Can Crop Commercialization Help Promote Land Productivity?
Evidence from Cambodia's Paddy, Maize, and Cassava Farming

By
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Summary

In 2019, the combined gross production of three crops: paddy, maize, and cassava accounted for about 88% of all crops' value in Cambodia; however, their productivity is relatively low. Cambodia's ability to improve land productivity through expanding access to agricultural inputs remains limited. Cambodia's agriculture policies have aimed at promoting crop production and exports. At the same time, crop commercialization, especially for paddy, is still low. In most provinces, households on average barely sell half of their harvest.

Key Messages

- There is an economically sizeable impact of crop commercialization on land productivity. If farmers can sell an additional 10% share of their non-aromatic paddy production, that would enable them to raise land productivity by an average 300 kilograms per hectare.
- Increased commercialization enables farmers to invest in fertilizers, pesticides, and, irrigation as well as obtaining agriculture loans.
- Among all the channels investigated, irrigation and agriculture loan are consistently the important factors that allow farmers to improve their land productivity.

Background

Food and agriculture sector is crucial to achieving the UN's targets for Sustainable Development Goal of Zero Hunger (SDG2) globally and even more so in the case of Cambodia where agriculture occupies a large share of GDP, employment, and trade. Furthermore, many of the poorest and most vulnerable depend primarily on the agricultural sector for their livelihoods. In Cambodia, crop cultivation is characterized by mostly low-input, low productivity, small-scale farming with an average landholding size of only 1.3 ha. Previous studies have shown how Cambodia's low level of farm productivity is associated with constraints on input use such as irrigation, fertilizers, and pesticides and of limited access to improved technology and productive assets. This study asks, beyond the positive impact of input factors suggested in previous studies, to what degree does crop commercialization play a role in promoting land productivity in Cambodian agricultural systems?

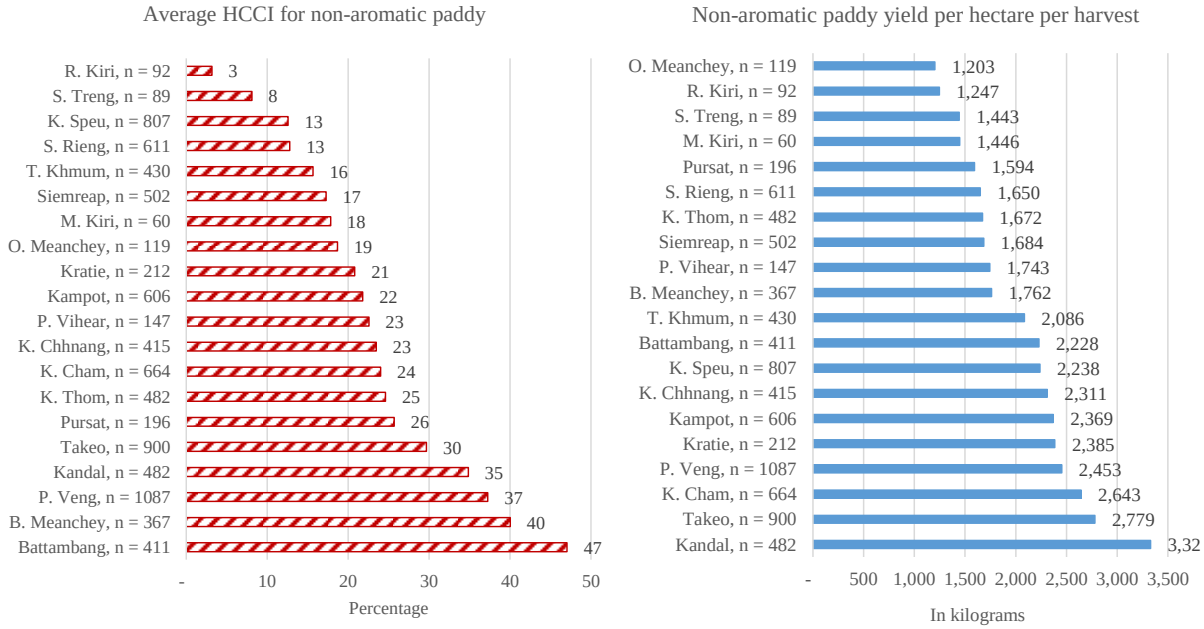
(Oxfam Cambodia)

Research methodology

The study answers the question by using the recent survey data of the Cambodia Inter-censal Agriculture Survey in 2019 (CIAS19) and the Cambodia Agriculture Census in 2013 (CAC13). Three crops are

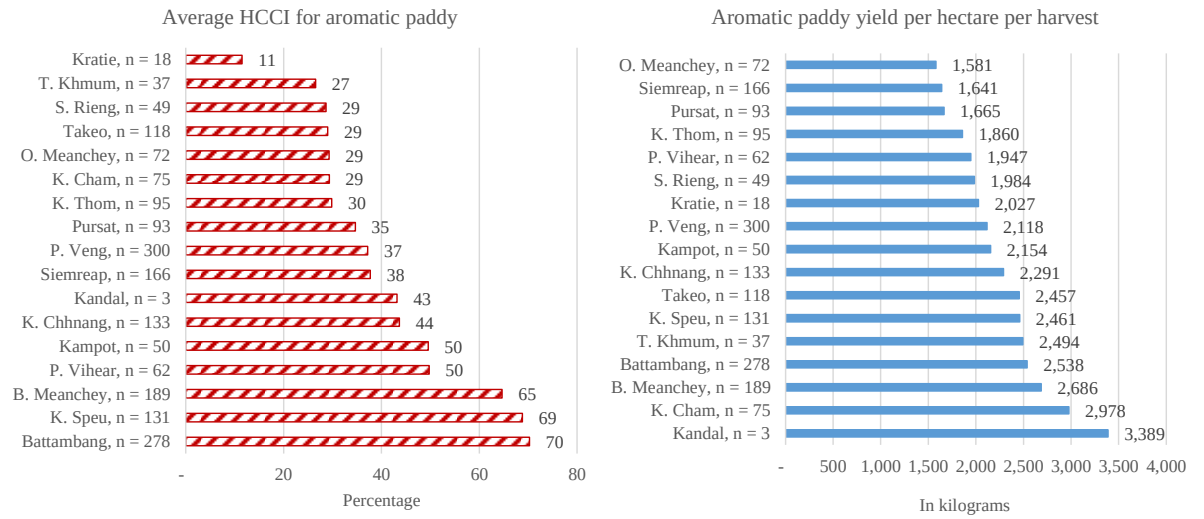
included in the analyses: paddy, maize, and cassava. Paddy constitutes both non-aromatic and aromatic paddy. Different from previous studies, we use a measure of Household Crop Commercialization Index (HCCI) as an indicator for the intensity of crop commercialization, and the amount of crop harvest (or yield) per hectare of cultivated land per harvest as the measure of land productivity. The CIAS19 collects data on households' characteristics, crop cultivation, raising livestock and poultry, and aquaculture and capture fishing operations from a sample of around 15,985 agricultural households with 30,221 parcels and home lots in 25 provinces. According to the survey, a holding comprises of up to 18 members and cultivates up to 16 parcels in addition to home lots. The major cities including Phnom Penh, Koh Kong, Preah Sihanouk, and Kep are excluded from the analyses.

Figure 1: Non-aromatic paddy yield and average HCCI by province



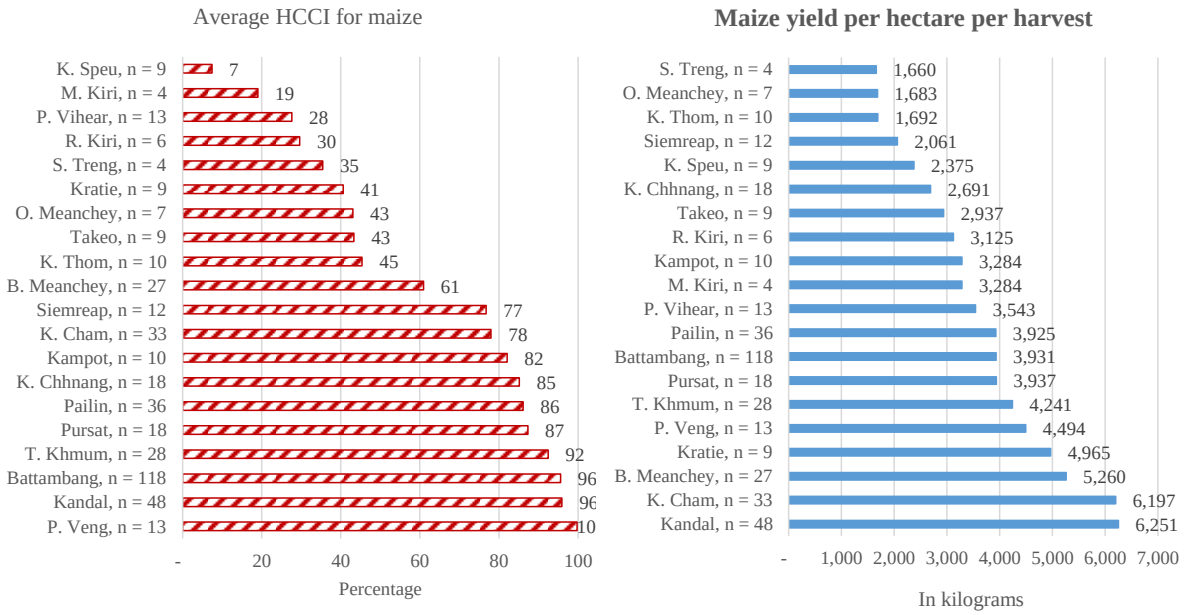
Note: The values are the average of all households in the sample by the province. *n* is the sample observations in each province. Source: Cambodia Inter-censal agriculture survey 2019

Figure 2: Aromatic paddy yield and average HCCI by province



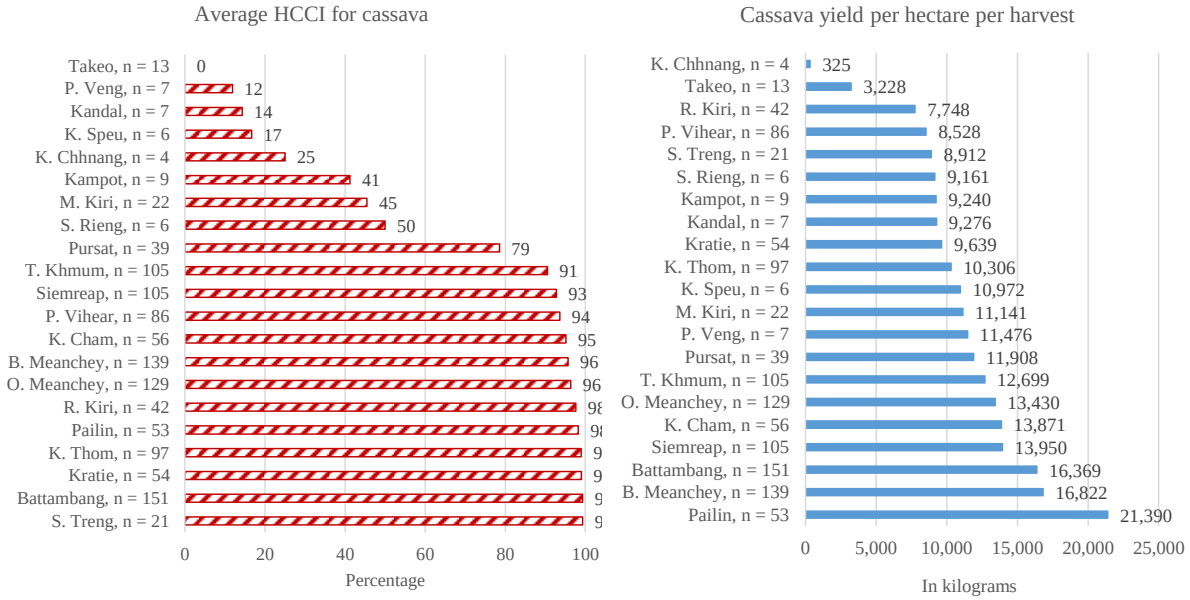
Note: The values are the average of all households in the sample by the province. *n* is the sample observations in each province. Source: Cambodia Inter-censal agriculture survey 2019

Figure 3: Maize yield and average HCCI by province



Note: The values are the average of all households in the sample by the province. *n* is the sample observations in each province. Source: Cambodia Inter-censal agriculture survey 2019

Figure 4: Cassava yield and average HCCI by province



Note: The values are the average of all households in the sample by the province. *n* is the sample observations in each province. Source: Cambodia Inter-censal agriculture survey 2019

Kandal is the most productive province, producing non-aromatic paddy, at 3,328 kilograms per hectare per harvest, which is followed by Takeo at 2,779 kilograms and Kampong Cham at 2,643 kilograms. Battambang, a well-known paddy producer, is only a little above average, producing at 2,228 kilograms per hectare although it has the highest crop commercialization ratio with households selling on average about half of its harvest. Kandal ranks fourth selling 35% and Takeo fifth selling 30% (Figure 1). This indicates that there is room to improve both land

productivity and the commercialization of non-aromatic paddy.

Aromatic paddy is quite known as a cash crop. Households in Battambang sell on average 70% of their harvest, followed by Kampong Speu and Banteay Meanchey, selling 69% and 65% of their harvest, respectively. Banteay Meanchey ranks third in land productivity, producing 2,686 kilograms per hectare per harvest after Kampong Cham and Kandal. Battambang ranks fourth while Kampong Speu is sixth, producing 2,461 kilograms per hectare (Figure 2).

Maize and cassava are also cash crops with about half of the provinces selling most of their harvest. However, land productivity is quite dispersed. Average maize productivity ranges from as low as 1,660 kilograms per hectare in Steng Treng to 6,251 kilograms in Kandal (Figure 3). Average cassava productivity ranges from as low as 325 kilograms per hectare in Kampong Chhnang to 21,390 kilograms in Pailin (Figure 4).

(Open Development Cambodia)

Major findings

Crop commercialization has a significant impact on land productivity: The effect is also economically large. On average, a 10-percentage-point increase in the percent of sales for a crop increases the land productivity for that crop by about 300 kilograms per hectare per harvest. For example, if Battambang, the well-known rice-producing province, can increase sales of its non-aromatic crops from 47% to 57%, the yield can increase to 2,500 kilograms per hectare per harvest. For the bottom two provinces, Ratanak Kiri and Steng Treng, which, respectively, sold only 3% and 8% of their non-aromatic crops, their yield would reach 2,500 and 2,400 if the households sell the same share of their non-aromatic harvest as Battambang currently does.

Commercialization increases efficiency: The commercial farmers are able to specialize and improve efficiency by adopting the use of fertilizers, pesticides, and irrigation. They obtain training and agriculture loans in order to do so.

(Khmer Times)

Farm size does not matter for the impact of crop commercialization on yield: The study defines smallholder farmers as those who possess areas of less than one hectare of land and the large holders as those with areas of at least one hectare of land. The results remains the same even though the analyses vary the cut-off points of the farm size at 0.5 hectares, 2 hectares, and 3 hectares. This could be because of the fact that many of the farm size in Cambodia are technically small.

Policy implications

The study concludes that there is an impact of crop commercialization on land productivity and the impact is economically sizeable. Increased commercialization

enables farmers to invest in fertilizers, pesticides, and, irrigation as well as obtaining agriculture loans. The findings from the study can be a policy guide for the government as well as to reinforce its policy agenda and goals.

To improve the lives of the farmers and more specifically farm productivity, the government should enact specific policies that:

- Focus on market-seeking mechanisms to move farmers from subsistence to market based farming
- Provide farmers with access to agricultural inputs such as fertilizers, pesticides, and most importantly irrigation and agriculture loans.

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