implemented and that the capacity of farmers and agricultural cooperatives is strengthened.

3.2.2 Ecosystem

Figure *4* highlights the ecosystem of stakeholders involved in the implementation of contract farming of cashew nuts. Below, we briefly illustrate the role and responsibilities of each actor.

- **Farmers**: At the center of the ecosystem are farmers who produce the cashew nuts based on the agreed terms and conditions specified in the contract. They play an important role in the successful implementation of the signed contract.

- **Agricultural cooperatives, agricultural associations and federations**: ACs represent a collection of farmers and are established to protect farmers' interests and bargaining power to avoid possible exploitation and unfair practices by the buyers. ACs often play an intermediary role between buyers and farmers. Ensuring price stability and market access is another crucial mandate of the ACs. Agricultural associations or federations are established organizations of agricultural cooperatives with the mission to increase collective bargaining power and protect members' interests. Information sharing and the provision of training courses related to cashew nuts are other activities of the ACs and agricultural associations and federations.

- **Buyer companies**: Contracting companies can be processors and/or exporters and are the main stakeholder in the implementation of contract farming. They often work with

agricultural cooperatives, not directly with farmers. The buyer companies might also provide agricultural equipment and training courses (e.g., harvest techniques, plantation, and the use of fertilizer).

- **Middlemen/women**: The group represents buyers for local companies or companies in Vietnam. ACs and farmers could have the option of selling their cashew nuts to middlemen or women. Their existence presents advantages and disadvantages to the successful implementation of contract farming.

- **Input suppliers**: The group represents retail and wholesale suppliers of agricultural equipment, fertilizer, and pesticides. As the use of fertilizer and pesticides remains high and unstandardized, the role of input suppliers is crucial in terms of supplying quality inputs and disseminating the correct uses of the inputs.

- **Ministry of Agriculture, Forestry and Fisheries**: MAFF is the main government ministry in the implementation of contract farming coordinating and providing technical guidance and services to involved stakeholders. An important role that MAFF plays in the contract farming ecosystem is to serve as a signatory witnessing the signing between buyer companies and agricultural cooperatives. As stipulated in the Sub-Decree 36 on Contract Farming, MAFF is the chair of the Coordination Committee for Agricultural Production Contract.

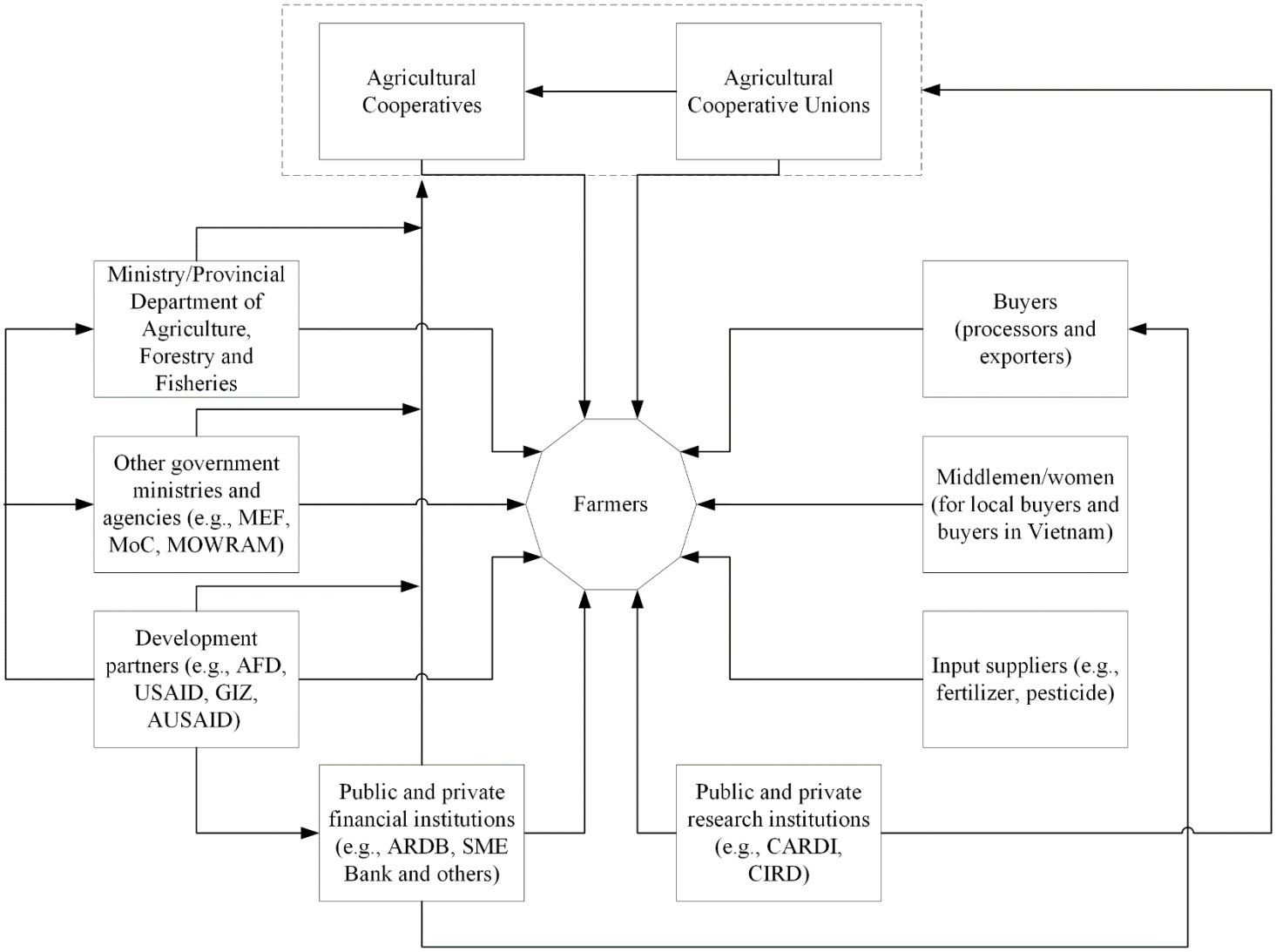
- **Other government ministries and agencies**: The CCAPC contains seventeen other government ministries and agencies. Their role is crucial for effective and timely coordination of the committee.

- **Development partners (DPs)**: Several DPs have provided technical and financial support to the agriculture sector and contract farming. The United States Agency for International Development (e.g., harvest program), the Australian Agency for International Development (AUSAID) (e.g., CAVAC and CAPRED), the German Development Agency (GIZ), and the French Agency for International Development are DPs who have been supporting contract farming implementation. It should be noted that the DPs have supported almost all stakeholders in the ecosystem from MAFF to ACs and to Farmers.

- **Public and private credit institutions**: Access to finance remains crucial for the successful implementation of contract farming. It is a cross-cutting issue affecting contracting companies, ACs, and farmers. Public and private credit institutions coexist. Examples of public credit institutions are the Agricultural and Rural Development Bank (ARDB), the SME Bank, and the Credit Guarantee Cooperation of Cambodia (CGCC). These institutions are established to provide more streamlined and flexible loans with relatively lower annual interest rates. Private credit institutions include commercial banks, microfinance institutions, and other credit operators. It should be noted that public institutions such as ARDB lend more to buyer companies, not much to ACs and farmers.

- **Public and private research institutions**: The Cambodian Agricultural Research and Development Institute (CARDI) and the Cambodian Institute for Research and Rural Development (CIRD) are research institutes aiming to help farmers access improved and quality seed and provide technical support. The role of these research institutions will be indispensable in terms of seed variety and purity and strategies to mitigate the impacts of climate change.

Figure 4: The Decagon ecosystem of contract farming of cashew nuts



Source: Authors' compilation from KII and FGD interviews.

3.2.3 Regulatory framework for contract farming

Sub-Decree 36 on Contract Farming and Directive 136 are the two regulatory documents governing the functioning and implementation of contract farming in Cambodia. Provisions under the Sub-Decree are applied to all types of contract-based agricultural production and businesses. The Sub-Decree stipulates the institutions and coordination mechanisms led by the Ministry of Agriculture, Forestry, and Fisheries (MAFF), which is responsible for communication and coordination and providing technical guidance and services. It states that MAFF should monitor and evaluate all functions, report to the government, and collaborate with relevant ministries and institutions. The Sub-Decree also stipulates the establishment of the Coordination Committee for Agricultural Production Contract (CCAPC). The main duties of this committee are to: develop policy and strategic plans that support and promote contract farming; facilitate and strengthen harmonization between contracting parties; intervene in or reconcile arguments or conflicts relating to agricultural production contracts that expert institutions are unable to resolve; or help settle conflicts between institutions.

Pursuant to Sub-Decree 36, a ministerial circular 196 was issued in 2017 by MAFF, outlining conditions and procedures in the implementation of contract farming. MAFF established a secretariat for contract farming within the Department of Agro-Industry (Decision 560). A contract farming sub-committee was also formed at the sub-national level in all 25 provinces, with the provincial governor as chairman of the sub-committee (Chhim *et al.*, 2021). It should be noted that the law on contract farming is in the drafting stage (Ngo *et al*., 2021).

The Law on Agricultural Cooperatives, promulgated in 2011, is another crucial legal document in contract farming implementation. The law aims to promote the participation of Cambodians whose primary economic engagement is in agricultural production, agro-industry, agri-business or services related to agricultural production in establishing and developing agricultural cooperatives to increase collective bargaining and protect members' interests. The law stipulates that MAFF is the competent authority to support and promote the establishment, operation, and development of agricultural cooperatives.

In 2017, MAFF released a handbook on contract farming, aiming to provide clarity to farmers and buyers in the implementation of contract farming. The handbook outlines the roles and responsibilities of farmers, buyers, and coordinating authorities. The handbook also provides application forms and templates that participating entities in the contract can use.

3.2.4 Models of contract farming and types of contracts

Eaton and Sheperd (2001) outline five contract farming models. The implementation of certain models is dependent on country context and the needs of buyers and sellers.

- *The centralized model*: In this type of contract farming, the contracting company is the only entity involved in contracting with farmers. All services are provided by the company, with no involvement from other stakeholders. In this model, the contracting company often contracts with many smallholder farmers rather than buying from several large ones.

- *The multipartite model*: Instead of having the buyers solely involved in the contract, there are several stakeholders providing services based on their expertise. For instance, while the buyers can provide technical support to farmers, they might lack sufficient financial capital. Thus, they might rely on financial institutions to fill the gap. This model is common involving large projects that each entity does not have sufficient resources to implement the project.
- *The intermediary model*: In this type of contract farming, the company work with intermediaries (e.g., trade agents or agricultural cooperatives), avoiding a direct involvement with the farmers. The intermediaries would then collect the harvested produce from the farmers and sell it to the company.

- *The informal model*: The buyer company directly contracts the farmers either verbally or in writing. There is no involvement from other entities in the ecosystem. The model is more suitable for short-term and small-scale contracts.

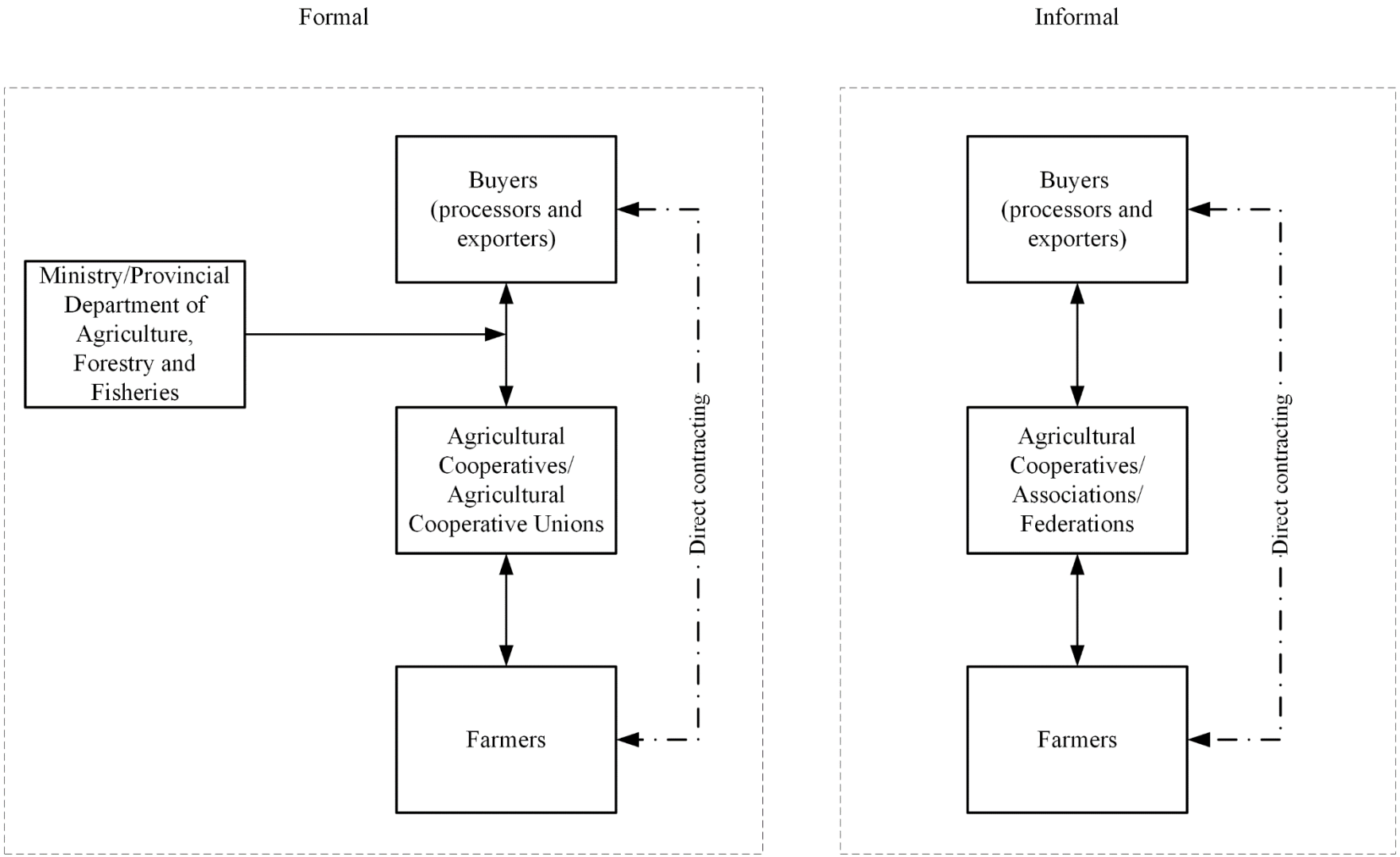
- *The nucleus estate model*: Under this model, the buyer company owns and manages the farm. The land could be their own or leased from farmers. The company has full control over production and quality.

In Cambodia's context, the contract farming of cashew nuts involves a mix of the multipartite and intermediary models, more closely leaning toward the intermediary model. Figure *5* presents the models and types of contract farming.

The buyers, agricultural cooperatives, farmers, and the Ministry of Agriculture, Forestry, and Fisheries are the main entities in the contract. Both formal and informal types of contracts exist. Under the formal model of contract farming, once buyers and sellers, represented by the AC president, respectively, agree on terms and conditions, both parties need to apply to the Ministry or Provincial Department of Agriculture, Forestry, and Fisheries through the Department or Office of Agro-Industry. The contract parties are often required to use the contract template of the Department or Office of Agro-Industry. The contract is officially signed off by representatives of the company and ACs, with MAFF or PDAFF as signatories to the contract. Once signed, the parties involved have binding obligations to satisfactorily fulfill the terms and conditions. Violation of the terms and conditions would result in several steps of mediation by the government. It should be noted that it is rare that the company signs contracts directly with farmers. Thus, the signing happens with representatives of the agricultural cooperatives or agricultural cooperative unions. The government also has an interest in ensuring that the implementation of the contract is as smooth and effective as possible. Under the informal contract, the company contracts verbally or in writing with agricultural cooperatives to buy the cashew nuts, with no involvement from MAFF or PDAFF. Again, buyers often do not contract directly with farmers.

It should be noted that the implementation of the contract farming model in an informal arrangement remains common compared to a formal one. Although the informal type might present certain advantages and flexibilities for the involved entities, it might be safer to choose the formal channel of contracting. "Although the informal arrangement is being implemented and is more common than the formal one, it is not a recommended channel" (Government official, Kompong Thom).

Figure 5: Models of contract farming of cashew nuts



Source: Authors' compilation using the KII and FDG interviews.

Under both formal and informal arrangement, several terms and conditions of the contract are stated.

- *Unit price*: This could be fixed or flexible, depending on the discussion and agreement between the buyer company, ACs, and farmers. A fixed price implies that the unit price stated in the contract must be applied regardless of the prevailing market prices and conditions. Nonetheless, flexible pricing applies to a price range within which prices can vary. That means the final unit price could be agreed upon at the time of buying and selling. Flexible pricing, one that is based on market prices, seems to be more common than fixed pricing.

- *Price deviation*: In certain instances, the parties might state a price deviation from which an agreed markup can be applied. For instance, the stated price deviation is 3-5 percent for conventional cashew, and the unit price is US$2 per kilogram. At the time of buying and selling, the unit price based on the market is US$2.5 per kilogram (a 25 percent increase). Thus, the buyers can add 3-5 percent to the $2 per kilogram price by buying at US$2.04-US$2.1 per kilogram from the agricultural cooperatives.

- *Quantity and quality of the cashew nuts*: This involves stating size, chemical substances, color, and others. The unit price at the time of buying might be lower than the stated contract price if the quality is lower.
- *Seed varieties*: Choosing highly productive seed is crucial to produce cashew nuts, which are in high demand. M23-H09 is an example of seed type some buyers contact with ACs and farmers.

- *Inputs used*: Having standard compliance encourages farmers to adhere to these requirements. The company maintains a list of input usage for each contracted farmer, with agreed-upon quantities determined in advance.

- *Shocks*: If a shock occurs due to drought or other climate-related issues, farmers are required to notify the buyer company. For instance, the notification should be 2 to 3 weeks prior to the agreed delivery date (Processor, Kompong Thong).

Box 2: A case study of cashew contract farming, Kompong Thom

A cashew nut agricultural cooperative in Santuk district, Kompong Thom has recently signed a formal contract with a company for the purchase of 50 tones of cashew nuts per season. The contract was witnessed by representatives from the Department of Agriculture, Forestry and Fisheries and a development partner. The development partner is the main coordinator throughout the process. Main terms and conditions of the contract are:

- *Unit price*: the price was between KHR4,500-KHR5,200 (US$1.13-US$1.3) per kilogram of wet cashew nuts. This range was formulated mainly based on the prevailing market price of cashew nuts at the time of buying. In other words, the stated price is flexible rather than fixed, allowing the involved entities to negotiate for the final price.

- *Size and moisture contents of the cashew nuts*: The exact size, moisture, and color are also stated in the contract. The actual price might vary based on the quality of the cashew nuts at the time of buying.

- *Quantity bought and sold*: the quantity of cashew nuts is clearly agreed and stated in the contract. The contract also appends a list of farmers, mostly members of the AC, with the quantity each farmer could sell.

Besides, the buyer company provides minimal agricultural equipment and training courses on harvest technique, plantation, and the use of fertilizer. Other training courses include accounting, bookkeeping, and financial planning. The training was provided mainly to the representatives of the agricultural cooperatives and not much to the farmers. The training was mainly implemented with financial support from the development partner involved.

Source: KII and FGD interviews (Santuk, Kompong Thom)

3.2.5 Benefits of contract farming

Contract farming has several benefits for buyer companies and farmers of cashew nuts. The majority of the key informants and respondents to the focus group discussion agreed that they had benefited from contract farming from better and guaranteed price to market access and to production knowledge.

> We could get stable and guaranteed price of cashew nuts. We know the price we will receive and the quantity we will supply. We also participated in training courses provided by the company and other stakeholders, helping us improve production further. In addition, being a member of the agricultural cooperative helps increase collective bargaining protecting us from being exploited by the buyer and middlemen (FGD respondents, Kompong Thom).

Below is a list of benefits for farmers and buyers.

Farmers	Buyer companies
- *Guaranteed and stable price*: Farmers are generally unaware of the market price for their produce at the start of the season. Given fluctuations in market demand, the risk of getting a lower price can be high. With contract farming, the farmers receive a guaranteed price. - *Market access*: Farmers would also benefit from knowing that there are buyers who will buy the produce at the agreed standard and quality. - *Skill and knowledge on production*: Given that standards for cashew nuts are set in the contract, farmers need to be more careful and attentive in the production process. The skills and	- *Desired quality and quantity of produce*: The companies could get standardized products from farmers. - *A guard against market supply-demand fluctuation*: The buyer companies could have a stable supply of raw materials used in the production of processed food. - *Traceability*: The buyer companies clearly know the source of the ingredients they use. - *Contributions to poverty reduction and community development*: The benefits farmers get from implementing contract farming could contribute to

knowledge might also be transferred by the buyer's company. - *Increased collective bargaining*: Membership in the agricultural cooperatives help farmers speak in one voice, raising their bargaining power and protecting them from being exploited by the buyer company or the middlemen.	improved living standards for the farmers and the community.

Source: KII and FGD interviews.

3.2.6 Challenges of contract farming implementation

Despite the benefits, ensuring a smooth and effective implementation of contract farming is hindered by several constraints. Below, we list and explain the challenges reported by KII and FDG respondents in the case of cashew nuts.

- *Production*: Overall, the majority of the KII and FGD respondents agreed that farmers' knowledge on the production of cashew nuts has improved, attributable to both the training courses provided by the buyer companies and other stakeholders and hands-on experience. The use of fertilizer and pesticides is the most common challenge raised by the interviewed respondents.

  > When it comes to the application of pesticides, farmers often rely solely on suppliers, who may lack proper knowledge on how to correctly mix and spray the pesticides according to the recommended dosage. Farmers often follow their peers, who have limited knowledge of the use (FGD with cashew nut growers, Kompong Thom).

  Farmers also lack the technical know-how to mitigate production losses caused by pests and tea mosquito bug. The production challenge has been intensified by climate change (i.e., unpredictable rain falls, precipitation with a high level of salt content, and high temperature).

- *Access to finance*: The lack of capital by the ACs to buy cashew nuts from farmers was raised and highlighted as another challenge in the cashew nut value chain. The lack of capital also constrains farmers from selling to the ACs or entering a formal contract with the ACs, as they are more likely to sell to whoever could buy the produce when they need money to pay back the credit, either to the middlemen or other creditors. Although access to finance has improved, rigid loan terms and conditions remain. The interviewed buyers (processors and exporters), AC representatives, and farmers agreed that the annual interest rates charged by ARDB and SME Bank are lower than those charged by private financial institutions, about

50 percent lower[3]. Nonetheless, collateral-based lending remains common, further limiting borrowing. Also, ARDB and SME Bank target processors and exporters who have collateral or a higher ability to pay, not agricultural cooperatives and farmers. "The lending model is not tailored to smallholder farmers and the AC" (FDG interviews, Kompong Thom).

- *Competition with buyers from Vietnam*: The existence of the Vietnamese market presents both opportunities and challenges. On the one hand, Vietnam provides market access where farmers can sell their produce. On the other hand, the AC could have difficulties buying the required quantity when farmers choose to sell to middlemen, who then sell the produce to Vietnam.

- *Lack of support from DPAFF*: Although the Provincial Department of Agriculture, Forestry and Fisheries plays a coordinating role in the implementation of the signed contract, more support is expected from PDAFF. The results of the KII and FGD interviews indicate minimal assistance to the ACs and farmers from PDAFF, particularly on extension services for production techniques.

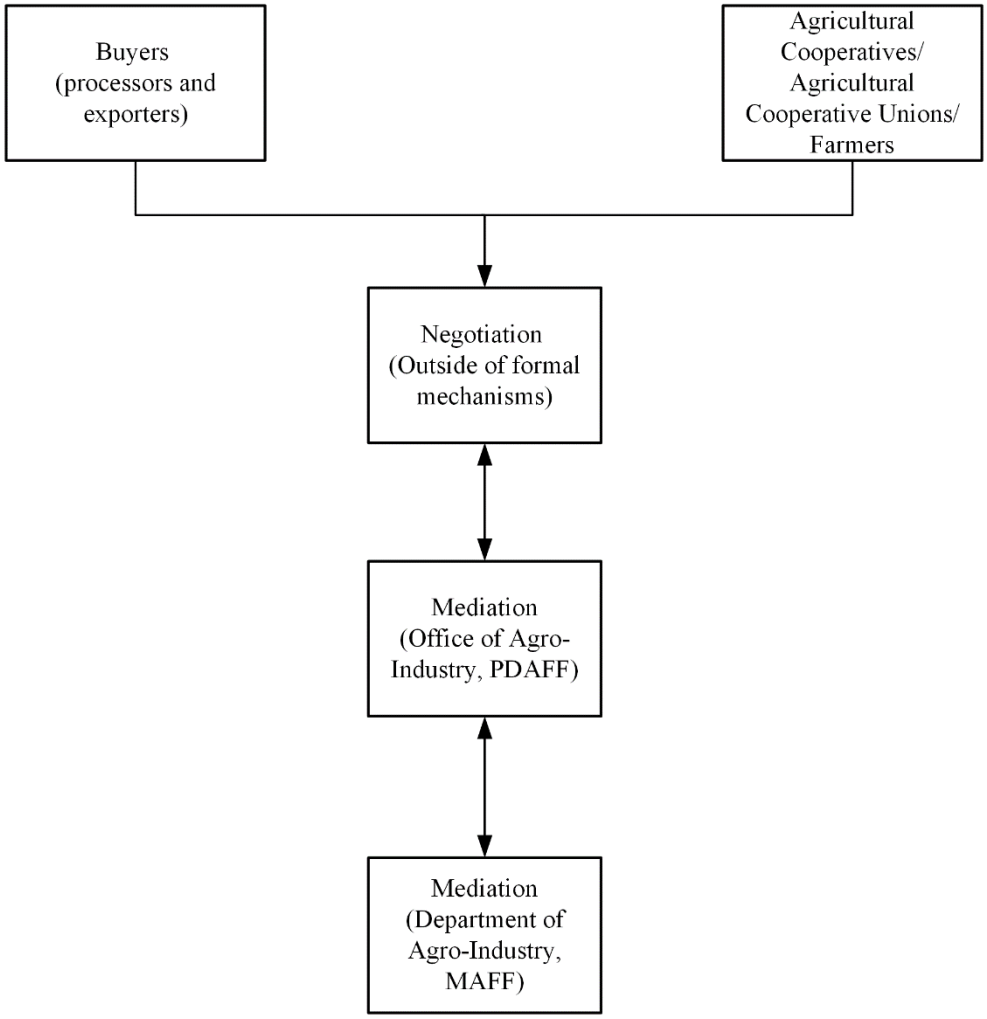
3.2.7 Disputes and dispute resolution

Conflicts arise when terms and conditions agreed upon by farmers and buyers are violated by either party or both. The results of the KII and FGD interviews indicate that there have not been clear guidelines on how breaches of contract terms and conditions will be resolved. Settlement of disputes outside of formal mechanisms between farmers, ACs, and buyers is common. If both parties could not agree on the resolution, they might bring the case further to the village or commune chief. They could also bring the unresolved case to the Office of Agro-Industry, the Provincial Department of Agriculture, Forestry and Fisheries, and, finally, to the Department of Agro-Industry, the Ministry of Agriculture, Forestry and Fisheries. It should be noted that the involvement of MAFF or PDAFF in dispute settlement is only done under the formal contract type. MAFF or PDAFF might be involved when conflicts arise under the informal contract arrangement. Nonetheless, they are not legally obliged to do so.

Figure 6 presents the mechanism for dispute settlement under the formal contract type. It should be noted that the interviewed respondents indicate that there have not been major disputes in the implementation of contract farming of cashew nuts, and most of the minor cases were settled outside of formal mechanisms.

[3] Microfinance institutions and other credit operators could charge up to 1 percent per month (12 percent per annum), depending on loan size. Collateralized lending is common, constraining farmers, ACs and SME owners from borrowing.

Figure 6: Mechanisms for dispute settlement



Source: KII and FGD interviews.

3.2.8 Support by stakeholders

Another key actor in the contract farming ecosystem is a group of development partners who have supported government ministries and agencies, buyer companies, agricultural cooperatives, agricultural cooperative unions, farmers, public and private financial institutions, and public and private research institutions that conduct agricultural research and development. Their involvement has been indispensable in filling the technical and financial gaps. The United States Agency for International Development (USIAD) (e.g., harvest program), the Australian Agency for International Development (AUSAID) (e.g., CAVAC and CAPRED), the German Development Agency (GIZ), and the French Agency for International Development (AFD) are examples.

3.2.9 Women participation

The results of the KII and FGD interviews indicate that women's participation in contract farming has increased, particularly at the farmer level. An increasing number of women have also joined agricultural cooperatives and taken up various positions in the management team. Nonetheless, their representation in top positions (i.e., AC president or vice president) remains low even though equal opportunities are opened to them. The results seem to also indicate position segregation, with women holding financial and administrative posts. Some KII and FGD respondents said that women perform better in those roles than their male peers.

Despite equal opportunities and strong encouragement, several factors constraint women from holding top positions.

- Domestic work burden is the main factor constraining their ability to participate in the management of the AC and other activities. They need to take care of the children, husband, and other household chores in addition to their farming and other non-farm activities. Men's participation in household chores is viewed as insufficient to allow women to spend more time on the work.

- FGD participants tend to believe that men are more suitable for the management position and could perform that task better than women, as men could participate in seminars and workshops in other provinces. They also raised the issue of cultural and social norms that women should be at home looking after the children and the house and that men are the breadwinners.

- Women often lack confidence. Despite the equal opportunity for women to participate, they often shy away from management positions. The lack of confidence is mainly attributable to a low level of education and limited support from their male partner.

- Particularly for the AC, no financial incentive is another factor resulting in low participation and unwillingness to participate in the AC's activities. Young and educated men and women would look for better opportunities in the area or other provinces.

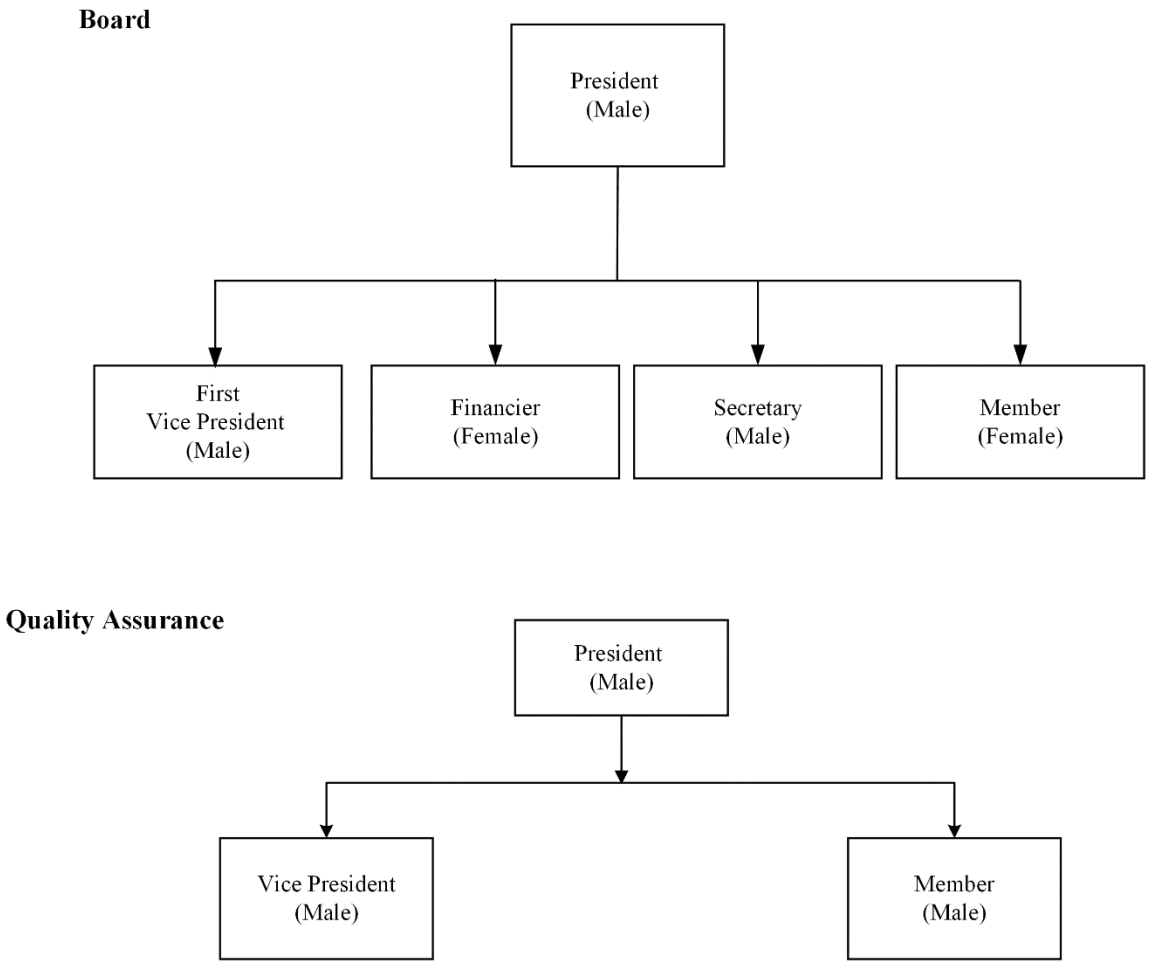
> The capacity of the AC remains limited, particularly in leadership and management. Lack of financial incentives is one of the main factors contributing to the lack of participation and human resources. Women are given equal opportunity and are encouraged to hold management positions in the AC. However, they are often reluctant and not confident to participate (AC president, Kompong Thom).

Box 3: Women's management role: a case of a cashew nut agricultural cooperative in Kompong Thom

Below are graphs that present the organizational structure of the Board and Quality Assurance Team of a cashew nut agricultural cooperative in Kompong Thom. The AC was established in 2012 but was formally registered in 2019. There were 149 members at the

time of the survey. Women comprised of 44 percent of the total members. As shown, there are two female members on the Board: a financier and a representative of AC members. The president and vice president are male. It should be noted that all members of the Quality Assurance Team are male.

Figure 7: Organizational chart of an AC in Kampong Thom



Source: KII and FGD interviews, Kompong Thom

3.3 Rubber

3.3.1 Overview of rubber production in Cambodia

Natural rubber (NR) has been one of the most important cash crops in Cambodia for both industrial scale and smallholder livelihoods. Based on the data from the General Department of Rubber (GDR), rubber plantations in Cambodia cover a total of 404,159 hectares; an estimated 72 percent are tapped for latex, while 28 percent are still in their immature phase yet to deliver a first harvest (DGR, 2021). In 2021, Cambodia exported about US$740 million to international markets, making it the 6th largest natural rubber exporter worldwide. Based on value, rubber was the 11th most exported product from Cambodia. The export figure was

different from GDR's estimate at about US$530 million in 2021 and almost US$542 million in 2022 (OEC, 2021; GDR, 2021). Based on the latest GDR's figure, rubber exports from Cambodia surged by 42.8 percent in the first quarter of 2023 compared to the same period last year and brought the country US$168 million. The main export destinations are Vietnam at approximately 85 percent, while others include China, Malaysia, South Korea, Singapore, India, and the EU (GDR, 2023).

The price volatility has been a major issue affecting different aspects of NR production in Cambodia, including scaling up, how the rubber trees are grown and maintained (i.e., soil fertility and pest and disease management), and how latex is tapped and sold. For the last 20 years, the international price of NR has varied from US$1,315 per metric ton (the lowest in 2002) to US$5,400 per metric ton (the highest in 2011). The average price in 2022 was approximately US$1,450 per metric ton, according to Trading Economics, a major source for international pricing of commodities. Major factors influence the price volatility, usually linked to the increase or decrease in demand in major markets for tires such as China and the relative price of oils, which could be used as an alternative synthetic rubber product. Other factors might also include fluctuations in rainfall and drought in major producing areas such as countries in Southeast Asia and India.

Although rubber is the third-most important crop in Cambodia, it has received little attention and funding. The Ministry of Agriculture, Forestry, and Fisheries through GDR has drafted the "Rubber Law" in 2019 with industrial players and other partners, which aims to manage the rubber subsector in Cambodia and will cover activities involved in rubber harvesting in Cambodia. It has been at the Council of Ministers for review (Chan, 2018). However, the law has not yet been approved. A multi-agency partnership has been formed in 2021 through the agreement between WWF and the GDR for transparent and sustainable natural rubber supply chains in Cambodia. This effort also emphasizes the importance of smallholder rubber cooperatives for a sustainable rubber supply chain (Chan, 2021).

3.3.2 Overview of rubber latex value chain and resource flow

Natural rubber production in Cambodia could be classified into two categories, industrial and smallholder/medium plantations. For the industrial plantations were mainly derived from the privatization of the former state own plantations in the late 1990s and early 2000s, and through economic land concessions to different Cambodian and foreign owned private companies, in which the plantation sizes could reach several thousand or hundred-thousand hectares. For smallholder plantations usually belong to local farmer communities with the land sizes of about 5 ha or bellow. For medium scale, the plantation sizes could reach hundred hectares, but the proportion is nominal.

Industrial plantation

Based on our research in Mundul Kiri and Tbong Kmom Provinces, the NR latex value chain and resource flows are summarized and illustrated in Figure 8. For industrial plantations, rubber latex is usually collected by the company's workers and transported to the company's respective processing facilities, mostly in the form of liquid NR latex. The companies' factories could transform the NR latex into two different products: NR crepe (derived from the French term "crêpes") and rubber smoke sheet (RSS).

For NR crepe, colloidal latex is first homogenized and mixed with formic acid to create coagulation. The coagula are then processed through crushing, drying, and finally a "creping battery" to form NR crepe. For RSS processing, NR latex liquids are first cleaned, homogenized, and mixed with formic acid in a separate cylinder tank. They are then slide-cut into thin layers, go through different creping batteries to remove water, are sun-dried, and finally smoked to obtain the final RSS products. Most companies sell their semi-processed products to Vietnam, but a fraction also goes to other countries (e.g., China, the EU, Singapore, Malaysia, and South Korea).

Smallholder plantation

The NR latex value chain for smallholder production is more complex. Farmers could sell different forms of NR latex, such as solidified or liquid forms, or both, to different trading entities. In some areas, they could sell liquid latex directly to nearby industrial plantation factories, where it is then processed as mentioned above. However, the proportion is not much, as most industrial plantation factories focus mainly on NR latex from their own plantations and frequently encounter labor shortages to harvest latex to its full potential. Some NR latex is sold to local or SME producers for RSS production, depending on availability, and the RSS are then sold across the border to Vietnam.

In recent years, especially in areas where SME for RSS production are limited or negligible, a huge proportion of farmers have preferred to sell their latex in solidified or coagulum forms to collectors every 5 to 10 days, depending on locations and volumes. These are then sold across the border through traders for further processing in Vietnam. Farmers who normally sell liquid latex also occasionally consider making coagula and selling it to collectors during periods of low dry rubber content (DRC) and frequent rainfalls.

Tire factories and demands of NR for final processing

In recent years, there have been two major Chinese-invested car tire factories established in Cambodia; one is in the Special Economic Zone in Bavet, Svay Rieng, while the other is in the Sihanoukville SEZ. Both have close to US$300 million in investment each and could produce up to millions of different car tires (Chea, 2023). NR crepe and RSS could not be used directly for car tire processing. There is still another process to transform these products into black rubber sheets by combining NR, synthetic rubber, carbon powders, and other materials. As a result, BRS semi-finished products need to be imported entirely from Vietnam, China, or Thailand to produce car tires in Cambodia.

To obtain greater benefits for local farmers and NR producers, the private sector in Cambodia would need to invest in BRS and other semi-finished materials domestically. However, this hangs on the uncertainty of the viability of the car tire industry in Cambodia, which is still at an early stage, and production competitiveness, which involves other factors such as electricity cost, economies of scale, logistics, technologies, and maintenance. This requires a learning curve for the relevant stakeholders and the whole industry at large.

3.3.3 Actors involved in smallholder rubber development

The current major actors involved in smallholder rubber development and their roles are the followings:

a) Public sector

- **General Directorate of Rubber**: the important roles of GDR are related to the development of national policies for the rubber subsector, implementing selected research and development projects, providing technical and human resources for capacity building in NR production technologies, facilitating the registration of rubber cooperatives, helping coordinate large-scale contract farming and agreement enforcement, and maintaining statistics related to rubber production and exports. Lack of public funding and negligible extension service support from the private sector working in the NR industry limit GDR research and outreach activities at the local level. Suboptimal governance efficiency for both budget allocation and human resources might also exacerbate the situation. A loan program of approximately US$16 million to support the development of the rubber sector in Cambodia between MEF, MAFF, and AFD has been negotiated, but no deal has yet been achieved.

- **Ministry of Industry, Science, Technology, and Innovation**: Mainly for the industrial regulation and policy support for major rubber processing plants under its mandates.

- **Ministry of Commerce**: Mainly for business, investment, and export regulation policies. MoC also helps provide export market linkages for processed NR through the national and provincial formation of rubber industry cooperatives.

- **Provincial Department of Agriculture, Forestry, and Fisheries**: The important roles for PDAFF are related to providing administrative and legislative support for most of the development programs related to smallholder rubber production in their respective targeted areas. They also provide legislative support for the rubber cooperative in the communities and participate as witnesses in major contract farming and conflict resolution within the rubber cooperatives or with other third parties. They also provide some technical support related to rubber production through their technical staff when funding is available. However, extension and outreach activities at the local level are limited due to similar challenges as in the GDR.

b) Development partners and Civil Society Organizations

- There have been major different development partners, such as Oxfam/Oxfam Novib Cambodia, the Federal Ministry for Economic Cooperation and Development (BMZ) through the Welthungerhilfe program (WHH), and AFD, providing funding to NGOs in Cambodia to implement smallholder rubber production development programs. NGOs such as World-Wide Fund for Nature (WWF), NGO Forum on Cambodia, Farmers and Nature Net Association, and Cambodia Partnership for the Development of Human Resource in Rural Areas Association (CAMBODHRRA) have received funds from the above funding agencies to implement smallholder rubber production in their respective targeted provinces, such as Mundul Kiri, Tbong Kmom, Kampong Cham, and Steung Treng. It should be noted that most of the development activities in the local communities have been operated by DFs and CSOs or NGOs.

- WWF has supported smallholder rubber cooperatives in the last four years with funding from the German Government's Federal Ministry for Economic Cooperation and Development in Pechreada District and in early 2023 in Keo Sema District under the support of AFD. Major intervention activities include: (1) supporting the formation or reactivating rubber farmer cooperatives; (2) capacity building on rubber production (i.e., selection of rubber clones and varieties, planting, and sustainable tapping practices); (3) a multi-actor partnership program for transparent and sustainable natural rubber supply chains in the target areas (i.e., the public and private sectors, NGOs, traders, processors, and rubber smallholders in Mundul Kiri) to promote sustainable rubber production; (4) Supporting other livelihood programs such as agroforestry, intercropping, and small-scale chicken raising by using other cohort projects.

- FNN and CAMBODHRRA: Both NGOs received funding from Oxfam Novib to implement smallholder rubber production projects, with a share of targeted areas in Tbong Kmom and Kampong Cham Provinces. Main activities are related to providing assistants in AC's rules and regulations preparation for registration, support in training on GAP for rubber production and responsible/sustainable rubber production, training on leadership, financial literacy, market linkages, and exchange visits or study tours for collaborated ACs.

- NGO Forum: On smallholder rubber development, it received funding from Oxfam and has been responsible for coordinating the development of sustainable natural rubber production guidelines in Cambodia, promoting contract farming, and capacity building.

c) Private sector

- Middlemen and women: The group represents buyers or collectors for NR latex from ACs who sell it to other wholesalers in Cambodia or directly to Vietnam. Most products are in the form of coagula. They could come to collect from farmers at a regular interval of 5–10 days, depending on locations.

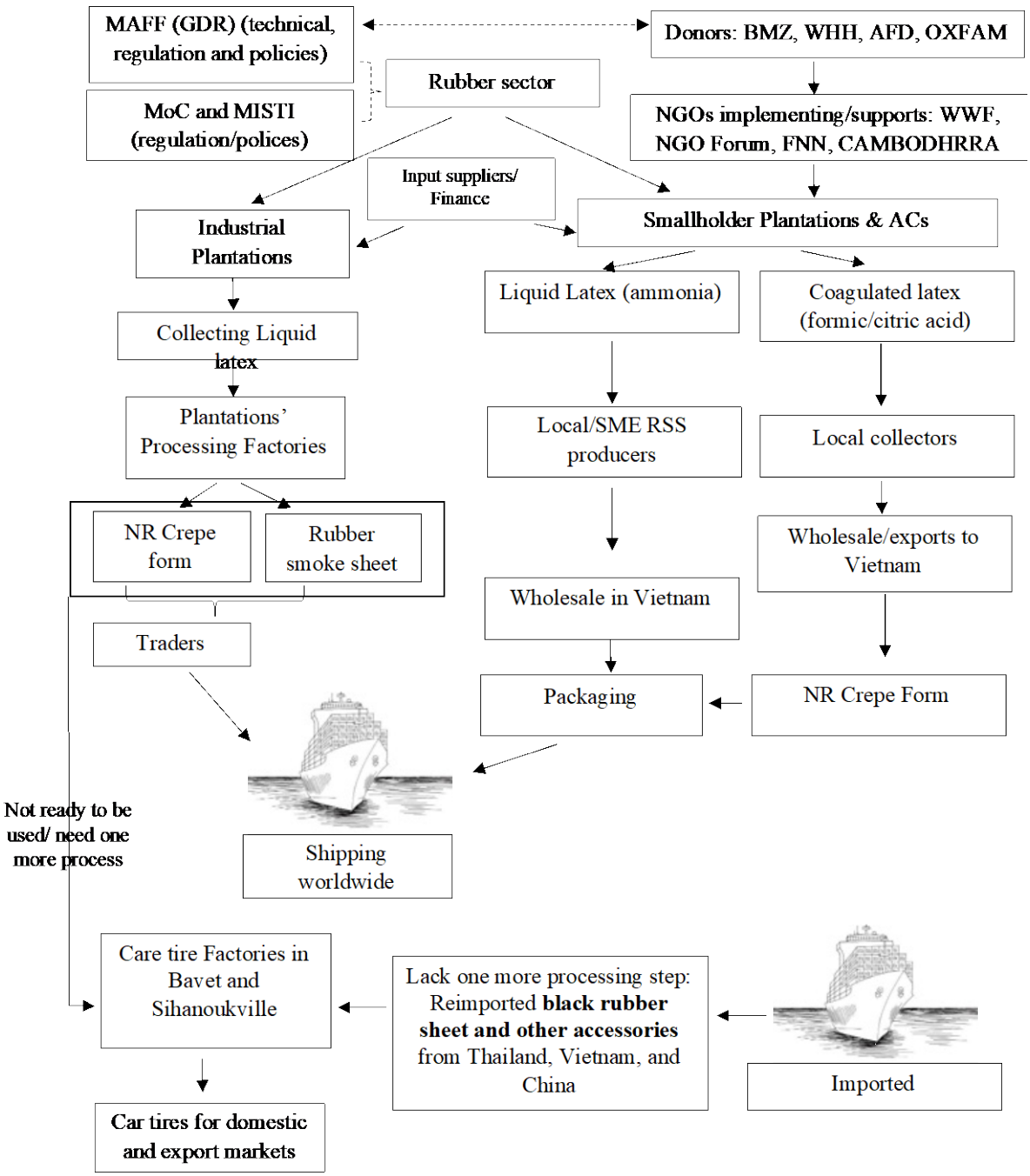
- Input suppliers: They represent the companies or retailer stores supplying fertilizers, pesticides, latex collecting bowls, coagulative materials such as formic or citric acids, ammonia, ethephon, and other accessories or tools. This also includes local nurseries that supply rubber clones or seedlings.

- SME/factories for NR processing: They represent small and medium enterprises, usually purchasing liquid NR latex from farmers or ACs, and mostly processing it into rubber smoke sheet. For large-scale NR latex processing, factories are usually linked to industrial plantations, from which most of their raw materials are obtained. Only a very small proportion were purchased from farmers or ACs. This group also represents car tire-producing factories (refer to Figure *8*).

- Financial institutions: This group refers to microfinance or banking institutions located in communities. Most often, they are private-owned sectors. However, the Agriculture and Rural Development Bank is a state-owned enterprise that has

recently been providing concession loans to promote agricultural investment in Cambodia.

Figure 8: Natural rubber value chain and its ecosystem in Cambodia



Source: Authors' compilation using information from the KII and FDG interviews.

3.3.4 Current situation of rubber ACs in the studied areas

Agricultural cooperatives for NR latex have been promoted since the early 2000s at different levels—local, district, or province—in major production areas in Cambodia. In Ratanak Kiri, more than 10 rubber ACs were created. These activities were expanded from the early 2010s onward, when the price of NR was at its peak. Creating rubber ACs for the communities would not be so difficult but sustaining their functions and operations has been a major problem. Most of the ACs helped establish by GDR, PDAFF, MoC, or NGOs have had intermittent activities without much follow-up action or systematic approaches. As a result, they created ACs that could not sustain their functions after the projects were over. This has been a challenge for most ACs producing other crops or agricultural commodities as well.

Focus group discussions were conducted with two smallholder rubber ACs, one in Pechreada, Mundul Kiri, and another in Krosa, Memot District, Tbong Kmom Province, where multi-actor and systematic approaches for sustainable rubber production programs have been implemented.

The rubber AC in Pechreada was reestablished in 2019 under the support of the WWF program, with a revised committee structure, internal regulations, and terms of reference. There are 108 households in the AC, mostly having less than 5 hectares per household and planting three different rubber clones such as RIM600, GT1, and RAV4. Business shares within the rubber AC's members were initiated (KHR100,000 or US$25 per share), and a total capital of approximately KHR20 million was collected. Financial management has been improved, as the collective capital was deposited at a bank with the withdrawal rule of at least three committee members. The AC's members have received training on management, leadership, financial management, and standard practices for sustainable rubber production (i.e., rubber clone selection, planting techniques, soil, and disease management, tapping practices). Some of AC's members also benefit from other livelihood programs supported by WWF, such as agroforestry, intercropping, small-scale pasture production, and household chicken raising.

For the rubber AC in Krosa, Memot registered at the Ministry of Interior in 2007 under the support of CEDAC but ceased its operation in 2010 due to a lack of support and members' commitment. It was reactivated with the coordination of GDR and PDAFF in 2017. There are more than 30 members and approximately 80 hectares of ready-to-harvest rubber plantations in the AC. In 2022, FNN started partnering with the AC for mostly capacity-building activities such as tapping practices, soil fertility and disease management, leadership, financial management, exchange visits, market linkages, workshops on other domestic and regional guidelines, or information related to NR.

3.3.5 Sale and contract farming practices by rubber ACs

Both ACs usually sell their NR latex in the coagulative form, as it is much easier for each farmer to keep and accumulate their coagula between 5 and 10 days before they are sold to and collected by middlemen or women. Due to the limited amount of rubber latex for daily harvest, it is very challenging for collectors to come. Usually, there could be more than one middleman in the communities, while price negotiation could be done from time to time between ACs and collectors, possibly 1-2 days before each collection time (refer to the value chain section). The range of price could vary throughout the season, but during the studied time, it was between KHR2,000 and KHR2,500 per kilogram (US$0.49 and US$0.62). The benefits of collective sales of NR coagula through ACs, as compared to individual sales, are the following:

- The quantity of NR coagula is economical for middlemen to come to collect each time.

- Higher bargaining price: AC's member to get between KHR250-KHR300 per kilogram (US$0.061- aUS$0.071) compared to individual sale.

- The AC could obtain between KHR20 and KHR50 per kilogram of commission or extra benefit for ACs in Pichreada and Memot, which could be saved and used for the operation.

- Build connection and network with middlemen.

- More consistent price from farmers, as AC's members could effectively communicate the price, while collectors could not deviate the price for separated farmers or circumstances.

It should be noted that no formal contract farming has been implemented to determine quantity, quality, or a fixed or deviated price between ACs and collectors or any processing plants. The price must be negotiated every time before each collection. NR latex is one of the most widely traded crop commodities and finding markets or local traders to sell farmers' latex would not be difficult. However, its price would be among the most volatile commodities, which could be affected by external factors, especially the dynamic of supply and demand in the region. The NR price in Cambodia is much less resilient as compared to other major players in Southeast Asia, who have much better infrastructure and logistical support and domestic production capacity for final products.

Contract farming for NR latex could be done if any processing factories would need high-quality and consistent liquid latex, which they could not have enough supplies of from their own industrial plantations. In Pichreada, Mundul Kiri, there is only a tangible processor, transforming from NR latex to crepe or RSS products. However, the company even could not tap the latex up to its potential capacity due to insufficient local labor. Nevertheless, no company would take the risk of establishing a major processing factory by depending on buying NR latex from local smallholders. Additionally, unlike other crops that could be harvested in a short period of time, viz. rice and cashew, rubber latex could be harvested year-round, except during browning and leaf-fall periods between February and March. These could make contract farming very difficult to implement.

In 2018, when the price of rubber started surging again, the rubber AC in Krosa, Memot, had an informal contract agreement to sell liquid latex with some price incentive to processing enterprises that collaborated with Thai trading companies to produce RSS for export to Thailand. However, the contract failed later as it took a long time for farmers to obtain the payment, sometimes taking 4-5 months.

Box 4: A case of new contract farming initiated between rubber AC in Memot and a French processing company.

In mid-July 2023, a formal contract farming program was recently initiated by a new French NR processing company in Memot to purchase high-quality liquid latex from the Krosa AC's

members. Negotiation for the contract has been conducted on agreed-upon terms and conditions. The AC's members will need to supply a good-quality tank of liquid latex for each collection day or transportation. While AC's members could benefit from the contract in the following ways:

- The company will provide new and clean bowls for collecting latex and ammonia to delay latex coagulation if the selling contract is for more than a year. New latex collection bowls are essential to obtain clean liquid latex and ensure high-grade RSS products.
- Selling liquid latex is more accurate, as the price is directly determined based on the DRC. When latexes are sold in the coagulum form, moisture content and dirtiness could complicate the price determination and usually cause serious arguments between farmers and traders.
- Collecting NR latex in the form of coagulum is more laborious, as farmers need to go to the field to stir and mix formic acid and latex in the collection bowls. Formic acid could negatively affect soil pH, microbial activities, and the environment when it is spilt or disposed of on the ground. There are some exceptions to the rule that latex coagulation practices should be followed, particularly when rainfall becomes imminent or during times when DRC becomes very low.
- Leaving NR coagula in the field or in the neighborhood for 5 to 10 days would not be environmentally friendly for the local communities.
- AC and its members would have some price incentives and reliable market sources.
- AC's members could receive additional technical support for sustainable natural rubber production.

Source: KII and FGD (Memot, Tbong Kmom Province)

3.3.6 Women participation in rubber cooperatives

Gender standard operating practices have been a core value for international development partners such as BMZ, WHH, and AFD, as well as NGOs or CSOs implementing the projects such as WWF, FNN, and CAMBODHRRA. It is strongly required to incorporate this value into the project's key informant indicators (KPIs) and activity plans.

From KIIs and FGDs, women are usually given an equal chance to be on the AC committees. However, their availability and willingness to participate are important issues. At least 30 percent of women's participation is needed to be integrated into the targeted group of farmers. For example, of the three members of the committee for the ACs promoted by the program must be woman. However, the quality or impact of women's contributions in AC management is still being observed. One of the good examples for the AC in Pechreada is that three of the 10 committee members are women. Women were also strongly encouraged to participate as much as possible in the project activities, such as trainings, workshops, and other livelihood programs. Women's participation has improved. However, the impact on the quality of their participation would still be suboptimal as compared to their male counterparts.

Based on the KII and FGD interviews, there have been several barriers limiting women's participation in smallholder rubber development projects. First, traditionally, their prioritized time allocation for daily activities is mainly focused on family foods and looking after the children and their education. Second, participating in the ACs' management and activities requires traveling to attend meetings, trainings, and workshops, which is often not very comfortable for women, especially riding a motorcycle for long distances in rural road conditions. Third, many women in the rubber farming communities are less interested in technical production practices for NR production as compared to their male counterparts. Fourth, the program's promotion of gender would be more effective when women had strong beliefs, motivation, and commitment and empowered themselves in the ACs' activities. The mindset would need times to change gradually. Women's participation in communities predominantly populated by ethnic groups would be more challenging than in Khmer communities. However, there have been some good examples of effective women's participation in the program (refer to Box 5).

Box 5: A case of successful women's participation and gender empowerment in Pechreada AC

Following the new election mandate and new structural reform, which was amended in the Pechreada AC's registered rules, guidelines, and ToR, at least three committee members among the 10 have to be women. Despite the challenge of endorsing the rightful number of women in the committee, the program had identified a young, educated woman who is from the Pnong ethnic group to be one of the committee members. The woman has a bachelor's degree, which is very rare for women from ethnic groups. She has plenty of experience working with NGOs on administration and finance, which could give the AC a valuable human resource in financial management, bookkeeping, and reporting. Her contribution to the AC is phenomenal.

The lesson learned from this was that it is strongly recommended that any development program use this as an example to quickly identify potential agents of change within the communities, which could be young women or fellow youth, and motivate and empower them to participate in AC development activities in their communities. Young, educated, and motivated women or youth from the communities could bring more technical and information technology knowledge and enormous momentum for changing behavior and mindset in the communities.

Source: KIIs (Pechreada, Mundul Kiri)

3.3.7 Disputes and dispute resolution

Conflicts in this section could be categorized into two aspects: internal conflicts and external conflicts. Through the KIIs conducted in this study, the most sensitive topic for internal conflicts is related to the management and handling of the collective budget within the ACs. In most ACs, the collective budget is usually given to the top AC leaders to keep, while some budget expenses and handling may not be transparent enough. Some ACs' leaders might take the budget and use it without check and balance for other things outside the AC's interests or for most of its members. The dispute sometimes became serious, which required local authorities and PDAFF to intervene to find solutions. These usually undermine the level of trust of the AC's members and negatively affect the AC's expansion and development at large. The best resolution to this problem is to prevent it from happening. A robust and transparent regulation and governance system need to be enforced in both ACs' registered documents and

real practices. Instead of keeping the budget at home with the AC's leader, WWF officials tried to advocate the new practices for financial management by persuading the AC to create a bank account that required at least three committee members approval to withdraw the budget. Introducing changes or incorporating practices

Quality control could also be a problem. Rubber AC usually negotiates prices 1-2 days before traders come to collect. Usually, all members would get the same price, regardless of the quality of the coagulum latex. Some farmers' latex might have higher moisture content or be more contaminated with dirt than others. This might cause serious arguments with traders who want to deduct the price. Whether it was a coincidence or on purpose by some farmers, it would be considered unfair for those who had much better quality and received the same average price. Similarly, internal quality control might also be an issue for the collective sale of liquid latex, as they are also supposed to be mixed, and it is almost impractical to test dry rubber content (DRC) for individual farms. If some members could go away with this without much consequence, it would promote bad practices for the whole AC.

One of the external conflicts is mainly related to trading issues with informal contracts to sell liquid latex to processing enterprises. About five years ago, an informal contract was agreed between AC members and enterprises to produce RSS for Thai traders Tbong Kmom. The RSS enterprise collected liquid latex for processing but failed to pay AC members regularly. On some occasions, payment delays would last up to several months. When an informal contract was made, or even in a formal contract situation, solutions were always mediation outside court or the legal system, while the delays could significantly affect the farmers' livelihoods as many also needed to pay the debts to other financial institutions. It was hard to put the blame completely on the local processors, as they also had a lot of problems of their own. Usually, no formal contracts between local processors and traders outside the countries were implemented, thereby no fixed prices were secured. Local RSS processing has been a very tough business. Based on the KIIs conducted, their numbers have decreased almost 70 percent since 2017, for example, from 10 of the available local RSS processors in 2017 to currently 3 in surrounding target areas.

3.3.8 Challenges in the smallholder NR ecosystem

At the cooperative level, rubber cooperatives lack skills in sustainable production practices, AC management, leadership, and financial literacy. Most decision-making is dependent on CSO officials. Production is small and scatteredly distributed, making face-to-face communication and NR latex collection uneasy. Telecommunication and the internet have also been problematic in rural areas, causing problems in communication and the distribution of market price information. As a result, coop members are not always aware of the actual price, and different locations might sell their production at different prices. The capital shared by cooperatives' members is still small, and buying more shares from the members to expand the capital requires trust and good governance. Obtaining loans for investment has been problematic due to the members' current debts, collateral, and other issues.

At the collector and processing level, natural rubber could be considered the most price-volatile product, which could be affected by different external factors. Its prices could change every day, making contract farming on a fixed or deviation price risky for collectors and processors. Additionally, unlike other crops that could be harvested seasonally, NR could be harvested every day. Thus, it does not seem very necessary to have a contract with the communities to

secure enough raw materials for processing. All large-scale rubber processing plants depend mainly on the NR latex harvested from their own plantations. In some cases, NR latex could not even be harvested to its full potential from their own plantations due to labor shortage. It is unlikely to consider contract farming to buy more latex from the cooperative.

Usually, the formation of ACs and CFs requires facilitation efforts from both the public and NGOs. However, with limited public funding to the General Directorate of Rubber and Provincial Department of Agriculture, Forestry and Fisheries, especially for local staff, these activities have been limited. Human resources, both in quantity and quality, especially for local staff, are still limited due to insufficient incentives, coordination, and good governance.

Unlike other major food crops in Cambodia, the rubber sector has received limited attention and funding. Different organizations have different development agendas, priorities, and approaches. The multi-actor approach and synchronization of activities at the local levels are time-consuming, while project duration is limited to make substantial impacts for the communities. Additionally, funding is limited to capacity building, while budgets for other crucial tangible investments or construction are prohibited.

4. Discussion

Contract farming has been seen as an institutional mechanism that could help smallholder and resource-poor farmers address the difficulty of meeting technical requirements and compliance costs and participate in modern market linkages. Contract farming presents advantages and disadvantages for farmers (producers) and companies (buyers). Nonetheless, the growing implementation of contract farming could imply that the benefits might outweigh the costs. In Cambodia's context, we argue that important binding constraints need to be reduced (or removed) to allow for a more effective implementation of contract farming, not only for rice, cashew, and rubber, but for other agro-industrial crops that the government wants to prioritize for exports to regional and global markets.

Recognizing the benefits, the government has put in place regulatory framework aiming to provide clarity and improvement to the implementation of contract farming, at least for priority agro-industrial crops (e.g., rice, Keo Lamiet mango, cashew nuts, and cassava). As shown, Sub-Decree 36 and other related laws and regulations are the main legal and regulatory documents governing the implementation of contract-based agricultural production. A law on contract farming is necessary to provide clarity to buyers that want to engage in contract-based agricultural production and to offer the competent authorities a means to implement contract farming effectively. Ngo *et al.* (2021) indicate that the law on contract farming is in the drafting phase. Hence, finalizing the law would be in the best interest of the government, companies (buyers), farmers (producers), and other involved stakeholders. Another necessary regulatory framework that should be considered is the one governing conflicts between producers and buyers and the mechanism through which the conflicts are resolved. A Sub-Decree on conflicts and conflict resolution arising from the implementation of contract-based agricultural production would serve the purpose.

Access to finance by the buyers, agricultural cooperatives or agricultural cooperative unions, and farmers remains a binding constraint for the success of contract farming. The finding is consistent with that of previous studies (Chhim *et al.*, 2021; Ngo *et al.*, 2021; Sum and Khiev, 2015). To help address the issue, in addition to the traditional sources of credit access, the

government has established public-sector-oriented forms of credit, aiming to provide more favorable terms and conditions and reasonable levels of interest rates while addressing market failures and imperfections in credit access for smallholder farmers, agricultural cooperatives, and owners of small and medium enterprises[4]. Loans and other financial products offered by the Agricultural and Rural Development Bank, SME Bank, and Credit Guarantee Cooperation of Cambodia are examples of such an initiative. ARDB, for instance, offers a range of loan products, from loans to small and medium enterprises under the special financing program of the government to loans to agricultural cooperatives to loans supporting smallholders in the agricultural sector (ARDB, 2021). It also provides a competitive interest rate, which is lower than what is often charged by private financial institutions.

Despites, collateral-based lending remains prevalent, with less favorable terms and conditions for smallholders, agricultural cooperatives, and SME owners who lack collateralized assets, particularly land. ARDB and other state-owned banks and credit guarantee schemes might introduce non-collateral-based lending or use other tangible assets. For instance, the contracted quantity between producers and buyers certified by MAFF or PDAFF might be considered collateral.

Climate change (e.g., natural disasters, high temperatures, and precipitation changes) will be one of the biggest global risks in the next 10 years, demanding consistent mitigation and adaptation strategies by the government and other involved stakeholders. Failure and inaction to put in place necessary mitigation and adaptation strategies would have negative ramifications for local and global food security and livelihoods (WEF, 2023b). In Cambodia's context, natural disasters and extreme weather have been frequent and unpredictable and have had negative impacts on agricultural production, including that of rice and cashew nuts. For instance, rice production declined by 4.7 percent during the 2002-23 production year to 11.6 million metric tons. The drop was mainly attributable to unfavorable weather conditions (i.e., droughts and floods) (World Bank, 2023; MAFF, 2022). Farmers often have limited means and knowledge to mitigate the climate-related risks to their production, making them highly vulnerable.

The government has acknowledged the impacts of climate change and the need to mitigate the risks, specifying strategies and interventions in various national and sectoral policies for the development of agriculture sector and agro-industrial crops (e.g., the Agricultural Sector Strategic Development Plan, 2019-2023, and the National Cashew Policy, 2022-2027). Building new and restoring existing irrigation systems and other bodies of water are a long-term mitigation strategy and an important intervention, particularly for rice and cashew nuts. The government has spent significantly on irrigation-related infrastructure, relying mostly on capital allocation from development partners. For instance, the Ministry of Water Resources and Meteorology and the Asian Development Bank have been discussing long-term investment in meteorology and water management projects, that might result in a US$200 million investment package. Nonetheless, having a sufficient and functioning irrigation system remains a challenge and a concern often raised by farmers. Increasing investment in research and development of climate-resilient seeds is another long-term mitigation and adaption strategy.

[4] The Cambodian People's Party (CPP), running for the 2023 general election, has announced a policy of allocating US$100 million of the government budget to buy agricultural produce during the harvest seasons to stabilize prices. The concern about price stability might be attributable to economic uncertainties and supply-demand imbalances. The allocated budget might be used for priority agro-industrial crops such as rice, Keo Lamiet mango, cashew nuts, cassava, corn, and other crops, if needed. If materialized, this would be a welcome initiative that could strengthen confidence in the sector and potentially improve the livelihoods of farmers.

Despite the efforts by the government, development partners, NGOs, and other stakeholders to ensure gender equality and close gender wage gaps, women remain underrepresented in top management positions at national and sub-national levels and across sectors and are paid relatively less than their male peers (Huot *et al.*, 2023; UN Women and CDRI, 2021; UNDP, 2021; USAID, 2020). We concur with the findings of previous studies. Although women have increasingly participated in farm and off-farm activities and the activities of agricultural cooperatives, they continue to shy away from holding leadership and management positions. We find that women are given equal opportunity and strong encouragement to take up leadership and senior positions, particularly in agricultural cooperatives and agricultural cooperative unions. Nonetheless, they tend to opt out of the opportunity. Domestic work burden, low education, lack of self-esteem and confidence, cultural and social norms that view men as breadwinners and are more suitable for the positions, migration, and no financial incentives are contributing factors.

Previous studies have suggested solutions to address persistently low women's representation in leadership and management positions, one of which is to set quotas reserving the posts or membership for women (UN Women and CDRI, 2021). We, however, find no evidence of such a solution among the interviewed management team of ACs and FGD respondents. Their principle is to open the positions to all, ensuring that women and men have equal rights and the opportunity to participate. In addition, they apply merit-based principles to select eligible and qualified women and men for the top positions. There is also no mention of setting quotas for women in the Law of Agricultural Cooperatives, but the principle of equal rights for women and men. It should be noted that some of the interviewed representatives of the ACs consider providing financial incentives to attract and retain female and male talents.

5. Conclusion and recommendations

In this study, we examine the ecosystem of the implementation of contract farming and how women participate in the system. Specifically, we investigate the various actors in the ecosystem, the models and types of contract farming being implemented, the regulatory framework governing its implementation, the benefits and costs to farmers (producers) and companies (buyers), mechanisms for conflict resolution, and the role of women as farmers and members of the agricultural cooperatives or agricultural cooperative unions in the implementation of contract farming. We combine desk reviews with qualitative analysis by interviewing government officials, buyers, farmers, representatives of agricultural cooperatives, and development partners who have been supporting other stakeholders in the contract farming ecosystem. The analysis focuses on three industrial crops: rice, cashew nuts, and rubber.

Despite the benefits of contract farming perceived by farmers, buyers, and other stakeholders; binding constraints exist, including (1) the lack of regulatory framework to provide clarity to farmers, businesses and, more importantly, competent authorities to implement the contract farming effectively; (2) the high prevalence of informality in the implementation of contract farming; (3) difficulty in accessing sufficient capital with favorable terms and conditions; (4) limited technical knowledge and know-how on production, particularly on climate change mitigation and adaptation strategies and the use of fertilizer and pesticides; (5) and underrepresentation of women at leadership and management roles of the agricultural cooperatives or agricultural cooperative unions. The underrepresentation of women is

attributable to domestic work burden, low education, lack of self-esteem and confidence, cultural and social norms that view men as breadwinners and are more suitable for the positions, migration, and no financial incentives. Opportunities are equally given to women and men.

To address the constraints, we suggest the following policies and program interventions:

Types of interventions	Timeline	Crops		
		Rice	Cashew nuts	Rubber
Policy	Short term (1-3 years)	† Finalize the law of contract farming which has been in the drafting phase. † Amend Sub-Decree 36 on Contract Farming to include a representative from the Cambodia Competition Commission in the Coordination Committee for Agricultural Production Contract. † Streamline the CCAPC to the provincial level for timely and effective responses to concerns and conflicts. † Establish and communicate clear guidelines on processes and procedures for conflict resolution in the contract farming implementation. A Sub-Decree on conflict resolution in contract farming might be necessary. † Regulate retail and wholesale suppliers of fertilizer and pesticides, ensuring that they have proper licenses and knowledge. Ensure that bottles or containers of fertilizer and pesticides are properly labelled in Khmer.		
	Medium term (3-5 years)	† Continue to encourage buyers, agricultural cooperatives, and farmers to engage in formal contracting with MAFF or PDAFF as a signatory.		
Program	Short term (1-3 years)	† Organize regular sessions to raise awareness of contract farming and its implementation. This should be done by the Office of Agro-Industry, Provincial Department of Agriculture, Forestry and Fisheries. † Continue gender mainstreaming activities for equal rights and opportunities for women and men to participate in leadership and management roles. The campaign should target women and men.		
	Medium term (3-5 years)	† Increase human and financial resources to the Office of Agro-Industry, PDAFF. † Streamline access to finance by reducing collateral-based lending. This is particularly relevant for the Agricultural and Rural Development Bank and the SME Bank. The contracted quantity certified by PDAFF might be used as collateral.		

		† Increase women's level of education.		
		† Raise awareness and provide training on climate change mitigation strategies. † Expand and restore irrigation systems.	† Raise awareness and provide training on climate change mitigation strategies. † Expand and restore irrigation systems.	† Raise awareness and provide training on climate change mitigation strategies.
		† Increase public funding to agricultural research and development, particularly on climate-resilient seeds and mitigation strategies.		

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