Case Study: Rice Marketing Value Chains in Takeo Province[1]

Introduction

Agricultural productivity has markedly increased, with average annual growth of about 5 percent during 2001-10. Rice is by far the largest crop sub-sector–with average growth around 7.7 percent a year it contributed about 26 percent of agriculture sector GDP in the same period (NIS 2011). Despite this demonstrated improvement, many studies have identified post-harvest constraints affecting agricultural productivity. These include high losses and low quality due to post-harvest handling practices, storage facilities, and milling capacity and standards; high production costs compounded in some years by low yield; trading standards and informal cross-border trade with Thailand and Vietnam (ACI and CamConsult 2006; RGC 2010; Sok *et al.* 2011). Of particular concern to rice farmers are high production costs and weak marketing infrastructure and coordination.

Takeo holds huge potential for cross-border trading. Indeed, selling paddy to Vietnam has become a crucial condition for economic development in the province. Study on production costs and marketing chains in the province can help clarify how benefits are distributed among value chain actors and shed light on post-harvest constraints hindering Cambodia's rice sector development.

The aim of this study is to examine rice marketing value chains in Takeo province and provide policy options to increase the benefits accruing to rice growers and value added in Cambodia. Specific objectives are to (1) map the rice value chains; (2) analyse the revenues, costs and margins of rice production; (3) examine market information and determine the governance relationships between adjacent enterprises on the value chains; and (4) identify appropriate policies to improve rice marketing in Takeo province.

Qualitative and quantitative methodological approaches from "Making Value Chains Work Better for the Poor" (M4P 2008) were used to map the rice value chains and their coordination structures, control mechanisms, rules and regulations in Takeo province. Field data was collected from mid-February 2012 through to mid-March 2012. As well as field observations, information was compiled from focus group discussions (FGDs) and key informant interviews (KIIs) with various value chain actors ranging from farmers, collectors and traders to mill owners, rice exporters and marketing organisations. FGDs with farmers were held in villages across Tramkok, Prey Kabas and Koh Andaet districts. Information on rice marketing was collected in two more districts – Angkor Borey and Kirivong – and Takeo town. Both qualitative and quantitative primary and secondary data were used to analyse the value added between adjacent actors on the value chain.

Results and Discussion

Value Chain Mapping

There are two rice value chains – wet and dry season. Most farmers grow wet season rice mainly for home consumption. The few farmers that produce dry season rice do so mainly for commercial purposes. All actors in the dry season value chain are dynamic, whereas those in the wet season value chain are less active. Village collectors and/or traders are key actors in both value chains (Figure 1). These are small-scale enterprises with buying capacity of 10-30 tonnes, determined by lack of transport and low capital investment. They buy different rice varieties and mix them together, but separate premium quality rice and sell it at a higher price to regional traders. Village collectors and traders are usually farmers in the villages, who either use regional traders' capital to buy paddy from individual farmers and deliver it to those traders for a commission fee of USD0.05 per 50 kg sack, or use their own capital to buy and sell paddy for profit.

Production Costs, Gross Margins and Net Cost Returns on Own Labour

Rice farmers in the study areas face high input costs

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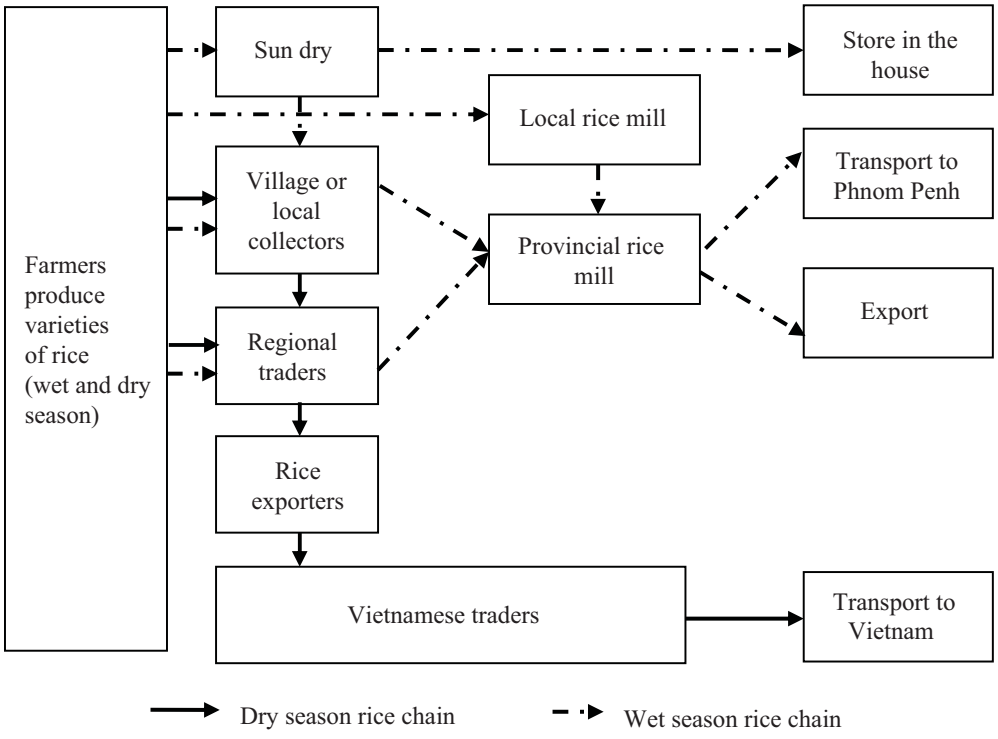
Figure 1: Map and Flow of Actors in the Rice Value Chains in Takeo Province



of labour and machinery hire (for land preparation), fertilisers, pesticides (for dry season crops), seeds and irrigation water (Figures 2 and 3). Labour cost is considerable at around 30 percent of total production or 15 percent of total wet season harvest value (Table 1). Most wet season rice farmers use traditional cropping systems where the biggest cost incurred is for hired labour, particularly for transplanting which is more labour-intensive than direct-seeding (broadcasting) usually done by family members. By contrast, dry season farmers use intensive cropping systems where direct seeding and mechanisation reduces the cost of hired labour to zero.

Water fees for wet season crops account for 25 percent of production costs or 13 percent of harvest value, and water fees for dry season crops account for 19 percent of production costs or 11 percent of harvest value[2]. Water fees are one of the highest costs that farmers, especially dry season producers, complained about the most.

Chemical fertiliser is the biggest cost for dry season farmers, taking on average about 23 percent of total crop revenue. Wet season farmers purchase much less fertiliser, at about 11 percent of crop revenue (Table 1). In terms of the quantity of fertiliser used, farmers reported following advice given by fertiliser merchants or neighbours. Others, especially dry season farmers, said they apply what they can reasonably afford to get a higher yield.

Cost of pesticides is another significant drain, particularly for dry season farmers. Wet season farmers generally do not use pesticides, except in the event of a severe pest outbreak.

Wet season farmers mainly save seed from their own fields and prefer their own seed because that is what they can afford. Dry season farmers on the other hand commonly buy seeds at a considerably high cost at about 6 percent of harvest value (Table 1).

On average, wet season crops yield about 2.3 tonnes of paddy per ha and dry season crops yield around 7.2 tonnes per ha. Farm gate prices per tonne are around USD250 for wet season rice and USD194 for IR dry season rice. The wet season farm gate price reported in field interviews in March 2012 was similar to the recorded price for October 2011 (Table 2), indicating the relative stability of paddy prices at the time of study (RGC 2011). Average gross farm incomes are USD575 for wet and USD1396 for dry season rice (Table 1). Production costs for both wet and dry season rice are extremely high and mostly beyond farmers' control. Hence the very low gross returns for rice production in both seasons.

Value Chain Analysis

The market structure is well organised with a network of collectors, traders, exporters, millers and international traders (Figure 1). The paddy market is highly efficient with many actors and strong competition at prices set by market forces. Farmers can sell their paddy throughout the year in a highly competitive market. Information on prices for

[2] Wet season farmers spent more on water fees than dry season farmers did because of the short drought during the 2011 planting season when they had to pay for water pump hire and fuel to irrigate their crops.

Figure 2: Wet Season Farming Costs (ha)

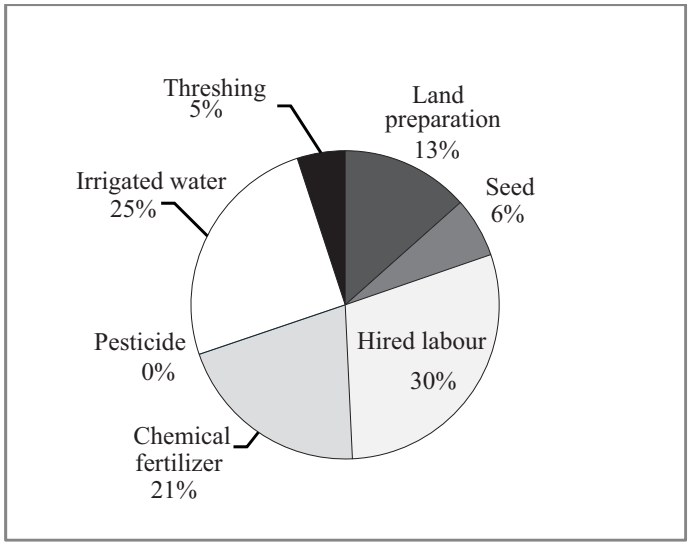
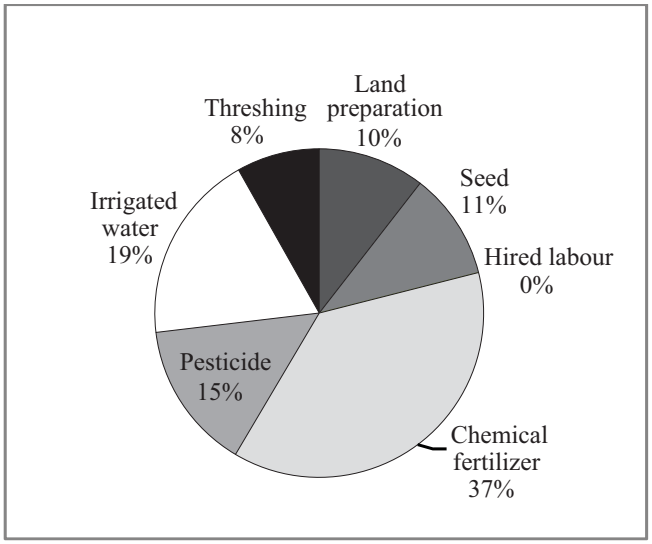


Figure 3: Dry Season Farming Costs (ha)



Source: Authors' calculation based on field interviews, May 2012

different varieties and qualities of paddy is updated almost daily, indicating the high competition for profit among actors in the rice value chain (Gergely *et al.* 2010).

Tables 3 and 4 present a breakdown of costs and mark-ups along the rice value chains. Value added between adjacent actors in the value chains was calculated based on information on buying and selling prices, logistics and transport costs and mark-ups collected during field interviews in February-March 2012.

Most wet season farmers sell paddy on an individual basis to village collectors at farm gate prices of around USD0.25 per kg (USD250 per tonne). Village collectors bear the costs of loading, materials (sacks, string, containers) and transport, which add up to around USD3.4 per tonne or 1.4 percent of farm gate price for mixed wet rice. They mark up the price by about 3.6 percent, equivalent to a mark-up of USD9 per tonne, bringing the rice value for collectors to USD263 per tonne. Village traders' mark-up of 22 percent (USD55 per tonne)

Table 1: Gross Margin Analysis for Rice Farming (per ha)

Activity	Wet season		Dry season	
	USD	%	USD	%
Output : Paddy production	575	100	1396	100
Input				
Land preparation	40	7	90	6
Seed	19	3	90	6
Hired labour	88	15	0	0
Chemical fertiliser	61	11	321	23
Pesticide	0	0	125	9
Irrigation water	75	13	160	11
Threshing	15	3	70	5
Total input costs	298	52	856	61
Gross margin, excluding HH labour	277	48	540	39
Gross margin, including HH labour	150	26	297	21
Net cost return of labour per day	8.15		8.31	
Cost (per kg)	0.13		0.12	
Benefit (per kg)	0.12		0.07	

Note: Exchange rate USD1=4000 riels; calculations exclude household own labour.
Source: Authors' calculations based on field interviews, May 2012

is high compared to regional traders' mark-up of 16 percent (USD40 per tonne), especially given that village traders spend less on logistics and transport (USD7.5 per tonne) than regional traders do (USD10 per tonne). By the time rice arrives at the mill, the price has reached USD377 per tonne, which is a 50 percent increase on the farm gate price (USD250).

Unlike wet season farmers, dry season farmers grow rice for commercial purposes. Therefore, actors in the dry rice value chain are very active and trading is competitive. Mostly IR varieties, which produce lower quality grain than wet season varieties, are traded in the dry season. Thus, the farm gate price is also lower, at around USD193 per tonne (Table 4). As in the wet rice value chain, the value added after the farm gate price is due to similar costs of loading, transport and informal fees. However, the mark-ups between adjacent actors are not as variable as in the wet rice value chain, ranging from 3.4 percent to 7.5 percent or around USD7 to USD14 per tonne, respectively. This indicates that the dry rice market is more efficient with high competition among actors. Importantly, there is a continuous flow of updated information on rice prices.

Relationship, Governance and Challenges in Rice Marketing Value Chain

Figure 4 illustrates the coordination and sequence of information exchange in the rice value chains in Takeo province. Vietnamese traders set the price, quality and quantity and farmers are the final price takers. Cambodian traders have little bargaining power when negotiating prices and quality with Vietnamese traders. Quality does not seem to be a serious problem when demand is high, but Vietnamese traders often take advantage and downgrade quality to reduce the price.

There is no formal or systematic quality control mechanism to classify paddy quality at each stage of the value chain. Actors assess quality, the main criteria being moisture content and grain rot, based on their own knowledge and experience.

Rice Policy

Takeo is one of the main rice producing provinces in Cambodia, accounting for 12.5 percent of national production and contributing 17.6 percent of national surplus. That makes it a key province for driving the government's "white gold" policy aimed at exporting 1 million tonnes of milled rice by 2015. Despite Takeo's high potential for producing surplus rice for export, there are many shortcomings including the main variety cultivated, low quality seeds, limited extension services, and inadequate post-harvest marketing infrastructure.

Rice varieties: MAFF recommends and promotes 10 rice varieties, including three early IR types – Sen Pidor, IR66 and Chulsar – that have the potential to produce export-standard grain. However, farmers continue to use IR504 from Vietnam, to the detriment of the local varieties being promoted for export markets. IR504 is widely used by farmers in irrigated and recession rice areas and makes up about 41 percent of total production in Takeo. Although the variety is considered poor quality in local markets, high yields and demand from Vietnamese traders have led farmers to grow it on a commercial scale.

Low quality seeds: Farmers continue to use low quality seeds. Despite the development of specialist

Table 2: Cambodia's Rice Prices (USD per tonne), August 2011 to October 2011

	Cambodia	Thailand	Vietnam	Price difference	
				Thailand	Vietnam
White Rice					
Farm gate	250-350	340-350	340-350	90-0	90-0
Milled rice	650	490-493	461	157-160	89
Export price (FOB)	680	605-610	565-575	70-75	105-115
Fragrant Rice					
Farm gate	354-452	402-452	-	47-0	-
Milled rice	870	907-910	-	37-40	-
Export price (FOB)	900	1075-1085	675-685	175-185	185-225

Note: FOB = free on board
Source: RGC 2011

Table 3: Wet Season Rice Marketing Value Chain (USD per tonne)

	Village collectors		Village/local traders		Regional traders		Provincial rice millers	
	USD	%	USD	%	USD	%	USD	%
Buy in	250.0	100.0	262.5	105.0	325.0	130.0	375.0	150.0
Loading	1.0	0.4	2.0	0.8	2.0	0.8	2.0	0.8
Transport	1.4	0.6	4.1	1.6	5.0	2.0	0.0	0.0
Materials	1.0	0.4	1.5	0.6	1.5	0.6	0.0	0.0
Informal fees	0.0	0.0	0.0	0.0	1.5	0.6	0.0	0.0
Mark-up	9.1	3.6	54.9	22.0	40.0	16.0	0.0	0.0
Total	**262.5**	**105.0**	**325.0**	**130.0**	**375.0**	**150.0**	**377.0**	**150.8**

Source: Authors' calculations based on field interviews, May 2012

seed producers, seed supplies are still limited in many areas of the country including in Takeo province. Most farmers do not renew their seeds regularly and storage practices mean that seeds are mixed, thus reducing germination rate and quality from one production season to the next. Farmers, especially wet season farmers, tend to renew seed only when collectors and millers demand better quality, or in order to fetch a higher price for their crops.

Lack of extension services: Farmers complain about problems accessing technical assistance from local authorities to control pest problems, particularly in the dry season. They apply many different kinds of pesticides, but some of these are banned products and harmful to health and the environment. More seriously, because most pesticides sold on the market are imported from Vietnam or Thailand, the instructions are in Vietnamese or Thai and farmers cannot read the precautions or recommended dilution and application rates. The dearth of extension services information and advice on fertiliser application leaves farmers reliant on merchants' advice or simply using fertiliser at rates/quantities they can afford. Poor quality control at the border allows non-standard fertilisers to enter the market. Further, about 10 percent of fertilisers are diluted or low-grade products re-bagged in sacks labelled with a high-grade brand (Theng 2012).

Rice marketing: About 69 percent (764,902 tonnes) of total rice production in Takeo is surplus, which indicates the huge potential for export. Because of lack of capital investment in rice mills and modern milling technology, the sector has limited capacity to process this surplus. Hence, mainly paddy (non-milled grain) is exported and chiefly to Vietnam. Trade seems to be dominated by Vietnamese traders setting prices and quality standards, which allows them to downgrade quality or underestimate value and lower the price. It is critical, therefore, that measures be put in place to classify paddy quality. In doing so, trade would be fairer for both sides.

Policy Implications

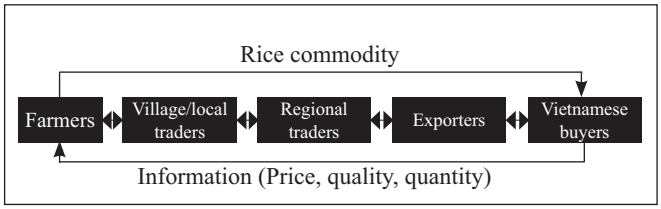
Farmers face high production costs and low farm gate prices. This indicates the need to lower production costs, particularly those beyond the control of

Table 4: Dry Season Rice Marketing Value Chain (USD per tonne)

	Village collectors		Village/local traders		Regional traders		Exporters		Vietnamese traders	
	USD	%	USD	%	USD	%	USD	%	USD	%
Buy in	192.5	100.0	202.5	105.2	217.5	113.0	237.5	123.4	262.5	136.4
Loading	1.0	0.5	2.0	1.0	2.0	1.0	2.0	1.0	2.0	1.0
Transport	1.4	0.7	4.1	2.1	5.0	2.6	5.0	2.6	0.0	0.0
Materials	1.0	0.5	1.5	0.8	1.5	0.8	1.5	0.8	0.0	0.0
Informal fees	0.0	0.0	0.0	0.0	1.5	0.8	2.0	1.0	0.0	0.0
Mark-up	6.6	3.4	7.4	3.8	10.0	5.2	14.5	7.5	0.0	0.0
Total	**202.5**	**105.1**	**217.5**	**112.9**	**237.5**	**123.4**	**262.5**	**136.3**	**264.5**	**137.4**

Source: Authors' calculations from May 2012 field interview data

Figure 4: Coordination of Information along the Value Chains



producers, and to improve farm gate prices for both wet and dry season rice.

Value chain analysis shows that the rice produced in Takeo province does not meet the required standard for export. Actions to consider on the production side include introducing quality rice varieties, distributing and regularly renewing quality seeds, and providing extension services on best farming practices including pest control and soil fertility and enrichment. Doing so will enable farmers to reduce their costs, particularly fertiliser and pesticides, and produce higher yields of export quality paddy that fetch better market prices.

The well-structured rice market in the province enables farmers to sell their paddy at very competitive market prices. Paddy surplus is milled and traded efficiently in local markets, but due to low milling capacity and inadequate capital investment the milling sector cannot process the entire surplus. Export of paddy, therefore, remains crucial. Presently, paddy surplus is traded with Vietnam only. Cambodia has signed a Memorandum of Understanding with Vietnam to export and import rice commodities, but changes in Vietnam's rice trade policy through higher tariffs, quota restrictions or the closing of its borders to protect its local markets would throw Takeo's rice sector into crisis. An important economic safety measure to counter the risk of such disruption would be to open a Cambodia export rice chain.

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