Cambodian Cassava and COVID-19

An Analysis on Production, Productivity, and Gender

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Motivation

- COVID-19 significantly impacted Cambodia's economy accross various sector.
  - Cambodia shifted its GDP from an average annual growth rate of 7% to a notable **contraction of 3.1% in 2020**. It rebounded to 3% in 2021, 5% in 2022, and is expected to **grow by 5.4% in 2023**.
  - During that time, the tourism, manufacturing, and construction sectors being particularly hard hit.
- In the broad picture, agriculture, however, grew its share of the GDP, accounting for 22.7% in 2020, **22.8% in 2021**, and 21.9% in 2022, compared to **20.7% in 2019**. Three main reasons this for:
  - Farmers are able to carry on with their regular agricultural tasks.
  - The government intensified its support for agriculture.
  - The number of agricultural workers ↑.

Motivation

- However, it's unclear which specific agricultural products have seen ↑ or ↓ due to the pandemic, and how farmers can maintain profitability in their operations.
  - At the household or individual level, Wendy, Salcher, and Tong (2021), along with The Asia Foundation (2020), discovered a similar outcome: respondents across their surveys experienced income losses during COVID-19. The survey included farmers.
  - Despite ↑ government financing and support for agriculture, the impact on farming production remains an unanswered question.

This Paper

- **Research Questions**: How did cassava production, productivity, and gender participation change during and before COVID-19?
  1. What were the impacts of Covid-19 on cassava production, productivity, and gender participation?
  2. How did government measures and interventions during Covid-19 impact production, productivity, and gender participation in cassava?
  3. What are the expected changes in production, productivity, and gender participation in cassava as the pandemic comes to an end?
- **Approach**: Blend quantitative methods with desk review work.
- **Results**: Although productivity was $\downarrow$ pre-pandemic levels, cassava farmers experienced income losses due to the $\uparrow$ prices of inputs.

Outline

Background

- Production
  - Cassava is the second largest crop in Cambodia, grown primarily for its starchy tuberous roots, which are used for various purposes including food, animal feed, and industrial applications like starch and ethanol production.
  - It signigicanly produces in **Battambang, Kampong Cham, Kratie, and Tboung Khmum**.
  - Smallholder farmers typically grow cassava using traditional farming methods, although there has been a push for improved agricultural practices and mechanisation to ↑ productivity.

Background

- Productivity
  - The average yield per hectare of cassava can vary depending on several factors including weather conditions, farming practices, and access to technology. The average yield was around **15-20 tons** per hectare.
  - Productivity in cassava farming can be affected by various challenges (e.g. pests and diseases, inadequate access to high-quality planting materials, limited mechanisation, and ↑↓ **market prices**).
- Gender Participation
  - Women often play a significant role in cassava production. They are involved in various stages of the cassava value chain: planting, harvesting, processing, and marketing. Gender disparities exist in terms of **access to resources** (land, finance, and agricultural inputs).

Data and Methodology

- We used the data on CDRI Cassava Household Phone Survey in 2022
  - Carried out by the Centre for Development Economics and Trade (CDET)
  - This survey aimed to collect information about how the pandemic affected cassava production and the socioeconomic conditions of farmers.
  - With **5,862 household populations** $\rightarrow$ **768 household samples** across five main provinces: Tboung Khmun, Oddar Meanchey, Battambang, Banteay Meanchey, and Siem Reap
    - They conducted **a listing exercise** with village chiefs to gather population data and randomly selected samples for interviews.
    - The CDET's research team employed a mix of stratified, cluster, and random sampling techniques to choose the samples.

Data and Methodology

- The questions referred to two distinct periods: before COVID-19 and during the COVID-19 period.
- Phone surveys conducted during the lockdown period might be particularly susceptible to receiving inadequate information.
- Our goal is to gather data on **cassava production, income, expenditure, productivity, and gender participation** in the production process from respondents who have actively participated and provided answers to crucial questions linked to our study objective: the changes in cassava production between 2019 and 2021.
  - Therefore, we opted to **exclude 60.8%** of samples lacking information relevant to our objective. The decision stemmed from the vast majority of samples not reporting income, costs on cassava inputs, and labor participation in both years.

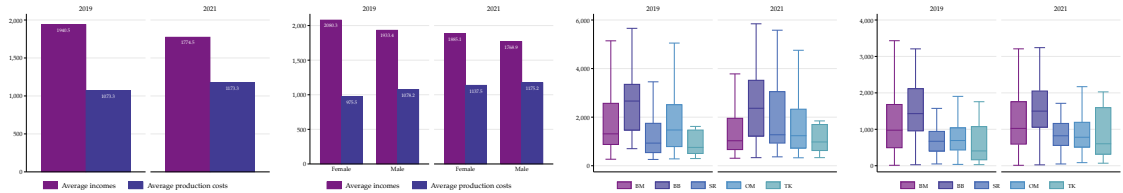
Data and Methodology

Research Methodology

As we crafted this paper for non-technical audiences and due to limitations in employing advanced techniques with our data, we opted for a straightforward research methodology—**descriptive statistics**—to illustrate the patterns and changes in cassava.

Empirical Results

Net income and production cost

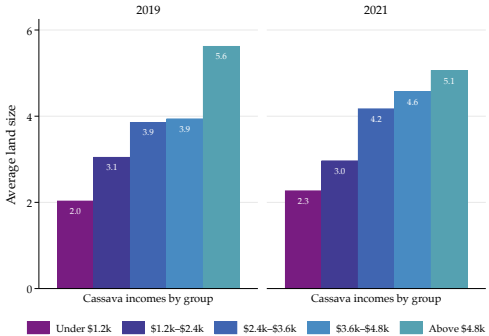


(a) net income (b) production cost (c) inc by province (d) pro by province

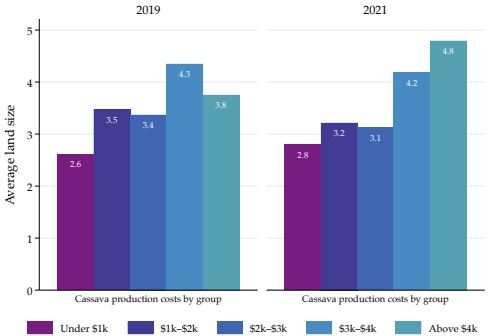
Figure: Hosueholds' net income and production cost

- On average, cassava farmers across five selected provinces saw a sharp ↓ in net income by **8.55%** from \$1,940.5 in 2019 to \$1,774.5 in 2021.
- Production costs: For female-led households, there was a 16.6% ↑ (from \$975.5 to \$1137.5), while male-headed households saw an 8.9% ↑ (from \$1078.2 to \$1175.2).

Land size vs. net income and production cost



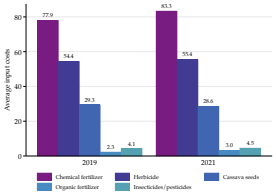
(a) land size and net income



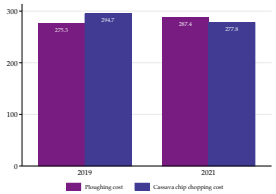
(b) land size and production cost

Figure: Average cassava land size vs. net income and production cost by group

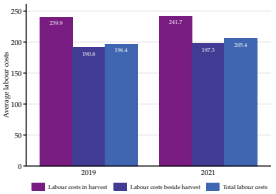
Production costs



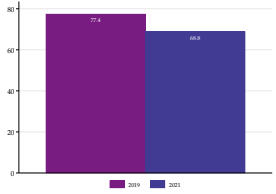
(a) inputs



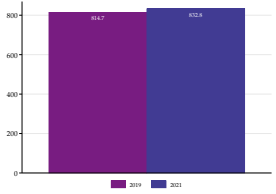
(b) ploughing



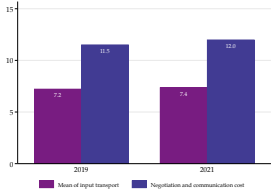
(c) labour



(d) transport

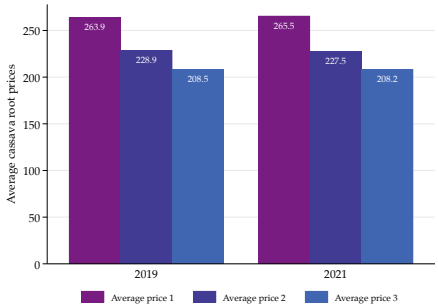


(e) land rent

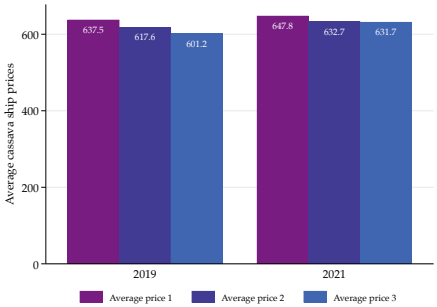


(f) input transport

Output prices



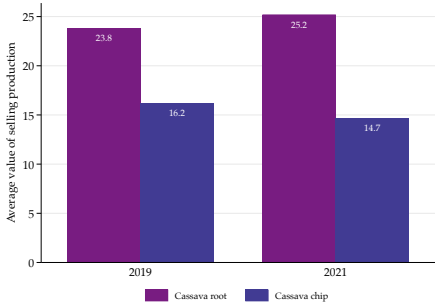
(a) cassava roots



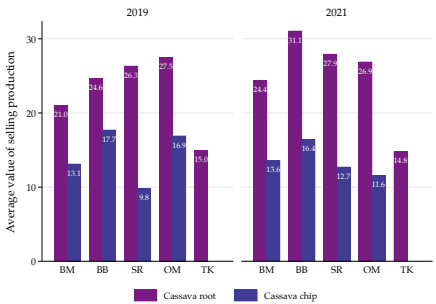
(b) cassava chips

- The price of cassava roots appear to have remained constant compared to 2019.
- The price of cassava chips have a slight ↑.

Change in productivity



(a) change in selling by year

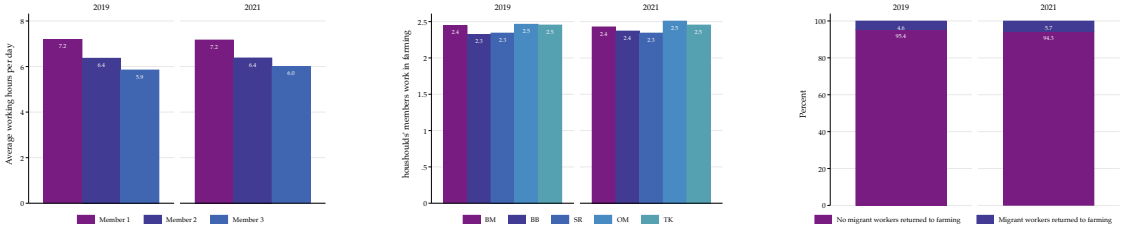


(b) change in selling by province

Figure: The mean value of selling cassava outputs.

During the COVID-19 outbreak, farmers boosted the sale of cassava roots but reduced the sale of cassava chips.

Household members in farming activities

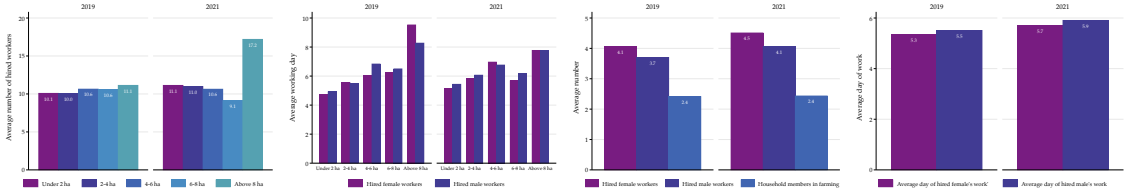


(a) average working hours (b) Household's members (c) migrant workers

Figure: Household members in farming activities

- In every province, a minimum of 2 household members are engaged in farming and this does not change even during COVID-19.
- The number of laborers participating in cassava farming has ↑ **by 23.9% in the short term**.

Productivity and labour participation per household



(a) labour v. land size (b) working day v. land (c) labour (d) working days

Figure: Change in productivity and labour participation per household

- In 2019, farmers with land under 2 ha and between 2 to 4 ha typically hired 10 workers for 5 days. This number slightly ↑ to 11 workers, with an ↑ in working days to approximately 6.
- Women make up the predominant workforce in cassava farming. The number of hired female workers ↑ by 9.7%, while male workers also ↑ by 10.8%.

Discussion

- Although the general pattern is that the sales $\downarrow$ sharply and the cost $\uparrow$ during the pandemic, there was heterogeneity in farmers' responses.
- There may be some potential factors that may confound the bivariate relationship (e.g., the number of COVID-19 patients).
- CDRI researchers collected data from farmers by phone (based on a list provided by village chiefs).
  - Initially, they interviewed 768 households, but **around half of them did not produce cassava at all both in 2019 and 2021**. As a result, we had to drop many observations from our sample, restricting the representativeness of our sample.
- Although the effect of the pandemic on agriculture is relatively smaller than other sectors, small farmers also suffered due to higher prices of agricultural input.

Policy Implications

Actions: Short-term implication for the National Cassava Policy 2020-2025	Responsible Institutions
Enhancing productivity at farm level to increase farmer's income, cope with price volatility, and maintain down-stream competitiveness	
Improve yield and soil quality	MAFF, MoInfo, Universities, MoE, ARDB
Reducing cost of cassava production	ARDB, SNAs, MAFF, Private Sector
Improving best practice on harvest and post-harvest	MAFF, RUA, MEF, ARDB, NBC
Enhancing regional value chain cooperation for mutual benefit	
Reducing technical barriers to trade of cassava chips to neighbouring countries	MoC, MISTI, MEF, ARDB
Promoting export of processing products for value creation and market security	
Promoting contract farming between farmers and processors to leverage mutual benefits	MAFF
Promoting processing industries to a competitive scale	NBC, MoC, ARBD
Increasing value add of the processing industries	MEF, NBC, MISTI, MoC
Reducing electricity cost	MME
Improving access to market, research and innovation	MEF, MoC
Reducing transportation cost	MPWT
Reduce taxes or create exemptions to lower the product price	MEF
Inspect and monitor informal business at borders and companies	MoC, MEF, MoI, SNAs
Reduce unofficial administrative cost	MAFF, MISMI, MoC, MoI, MEF, SNAs
Promote trade facilitation	Related ministries, SNAs, MoC,

Actions: Medium-term implication for the National Cassava Policy 2020-2025	Responsible Institutions
Enhancing farmers' profitability by improving cassava production system and market linkage	
Promote farmers access to special support scheme	NBC, ARDB
Create supply chain linkages through promoting processing industries	MoC, MAFF, MISTI, SNAs
Promote research and development in cassava	MAFF
Improve labour productivity	MAFF
Set up supply chain structure with farmers	SNAs, MAFF
Address issues on trust between farmers and processors or exporters	MAFF, MoC, MoI, SNAs
Enhancing competitiveness at the business-to-business level	
Promote diversifying markets through cassava-based products	MISTI, MoC, MAFF, CDC, MEF
Reduce cost of production factors of processing factories	MME, EDC
Build skilled labour needed for processing factories	MISTI, MLVT, MAFF
Promote dynamic circular economies between linking related sector and processing line	MoC, MAFF, MISTI
Turn waste into profits	MoE, MAFF, MoC, MISTI, CDC, SNAs, MEF
Enhancing the sector competitiveness	
Reduce costs of moving cassava-based products from Cambodia to international market	Related ministries, MISTI, MoC
Reducing logistical costs and leveraging economies of scale	MPWT, MISTI, SNAs
Improving trade facilitation	MoC, Related ministries
Removing barriers on trade	MoC, MAFF
Promoting support on trade finance	NBC, ARDB

Policy Recommendations

- Productivity Enhancement
  - The government and stakeholders should launch a focused community project to encourage modern farming methods. This initiative should include training programs for farmers on sustainable and efficient cassava cultivation techniques.
- Market Access and Value Chain Development
  - Immediate steps are required to boost cassava utilization in the local market and attract FDIs. Therefore, the R&D centre that the government plans to establish should research and develop new cassava products that are consumable for humans and animals.

Policy Recommendations

- Promoting Cassava Community and Network Among Suppliers and Demanders
  - The community should serve as a hub for sharing knowledge, skills, and market information. With MAFF's leadership, they should facilitate the establishment of cassava communities and networks at the district and provincial levels.
- Promoting the Use of Agricultural Apps
  - MAFF should encourage app usage through a training program and videos demonstrating how to buy and sell products, read agricultural news, and access farming best practices. The app should be a place more than trade.

Policy Recommendations

- Promoting Gender Inclusivity
  - Promoting gender participation in labour activities is crucial for enhancing household well-being and social inclusion. The government must enact gender-responsive policies to ensure equal participation of women in agriculture.
- Applying Intervention Policy When It Is Necessary
  - Post-Keynesian economic literature favours state intervention to promote local businesses and key economic sectors. Agriculture, with its reliance on low-skilled labour and limited financial resources, needs significant support due to its vulnerability.

Conclusion

- Cassava holds significant potential for Cambodia. Following COVID-19, the crucial question remains: what is next for Cambodia's cassava? Taking proactive steps to enhance the value addition to cassava is essential.
- The next research agenda should focus on market analysis and explore options for farmers to transition to other crops if they struggle with cassava production or if their soil is not suitable for cassava cultivation.

Thank you!