



The Production, Marketing, and Export of Rice in Takeo

Chhim Chhun, Theng Vuthy, and Nou Keosothea

INTRODUCTION

Though the rice sector has demonstrated rapid growth in Cambodia in the past decade, many studies show that there are significant issues in production and post-harvest operations to do with the cost of production, rice quality, storage capacity, the structure and performance of the milling sector, and the management of cross-border trade with Thailand and Vietnam (ACI and CamConsult 2006; ADBI 2008; Gergely et al. 2010; RGC 2010; Sok et al. 2011). Understanding the rice value chain may help to increase the benefits that accrue to smallholder producers. Takeo is one

C. Chhun (✉)

Cambodia Development Resources Institute, Phnom Penh, Cambodia
e-mail: chhun@cdri.org.kh

T. Vuthy

Office of Food Security and Environment, USAID, Phnom Penh, Cambodia
e-mail: vtheng@usaid.gov

N. Keosothea

National Committee, Economic and Social Commission for Asia and the Pacific,
Ministry of Foreign Affairs and International Cooperation,
Phnom Penh, Cambodia

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R. Cramb (ed.), *White Gold: The Commercialisation of Rice
Farming in the Lower Mekong Basin*,

https://doi.org/10.1007/978-981-15-0998-8_12

of the main rice-producing provinces in Cambodia and increasingly engages in cross-border trade with Vietnam. The aim of this case study was to examine the production and marketing of rice in Takeo Province with a view to identifying ways to increase the benefits accruing to rice growers. The specific objectives were to (1) map the rice value chain (from producers downstream); (2) analyse costs and margins along the value chain; (3) examine relationships, governance, and flows of information along the value chain; and (4) identify policy options to improve the value chain.

To map the rice value chain in Takeo Province, both qualitative and quantitative approaches were adopted, drawing on primary and secondary data (M4P 2008). Data collection was conducted from mid-February to mid-March 2012. Focus group discussions (FGDs) and key informant interviews (KIIs) were used to obtain information from various actors, ranging from rice producers, rice collectors, rice traders, rice mill owners, rice exporters, and institutions working with rice marketing. FGDs were conducted with farmers in three districts: Tram Kak (predominantly rainfed wet-season [WS] rice), Prey Kabbas (rainfed WS rice with supplementary irrigation), and Koh Andaet (rainfed WS rice and dry-season [DS] and/or recession rice). For the value chain actors, information was also collected in two more districts—Angkor Borei and Kiri Vong—and in Takeo town.

ECONOMICS OF RICE PRODUCTION

The first link in the rice value chain is on-farm production. Table 12.1 presents typical gross margin analyses for WS and DS rice based on information provided by farmers in 2012 (i.e., for the 2011–2012 farming season). Farmers averaged yields of about 2.3 t/ha in the WS and 7.2 t/ha in the DS, the latter attributable to the use of high-yielding IR varieties (derived from the International Rice Research Institute), higher fertiliser rates, irrigation, and the higher level of insolation. Farm-gate prices were around USD 250/t for WS paddy and USD 194/t for DS paddy, the IR varieties required for export to Vietnam being of lower quality. Despite the lower price, DS rice production provided nearly 2.5 times the gross revenue of WS rice and twice the gross margin per ha. Nevertheless, the gross margin per day of family labour was similar, at about USD 8 per day, compared with daily wage rates of about USD 3 in the WS and USD 3.75 in the DS.

Farmers in the study area felt they faced high production costs, accounting for 52% of gross income in the WS and 61% in the DS. The main costs

Table 12.1 Gross margin analysis for rice farming (1 ha)

Activity	Wet season		Dry season	
	USD	%	USD	%
Value of paddy produced	575	100	1396	100
Input costs				
Land preparation	40	7	90	6
Seed	19	3	90	6
Hired labour	88	15	–	0
Chemical fertiliser	61	11	321	23
Pesticide	0	0	125	9
Irrigation	75	13	160	11
Threshing	15	3	70	5
Total input cost	298	52	856	61
Gross margin (excl. family labour)	277	48	540	39
Gross margin (incl. family labour)	150	26	297	21
Gross margin per day of family labour	8.15		8.31	

Source: Farmer interviews in study villages

Note: 1 USD = 4000 riels

in the WS were hired labour, fertilisers, and irrigation, while in the DS the main costs were fertilisers and irrigation.

Costs of production are very high due to the high price of water fees, fertilisers, and pesticides. The high price of diesel also contributes to high production costs. In addition, we bought inputs on credit and paid back at harvest. For instance, fertilizer (DAP), the current price was USD 35 per 50 kg bag, but we paid back at the price of USD 40 per bag at harvesting. (FGDs with farmers in Koh Andact and Prey Kabbas)

Most WS production followed traditional cropping practices, with transplanting and harvesting by hand, and thus hired labour was a significant cost. However, DS rice involved direct seeding (broadcasting) and mechanical harvesting, and hence all tasks could be handled with family labour and the cost of hired labour was zero.

Purchasing chemical fertilisers was another significant production cost, especially in the DS. This is because DS varieties are more responsive to fertilisers and DS yields are more assured, given access to irrigation. Hence, there are higher returns to increased fertiliser use and less risk of

making a loss in the additional investment. However, farmers had little guidance on appropriate fertiliser rates.

There are no government agents or extension workers who come to teach us how to use agricultural inputs properly. Nowadays, we apply inputs following our neighbours in the villages, or retailers tell us how to use both fertiliser and pesticide and the application rate. (FGD with farmers in Koh Andaet)

Irrigation fees were one of the cost items that interviewed farmers complained about the most, especially DS farmers. WS farmers also spent a significant amount on irrigation because they faced a short drought in 2011 requiring them to hire water pumps and buy fuel.

WS farmers did not usually apply pesticides unless there was a severe pest outbreak. However, DS farmers typically incurred a high cost for pesticides. In some years, pesticide costs were as high as for fertilisers, but in the study year there had been little problem with insect pests, hence pesticides accounted for around 15% of total production costs.

Purchasing rice seeds was not common for WS farmers; they retained their own seeds by drying and storing it carefully for use in the following season. However, DS farmers purchased seeds, accounting for 11% of production costs. This was because they used high-yielding seeds provided through Vietnamese traders, and broadcasting required a higher seeding rate.

THE RICE VALUE CHAIN

Various value chain actors were identified during field interviews, as shown in Fig. 12.1. There were two main pathways, one for the WS harvest and one for the DS harvest. Most WS rice was produced for home consumption, with a small surplus sold. DS rice, by contrast, was produced for commercial purposes and most was sold immediately after harvesting. As a consequence, value chain actors were less active in the WS but very busy in the DS. WS rice was mainly traded to supply domestic consumers, with the flow from farmers to village collectors, regional traders, and local and regional millers. The DS market chain led to Vietnam, with paddy being transported by barge or road transport to the border at Phnom Den for milling within Vietnam.

Village collectors and traders were key actors in buying paddy from individual farmers and selling to rice millers and regional rice traders,

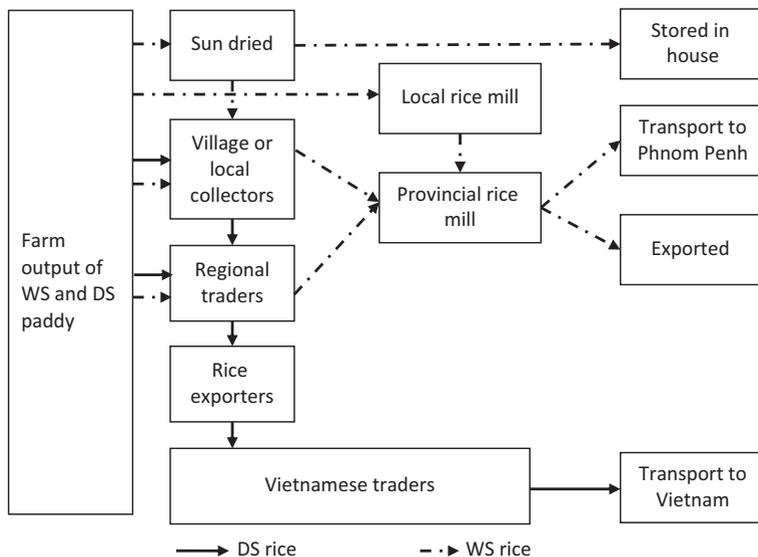


Fig. 12.1 Map of rice value chain in Takeo

mostly the latter. They were small businesses with a buying capacity of 10–30 t due to limited transport and capital. They typically loaded the paddy onto an oxcart or hand-tractor cart to transport from the village to the regional traders. They generally bought different varieties and mixed them, though they separated premium quality paddy which they sold for a higher price. Village collectors and traders were commonly farmers from the same village. Some bought paddy using capital advanced by the regional traders and transported the purchased stock to the regional traders for a commission USD 0.05 per 50 kg bag; some used their own working capital to buy paddy and sell for a profit.

Regional traders were larger businesses with the capacity to buy more than 100 t and sell to exporters. They usually had their own trucks and hired labourers. During the harvest season, given the recent progress in rural road development, regional traders had access to almost all collectors. They parked their trucks in the villages to collect paddy from the collectors and pay them immediately in cash. Sometimes they stored paddy in their warehouses for speculative reasons, but usually they transported the paddy directly to the next point in the chain. During the WS harvest, regional

traders brought the collected paddy to local or provincial millers, who then sold rice to local consumers and retailers or transported rice to the Phnom Penh market or exporters. During the DS harvest, regional traders collected paddy to sell to Vietnamese traders within Cambodia but mostly they sold directly to Cambodian exporters who had a regular relationship with Vietnamese traders.

Exporters were larger businesses, usually located near a river port or the border, collecting paddy from regional traders for Vietnamese buyers. They were well connected with the traders from Vietnam and thus knew which varieties to buy in what quantities. To some extent they were financed by the Vietnamese traders, especially if the demand for paddy was high and the exporters experienced a capital constraint.

Local rice millers were also actors in the rice value chain. They bought paddy directly from farmers, milled it, and sold the rice in the local market. They also sold some paddy to provincial rice millers. Normally, they purchased and milled only WS paddy as local consumers demanded good quality local rice varieties rather than the bulk-export varieties planted in the DS.

VALUE CHAIN ANALYSIS

To estimate the value added by actors along the value chain, data were collected during the field interviews in February–March 2012 regarding buying and selling prices, handling and transportation costs, and mark-ups.

Table 12.2 Margins in value chain for wet-season paddy (USD/t)

	<i>Village collector</i>		<i>Local trader</i>		<i>Regional trader</i>		<i>Provincial rice miller</i>	
	<i>\$/t</i>	<i>%</i>	<i>\$/t</i>	<i>%</i>	<i>\$/t</i>	<i>%</i>	<i>\$/t</i>	<i>%</i>
Purchase price	250.0	100	262.5	105.0	325.0	130.0	375.0	150.0
Handling	1.0	0.4	2.0	0.8	2.0	0.8	2.0	0.8
Transportation	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 fee	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 from field data obtained in May 2012

Table 12.3 DS rice marketing value chain in Takeo province (USD/t)

	<i>Village collector</i>		<i>Local trader</i>		<i>Regional trader</i>		<i>Exporter</i>		<i>Vietnamese trader</i>	
	<i>\$/t</i>	<i>%</i>	<i>\$/t</i>	<i>%</i>	<i>\$/t</i>	<i>%</i>	<i>\$/t</i>	<i>%</i>	<i>\$/t</i>	<i>%</i>
Price	192.5	100.0	202.5	105.2	217.5	113.0	237.5	123.4	262.5	136.4
Handling	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	105.2	217.5	113.0	237.5	123.4	262.5	136.4	264.5	137.4

Source: Authors' calculations from field data obtained in May 2012

The results are presented in Table 12.2 for WS paddy and Table 12.3 for dry-season paddy.

The value chain for WS paddy began at harvesting, when farmers sold some surplus for cash income, and ended at the provincial rice millers (leaving aside the paddy used for household consumption that was taken to the village rice mill and returned to the household). The overall value added along this value chain was about USD 127/t or 50% of the farm-gate price (Table 12.2).

Most farmers sold paddy to small-scale village collectors at farm-gate prices of about USD 0.25/kg (USD 250/t). The village collectors bore the costs of loading, materials (bags, twine, and containers), and transportation, totalling around USD 3.4 or 1.4% of the farm-gate price. Most village collectors used their own means of transportation such as motorbikes, ox-carts, or hand-tractor carts, and hence had lower transport costs than local or regional traders. Their mark-up was about USD 9/t, and hence the value added by the collectors was about USD 12.5 or 5%. They accepted the market price offered by local traders from outside the village.

These local traders had somewhat higher costs than the village collectors and a significantly higher mark-up at USD 55/t, representing nearly half the value added from the farm gate to the miller. This suggests that the local traders had access to more price information and working capital than the collectors and could manipulate their buying price to a degree to increase their profits. However, some of the higher mark-up may have been due to storage costs beyond those incurred by the village collectors.

Regional traders were usually engaged in inter-provincial trade, spending relatively more on transport to their warehouses or to exporters, including “informal fees” along the way. Their mark-ups (USD 40/t) were somewhat lower than those reported for the local traders. They too were price-takers when selling to the local or provincial millers but may have been able to exercise some market power with the local traders.

In contrast to the WS, DS rice farmers produced rice solely for commercial purposes. Actors in the value chain were very active and competitive. Two additional DS actors were identified from the field interviews—exporters and Vietnamese traders (Fig. 12.1). The paddy traded in the DS mostly comprised IR varieties of lower quality than the local varieties grown in the WS. Hence the farm-gate price was lower, at around USD 193/t (Table 12.3). As for WS paddy, the value added from the farm gate onwards was in part due to the costs of handling, materials, transportation, and informal fees incurred by each actor; these expenses were similar between seasons.

However, the traders’ mark-ups were significantly lower for the DS crop and did not differ greatly from the village collectors’ mark-up, ranging from USD 7 to 10/t (or 3.4 to 7.5% of the farm-gate price). This indicates that the market was more competitive in the DS, squeezing the margins of all actors. The exporters, however, obtained a higher mark-up of USD 15/t, perhaps reflecting a degree of market power as the number of exporters was fewer and there was little domestic demand for the paddy. During the field interviews, it was not possible to obtain information on the transportation costs from the Cambodian port to Vietnam, only the handling cost of the Vietnamese traders at the border. Hence the remainder of the value chain and the final selling price in Vietnam was not captured (see Chap. 18 for the story from the Vietnamese side of the border).

In general, the market showed a high degree of competition, with many actors involved at each stage and prices set largely by market forces. Farmers could sell their paddy throughout the year into a highly competitive market. Paddy prices for different types and qualities were widely communicated on a daily basis (Gergely et al. 2010). However, there were obvious deficiencies in the market infrastructure, especially for export paddy. Takeo exported most of its rice surplus as paddy to Vietnam. Thus, the rice market in Takeo was highly dependent on the demand from Vietnam; if the border was closed or buying prices were reduced, there would be a major income crisis for value chain actors within Takeo,

Table 12.4 Rice prices in Cambodia, Thailand, and Vietnam, August–October 2011 (USD/t)

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

Source: Ministry of Agriculture, Forestry and Fisheries, Cambodia

^aFOB

especially the producers. This has occurred in the case of the cassava trade between north-western Cambodia and Thailand.

The amount of paddy exported across the border depended almost solely on the differential in paddy price between Cambodia and Vietnam. As shown in Table 12.2, the farm-gate price of paddy in Cambodia was much lower than in Vietnam (and Thailand), stimulating the flow of exports from southern Cambodia to Vietnam, including both official and unofficial exports (hence there was no official record of the amount of paddy exported). This indicates that there was a lack of storage and milling capacity within Cambodia to process and export milled rice to Vietnam or the international market. The high cost of milling in Cambodia is reflected in the relatively high prices of milled and export white rice in Table 12.4. Nevertheless, the relative prices of Cambodian fragrant rice make it potentially competitive with Thailand in this sub-sector of the market.

RELATIONSHIPS AND GOVERNANCE IN THE VALUE CHAIN

There is a two-way flow of information in the DS (export) rice value chain in Takeo. On the one hand, information about the availability of paddy in the villages is transferred along the chain from farmers to Vietnamese traders. On the other hand, information about prices and requirements for quality and quantities flows from Vietnamese traders back to farmers in the villages. This information flows through the intermediate actors in the

value chain—exporters, regional traders, local traders, and village collectors. The price, quality, and quantity are set by the Vietnamese traders; the information is then passed on and manipulated by the different actors to cover their costs and obtain a margin, and finally farmers are faced with the farm-gate market price, quantity, and quality requirements. Mostly the Cambodian traders have little chance to negotiate the price and quality with the Vietnamese traders. When the demand is high, the Vietnamese traders seem not to take the quality problems so seriously, but they often take advantage of their position in the chain to downgrade the paddy and reduce the price.

There are no formal rules and regulations relating to setting the price of paddy in Takeo. Usually, the price is simply agreed between buyers and sellers, but it is ultimately limited by the price level set by the Vietnamese traders, otherwise the actors along the value chain will make a loss. Since rural roads have been markedly improved over the last decade, traders can now easily access most villages. Therefore, farmers have a degree of choice to sell their paddy to whomever can provide a better price.

Nowadays, we can sell our rice to someone who can give us the higher price. We don't care who they are. (FGD with farmers in all villages interviewed)

There are paddy traders now; the buying price is very competitive. To get enough paddy, sometimes we have to increase prices; however, the price is not higher than the price set by the Vietnamese traders. (KII with village traders in Angkor Borei)

There is also no formal or systematic mechanism in place to classify paddy quality at each link in the value chain; actors make judgements based on their own knowledge and experience before accepting paddy at agreed prices. The main quality criteria considered are moisture content and damaged or mouldy grain. Vietnamese traders particularly emphasise moisture content (a function of Cambodian traders buying paddy straight after harvest by combine harvesters when moisture content is still high). The Cambodian paddy exporters complain that the Vietnamese traders are too strict in setting quality standards as Cambodian farmers generally produce paddy that is not as good as the benchmark sample.

Normally, the Vietnamese traders give the sample of paddy quality and [associated] price to the exporters. Then the exporters pass on the quality requirements and prices to the regional traders to buy paddy for them. Most often, exporters

are faced with quality problems because the collected paddy is usually of mixed quality or farmers grow mixed varieties, so it is difficult to distinguish them according to the quality demanded. Sometimes, Vietnamese traders downgrade the paddy, not accepting the quality of the paddy that we have collected and transported to the port. Therefore, negotiations had to take place and finally the price was decreased. (KII with rice traders and exporters in the study area)

RICE POLICY IN TAKEO

Takeo is one of the main rice producers in Cambodia, accounting for 12.5% of national production and 17.6% of the national rice surplus. Thus, Takeo is one of the key provinces contributing to the government's policy promoting rice exports, with a goal of exporting 1 million t of milled rice. About 41% of Takeo's paddy output came from DS production in 2011–2012. Though Takeo shows potential, there are many shortcomings in the rice sector, including the varieties used, low-quality seeds, limited extension services, and post-harvest issues.

Recently, the Ministry of Agriculture, Forestry and Fisheries (MAFF) promoted ten varieties, including three early-maturing IR varieties—Sen Pidor, IR66, and Chulsar—that have the potential to meet the quality standard for high-value rice exports. However, farmers continue to use more Vietnamese varieties. IR504 from Vietnam is widely used by farmers in irrigated and recession rice areas in the DS. Though this variety is not of good quality for the local market, the high yield and the demand from Vietnam has meant that farmers widely adopt it for commercial production.

As indicated above, farmers continue to use low-quality seeds. Though there are companies producing seeds, supplies are still limited in many areas, including Takeo. Hence, most farmers do not renew their seeds regularly, particularly for WS rice. Seeds are often mixed during storage and reduced in quality after being used for many years. Farmers renew their seeds only when collectors or millers demand better quality and offer higher prices.

During the field interviews, farmers complained about the difficulty of finding technical assistance to control rice pests, especially in the DS. They applied many kinds of pesticides; some were banned and very dangerous to human health and the environment. Most of the pesticides sold in the market were imported from Vietnam or Thailand, with original language labels. Furthermore, there was a dearth of information from extension services to advise farmers on fertiliser application. Farmers applied at a rate

they felt they could afford or merely followed the advice of the fertiliser merchants. Some fertilisers sold on the market also had low quality, as discussed in Chap. 14.

About 69% (764,902 t) of total paddy rice production in Takeo is surplus, available for export. The milling sector has limited capacity to absorb this surplus to process and export. Thus, the export market for paddy remains vital for Takeo rice farmers. As indicated earlier, paddy in Takeo is mainly traded with Vietnam; the trade is dominated by Vietnamese traders in setting prices and the required quality. Vietnamese traders can downgrade the paddy and hence lower the export price. Measures are needed to formally grade paddy and encourage better quality so the trade is fair and beneficial to value chain actors on both sides of the border.

CONCLUSION

Rice production in Takeo provides a subsistence base for farm households, an adequate return to household labour and, for those who have access to irrigation in the DS, an important commercial activity. The returns to farmers could be improved by providing better information about and regulation of the key inputs—seeds, fertilisers, and pesticides. The rice market in Takeo is well structured with a network of collectors, traders, and exporters. Farmers can readily sell their paddy at a competitive market price. The marketed surplus is traded and milled efficiently in the domestic market, but the milling sector does not have the physical capacity or capital to handle the DS paddy surplus, which is exported directly to Vietnam. Thus, the export of paddy remains crucial for the commercial rice industry in Takeo. Though Cambodia and Vietnam have an agreement with regard to the cross-border trade in paddy, if Vietnam's rice policy changed to protect its own farmers, the rice sector in Takeo would be vulnerable. Nevertheless, while Cambodia continues to develop its rice processing and export capacity, the cross-border trade in paddy provides a viable source of income for a sub-sector of rice farmers in Takeo.

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