



# Commercialization of Rice and Vegetables Value Chains in Lao PDR: Status and Prospects

2018



# Commercialization of Rice and Vegetables Value Chains in Lao PDR: Status and Prospects

**Final report**  
**June 20, 2018**

Report No: AUS0000419



# ➤ Table of Contents

Acknowledgments	i
Acronyms and Abbreviations	ii
➤ Executive Summary	1
1 ➤ Introduction	3
2 ➤ Rice Value Chain	9
2.1 ➤ Domestic market	10
2.2 ➤ Export market	22
2.3 ➤ Cost drivers	26
3 ➤ Vegetables Value Chain	31
3.1 ➤ Conventional vegetables	32
3.2 ➤ Cost drivers	36
4 ➤ Conclusions and Policy Recommendations	41
A. Value chain linkages	42
B. Regulatory environment	44
C. Investment	45
➤ Annex	47
Detailed cost data for sticky rice value chain	47
Detailed cost data for vegetables value chain	49
➤ References	52

## List of Figures

Figure 1 > Segments of a typical agricultural value chain	5
Figure 2 > Value chain concept	5
Figure 3 > Rice retailing in Vientiane	22
Figure 4 > Retail prices of glutinous rice in Vietnam, US\$/ton, 2015	23
Figure 5 > Lao PDR: Price build-up and value added along the sticky rice value chain, US\$/ton	28
Figure 6 > Lao PDR: Magnitude and origin of different categories of costs, LAK/ton	30
Figure 7 > Lao PDR: Wet market with vegetables in Vientiane	35
Figure 8 > Lao PDR: Price build-up and value added along the lettuce value chain, US\$/ton	37
Figure 9 > Lao PDR: Price build-up and value added along the coriander value chain, US\$/ton	38

## List of Tables

Table 1 > Per capita rice consumption, selected countries, kg/year, 1993–2013	9
Table 2 > Lao PDR: Cost and margins of the rice value chain at farm-gate	11
Table 3 > Paddy prices and paddy farm profitability: cross-country comparisons	11
Table 4 > Lao PDR: Source of leading rice mills' paddy supply in Khammouane Province	12
Table 5 > Lao PDR: Costs and margin of the rice value chain at the assembly stage	14
Table 6 > Lao PDR: Costs and margin of the rice value chain at the milling stage	16
Table 7 > Lao PDR: Costs and margin of the rice value chain at the wholesale stage	19
Table 8 > Lao PDR: Costs and margins of the rice value chain at the retail stage	21
Table 9 > Lao PDR: Rice value chain: costs, prices, profits, US\$/ton	26
Table 10 > Share of farm-gate prices in wholesale and retail prices: cross-country comparison	26
Table 11 > Lao PDR: Distribution of costs and profits along the rice value chain at the beginning of the season, US\$/ton	27
Table 12 > Costs added as share of total costs along the value chain of conventional rice in Bangladesh, India, and China (in %)	27
Table 13 > Share of total profit accruing to value chain participants in selected countries	28
Table 14 > Lao PDR: Costs and margins in the vegetables value chain at the production stage	33
Table 15 > Lao PDR: Costs and margins of the lettuce value chain at assembly, wholesale, and retail stages	34
Table 16 > Lao PDR: Costs and margins of coriander value chain at assembly, wholesale, and retail stages	34
Table 17 > Lao PDR: Distribution of costs and margins along the lettuce value chain, US\$/ton of farm-gate product	36
Table 18 > Lao PDR: Distribution of costs and margins along the coriander value chain, US\$/ton of farm-gate product	36
Table 19 > Thailand: Vegetable prices at fresh markets in Nongkhai and Udon Thani	38
Table 20 > Cost drivers and key recommendation	46

# Acknowledgments

This report was prepared by a joint team from the World Bank's Food and Agriculture, and the Macroeconomics, Trade, and Investment Global Practices in the East Asia and Pacific Region. Report preparation was led by Mombert Hoppe and Sergiy Zorya (Task Team Leaders) and included a team consisting of Anke Reichhuber, Kenekeo Sayarath, Wisambi Loundu, and Somchay Soulitham from the UNIQUE Forestry and Land GmbH, Freiburg, Germany.

The team is grateful to the staff of the Ministry of Agriculture and Forestry, the Ministry of Industry and Trade, the Ministry of Planning and Investments, the donor agencies, and other participants for their inputs at a technical workshop hosted by the German Agency for International Cooperation (GIZ) in Vientiane on November 21, 2017 and at a validation workshop hosted by the World Bank in Vientiane on June 18, 2018. The team is further grateful to Hannah McDonald-Moniz (Communications Officer, EAPEC) for support provided during preparation and dissemination of the report.

Jean-Christophe Maur (Senior Economist, GFCAC) and Steven Jaffee (Lead Agricultural Economist, GFA02) served as peer reviewers. Nathan Belete (Practice Manager, GFA02), Mona Haddad (Director, CCEDR), Deepak Mishra (Practice Manager, GMT1) supported this work and provided guidance during preparation of the report and its dissemination. Amy Gautam (Consultant, GFA02) edited the report and Phet Udom Mainolath (Program Assistant, EACLF) provided logistical support.

Preparation of this report was funded from the MDTF to support the Second Trade Development Facility, funded by Australia, the European Union, Ireland, Germany, the United States, and the World Bank.

© 2017 The World Bank  
1818 H Street NW, Washington DC 20433  
Telephone: 202-473-1000; Internet: [www.worldbank.org](http://www.worldbank.org)

## Some rights reserved

This work is a product of the staff of The World Bank. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the Executive Directors of The World Bank or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

## Rights and Permissions

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

**Attribution**—Please cite the work as follows: "World Bank. 2018. Commercialization of Rice and Vegetables Value Chains in Lao PDR: Status and Prospects. © World Bank."

All queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; e-mail: [pubrights@worldbank.org](mailto:pubrights@worldbank.org).

## Acronyms and Abbreviations

<b>CoO</b>	Certificate of Origin
<b>EBA</b>	Everything But Arms
<b>EU</b>	European Union
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>FAO GIEWS</b>	FAO's Global Information and Early Warning System
<b>GDP</b>	Gross domestic product
<b>ha</b>	Hectares
<b>kg</b>	kilogram
<b>LAK</b>	Lao kip
<b>MoIC</b>	Ministry of Industry and Commerce
<b>O&amp;M</b>	Operations and maintenance
<b>PDR</b>	People's Democratic Republic
<b>US\$</b>	United States dollar

# Executive Summary

Rice is Lao PDR's biggest agricultural commodity in terms of farmers involved in production, cropland area allocated, and food consumption. Rice also generates important economic spillover effects, supporting jobs in milling, trading, and food catering sectors nationwide. Vegetables are emerging as a new source of growth, benefiting from the rising demand of more affluent and urbanized Laotians for nutritious and diverse diets. This report studies the extent of commercialization of rice and vegetables value chains in Lao PDR, the main challenges and opportunities, and ways to increase their contribution to the country's economic development. Economic benefits are maximized when farmers have incentives to produce for profit while consumers gain from reasonable prices and good quality of products. Therefore, this report focuses on the cost build-up between farmers and consumers, motivated by the high retail rice prices in Vientiane vis-à-vis complaints of low farm-gate prices.

The report follows a qualitative and quantitative value chain approach combined with a detailed regulatory assessment. It is based on about 100 interviews with key experts and stakeholders. It studies the value chain for rice from Khammouane to Vientiane Capital and for vegetables from Vientiane Province to Vientiane Capital.<sup>1</sup> The results are not country representative; they should be read as a snapshot of the selected value chains in selected areas in 2017. Yet this work is unique for Lao PDR, among the first to generate detailed estimates of cost build-up at each stage of the value chain using primary data and applying a consistent methodology. It is also unique in

generating knowledge on the vegetables value chain, which is less studied than those of rice and other agricultural commodities in Lao PDR.

The study finds that Lao farmers receive a relatively high farm-gate price, yet high production costs "eat" their profits (rather than low farm-gate prices, as often perceived in the country). However, the share of farm-gate prices in wholesale and retail prices in Lao PDR is the lowest among its peers. This dampens farm supply responses. In addition, the issues holding back the rice sector in Lao PDR pertain to: (i) low productivity and quality management at the farm and immediate postfarm levels; (ii) a fragmented milling sector dominated by small operators with old technology; (iii) an overall market system that fails to provide incentives for product quality; and (iv) the lack of a significant consumer class with high purchasing power that could foster consolidation of wholesale and retail sectors and reduce their costs. In summary, the high cost of paddy production and operational inefficiencies among multiple players in the value chain are responsible for high consumer rice prices.

These constraints are largely structural and require public action aimed at: (i) facilitating value chain linkages between farmers and millers; (ii) enhancing access to finance of farmers and millers; and (iii) improving the quantity and quality of public services delivery, while increasing focus on those areas critical to reduce production costs and commercialize the agriculture sector; e.g., seed, applied research, mechanization, cooperatives/farm clusters, and good agricultural practices.

<sup>1</sup> Vientiane Capital refers to the greater Vientiane area.





While regulatory or administrative barriers were not found to currently play a major role in directly inflating the cost structure of either the rice or vegetables value chain, the report finds that cumbersome regulations limit entry, affect market structure, and reduce competition. Recent efforts by Lao authorities to encourage private sector investment in value chains, promote contract farming, and limit the use of distortive trade instruments (such as export or cross-provincial

bans/roadblocks for movement of rice) seem to have generated some progress. Yet room still exists for regulatory improvements. Lowering regulatory costs for businesses, strengthening enforcement of contracts and product labelling, and removing price regulations for paddy and rice would increase private sector investment, competition, and incentives for efficiency improvements, and further reduce costs along both value chains.

# 1 > Introduction



## 1 > Over the past two decades, the Lao People's Democratic Republic (PDR) experienced rapid, yet not highly inclusive, economic growth.

Gross domestic product (GDP) growth typically exceeded 7 percent per year and, in 2016, this lower-middle-income country had a per capita GDP of US\$2,340. While Lao PDR's population and livelihood dependence remain predominantly rural and agrarian, the bulk of recent economic growth stemmed from more intensive utilization of the country's natural resources, including those for mining, forestry, and hydroelectric power. Despite their output growth, job creation in those sectors has been modest. Because of this, the poverty reduction elasticity of Lao PDR's growth has been relatively low. For every 1.0 percent of GDP growth, poverty in Lao PDR has declined by only 0.4 percent, compared to 1.2 percent in Cambodia and 1.0 percent in Vietnam.

## 2 > Agriculture is important for future inclusive growth, not least because it remains the primary source of livelihood for most Laotians.

Around 2 million adults are currently engaged in agriculture, representing 64 percent of the workforce. This pattern of employment is among the most agrarian in the world. While Lao agriculture remains structurally narrow, commercial opportunities are emerging, both domestic and for export. Rice accounts for some 72 percent of cultivated area, with much of the remaining diversification representing household livelihood coping

strategies rather than commercial endeavors. Increased domestic (and tourist) demand for fresh fruits and vegetables is being serviced primarily by imports from Thailand and China. Improving nutritional outcomes will require more affordable and regular access to such foods.

## 3 > The Government of Lao PDR has recognized the importance of improving people's access to diverse and nutritious food at affordable prices.

This necessitates a gradual shift from rice production to rice value chains, paying attention to competitiveness and supporting production of other crops – vegetables, for example.<sup>2</sup> This also necessitates looking at food prices in Lao PDR, where, for instance, rice prices are among the highest in Asia. In 2017, the average retail price of second-grade quality rice in Vientiane Capital was US\$0.85/kg,<sup>3</sup> compared to US\$0.42/kg in Phnom Penh, US\$0.38/kg in Hanoi, US\$0.40/kg in Bangkok, US\$0.44/kg in Yangon, US\$0.50/kg in New Delhi, US\$0.73/kg in Manila, and US\$0.80/kg in Jakarta.<sup>4</sup> High rice prices have a significant effect on Lao consumers. In 2013, Laotians consumed an average 159 kg of rice per capita per year (see Table 1 in the next section). This is more than in China (77 kg), Malaysia (88 kg), Thailand (114 kg), and Vietnam (144 kg).

## 4 > One of the reasons for high rice prices is Laotians' preference for a quite rare glutinous (or sticky) rice.

Most Asian consumers mainly

2 The Government of Lao PDR prepared the food security action plan and engaged the Asian Development Bank and the World Bank to prepare projects to implement it. The Agricultural Competitiveness Project financed by the International Development Association (IDA), which targets the development of rice, maize, and vegetables value chains, was approved in April 2018. The project to be financed by the Asian Development Bank will be approved over the summer of 2018.

3 First-quality glutinous rice even fetched US\$1.0/kg in Vientiane Capital in 2017, according to FAO GIEWS.

4 Rice prices are from the FAO GIEWS dataset. While rice quality is not directly comparable across countries, the presented prices are for the quality of rice closest to second-grade rice in Lao PDR. Other than in Vientiane, the reported prices are for non-glutinous rice, the preferred type of rice across Asia.

eat non-glutinous rice varieties. Glutinous rice is produced with surplus only in Thailand. This makes Lao PDR vulnerable to domestic production shocks and price fluctuations. Another reason is low farm productivity, which leads to high production costs and thus inflated prices (FAO, IRRI, and World Bank 2012; World Bank 2014, 2016). Yet information about the rest of the rice value chain is patchy and incomplete. No recent study applies a coherent methodology to estimate the cost build-up along all stages of the rice value chain in Lao PDR, which makes it difficult to make specific policy recommendations for rice sector commercialization.

**5 > Even less is known about the vegetables value chain in Lao PDR**, although the demand for more information and analyses increases along with the increase in demand for vegetables. The market for “clean and safe” vegetables is growing in fast-growing urban centers in Lao PDR, which provides ample market opportunities for Lao farmers and

traders. Most vegetables in Vientiane Capital are imported from China, Thailand, and Vietnam. No information is available about costs and prices at various stages of the value chain, limiting the understanding about the reasons for Lao farmers’ low supply response to the emerging market opportunities for vegetables.

**6 > To shed light on the above questions, this report studies the status of different segments of value chains for rice and vegetables and estimates the cost/profit build-up in 2017 in a consistent manner.** For rice, the study starts in the paddy production areas of Khammouane Province and ends in retail outlets in Vientiane Capital. For vegetables, the value chain starts on farm fields in Vientiane Province and ends in retail outlets in Vientiane Capital. The study draws conclusions as to what types of policy actions could assist in reducing the costs along the value chain and increasing private sector investment.

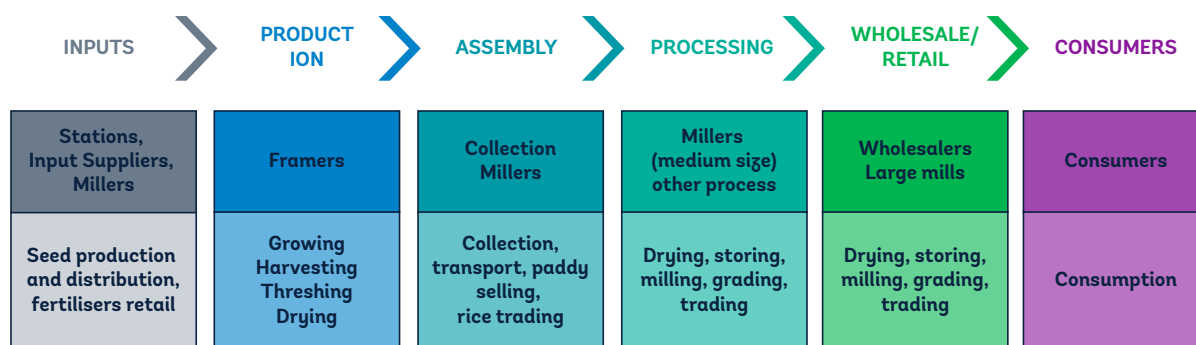


**7>The study uses a value chain approach.**

Segments of typical rice and vegetables value chains in Lao PDR include input supply, production, assembly, processing, wholesaling, and retailing (Figure 1). Inputs are supplied from different sources, among them private input suppliers and public agricultural stations, such as centers for seeds. Production is carried out by many small- and medium-sized farm households. Small farmers increasingly partner with agribusinesses such as rice mills, which provide fertilizer on credit and seeds sourced from seed production groups. Those inputs are repaid “in kind” during the harvesting season. Paddy assembly is taken care of by local

collectors, who buy from farmers and deliver to rice mills. In the case of contract farming, the miller may arrange its collectors hired on a flat-rate basis. Farmers closer to the rice mill can also deliver harvested paddy directly to the mill. Wholesaling and retailing involve mostly small wholesalers and retailers, but not exclusively. For instance, rice mills can directly cover this function by retailing rice at mill gate. Rice mills also wholesale rice directly to big urban markets in Khammouane, Pakse, and Vientiane Capital.

**Figure 1 > Segments of a typical agricultural value chain**



Source: World Bank staff presentation.

**Figure 2 > Value chain concept**

<p><b>Total Value generated by the value chain or by stages of the value chain</b></p> <p>=price*volume of product sold</p>	<p><b>Incremental costs created by stage of value chain</b></p> <ul style="list-style-type: none"> <li>• Wages</li> <li>• Interests and rents</li> <li>• Depreciation</li> <li>• Direct taxes</li> <li>• Inputs and equipment</li> <li>• Energy, water</li> <li>• Operational services</li> </ul>
	<p><b>Transfers to operators at the previous stage of the value chain</b> for intermediate products (raw material, semi-finished or traded product)</p>
	<p><b>Profit</b></p>

Source: World Bank staff presentation.

**8 > This study is unique for Lao PDR in estimating the cost build-up at each stage of the value chain, using primary data, and applying a consistent methodology.**

The approach followed in this study is a qualitative and quantitative value chain analysis of the rice and vegetables value chains combined with a detailed regulatory assessment. In value chain analysis, all inputs and outputs carry forward their inherited value from the previous stage. The total value generated is split between incremental costs created by each stage of the value chain, the semi-finished or finished intermediate products supplied by operators in the previous value chain stage, the inputs and services supplied by other, external enterprises, and the profits of value chain participants. To arrive at the value captured by chain operators, the costs of bought-in materials, components, and services are deducted from the value generated. Value added is commonly defined as the sum of incremental costs and profit. Figure 2 provides a summary of this concept.

**9 > This study identifies key drivers of value chain costs, profits, and, as a result, final output prices.**

The main variable of interest is the final domestic consumer price. However, the results with respect to the competitiveness of the production and processing stages are of course relevant for export competitiveness or competition with imports. The analysis follows these routes:

- By looking at the build-up of incremental costs from stage to stage, this study helps to reveal the competitiveness of individual participants.
- By looking at profits at each stage, this study helps to identify areas for efficiency improvements.
- By looking at cost categories, this study points toward cross-cutting issues with a potential for cost reductions.

**10 > The analysis of profits at each stage allows understanding where operators have market power that they can exploit.**

In economic theory, under perfect competition firms do not make profits. They are price takers and adjust their production to sell at a price where price equals marginal cost. In the long-run equilibrium, their returns cover all costs, including opportunity costs, but they operate at zero profits. Under welfare considerations such perfect markets are optimal and operate under allocative efficiency. Naturally, due to various reasons like asymmetric information or external effects, real markets are not perfect, but range from close-to-perfect to very imperfect depending on the degree of competition or at least contestability (the threat of entry and competition).

**11 > The existence of high and sustained profit margins mainly depends on the level of competition, and therefore on barriers to entry.**

Such barriers prevent (some) other firms from entering the market and competing profits away from incumbents by offering products at lower prices. Barriers to entry can be the result of tariffs, zoning, supplier agreements, vertical integration, limited access to finance, uncertainty, and risk, to name just a few. In the extreme case of a monopoly, individual firms have market power: though monopolists are constrained by consumer demand, they are not price takers, but instead either price setters or quantity setters. This allows firms to set a price higher than that which would be found in a competitive market, allowing them to generate economic profit in both the long and short run. Similar outcomes can be observed where only a few companies are present that collude in setting prices for outputs. Because the additional gains to producers are smaller than the losses to consumers (who can consume less and pay higher prices), such markets generally have an overall negative effect on welfare compared to competitive markets.

**12 > However, profits of individual companies can also be the result of superior skills, products, or management.** The cost structures of individual firms can vary greatly, and those firms that are more efficient in transforming inputs into outputs can generate significant profits over the short run, or they can have market power by offering products with particular characteristics (think of Apple, Inc.). Large margins per product sold may also reveal the necessity of covering fixed costs. For example, the cost structure of firms in the technology and pharmaceutical sectors requires substantial costs in product development, so prices will reflect not just marginal production costs but include a margin to recover investment costs. Or in the case of self-employed businessmen and -women, large margins may cover their own returns to labor, effectively their opportunity costs. However, high profits for the average firm in a low-innovation industry indicate that competition is limited.

**13 > Primary information and data for the rice and vegetables value chains were collected in 2017 in Vientiane and Khammouane Provinces of Lao PDR.** Around 100 interviews were conducted with stakeholders and key experts. Efforts were made to collect as much current, primary information as possible for this study.

However, data on costs and margins are sensitive information, and the private sector is often reluctant to share such data. Information received during the interviews was checked rigorously for its plausibility. Triangulation was performed in different ways: (i) primary data were compared with secondary sources; (ii) data on the cost build-up were compared with final sales prices; and (iii) data sourced from interviews were compared with data sourced from participant observation.

**14 > The results of this report are not representative for everyone and true to every detail.** For example, for the rice processing stage, the data approximate a medium-sized modernizing mill that could sell directly to retailers and source directly from farmers via collectors. Its cost structure is different from that of the small traditional mills that are the majority in the region, but do not supply markets in Vientiane Capital. The geographical coverage is limited to Khammouane Province and Vientiane Province and Capital. Yet the study targeted the most popular value chain locations with significant trade flows and major actors in the value chains. It is, therefore, useful and relevant for policy discussions about how to increase the economic contribution associated with commercializing food value chains in Lao PDR.





## 2 > Rice Value Chain

**15 > Lao PDR mostly produces glutinous or sticky rice (*Oryza sativa*), which is primarily geared toward domestic consumption.** It is derived from a mixed variety of long, short or broken waxy grain types, and requires minimal processing (mainly sorting) relative to processing of non-glutinous rice. Non-glutinous or white rice is derived from long grain varieties and requires a high level of processing to transform the grain from the translucent state to its white color. Because of its high quality, non-glutinous rice fetches a premium above the glutinous variety. The demand for white rice is mostly from foreigners, urban consumers, and the middle class.

**16 > Rice remains the main crop and almost all of Lao PDR's 783,000 farm households produce paddy on 75 percent of the arable land.** Between 2015 and 2016 Lao PDR produced 4.1 million tons of rice; by 2020 rice output is projected to increase to 5 million tons. Most paddy is produced during the wet (or monsoon) season due to lack of irrigation required for production during the dry season. Between 2000 and 2010, average paddy production grew by 1.8 percent per year, largely due to the increase in rice land area and cropping intensity. Between 2010 and 2017, the growth in paddy production accelerated to 5.3 percent per year, due to increases in cropping intensity (1.4 percent) and yields (3.7 percent)<sup>5</sup>

**17 > Despite the recent growth acceleration, rice produced in Lao PDR mainly meets domestic consumption (about 95 percent).** Laotians eat predominantly glutinous or sticky rice. It accounts for 92 percent of rice production area and

constitutes 70 percent of households' caloric and protein intake. Average per capita consumption in 2013 was 159 kg per year, only slightly reduced compared to 1993 (Table 1). Laotians consume much more rice per capita than their neighbors, except Cambodians. Most rice consumed is a second-quality rice costing about US\$0.85/kg in Vientiane Capital; yet first-quality rice, which costs US\$1.0/kg, is increasingly demanded by wealthier consumers in Vientiane. The large consumption of glutinous rice is a unique feature of Lao PDR. Most Asian people eat non-glutinous rice, and besides Lao PDR only Thailand produces a large quantity of glutinous rice for domestic consumption and exports. This makes Lao PDR vulnerable to weather variations affecting production and price fluctuations in Thailand.

**Table 1 > Per capita rice consumption, selected countries, kg/year, 1993–2013**

	1993	2000	2007	2013
Cambodia	174	167	158	159
China	74	77	75	77
Lao PDR	164	160	159	159
Malaysia	86	84	80	81
Philippines	89	104	129	119
Thailand	108	117	123	115
Vietnam	137	149	144	144

Source: FAOSTAT.

**18 > Processing and trading of rice in Lao PDR still follow traditional ways rooted in trust relationships but these activities are moving notably toward a more modern and professional system.** The structure of the traditional rice value chain in Lao PDR is configured as many small- and medium-scale farmers on one end; many

<sup>5</sup> According to the US Department of Agriculture Global Database.



small assemblers and traders and larger (than farmers) millers in the midstream; and many small wholesalers and retailers at the other end. Recently, foreign investors and forward-looking millers supported by projects brought some dynamism into the sector, which has significant development potential.

**19 › Exports account for only 5 percent of rice production.** Almost all of Lao PDR's exports are of glutinous rice to Vietnam during the Tet Lunar New Year period, when demand is high. Lao sticky rice is less expensive than the sticky rice produced in Vietnam and much cheaper than that produced in Thailand, allowing it to compete in Vietnam with local and Thai rice. Improved road connectivity between Lao PDR and Vietnam also helps increase Lao rice competitiveness.

**20 › In the last few years, Lao PDR entered in bilateral agreements on export quotas with China and Vietnam and Lao PDR can also benefit from the “Everything but Arms” (EBA) initiative,** which grants the country full duty-free and quota-free access to European markets for all products except arms and ammunition. Benefiting from these market access arrangements, however, would require a substantial increase in production quantity and quality of rice, and a reduction in non-tariff barriers for exporting firms, such as obtaining authorizations, processing documents with multiple offices, and informally paying officers to speed up the process.

**21 › This chapter first portrays the domestic part of the rice value chain,** focusing on glutinous rice, before describing the export regime and competitiveness. A last section summarizes the challenges and key cost drivers.

## 2.1 › Domestic market

### Production

**22 › Lao PDR lags behind its neighbors Vietnam and Thailand on indicators of land and labor productivity (World Bank 2016).** Its average yield of 3.5 tons/ha is much lower and its average use of nitrogen fertilizers is well below the recommendations. Production is very labor-intensive and costly, because not all farmers employ machinery for land preparation and harvesting, leading to high labor costs, mostly for hired labor. Although productivity gains were achieved in the past, major constraints continue to exist in Lao PDR, including a weak extension service and difficulties in accessing farm credit. Postharvest losses caused by delays in harvesting and threshing after harvesting as well as on-farm storage systems are two other major factors driving paddy costs. They further have negative effects on the quality of paddy. Important criteria for the quality of paddy are head rice, variety, moisture content, proportion of whole grains, and freedom of foreign material. If the paddy falls below a certain standard it negatively affects the milling process and causes additional costs. According to key informants, currently 80 percent of paddy sourced falls below that standard.

**23 › Low productivity, high production costs, and low quality of paddy lead to low farm profits.** Table 2 presents the costs and margins of the rice value chain at production stage for glutinous rice. With profit rates of 12 percent, the average profit of wet season paddy production was US\$109/ha in Lao PDR. Based on these estimates a farmer owning 3 hectares (ha) of rice in Lao PDR would earn about US\$300 per season, hardly enough to have an incentive to engage in production. According to PhilRice and IRRI estimates in Bordey et al. (2016), farmers in India and Vietnam achieved profits of

US\$193/ha and US\$246/ha, respectively, during the low-yielding (wet) season. Relative profit margins at the farmer level in Lao PDR are also low compared with other countries in the wider region (Table 3). Farmers in neighboring China, Thailand, and Vietnam, as well as in India, receive a much larger share of total value chain profits compared with those in Lao PDR.<sup>6</sup> In China and Thailand, this is partially a result of higher farm-gate paddy prices, but in India and Vietnam, farm-gate prices are lower than those in Lao PDR, but this does not prevent their farmers from generating higher profits. It seems that high production costs put pressure on Lao farmers, not low farm-gate prices as often perceived in the country.

**24 › In Khammouane Province, small farmers increasingly produce under some form of contract for the leading modern mills, which provide them with good quality inputs and training at**

**the beginning of the season.** Since 2009 the leading mills have formed in the five districts of Khammouane so-called development rice miller groups for cooperation and coordination. These groups' objective is to contribute to the development of the rice sector in the province. The Khammouane development rice miller group, for example, discusses and agrees on minimum paddy prices or export opportunities. Millers who want to join the group must support at least 200 farm households via contract farming arrangements.

**25 › Interviews with rice millers and farmers gave the impression that contracts were rather indicative.** No formal written agreements are signed. Instead, both parties rely on fairness, trust, and constant interactions to keep the supply chain operational. Growing this informal system will require investments in trust-building and bringing partners together. But inevitably, it will hit its limit

**Table 2 › Lao PDR: Cost and margins of the rice value chain at farm-gate**

Farm Production	Per Hectare	
	LAK	USD
<b>Gross revenue (yield*price)</b>	<b>7,584,500</b>	<b>923.03</b>
Production costs		
Variable costs	6,491,000	789.95
Total investments	200,00	24.34
<b>Total Costs</b>	<b>6,691,000</b>	<b>814.29</b>
Farmer income		
<b>Gross margin (revenue - var costs)</b>	<b>1,093,500</b>	<b>133.08</b>
<b>Net profit (gross margin - invest cost)</b>	<b>893,500</b>	<b>108.74</b>

Source: World Bank staff estimates.

**Table 3 › Paddy prices and paddy farm profitability: cross-country comparisons**

	Lao PDR	Thailand	Vietnam	India	China
Ratio of net profit to total costs	12%	59%	48%	21%	44%
Price of paddy, US\$/ton (14% moisture)	290*	332	227	254	476

Note: \* Average moisture content of Lao paddy at harvest is 22%. Farm-gate price of wet paddy is US\$264/ton, the price used for calculations in Table 2. For international comparison, however, this price is converted to dried paddy equivalent with 14% moisture content.

Source: Bordey et al. 2016, and World Bank staff estimates for Lao PDR.

6 This comparison needs to be made with a caveat. In contrast to Lao PDR, where sticky (or glutinous) rice, is mainly produced, other countries produce largely non-sticky (ordinary) rice. Sticky rice is usually more expensive than non-sticky rice, but the benchmark data for sticky rice produced in other countries are not available.

when mills' capacities and resources for constant interactions and supervision are stretched too far. Effective mechanisms for contract enforcement are nonexistent. Millers reported that they would welcome more professional relationships, as they had some bad experiences with farmers not paying back their loans.

**26 > According to the Doing Business “Enforcing contracts indicator,” no court or court division in Lao PDR is dedicated exclusively to hearing commercial disputes (World Bank 2017a).** Rather, anecdotal accounts reveal a lengthy process whereby plaintiffs must first endeavor to bring disputes at the village (most likely for mediation and arbitration), then to district and provincial level for resolution before proceeding to judicial measures in Vientiane Capital. The country's Law on Economic Dispute Mechanism governs both domestic and international arbitration on

economic disputes. While the law permits parties undertaking international trade or business to nominate a foreign or international arbitration institution as their dispute resolution mechanism, enforceability of an arbitration award in Lao PDR is subject to determination of the Peoples' Court.<sup>7</sup> As anecdotal accounts confirm, this leads to lengthy proceedings and delays in awarding arbitration awards.

**27 > To facilitate working with farmers and to create an environment for stable relationships, rice mills have organized the paddy market.**

Table 4 lists four leading mills of the Khammouane development rice miller group, each of which provide one of the vice presidents of the group, and the villages they source their paddy from. In Thakhek and Xebangfai districts only Vanida is active. All four mills source their paddy from Nongbok district but they go to mostly different

**Table 4 > Lao PDR: Source of leading rice mills' paddy supply in Khammouane Province**

Mill				
District	Vanida	Soulivan	Bounmy	Phosavan
Thakhek	Yes	No	No	No
Xebangfai	Yes			
Nongbok	Tarntherng Dongsangam	Navarngnoy Navarngthong Navarngvai Sadeu Dongphungphao Phonsao E Naxiengdy Beungsarntherng	Navarngnoy Nvarngthong Navarngvai  Dongyarng	Nongplard Dongyarng Xiengwarngthong Xiengwarngtha Songmeuangneu Songmeuangthai Koutjub Nonsila Nahoun Nachampa Nalak Pongkiw Nongpham Nonjik Dongtae

Source: World Bank staff estimates.

<sup>7</sup> <http://arionlegal.la/arbitration-in-lao-pdr/>

villages. The fact that hardly any overlap exists indicates that they are avoiding competition for paddy. This segmentation of the paddy market is also due to geographical factors, as distance increases transport costs, and is accentuated by trust issues, as outlined above. Thereby, millers have acquired monopsony buying power, which most likely guarantees them preferred prices from farmers. However, those contract arrangements are not mutually exclusive. Millers also buy rice from farmers who are not under contract. Once they have paid back their loans, farmers under contract can also sell outside of the contract if the mill is in oversupply or if farmers can get a better deal elsewhere. For example, traders from outside the province sometimes offer higher paddy prices, although they may not show up every season, weakening the relationships between farmers and local mills.

**28 › Overall, millers and farmers report benefiting from these contract arrangements.**

Working with farmers allows mills to improve the quality of the paddy and as a result they can increase their milling efficiency. Farmers benefit from support provided in terms of seeds, fertilizer, and training. It helps them raise their yields and quality. In addition, they benefit from relatively predictable paddy demand.

**Assembly**

**29 › Traditionally paddy assembly is taken care of by local assemblers who buy from farmers and deliver to mills.**

Medium-sized mills, however, with more modern equipment depend on larger catchment areas to fill their capacities, and rely more on collectors. In the areas visited (Thakhek and Nongbok districts), 50–60 assemblers are active. Interviews with farmers revealed that they

are not negotiating directly with mills but are aware of the prices being paid in the market. The spread of cell phones has given farmers access to information about marketing options, which means that they are in a better position to deal with the assemblers. Based on unanimous information received from different sources, assemblers and collectors receive a flat fee of about 2,000 LAK/meun (166 LAK/kg, 2 US cents/kg, or US\$20/ton) for transporting the paddy from the farmer to the mill at a distance of 20 kilometers (km) on average. Table 5 presents the costs and profits for assemblers.

**30 › The inefficient assembly system is the main driver of transport costs for assemblers.**

Apart from fuel and maintenance of their own (1.5-ton) truck, packing materials, and hired labor for loading, assemblers do not face large cost items. They drive themselves and their profit is their own returns to labor. No warehouses exist at local level that would allow farmers to store and manage their rice stock at a central location. Instead, assemblers drive up to three days from farmer to farmer buying a few bags (50 kg) of paddy from each to fill their truck. With some farmers they have made agreements via phone; others they visit unsolicited. After the main harvest season, farmers agree to only sell small portions of their remaining stock whenever they need cash. Assemblers, therefore, need many stops before they leave rural areas and drive back to the mills to empty their truck. A profit of US\$11/ton of paddy (Table 5), therefore, equals a wage<sup>8</sup> for the assembler of less than US\$4/day. This is about the same as the current minimum wage in Vientiane, and as a matter of fact in all of Lao PDR, as the rate of 900,000 LAK (roughly US\$107/month) was established by the government and became effective as of April 2015.<sup>9</sup>

8 The daily wage is estimated based on the following assumptions: an assembler drives a small truck that can handle a maximum of 1.5 tons of paddy and spends three days collecting the goods and transporting them to the mills.

9 Following preparation of this report, the minimum wage was increased to 1,100,000 LAK per month in April 2018.

**31 > Few regulatory controls and restrictions exist at the assembly stage and compliance costs remain small.**

The Law on Land Transport (Amended version) No. 24/NA from December 12, 2012 represents the primary legal framework governing the transport of goods commercially for domestic and international markets. Small informal traders, operating their own secondhand truck, are subject to a vehicle use permit. The annual fees for obtaining that permit are 200,000 LAK. Relative to other costs incurred by traders (i.e., vehicle operations and maintenance [O&M]), this represents a small cost. Interviews conducted with assemblers during the field investigation confirm that the past restrictions and controls that restricted the flow of goods across districts and provinces have been lifted. Assemblers are no longer required to acquire permits in various districts and localities to transport goods in the country. There are no other restrictions or significant requirements for transporting agricultural goods nor does the

law impose geographical limits or restrictions on tonnage for transportation. The only key setback for assemblers is the duration and validity of the permit. The validity period is only one year, whereas as in other jurisdictions, notably Vietnam and Thailand, licenses are valid for a period of seven or five years, respectively, and only required at the company level.

**32 > The tax regime is also favorable for assemblers.**

The current tax law grants businesses operating with an annual turnover of less than 12,000,000 LAK exemption from remitting turnover tax.<sup>10</sup> Assemblers, however, are frequently required at official checkpoints to present a copy of their annual tax registration and payment during transit to ensure compliance with existing regulation. The purpose of these random checks during transit is to check whether assemblers have paid their taxes, but they are also said to be used to extract informal payments, which the study was unable to quantify.

**Table 5 > Lao PDR: Costs and margin of the rice value chain at the assembly stage**

Assembly	Per MT farm gate product	
	LAK	USD
<b>Gross revenue (qty sold*price)</b>	2,334,000	284.05
<b>Production costs</b>		
Crop purchases (payment to farmer)	2,167,000	263.72
Other variable costs	61,364	7.47
Investment costs	15,000	1.83
<b>Total costs</b>	2,243,364	273.01
<b>Assembler's income</b>		
Gross margin (revenue- total var costs)	105,636	12.86
Net profit (gross margin - invest cost)	90,636	11.03

Source: World Bank staff estimates.

<sup>10</sup> Article 56 Lump-sum tax rate of the Tax Law. From 12,000,000 LAK and lower is exempted; from 12,000,001 LAK to 50,000,000 LAK is subject to lump-sum tax of not more than 600,000 LAK.

## Rice mills

**33 › Many rice mills operate in Lao PDR.** They achieve a lower efficiency and higher cost than mills in neighboring countries. Milling efficiencies range from 55 percent to 65 percent depending on the mills and paddy sourced. This is lower than the average efficiency of 66 percent found in Thailand and Vietnam. Thanks to recent foreign direct investment (FDI), it rose to 64 percent in Cambodia. FDI in Lao PDR has been limited.

**34 › Rice mills in Khammouane Province are small- to medium-sized operations that can process 5–48 tons/day.** A total of 105 medium-sized rice mills in Khammouane were registered as business operators with the provincial government in 2016 (Mekong Institute 2016). However, many small rice mills operate in communities with production capacities not exceeding 1 ton/day. Most of them are not in the provincial database. They are located farther away from the main transport lines and markets, and operate at a much lower standard, efficiency, and volume. As a result, they generally incur high processing costs. They only process paddy for local demand and sometimes sell to modern mills, where the paddy is graded, sorted, and further processed to obtain grade A (first-quality) rice.

**35 › Medium-sized rice mills in Khammouane mostly transport the rice to customers in Vientiane Capital in their own trucks instead of relying on transport companies.** This is due to the small volumes of trade. The average order weight is lower than 20 tons, which makes it unprofitable to hire transport companies. Transport costs from Khammouane to Vientiane Capital in their own truck is about 200,000–250,000 LAK/ton (5.4–6.8 US cents/ton-km) versus 300,000–350,000 LAK/ton (8.2–9.5 US cents/ton-km) if they hire a transport company. Millers report hiring transport companies only for quantities of over 30 tons. In

that case transport costs reduce to 150,000 LAK/ton (4.1 US cents/ton-km). Currently a transport company located in Savannakhet is serving rice millers in Khammouane. According to millers, it is newly established and provides better service, lower prices, better trucks, and more customer-friendly payment modalities than the transport companies based in Khammouane.

**36 › Transport costs internalized by mills are about 20–30 percent cheaper than rates available on the market, at least for smaller volumes.** This reflects concerns voiced by stakeholders that transport prices in the market are too high. One reason behind this finding may be related to the fact that transport companies sometimes face challenges in complying with the law. Transport companies are subject to the same Law on Land Transport as assemblers and need a transport enterprise-level license (Article 21 Establishment of Land Transport Enterprise) to operate. The annual fees for obtaining the enterprise-level license are set at 200,000 LAK. There are no other restrictions or significant requirements for transporting agricultural goods nor does the law impose geographical limits or restrictions on tonnage for transportation. However, transport companies report that processing documents in many offices and sections, sometimes even in the same department, is so time-consuming that they occasionally pay money to speed up the process.

**37 › A recent study on domestic transport prices in Lao PDR finds that prices are high largely due to the fragmentation of the market and low levels of competition (World Bank forthcoming).** Prices are set per truck, meaning the prices per ton for less-than-full truckloads turn out to be very high. Overall, the sector is fragmented with about a dozen larger players. The sector faces a combination of an aged fleet, low truck utilization, and large overcapacity, leading to high fixed costs. Operators are specialized along specific routes

and are largely unwilling to compete for additional traffic on other routes, or to compete for traffic among neighboring countries. This reduces competition and prevents consolidation among operators from taking place, which would reduce high fixed costs and could reduce prices.

**38 > Rice mills face significant difficulties in accessing financial services and improving their business.** Their difficulties are partly due to limited business and communication skills. They also lack confidence, which prevents them from approaching banks and government agencies. Only 4–6 medium-sized mills have managed to invest over the years in modern infrastructure and upgrade their equipment, using short-term (1–3 years) working capital loans.

**39 > Data collected during interviews suggest that milling in Lao PDR is profitable for those mid-sized mills that were able to modernize.** Table 6 shows costs and margins for 1 ton of processed paddy (65 percent rice, 35 percent bran and husks). According to those estimates, the estimated milling costs for rice (100 percent, without byproducts) are US\$27/ton,<sup>11</sup> similar to those in Cambodia, which according to World

Bank estimates range between US\$26 to US\$30/ton (World Bank 2016).

**40 > This study finds that rice mills are subject to indirect regulatory controls and policies that impede their ability to access affordable credit and benefit from state budget allocation for their investment capital needs.** Regulatory controls in the banking sector also have an adverse impact in limiting rice mills' access to investment capital. The banking sector is dominated by state-owned commercial banks that control a large share of the market. By the end of 2016, state-owned commercial banks, including joint state banks, controlled nearly two-thirds of the total credit share in the economy (Bank of Lao PDR 2016). Informal interviews conducted during the field investigations (with rice mills and private banks) confirmed that financing to the agriculture sector is almost exclusively dominated by the Agricultural Promotion Bank (APB) and to a lesser extent the Lao Development Bank, Ltd.<sup>12</sup>

**41 > Bank informants confirm that 80 percent of the total portfolio lending is geared toward production, leaving few options for financing for other value chain activities such as trade and**

**Table 6 > Lao PDR: Costs and margin of the rice value chain at the milling stage**

Processing	Total MT processed product (rice, bran, husk)	
	LAK	USD
Gross revenue (qty sold*price)	2,915,000	354.75
<b>Production costs</b>		
Crop purchases (payment to farmer)	2,334,000	284.05
Other variable costs	103,285	12.57
Investment costs	41,667	5.07
<b>Total costs</b>	<b>2,478,952</b>	<b>301.69</b>
<b>Processor's income</b>		
Gross margin (revenue- total var costs)	477,715	58.14
Net profit (gross margin - invest costs)	436,048	53.07

Source: World Bank staff estimates.

11 This cost (US\$27/ton) does not consider the value of byproducts such as bran and husk produced during the milling process. When the byproduct value is accounted for, the average milling cost is US\$17/ton, as presented in Table 6.

12 A third bank, Nayoby Bank, also has a lending portfolio in rural markets, but it is a specialized policy lending bank that targets lending to poor families in the country's urban centers and rural markets.

**processing.** The APB provides lending to the sector via three programs: (i) personal loans geared toward producers; (ii) group lending programs; and (iii) lending to businesses.<sup>13</sup> Lending to rice mills comes almost exclusively in the form of short-term (1–3 years) working capital loans, with interest rates ranging as high as 13–17 percent. Given the lack of investment capital, it was reported that rice mills often use their working capital loan to finance investment activities.

**42 › Interest rate subsidies exist but the process is cumbersome.** Interest rates are set by the Bank of Lao PDR, which exerts extensive control over lending rates. Bank regulation set caps on lending rates for loans mobilized through deposits at 3 percent above deposit rates (inclusive of service, approval, and valuation fee). This is applicable for all commercial banks (state-owned and private). While the APB and Lao Development Bank receive state budget to support their lending activities, interviews conducted during the field investigation confirm that most of the lending is mobilized through deposits on commercial terms. These loans are eligible for interest rate subsidies at 7 percent. Interest rate subsidies, however, are administered at the consumer level. Banks charge the full interest rate (usually at the standard rate of 14 percent) and once received, borrowers must apply individually with the state bank headquartered in Vientiane Capital to receive the subsidy. This process involves cumbersome paperwork, and all banks interviewed confirmed that significant delays arise in disbursement of the subsidy.

**43 › Collateral requirements set by banks' lending activities are prohibitively high.** State banks reported collateral requirements as high 70 percent for extending credit. Collateral requirements come exclusively in the form of immovable assets (land and real estate) even though the country has an

operating collateral registry for movable assets (such as machinery, equipment, and receivables) that can enable asset financing rather than more traditional asset-based financing. Few banks practice this type of lending, however. Some of the key constraints reported by the state banks in lending include the fact that most mills lack the proper accounting and recordkeeping to enable banks to perform adequate due diligence. Most mills interviewed during the field investigation are family-owned businesses and operate on an informal basis.

**44 › All private banks interviewed during the field investigation confirm that they did not have a lending portfolio in the agriculture sector.** Roughly 90 percent of private banks in Lao PDR are foreign, and their lending is geared toward a corporate clientele (mostly foreign) with high turnover. Lending activities are targeted at large infrastructure projects, such as hydropower, and construction. One bank reported that loan applicants need a minimum of three years of financial records for lending. Few indicated a presence of bank branches outside of Vientiane Capital, despite a 2006 amendment in the country's banking law that authorized foreign banks to set branches in the provinces.

**45 › Some evidence also suggests that inefficiencies in the country's judicial processes and arbitration system for resolving commercial disputes diminish private banks' risk appetite for lending to the sector.** While most private banks interviewed during the field investigation cited lack of expertise as a key deterrent in lending to the sector, anecdotal accounts with two private banks also indicated that difficulties in enforcing contracts and resolving commercial disputes likely diminish their risk appetite for lending. Two banks each reported separate accounts whereby commercial disputes had risen all the way up to the

<sup>13</sup> Lending to businesses is spread across five categories: (i) handicraft; (ii) irrigation and equipment; (iii) construction; (iv) trade and services; and (v) other.



country's Supreme Court. Proceedings for the first bank lasted four years (a claim of roughly US\$1 million), while proceedings for the second bank are currently in the third year and still pending a final resolution. Both instances involved defendants with close ties to the government, however in the first case, the court ruled in favor of the bank.

**46 > Rice mills have been subject to price controls since the 2012–2013 harvest season that are supposed to have the overall impact of capping the gross margins for processors at no more than 500 LAK for glutinous rice.** Pursuant to the Ministry of Industry and Commerce (MoIC) Announcement No. 1502/MIC dated August 24, 2016,<sup>14</sup> a price floor for purchasing glutinous rice paddy from producers at the farm-gate or village level is currently set at 2,500 LAK/kg (US\$300/ton). The regulation also sets a price ceiling for rice sold by rice mills and rice mill associations, and for the purposes of stockpiling, to no more than 3,000 LAK/kg (US\$360/ton). Informants confirm that government representatives at the district and provincial levels are heavily involved in setting and negotiating prices, particularly during the preharvest planning season when they, along with rice mills and farmers' cooperatives, set prices for contract farming. However, these prices disregard differences in quality.

**47 > The actual paddy buying prices paid at farm-gate or village level were consistently below the official price because they reflected the quality of the paddy.** This discrepancy is explained by the fact that only an estimated 20 percent of farmers produce the required standard in terms of variety, moisture content, mixing of different varieties, and foreign matter (refer to Table 2, where the paddy farm-gate price was estimated at US\$264/ton). On the other hand, selling prices

for milled rice reported by mills and wholesalers were consistently above the official price. This is explained by the fact that the mills in the study sample are medium-sized, and have, to some extent, upgraded their facilities and can charge higher prices for their rice. These differences between official and actual prices are not legally possible but are nevertheless consistently observed. More transparency of prices in the country by regular publication of market prices that consider quality differences and phasing out price controls for paddy and rice would improve incentives for all stakeholders throughout the chain to improve quality.

**48 > The price control regulation could prevent entry of investors, as newcomers might feel they would face higher scrutiny on prices they pay and receive and would therefore have lower profit expectations.** Additional uncertainty in the business environment is created by the Decree on Management of Goods Price and Service Fees No. 474/PM from November 18, 2010, which grants the MoIC jurisdiction to control prices as "it deems necessary." The stated objective of the decree is to "achieve price stability and protect lawful rights and interests of business operators and consumers, and State interests." Article 8 of the regulation defines measures such as "the determination of the highest price, lowest price, and scope of price" as well as "adjustment of supply and demand" among other permitted controls. A Price Administration Authority comprising the MoIC at the federal, provincial, and district level is defined as the governing authority. In this context, a newcomer seeking to create cost advantages in its operations to improve margins may in theory be subject to price interference and control from the regulatory authorities, which may undermine such efforts.

14 Titled: "Average price for buying glutinous paddy (paddy and irrigated rice field) from Oct to Dec 2016 and all round year 2017."

**49 › A recent report undertaken by the MoIC finds that the use of minimum and maximum prices in Lao PDR has generally not been effective and recommends ending this practice (MoIC, 2018).** The report finds that direct price setting discourages investment, and can slow down innovation and productivity growth. It stresses that, as in the case outlined in this report, the enforcement of such prices is not effective nor feasible due to challenges with defining and enforcing quality-adjusted prices. It further stresses that they have globally failed to reduce price volatility. The report advises to end the policy of recommending minimum and maximum prices for selected “sensitive” products and to focus on collecting price and cost information to enable more efficient price discovery, and the promotion of more efficient markets through reducing barriers to entry and promoting competition.

### Wholesaling in Vientiane Capital

**50 › Wholesaling in Vientiane Capital is mostly performed by small traders driving their own Hyundai trucks of 1–3.3 tons loading capacity with typical annual turnover of less than 50 tons.** Interviews revealed that many of them do not even have a formal title because of the occasional nature of their business. The usual distance between source and market is 10 to 50 km as they buy from

millers in different districts surrounding Vientiane Capital. Apart from fuel and maintenance of their own truck, packing materials, and hired labor for loading, wholesalers do not face large cost items. They drive themselves and their profit is their own returns to labor. Storage facilities would allow wholesalers to potentially benefit from higher prices later in the season and larger contracts, but would require significant working capital. According to key informants, wholesalers would also risk storage losses, because the rice would lose its quality and weight after a month of storage.

**51 › Transaction costs and travel time are driving up costs at the wholesale stage.** Like assemblers, wholesalers pay unsolicited visits to retailers hoping for business. They spend a lot of time driving around markets trying to sell the rice on their truck. Wholesalers could significantly reduce handling cost and fuel cost per ton by investing in larger trucks if they had large orders. However, most traded quantities are small. A typical order from a retailer is 10 50-kg bags. Given their business model and the small quantities, these wholesalers drive their own truck and it is not economical to hire transport companies. Moreover, large trucks are not allowed to enter market areas during daytime due to the small roads and high volume of traffic. Wholesalers thus

**Table 7 › Lao PDR: Costs and margin of the rice value chain at the wholesale stage**

Wholesaling	Total MT trade product (rice)	
	LAK	USD
<b>Gross revenue (qty sold*price)</b>	5,000,000	608.49
<b>Production costs</b>		
Crop purchases (payment to processor)	4,000,000	486.80
Other variable costs	192,480	23.42
Investment costs	10,100	1.23
<b>Total costs</b>	4,202,580	511.45
<b>Processor's income</b>		
Gross margin (revenue- total var costs)	807,520	98.27
Net profit (gross margin - invest costs)	797,420	97.05

Source: World Bank staff estimates.

need many stops before they empty their truck. They generate profit estimated at US\$97/ton of rice (Table 7). This profit equals a wage for the wholesaler of US\$13/day, assuming seven working days per week, just from selling rice.

**52 > Wholesalers face the same regulatory regime as assemblers.** Few regulatory controls and restrictions exist and compliance costs remain small.<sup>15</sup> Past legal restrictions and controls that restricted the flow of goods across districts and provinces have been lifted. This means that the cross-border trade restrictions that prevailed in the past have disappeared. Official checkpoints along the road still exist but only to ensure compliance with existing tax regulation.<sup>16</sup> Traders are no longer required to acquire permits in various districts and localities to transport goods in the country. The tax regime is also favorable for these small wholesalers. According to the current tax law, businesses operating with an annual turnover from 12,000,001 LAK to 50,000,000 LAK are subject to lump-sum tax of not more than 600,000 LAK.<sup>17</sup>

### Retail in Vientiane Capital

**53 > The main retail outlets are the many traditional small shops outside of wet markets, which are most often owner-operated and characterized by very low turnover (1 ton/month).** Retailers are supplied on a real-time, per-order basis by wholesalers and operate on rented premises with virtually no investment apart from

a storage room to keep a small rolling stock. The storage is sometimes a room in the retailers' house. Due to the large number of retailers, turnover is low and on some days, may be close to zero. Fixed costs are paid per month, the largest factor being rental fees for market stalls.

**54 > Some traders combine the wholesale and retail stage.** Net profits for pure retailing are estimated to be around US\$120/ton (Table 8). Assuming an average daily turnover of 50 kg at a profit of US\$120/ton equals an income of only US\$6/day. By ordering directly from the mills and selling larger quantities, they can save costs. They basically perform both functions depending on demand. That means they are flexible enough to sell small amounts of rice to consumers as well as larger volumes to other retailers. The usual threshold between retail price and wholesale price is 1 ton.

**55 > Competition plays out in many ways.** Traditional shops demonstrated during the interviews that they are aware of the current market prices and situations of their fellow retailers. Some retailers try to differentiate themselves by offering a better rice quality and services to build long-term relationships with regular customers. A popular strategy is to compete via prices "in order to sell more." Sometimes the tough competition forces traditional retailers to adjust their margins to reduce the price fluctuations from wholesale, to keep their clientele. Some retailers pointed out how buying directly from millers would allow them to sell rice at cheaper prices than their competitors.

<sup>15</sup> The Law on Land Transport (Amended version) No. 24/NA from December 12, 2012 represents the primarily legal framework governing the transport of goods commercially for domestic and internationally markets. Two types of licenses are referenced in the regulation: (i) a transport enterprise-level license for transport companies (Article 21 Establishment of Land Transport Enterprise); and (ii) a truck or vehicle use permit (Article 17 Vehicle Use Permit). Small informal traders operating their own second-hand truck would be subject to the vehicle use permit, and the more formal traders to the enterprise-level license. The annual fees for obtaining the enterprise-level license are set at 200,000 LAK per year, whereas the fees for the truck level permit range from 200,000 LAK for vehicles and cargo under 7 tons to 400,000 LAK for over 15 tons. Relative to other costs incurred by traders (i.e., vehicle O&M), this represents a small cost. No other restrictions or significant requirements exist for transporting agricultural goods nor does the law impose geographical limits or restrictions on tonnage for transportation. The only key setback for assemblers is the duration and validity of the licenses. For both licenses (business and truck-level), the validity period is only one year, whereas as in other jurisdiction, notably Vietnam and Thailand, licenses are valid for a period of seven to five years, respectively, and only required at the company level.

<sup>16</sup> It is doubtful whether enforcing tax payments along roads is an efficient way to do so, while there is anecdotal evidence that such checkpoints offer opportunities for extracting informal payments. Reviewing this approach would be important.

<sup>17</sup> Article 56 Lump-sum tax rate of the Tax Law.

**Table 8 › Lao PDR: Costs and margins of the rice value chain at the retail stage**

Retailing	Total MT traded product (rice)	
	LAK	USD
<b>Gross revenue (qty sold*price)</b>	6,500,000	791.04
<b>Production costs</b>		
Crop purchases (payment to wholesaler)	5,000,000	608.49
Other variable costs	393,030	47.83
Investment costs	121,545	14.79
<b>Total costs</b>	5,514,575	671.12
<b>Processor's income</b>		
Gross margin (revenue- total var costs)	1,106,970	134.72
Net profit (gross margin - invest costs)	985,425	119.93

Source: World Bank staff estimates.

Selling packaged and branded rice rather than just loose rice was one strategy to attract customers with a higher willingness to spend. Retailers are clearly adapted to the type of customers that are dominant around the location of the shop.

**56 › Retail markets are currently not subject to government price controls.**<sup>18</sup> However, a recent article in the Laotian Times reported “The National Assembly proposed upgrading the Prime Ministerial Decree on the management of prices to a law [.....and it has also] advised that an accurate price structure for each category of product and set guidelines for the reduction of product costs should be developed.” This raises concerns as more regulated prices would introduce further distortions with potentially negative consequences on the competitiveness and development of the sector (see also paragraph 49). It is unclear what specific foodstuffs or commodities are targets for these price controls; however, interviews with wholesalers and retailers in the rice and vegetable markets did not confirm this. Rather, regulatory oversight of the retail markets is aimed at establishing consumer protection standards such as product labelling regulation (including

price display) aimed at promoting price discovery in retail markets.<sup>19</sup> For instance, it was observed that for rice retail markets in Vientiane Capital, retailers consistently displayed the price of their product (Figure 3).

**57 › Supermarkets are emerging but appear to be marginal still in terms of importance to retail.** Experience from India, Bangladesh, China, Thailand, and Vietnam suggests that modern food retail (supermarkets, hypermarkets, convenience store chains, neighborhood chain stores, and discount and club stores) will also grow rapidly in Lao PDR, displacing traditional retailers. Yet it will take some time. Supermarkets can use economies of scale in procurement and marketing to reduce costs of staples to consumers and can use economies of scope to differentiate quality and thus appeal to different segments of consumers, so they will be able to offer lower prices than traditional stores. Important conditions for modern retail are a stable and favorable business environment, a growing middle class, and access to affordable and well-located real estate. While Lao PDR has a growing middle class, the business environment remains cumbersome and anecdotal

<sup>18</sup> <https://laotiantimes.com/2017/05/19/national-assembly-seeks-price-stability/>

<sup>19</sup> The Department of Internal Trade, Ministry of Industry and Commerce Announcement 1285, restating the requirement to include labels in the Lao language on products: <http://www.laotradeportal.gov.la/index.php?r=site/display&id=957#.WacyhsiGPIU>

Figure 3 &gt; Rice retailing in Vientiane



Photo by Bart Verweij/World Bank Laos

evidence indicates that informal restrictions to accessing prime real estate exist.<sup>20</sup>

**58 > Legal barriers to entry for supermarkets do not appear to be in place, but the minimum capital (investment) requirements are very high and informal barriers may exist.** The Decision on Shopping Centers and Department Stores No. 1950/MOIC.DTD from September 22, 2015 references retailers directly. Article 7 sets standards and conditions for establishing such enterprises and defines supermarkets as having an area of no more than 10,000 m<sup>2</sup> and hypermarkets of no more than 50,000 m<sup>2</sup>. Another regulation is the Decision on Wholesale and Retail Business No. 1005/MOIC.ITD from May 22, 2015, which regulates wholesale and retail businesses. Again, no major formal barriers to entry were found there. Both foreign and local companies are permitted to engage in wholesale and retail business (foreign companies were previously prohibited). Article 22 does include a list of prohibited activities for wholesale and retail business, however, and one

prohibited activity is “distribution of goods in the price management list without approval from the price management authorities.” Whether informal barriers to entry exist could not be confirmed but would be useful to study, as key informants report that it is difficult to receive a supermarket license at central location.

## 2.2 > Export market

**59 > Lao PDR only exports a small proportion (about 5 percent) of its rice production and relies on cross-border trade with its neighbors.**

The export market for rice can be separated into the markets for glutinous and non-glutinous rice. Currently, almost all exports are glutinous rice exported to Vietnam. Interviews conducted with processors confirmed that Lao PDR holds a competitive advantage in this market, offering a good mix of price and quality competing well with the offers of Vietnam and Thailand. Vietnam’s

20 For a detailed discussion of challenges in the Lao business environment and the role of discrete decision making, see World Bank (2018) and Imboden and Hoppe (2017).

glutinous rice is of worse quality than that from Lao PDR, so Vietnamese consumers are prepared to pay a premium for Lao rice (Figure 4). On the other hand, Thai rice is of much higher quality and more expensive, being consumed by more affluent Vietnamese consumers and providing Lao PDR with a good niche to serve a large number of middle-income consumers in Vietnam (CASRAD 2015).

**60 > Domestic regulations are relatively favorable to exports, although provincial reserve quotas exist.**

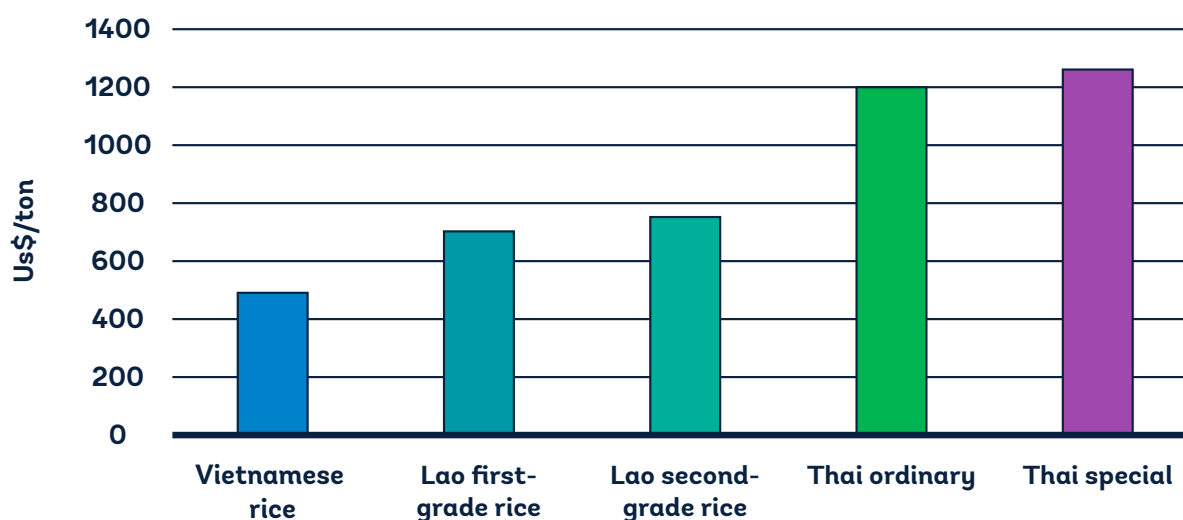
The MoIC governing ordinance “Procedures for Rice Import and Export in the Lao PDR” from March 1, 2012” is the main regulatory framework governing the imports and exports of rice. While exports of rice are legally permitted, quotas set at provincial level restrict the flow of rice across borders. According to the MoIC’s Announcement dated July 11, 2013, a baseline quota of 350 kg/head/year (after deduction of wet/dry paddy ratio and rice reserves) is set for each province to ensure sufficient quantities for reserves. After meeting reserve quotas, remaining quantities are eligible for export. Information regarding how

often these quotas are not met, resulting in export prohibitions, was not available. However, the threat of export prohibitions has globally shown to reduce incentives for investment into such sectors as it reduces investors’ ability to assess their likely returns on investment. As a result, export restrictions negatively affect the long-term growth of the sector by reducing investment inflows, which could bring in knowledge and technological innovations.

**61 > Indirect costs exist in the form of bureaucratic processes.**

For instance, under the regulation, traders are required to obtain authorization for exporting from the MoIC at both the provincial level and Vientiane Capital to ensure surplus reserves in the country to enable exports. Transport providers and exporters complain about burdensome procedures to process documents with too many offices. Informally they report that they make payments to officers to speed up the process. In combination with the threat of export prohibitions, this further reduces incentives for larger investors targeting primarily export markets to invest in Lao PDR.

**Figure 4 > Retail prices of glutinous rice in Vietnam, US\$/ton, 2015**



Source: CASRAD 2015.

**62 > The government has given priority to reducing regional trade barriers in the past few years to deepen integration in the Southeast Asia region.**

In 2010, Lao PDR ratified the ASEAN Trade in Goods Agreement, which eliminated intra-ASEAN<sup>21</sup> import duties on 99.65 percent of their tariff lines. In accordance with the agreement and implementation of a bilateral trade agreement entered into force in 2015 between Vietnam and Lao PDR, a preferential tariff agreement was signed into law in 2016 granting tariff reduction of 50 percent for products listed in Annex 2b of the agreement, including rice, through October 2020. Under the tariff agreement, imports of rice paddy along with milled and semi-milled rice from and into Lao PDR are subject to a tariff rate of 5 percent. Currently exports of glutinous rice to Vietnam face an import quota to Vietnam of 70,000 tons of rice per year.

**63 > Non-tariff barriers to trade persist and limit the potential scope of export markets.**

For instance, goods entering Vietnam are subject to Rules of Origins requirements to qualify for the preferential tariff rate in Vietnam. In this case, only agricultural goods that are entirely (100 percent) originating from Lao PDR are eligible for the preferential tariff. To benefit from tariff preferences (with a preference margin of 40 percent), exporters are required to obtain a Certificate of Origin (CoO) at the provincial level or in Vientiane Capital to claim preferences in Vietnam.<sup>22</sup> This process is said to be cumbersome as traders complain that they need to obtain

two supporting documents to issue one CoO. The process of issuing CoOs could be simplified. The issuance of other supporting documentation is also frequently reported to take significant time.<sup>23</sup> Exporters see this process as burdensome. They further report that approvals by the Vietnamese officials of CoOs and required paperwork are often arbitrary, and additional requests cause delays at custom points. More research is needed to identify regulatory simplifications and other cost-saving measures to facilitate border procedures.

**64 > In addition to Vietnam, potential export markets for glutinous rice would be China and the European Union (EU).**

Under a recent agreement, China agreed to purchase 20,000 tons of organic rice per year from Lao PDR. First shipments were made in 2016 under a previous agreement for 8,000 tons. However, currently only one mill (the IDP rice mill, a foreign-owned rice mill in Savannakhet Province) can produce rice with high enough quality to meet Chinese standards. Export to Chinese markets is further undermined by the fact that China's Development and Reform Commission elected the Chinese enterprise Xyanye Lao Co Ltd. as the sole exporter of Lao rice to China, creating a de facto monopsony.<sup>24</sup> Regarding the EU, as a Least Developed Country, Lao PDR benefits from the most favorable terms under the EU Generalized Scheme of Preferences, namely the EBA initiative, which grants the country full duty-free and quota-free access to European markets for all products except arms and ammunition. It is one of the few countries,

21 Association of Southeast Asian Nations.

22 Certificate of Origin use under Lao-Vietnam is called Form S and obtained via the Lao Trade Portal.

23 Additional licensing requirements and documentation for export are required and include a copy of the enterprise registration, a phytosanitary certificate from the Department of Agriculture and Forestry at the provincial level, a commercial invoice, a bill of lading, a packing list, and a copy of tax registration. Some of these requirements are mandated by Lao authorities only.

24 A monopsony allows buyers to pay lower prices, negatively affecting producers' income, and reducing incentives to expand production. Such market structures can have significant negative welfare effects on producers. Further work is underway to understand the impact of such restrictions in Lao PDR (where they occur frequently).

beside Cambodia, in the ASEAN block to enjoy this preferential treatment<sup>25</sup>

**65 › For non-glutinous rice, export competitiveness challenges are quite big for Lao PDR.** As a small player on those markets, Lao PDR is a price taker; to be competitive it must adjust its cost structure accordingly. The dominant forces and main producers are Vietnam, India, and Thailand. Traders report that paddy white rice produced in Lao PDR is more expensive than in Thailand and Vietnam by 500–1,000 LAK/kg (US\$122/ton). Based on the information sourced during interviews, paddy production costs for white rice in Lao PDR were US\$322/ton. A few millers in Khammouane Province can offer white rice at US\$523/ton.<sup>26</sup> Based on a report from The Institute of Developing Economies of the Japan External Trade Organization (IDE-JETRO),<sup>27</sup> it is safe to assume a cost of logistics from mill to border of about US\$60/ton of milled rice, which would cover transport, loading, and border crossing. It follows from those estimates that under current conditions, Lao PDR is not a competitive producer of milled white rice. The main cost factor is the quality and price of paddy production.

**66 › Poor paddy quality as well as poor milling standards in the processing of non-glutinous rice hinder the ability of medium-sized mills to export.** These results are in line with the current anecdotal evidence. Thai-Ha company (Kaset brand) formerly imported Lao non-glutinous rice from mills in Nongbok and Thakhek districts, providing technical assistance to monitor milling quality and providing package with Thai rice branding. Interviews with key traders show that the firm closed its office in Savannakhet Province as it was no longer profitable.

**67 › Only under exceptional circumstances and favorable exchange rates can mills find an opening for trade.** One mill – Vanida rice mill in Khammouane Province – can meet the Good Manufacturing Practice (GMP) standards in processing. A second company – the Bounmy and Soulvian rice mills – is currently in a pilot rice mill program for GMP funded by the Mekong Institute and Swiss Agency for Development and Cooperation. However, most rice mills are unable to meet the GMP standards, citing a lack of modern processing infrastructure (drying, heating, polishing, and sorting) as the key constraints. One of the main constraints in their effort to upgrade processing technology is difficult access to finance.

25 The EU regulation on rice is complicated. As indicated below, the EBA initiative established under EU regulation 978/2012 provides zero duty and quota-free access for all types of rice (including milled rice) for rice originating from Least Developed Countries, including Lao PDR. According to a special report by the USA Rice Foundation on EU rice regulation (comments regarding the 2015 National Trade Estimate Report on Foreign Trade Barriers; Docket No. USTR-2015-0014, dated October 28, 2015) since 2005 the EU replaced the margin of preference trade concession regime with multiple import regimes for rice consisting of a mix of Tariff Rate Quotas (TRQ), variable applied duties, and country-specific concessions. Import duties for milled and semi-milled rice (of all types) are summarized in Regulation No. 192/2010 fixing the import duties applicable to semi-milled and wholly milled rice. The import duty is bound at €175/ton. The applied rate is set twice a year (September 1 and March 1) based on imports from the preceding 12- and 6-month reference period, and is set at an applied rate of either €145/ton or €175/ton. However, special TRQ set at zero duty are established twice per calendar year: the first quota is set at 63,000 tons (Jan-July), with the lion's share going to the United States (- 38, 000 tons), Thailand (- 21,000 tons), and Australia (-1,800 tons). The second quota is set at 40,216 tons, with specific targets specified for India (- 1,800 tons) and Pakistan (- 1,600 tons). The remaining balance is set for rice of "other origins" and all other countries. These quotas are provided for under Regulation No. 1273/2011, providing for the administration of certain TRQ for imports of rice and broken rice. Regulation No. 449/2010 also provides TRQ for Egypt at 81,149 tons at zero duty for milled rice.

26 For comparison, the average export prices of white, non-glutinous, and non-aromatic rice offered by Thailand and Vietnam range between US\$320 and US\$450/ton depending on quality and the rice supply situation on the world market.

27 For a detailed treatment of logistics costs in Lao PDR please refer to IDE-JETRO (2015).



## 2.3 > Cost drivers

**68 > Table 9 presents the cost and profit breakdown at various stages of the value chain between Khammouane Province and Vientiane Capital.** Farm production costs explain 29 percent of the final consumer price. They are mainly driven by the high costs of hired labor, the lack of mechanization, and low yields. The rest is explained by high profits at the wholesale and retail segments, which are largely a reflection of the high transaction costs associated with each on the spot business deal and very small quantities, as described above. Recall that translating profits into income per day, for a wholesaler a profit of US\$97/ton of rice equals a daily income of US\$13 assuming seven working days per week. For

retailers, net profits are estimated at US\$120/ton, resulting in a daily income of only US\$6.

**69 > Despite the relatively high farm-gate price (Table 3), Lao farmers do not seem to fully benefit from high consumer prices.** In peer countries, the ratio of farm-gate to wholesale prices ranges from 34 percent to 51 percent (Table 10). Yet in Lao PDR this ratio is only 27 percent. The share of farm-gate to retail prices is also low in Lao PDR.

**70 > The build-up of incremental costs from stage to stage reveals where most of the value in the chain is generated and how costs accumulate.** The underlying hypothesis of this analysis is that by reducing the costs of individual participants, the competitiveness of the whole chain can be increased. Any effort to cut costs would usefully

**Table 9 > Lao PDR: Rice value chain: costs, prices, profits, US\$/ton**

	Farm-gate	Assembly*	Milling	Wholesale	Retail
<b>Price</b>	<b>264</b>	<b>284</b>	<b>355</b>	<b>608</b>	<b>791</b>
Cost:	233	273	302	511	671
Purchase of intermediate product		233	284	486	608
Incremental costs	233	40	18	25	63
Profit	31	11	53	97	120

Note: \* Prices and costs at farm-gate and assembly are presented for paddy. For the remaining segments, prices and costs are for rice.

Source: World Bank staff estimates.

**Table 10 > Share of farm-gate prices in wholesale and retail prices: cross-country comparison**

Countries	Ratio of farm-gate to wholesale prices, %	Ratio of farm-gate to retail prices, %
China	51	n/a
Indonesia	45	39
Philippines	34	33
India	46	39
Thailand	46	n/a
Vietnam	44	n/a
Lao PDR	27	21

Note: Price ratio for Lao PDR is for 2017. For other countries, the ratio is for 2013.

Source: World Bank staff estimates based on FAO GIEWS price data and PhilRice/IRRI 2016.

target those stages with the highest cost and therefore the highest potential to make a significant change. Table 11 provides a summary of the incremental cost build-up along the stages of the sticky rice value chain for 1 metric ton of farm-gate product at the beginning of the season, when prices are low.<sup>28</sup>

**71 › Not surprisingly, the highest costs are created at farm stage.** This is related to the inherent nature of agricultural production. Nevertheless, it may represent a good entry point for improving the competitiveness of the end-product as well as the whole value chain. The above analysis assumes an actual average yield of 3.5 tons of dry paddy per hectare. Just to illustrate, increasing that yield

figure to 4.5 tons by improving farming techniques while keeping input costs constant would reduce the above production costs from US\$233/ton to US\$181/ton. The second highest costs are created at retail stage. These results are in line with data on other rice-producing countries in Asia. Table 12 displays the results on costs added for Bangladesh, India, and China. The highest costs are generated at the farm stage. In India and Bangladesh, the second highest costs are also added by retailing, the highest for all postharvest stages. In both cases, rice retailing is described as very small operators selling small bags of rice from small stalls, indicating a similarly inefficient small shop sector for staple foods.

**Table 11 › Lao PDR: Distribution of costs and profits along the rice value chain at the beginning of the season, US\$/ton**

	Farm production	Assembly	Milling <sup>29</sup>	Wholesale	Retail
<b>Incremental costs</b>	233	9	18	16	41
Transfers to previous stage	0	264	284	317	396
Profit (sales price - incremental costs and transfers)	31	11	53	63	78
Total value generated (sales price)	264	284	355	396	514
Incremental costs as % of final consumer price	45%	2%	3%	3%	8%
Value added	264	20	71	79	118
Share of total value added (%)	48%	4%	13%	14%	21%
Profit rate (net profit/total costs)	13%	4%	18%	19%	18%
Profit as % of final consumer price	6%	2%	10%	12%	15%
Profit as share of value added (%)	12%	55%	75%	80%	66%
Daily income (US\$)	N.A	4	N.A	13	6

Source: World Bank staff estimates.

**Table 12 › Costs added as share of total costs along the value chain of conventional rice in Bangladesh, India, and China (in %)**

Cost added as share of total costs	Farm production	Assembly	Processing	Wholesale	Retail
Bangladesh	87	1	3	1	8
India	63	2	7	3	22
China	44		36	11	7

Source: Reardon et.al. 2012, and World Bank staff estimates for Lao PDR.

<sup>28</sup> Differences in totals are due to rounding.

<sup>29</sup> For the milling stage, the output includes rice and by-products; i.e., bran and husks. Thus, the sales price at milling stage and transfer at wholesale stage are not the same. That is why summing up profits and incremental costs over all stages adds to slightly more than the final sales price of rice.

**72** > For the identification of key drivers of value chain costs, the analysis of profits is particularly interesting if profits comprise a large share of consumer rice prices. Table 11 displays the distribution of profits and margins along the rice value chain at the beginning of the season for 1 ton of farm product. It follows that profits at processing, wholesale, and retail stage accumulate to 37 percent of the final consumer price. Each stage shows significant profit rates of 18–19 percent, which warrants a deeper analysis. It should be noted, however, that one reason that these profit rates represent a relatively larger share of the final consumer price is that they are situated toward the end of the value chain. Figure 5

illustrates how the final consumer price for sticky rice is built up by value added at each stage of the value chain, presented in a paddy equivalent.<sup>30</sup> The value added at each stage is the sum of profits and incremental costs.

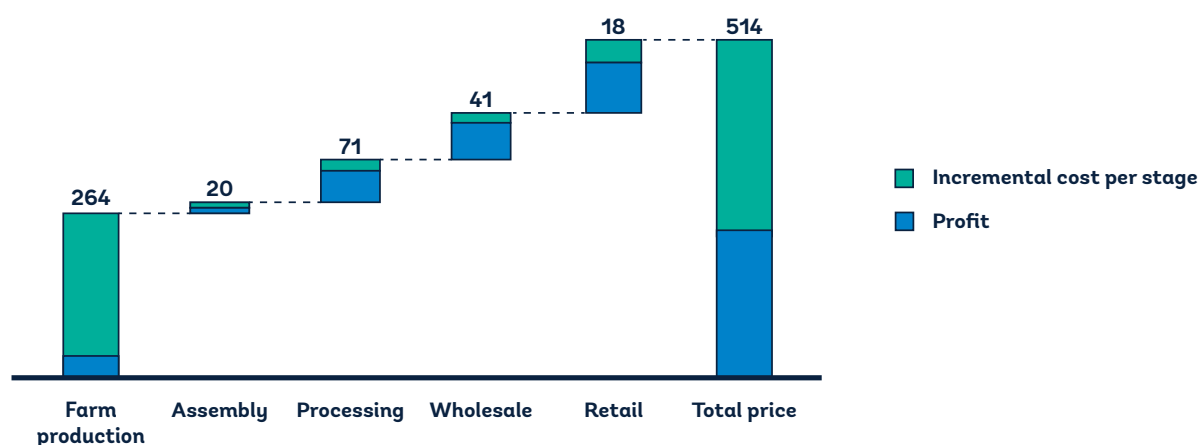
**73** > The relatively high profit rate of the milling stage is cause for some concern. It seems relatively high, given that the underlying cost assumptions include interest and depreciation of capital investments. Shares of total profits accruing to the processing stage in Bangladesh and India, for example, are much lower, although investment costs are not included in their budgets (Table 13). Millers’ share of the value chain profits

**Table 13** > Share of total profit accruing to value chain participants in selected countries

Cost added as share of total costs	Farm production	Assembly	Processing	Wholesale	Retail
Bangladesh	69	4	8	10	9
India	69	6	6	3	13
China	60		33	6	1
Lao PDR	13	5	23	27	33

Source: Reardon et.al. 2012, and World Bank staff estimates for Lao PDR.

**Figure 5** > Lao PDR: Price build-up and value added along the sticky rice value chain, US\$/ton



Source: World Bank staff.

30 Consumer price of rice in a paddy equivalent of US\$514/ton equals a consumer rice price of US\$791/ton.

in China was larger than that of South Asian millers, possibly because Chinese millers tend to sell directly to large urban wholesale markets and buy directly from farmers. A similar set-up could explain the high margins for the processing stage in Table 11, which assumes a medium-sized modern mill that can sell directly to retailers and sources directly from farmers via collectors. Furthermore, the description of the processing stage in the previous section hinted at the prevalence of barriers to entry because of regulation, supplier agreements, and limited access to finance in the sector, which prevent outsiders from investing. For example, apparently fixed prices for buying and selling rice might lead to lower profit expectations of potential investors, while in practice profits could be higher than the apparent cap at 500 LAK per kilo (see paragraph 46). These disincentives to invest might therefore contribute to generate handsome profits for those modern mills already inside the market.

**74 › Traditional retailing is a key source of employment in Lao PDR but clearly adds costs to food consumers.** Profit rates at retail stage are estimated to be around 18 percent, which seems high. In neither India, Bangladesh, nor China is the share of total profit accruing to traders as high as in Lao PDR. However, in Bangladesh and India, which display a similar small shop system and high costs at retail stage, profit shares were also high compared with those of other postharvest value chain stages. It is further noted that these profits in Lao PDR include the cost of covering retailers' own returns to labor, which may have been deducted from the profit estimates for the other countries. If all labor costs are deducted from income, retailers' profits and consequently their profit shares will be smaller. As mentioned above, an average daily turnover of 50 kg at a profit of US\$120/ton equals a daily income of US\$6 for a traditional retailer.

**75 › Similarly, the wholesale stage represents a large cost factor for the rice value chain.**

According to the study's regulatory assessment, legal barriers to entry do not exist for either wholesale or retail markets. Instead, the main factors driving costs per ton are high transaction costs associated with each on the spot business deal and very small quantities. Consolidation among retail stalls, larger storage, and better linkages between millers, traders, and retailers are opportunities for cost cutting and increasing the efficiency of the value chain. However, interviews suggest that traders are reluctant to enter into long-term contracts with business partners because they face the risk of default. In the absence of functioning and affordable mechanisms for the resolution of commercial disputes, all transactions are on the spot and business relations are trust-based. Investments into better linkages and consolidation are also constrained by limited access to finance and weak human capital.

**76 › Describing costs by categories can point toward cross-cutting issues with a potential for cost reduction.**

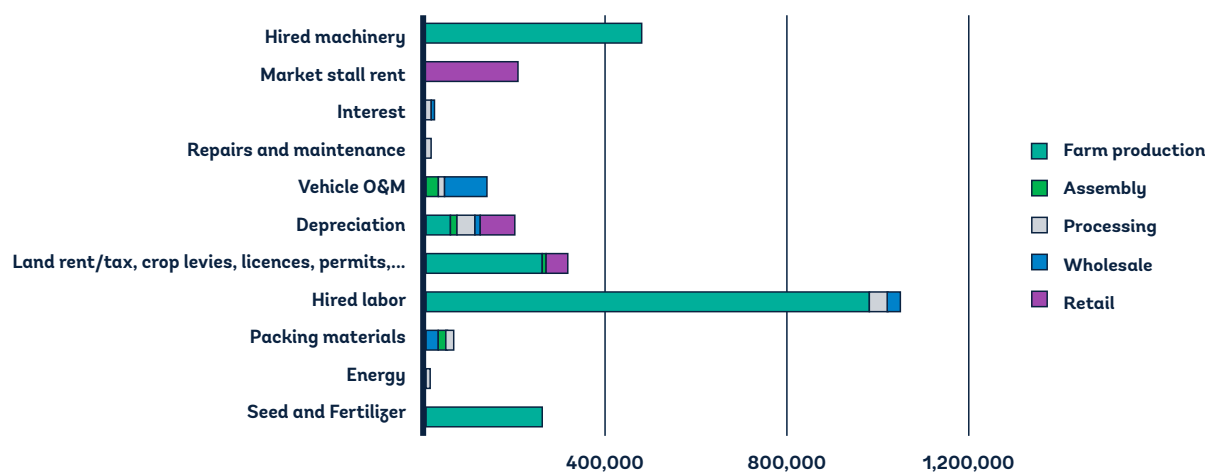
Figure 6 displays the magnitude and origin of different types of value chain costs. By far the largest cost factor is hired labor, most of which is needed for farm production. Another area of interest for improving competitiveness is everything related to mechanization, repairs, and maintenance. At each stage, significant costs are created by some form of machines and vehicles, and licensing requirements for the import of machinery and spare parts (non-tariff measures) restrict access to machinery and parts and reduces competition to provide such inputs. This is also reflected in the very low rating of the machinery indicator in the 2017 Enabling the Business of Agriculture report, particularly with regard to tractor dealer requirements (World Bank 2017b). The cost of complying with different sector-specific regulations (tax, levies,

licenses, permits) is also a significant factor based on the available data, which only include the actual regular payments. The true cost of compliance could be considerably higher as it would also include informal payments, which were not possible to quantify, and transaction costs associated with application processes, which may also differ considerably by occasion and office involved.

**77** In summary, the costs most attributable to the large wedge between producer and consumer rice prices in Lao PDR are a result of structural problems, the resolution of which requires public and private investments. Key among the structural problems is the low farm productivity.

Yet regulatory and administrative costs also still need to be addressed to enhance efficiency along the value chain and crowd in private investment. Currently, these costs do not seem to directly inflate the cost structure of the value chain, but the report finds that cumbersome regulations still matter as they limit entry, affect market structure, and reduce competition; thus they require attention. Among the most prominent are those related to access to capital, paddy and rice price regulations, and the lack of an efficient conflict resolution mechanism for commercial disputes.

**Figure 6** Lao PDR: Magnitude and origin of different categories of costs, LAK/ton



Source: World Bank staff estimates.



## 3 > Vegetables Value Chain

**78 > This chapter focuses on the value chain of conventional vegetables.** Lao consumers are increasingly becoming aware of the specific attributes of agricultural and food products, particularly in terms of their identity and means of sustainable production. While growing consumer concern for safe and sustainably sourced food is driving market expansion for certified products – whether organic, fair trade, or geographic indication – from specialty retailers to high-volume retailers, the conventional vegetable market remains by far the biggest. The specific vegetables analyzed in this study are lettuce and coriander. While lettuce is a common and popular vegetable, coriander is a specialty crop, like other herbs that are less widely grown and bring better prices. The production of herbs enjoyed impressive growth in the last two decades as more people began using fresh herbs for cooking, medicinal herbs, and value-added herbal products such as soaps, candles, teas, and bath oils. Study districts are in Vientiane Province supplying Vientiane Capital.

**79 > Most of the produce is sold in relatively unprocessed form.** Increasing female participation in the workforce will increase the demand for ready-to-cook, ready-to-eat, and processed foods. Consumers with higher incomes and education levels are demanding foods that are compliant with sanitary standards, and that meet their expectations for taste, packaging, and appearance, and they are willing to pay more for these foods. In addition to necessitating compliance with food regulations and standards, their demand should be driving innovation in processing, packaging, and branding in micro,

small, and medium processing enterprises. However, the current state of processing of vegetables in Lao PDR is very low. According to farmers and traders, this is mainly due to the lack of knowledge on processing techniques and lack of access to finance. Likewise, the lack of labor is a common constraint among farmers and traders.

**80 > The main market outlets are traditional wet markets.** Supermarkets, hypermarkets, and specialized luxury stores are gaining importance and they are increasingly supplying a range of processed food imports as well as traditional foods and fruits and vegetables to middle- to high-income shoppers. However, most of the produce is sold by small retailers on traditional wet markets. Most of the trade is carried out by small-scale, one-person traders; many of them are farmers themselves. The crop is assembled by collectors who own small trucks and transport the goods to wholesale markets. Business is mostly done face-to-face, one-on-one, and with payments in cash. Wholesalers buy vegetables from collectors, hire a trolley, and carry vegetables from the collector's truck to their stall. Retailers operate at a small scale and sell many different types of vegetables to consumers. They usually sell in fresh markets around Vientiane Capital. Market offerings are highly dependent on production seasonality.

**81 > Due to the strong production seasonality, vegetable price fluctuations are very high in Lao PDR.** Prices are highest very early in the harvesting season, when overall supply is still low. Later during the harvest times there is an oversupply and prices drop drastically. For example, producer prices for coriander are 9,000 LAK/ton in the

rainy season and 5,000 LAK/ton in the dry (winter) season. International trade of vegetables is limited. Vegetables are imported from Thailand, but according to interviews volumes vary and are only intended to fill seasonal gaps in the supply offered by Lao farmers. Exports to Thailand are the exception rather than the norm.

## 3.1 > Conventional vegetables

### Farm production

**82 > Vegetable production is mostly practiced in a traditional way by individual households.** The typical size of the vegetable farm is 2 rai (or 0.32 ha) on average. While adoption of new technologies in vegetable production in Lao PDR is progressing, the situation is still characterized by poor crop management, less choice of variety, and pest and disease problems, which decrease productivity and quality and increase the cost of production. The main factor driving up the cost is hired labor, the same as for paddy production.

**83 > Farmers do not have formal contractual arrangements with collectors.** They have informal links with several collectors who buy from them on a regular basis. Farmers keep two to three varieties to mitigate risks related to production and marketing. The rotations allow for some diversification: mustard in the early dry season, followed by eggplant; or Chinese cabbage after the main rice harvest followed by cauliflower; or lettuce after coriander. During the rainy season, less vegetables are harvested and productivity is lower.

**84 > Farmers incur a loss of production due to poor postharvest handling, albeit less than expected.** Incidence of loss at farm stage in Lao

PDR is relatively low as farmers either harvest on demand or call their regular collectors when they have produce that is ready for harvest. Normally, traders provide farmers with plastic bags. The produce is harvested, cleaned, and bundled in situ in the open the field. Overmaturity is a frequent occurrence, as some farmers wait for the order from collectors rather than harvest the crop when it is ready but with no sure market. Losses that materialize later and are caused by quality issues and overmaturity are passed on to farmers because collectors require 25 percent allowance for losses incurred when handling the produce from the farm to the market. Because they usually provide plastic bags as packing material with 12 kg capacity, farmers fill each plastic bag with 15 kg. Therefore, improving quality and productivity at farm stage to reduce overall costs represents a good entry point for improving the competitiveness of the whole value chain.

**85 > Farmers are not subject to any form of public regulation in terms of production standards or food safety regulations.** As a result, they do not face any cost of compliance. On the other hand, an opportunity to improve the quality of vegetable products is missed. Upgrades in terms of standards could add benefits to the whole value chain.

**86 > The traditional supply chain does not provide for product differentiation by branding, for example, or certificates of origin.** All farmers supply the exact same type of markets with similar products and, depending on the current supply and demand situation, profit rates at farm stage fluctuate daily in line with price fluctuations. Farmers try to manage price risk by diversifying their crops and by dealing with a handful of different traders to negotiate the best price. Cell phones are essential tools to receive current price and market information. Margins at farm stage vary a lot (Table 14). The difference in the margins

between lettuce and coriander can, to some extent, be explained by the type of crops, specialty versus common vegetables, but may also reflect some scarcity of coriander when data collection took place (in April 2017). All things considered, if done properly, vegetable farming can be a much more profitable business than rice farming.

### Traders (collectors, wholesalers, retailers)

**87 > Collectors, wholesalers, and retailers share many characteristics and sometimes these functions are combined.** Costs for collectors (assembly) and wholesalers are related to transport and hired labor. Costs incurred at retail stage are mostly related to costs of operating the market stall and packing and cooling the vegetables. Table 15 and Table 16 show that all traders make positive profits per ton of end-product.

**88 > Large cost factors for all three types of traders are losses caused by the mix of suboptimal/outdated packing technology, insufficient inspection methods, and outdated market infrastructure:**

**Packing technology:** Produce is washed and packed in plastic bags, which is beneficial in preventing too much water loss. Washing adds water to the produce and increases the weight at which wholesalers can sell it on the market.

However, sweating inside the bag is a common condition that makes it more likely for produce to rot if it has been damaged as a result of handling.

**Inspection:** The quality of vegetables is mainly inspected visually. High losses are due to trimming of damaged leaves and rotten parts because of bacteria soft rot.

**Market infrastructure:** The conditions at wet markets, which lack modern cooling and storage facilities, force retailers to sell their goods within three days maximum. Prices for goods at the end of the first day and on their second or third day are reduced drastically.

**89 > Given the dominant quality issues, traders spend a lot of time sorting, cleaning, and repacking the goods at each stage of the chain.** Losses reduce the profits at each stage; accordingly, the underlying analysis assumes 10 percent loss at each stage. In total this means that 1.0 tons of final product require 1.4 tons of raw material (farm-gate product). This is in line with earlier estimates. A previous study conducted by AVRDC estimated that an average of 17 percent of vegetables leaving the farm-gate are never consumed and are lost along the supply chain (Weinberger et al. 2008).

**Table 14 > Lao PDR: Costs and margins in the vegetables value chain at the production stage**

Farm Production	Coriander Per Hectare		Lettuce Per Hectare	
	LAK	USD	LAK	USD
Gross revenue (yield* price)	78,750,000	9,583.79	35,340,000	4,300.84
<b>Production costs</b>				
Variable costs	36,381,000	608.49	32,175,000	3,915.66
Investment costs	571,000	14.79	1,142,000	138.98
<b>Total costs</b>	36,952,000	671.12	33,317,000	4,054.64
<b>Farmer income</b>				
Gross margin (revenue - var costs)	42,369,000	5,156.26	3,165,000	385.18
Net profit (gross margin - invest costs)	41,798,000	5,086.77	2,023,000	246.20

Source: World Bank staff estimates.



**90 > Like at the farm stage, profit margins vary and fluctuate daily, depending on the current demand and supply conditions.** The high price fluctuations suggest that the supply chain is not well managed. No long-term contracts between traders and farmers' groups exist to manage supply risk. In the absence of functioning and affordable mechanisms for the resolution of

commercial disputes, all transactions are on the spot and business relations are trust-based. Some traders try to cut costs and manage risks better by combining several functions (retailing, wholesaling, and collection) through vertical integration. However, these efforts and investments are constrained by limited access to finance and lack of labor capacity.

**Table 15 > Lao PDR: Costs and margins of the lettuce value chain at assembly, wholesale, and retail stages**

	Assembly		Wholesale		Retail	
	assembled (washed) product		traded (washed) product		traded (washed) product	
	LAK/ton	USD/ton	LAK/ton	USD/ton	LAK/ton	USD/ton
<b>Gross revenue (qty sold* price)</b>	7,000,000	851.89	8,300,000	1,010.10	12,000,000	1460.39
<b>Production costs</b>						
Crop purchases (payment to farmer)	6,270,000	763.05	7,700,000	937.08	9,130,000	1,111.11
Other variable costs	597,165	72.67	350,000	42.59	1,634,888	198.96
Investment costs	68,547	8.34	128,750	15.67	224,250	27.29
<b>Total costs</b>	<b>6,935,712</b>	<b>844.07</b>	<b>8,178,750</b>	<b>995.35</b>	<b>10,989,138</b>	<b>1,337.37</b>
<b>Assembler's income</b>						
Gross margin (revenue - total var costs)	132,835	16.17	250,000	30.42	1,235,113	150.31
Net profit (gross margin - invest costs)	64,288	7.82	121,250	14.76	1,010,863	123.02

Source: World Bank staff estimates.

**Table 16 > Lao PDR: Costs and margins of coriander value chain at assembly, wholesale, and retail stages**

	Assembly		Wholesale		Retail	
	assembled (washed) product		traded (washed) product		traded (washed) product	
	LAK/ton	USD/ton	LAK/ton	USD/ton	LAK/ton	USD/ton
<b>Gross revenue (qty sold* price)</b>	15,000,000	1,825.48	22,000,000	2,677.38	12,000,000	3,529.27
<b>Production costs</b>						
Crop purchases (payment to farmer)	9,990,000	1,215.77	16,650,000	2,026.29	22,000,000	2,677.38
Other variable costs	650,400	79.15	350,000	42.59	2,579,550	313.93
Investment costs	31,743	3.86	1128,750	15.67	224,250	27.29
<b>Total costs</b>	<b>10,672,143</b>	<b>1,298.79</b>	<b>17,128,750</b>	<b>2,084.55</b>	<b>24,803,800</b>	<b>3,018.60</b>
<b>Assembler's income</b>						
Gross margin (revenue - total var costs)	4,359,600	530.56	5,000,000	608.49	4,420,450	537.96
Net profit (gross margin - invest costs)	4,327,857	526.70	4,871,250	592.83	4,196,200	510.67

Source: World Bank staff estimates.

**91 > The price peaks observed in Vientiane Capital indicate that good opportunity exists for regional trade or investment in supply chain management, as the peaks occur during different periods of the year and could be exploited by traders.** However, these opportunities are apparently not exploited to the extent possible. Access to farmers could be a barrier to entry, as most existing collectors are from the same villages as the farmers and benefit from preferential treatment due to family and friends.

**92 > While few regulatory controls and restrictions exist at collection stage (the same regulations as for traders of rice apply), some evidence suggests that retail markets are subject to some government regulation.**<sup>31</sup> A recent article in the Laotian Times reported “The National Assembly proposed upgrading the Prime

Ministerial Decree on the management of prices to a law [.....and it has also] advised that an accurate price structure for each category of product and set guidelines for the reduction of product costs should be developed.” It is unclear what specific foodstuffs or commodities are targets for these price controls; however, interviews with wholesalers and retailers in the rice and vegetable markets did not confirm this initiative. Rather regulatory oversight of the retail markets is aimed at establishing consumer protection standards such as product labeling regulation (including price display) aimed at promoting price discovery in retail markets;<sup>32</sup> however, enforcement of such measures remains weak. For instance, during the market survey a consistent lack of compliance was observed among retailers in the vegetable markets, where few labels were displayed (Figure 7).

**Figure 7 > Lao PDR: Wet market with vegetables in Vientiane**



Source: World Bank staff picture.

31 <https://laotiantimes.com/2017/05/19/national-assembly-seeks-price-stability/>

32 The Department of Internal Trade, Ministry of Industry and Commerce Announcement 1285, restating the requirement to include labels in the Lao language on products: <http://www.laotradeportal.gov.la/index.php?r=site/display&id=957#.WacyhsiGPIU>

## 3.2 > Cost drivers

**93 > The build-up of incremental costs from stage to stage reveals where most of the value in the chain is generated and how costs accumulate.** The underlying hypothesis is that by reducing the costs of individual participants, the competitiveness of the whole chain can be increased. Any effort to cut costs would usefully target those stages with the highest cost and therefore the highest potential to make a significant change. Table 17 and Table 18 depict the distribution of costs along the value chains of lettuce and coriander. The price data were collected on one single day during the rainy

season in 2017. Production costs are adjusted accordingly. (Differences in totals are due to rounding.)

**94 > Like for the rice value chain, the highest costs in lettuce and coriander are generated at the farm stage.** This is related to the inherent nature of agricultural production. Nevertheless, it may represent a good entry point for improving the competitiveness of the end-product as well as the whole value chain. Important cost factors at farm stage are hired labor and inputs. Incremental costs generated at retail stage also make up a significant portion of the final consumer prices.

**Table 17 > Lao PDR: Distribution of costs and margins along the lettuce value chain, US\$/ton of farm-gate product**

	Farm production	Assembly	Wholesale	Retail
Incremental costs	654	74	47	158
Transfers to previous stage	0	693	749	778
Profit (sales price - incremental costs and transfers)	40	7	12	86
Total value generated (sales price)	694	774	808	1022
Incremental costs as % of final consumer price	64%	7%	5%	15%
Net profit as % of final consumer price	4%	1%	1%	8%
Profit rate (net profit/total costs)	6.1%	1%	1%	9%
Profit as share of value added	5.7%	8.75%	20%	35%

Source: World Bank staff estimates.

**Table 18 > Lao PDR: Distribution of costs and margins along the coriander value chain, US\$/ton of farm-gate product**

	Farm production	Assembly	Wholesale	Retail
Incremental costs	514	75	47	239
Transfers to previous stage	0	1095	1621	1874
Profit (sales price - incremental costs and transfers)	581	475	447	357
Total value generated (sales price)	1,095	1,645	2142	2470
Incremental costs as % of final consumer price	21%	3%	2%	10%
Net profit as % of final consumer price	24%	19%	19%	14%
Profit rate (net profit/total costs)	113%	41%	28%	17%
Profit as share of value added	53%	86%	90%	59.9%

Source: World Bank staff estimates.

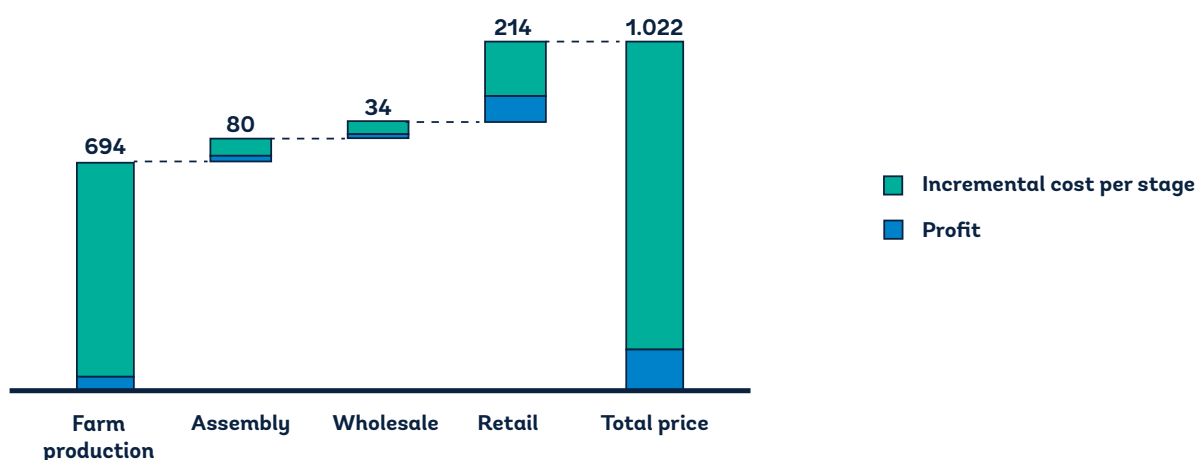
**95 > For the identification of key drivers of value chain costs, the analysis of profits is particularly interesting if profits comprise a large share of the vegetable consumer prices.** The tables above show the distribution of profits along the value chains of lettuce and coriander. Overall, as a high-value product coriander is much more profitable for farmers and traders. Net profits along the lettuce value chain are not as high as for coriander, and only the profits at retail stage contribute in a significant way to the final consumer price. For coriander the profits generated by all three types of traders combine to half of the final consumer price, which suggests some space for efficiency improvements, keeping in mind that profits for collectors, wholesalers, and retailers include their own returns to labor. Figure 8 and Figure 9 illustrate how final consumer prices are built up by value added at each stage along the lettuce and coriander value chains.

**96 > To further analyze the profit margins at retail stage a simple comparison with price data from Thai wholesale and retail markets was carried out.** Table 19 presents data from two different

fresh markets in Thailand across the border from Vientiane. Retailers in the two visited markets in Thailand employ similar markups to the ones visited in Vientiane. The retail prices in Thailand are 1.5 to 2.0 times higher than the purchasing prices at wholesale markets.

**97 > To analyze margins at retail and wholesale stage more in detail, the study conducted a survey of five different wet markets in Vientiane (Nonkhor, Thongkhankham, Khuadin, Huakhua, and Nonsavarng).** Given the large differences between the results for coriander and lettuce, price data were collected across nine different vegetables (spinach, morning glory or water spinach, Vietnamese lettuce, Chinese flowering cabbage, Chinese cabbage, cabbage, coriander, mint, green or spring onion). The comparative analysis revealed that one market (Nonkhor) was consistently the cheapest and one market (Nonsavarng) was consistently the most expensive for consumers. Average retail prices in Nonsavarng were 1.4 times higher than in Nonkhor. This difference was driven by wholesale prices to some extent. Nonsavarng was 1.2 times

**Figure 8 > Lao PDR: Price build-up and value added along the lettuce value chain, US\$/ton**



Source: World Bank staff estimates.

more expensive at that stage. But gross margins at retail stage in Nonsavarn (1.8) were also found to be significantly higher than in Nonkhor (1.5).

**Table 19 > Thailand: Vegetable prices at fresh markets in Nongkhai and Udon Thani**

Vegetable	Wholesale (LAK/kg)	Retail (LAK/kg)
<b>Nongkhai</b>		
Coriander	15,600	24,000
Lettuce	6,480	9,600
<b>Udon Thani</b>		
Coriander	12,960	19,200
Lettuce	3,650	7,200

Source: World Bank staff estimates.

**98 > Overall, factors that were identified to influence retail prices were:**

**Location:** Nonsavarn is far from other markets in the area, which reduces competitive pressure on retail prices. Nonkhor is in the center of Vientiane Capital and retailers can sell more than in Nonsavarn market.

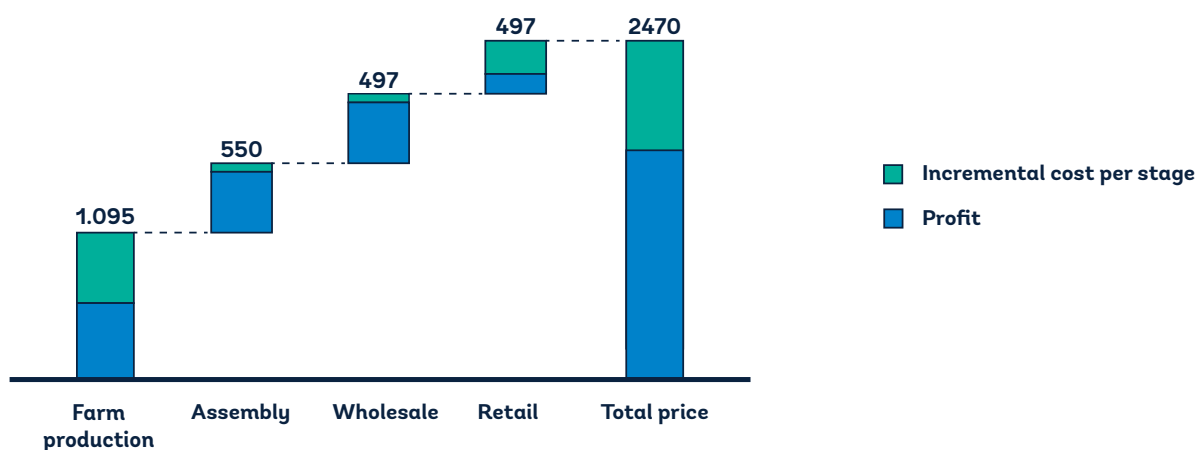
**Integration:** In Nonkhor retailers have better access to many wholesalers on the spot and do not have to pay for transportation. In Nonsavarn some retailers purchased from other wholesalers who purchased from Nonkhor market and some retailers purchased vegetables imported from Thailand by other wholesalers and sold them at a higher price to recover their cost.

**Size:** The number of retailers in Nonsavarn market compared to Nonkhor market is approximately one-third, which reduces competitive pressure on prices.

**Transparency:** In Nonsavarn retailers do not display prices. Given high search costs and the need for negotiation, many buyers end up paying higher prices.

**Administration:** Market fees in Nonkhor are cheaper than in Nonsavarn market.

**Figure 9 > Lao PDR: Price build-up and value added along the coriander value chain, US\$/ton**



Source: World Bank staff estimates.

**99 > In terms of cost categories pointing toward cross-cutting issues, two factors can be identified: losses and high price fluctuation.**

Poor crop management at farm stage, wrong choice of variety, and pest and disease problems decrease productivity and quality and increase the cost of production. Coupled with traditional postharvest systems and market infrastructures, high losses are incurred at every stage of the chain. A fractured supply chain causes high price fluctuation, market risks, and inefficiencies, which could be overcome by closer business linkages among all players. However, a longstanding preference for well-known business partners and the lack of access to affordable and timely resolution of commercial conflicts reduce the appetite of value chain actors to form longer-term contractual relationships and enter into deals with business partners outside of their trusted comfort zone.

**100 > Summarizing, these key factors seem to drive value chain costs and prices for vegetables:**

**Low farm productivity:** Poor crop management and postharvest handling, low choice of variety, and pest and disease problems decrease productivity and quality and increase the cost of production. The absence of public regulation in terms of production standards or food safety

regulations misses the opportunity to meet the increasing demand for safe and sustainably sourced food that is driving market expansion for certified products.

**Poor management of wet markets:** Significant potential to reduce retail prices for vegetables exists by improving the efficiency of wet market operations. Entry points are the administration and level of market fees, as well as the enforcement of product labelling regulation (including price display) aimed at promoting price discovery in retail markets. Investment in market infrastructure to improve cooling and storage facilities would go a long way to reduce food losses.

**Lack of value chain organization:** Apart from the fact that farmers and traders lack the necessary technical and financial capacity to address issues related to quality, food safety, certification, postharvest systems management, logistics, agroprocessing, packaging, and branding, they need stronger coordination along the chain to agree on joint systems and standards. Stronger vertical linkages between different stages of the chain and horizontal consolidation via marketing and contractual arrangements between farmers and traders/processors would reduce losses and price fluctuations.



## 4 > Conclusions and Policy Recommendations

**101 > This study analyzed the reasons for high consumer prices and a large price wedge between farm prices in production regions and Vientiane, the consumption center.** Consumer prices for rice are driven up by the following key factors: (i) low farm productivity; (ii) barriers to entry and to investment at the processing stage; (iii) high profits and high transaction costs associated with an inefficient trade and marketing system at the traditional wholesale and retail stage; and (iv) costs associated with mechanization and maintenance of vehicles and machinery. Consumer prices for vegetables are driven up by: (i) low farm productivity; (ii) an inefficient trade and marketing system coupled with poor management of wet markets; and (iii) a lack of value chain organization.

**102 > Bringing together the analysis of the rice and vegetables value chains, some common price drivers can be identified:**

- High production costs per ton at farmer level is a key constraint. For rice, production costs comprise 45 percent of the final consumer price. For vegetables, they represent 21–64 percent of the final consumer price.
- The relatively high margins and costs at the retail stage are cause for some concern because they also have a large impact on consumer prices. The sector is dominated by an inefficient small shop system, characterized by small quantities, and on the spot deals that drive costs up because of the associated transaction costs and fixed costs incurred by every stall.

**103 > The two value chains also share some challenges that affect all stages:**

- Lack of access to a system that provides affordable and timely resolution of commercial conflicts reduces the appetite of value chain actors to form longer-term contractual relationships and enter into deals with business partners outside of their trusted comfort zone; yet this could bring larger volumes, better quality, and better risk management.
- The regulatory environment includes challenges for nonfarm businesses to make investments and grow. Complying with regulation creates some unnecessary transaction costs in the transport sector. The system of mandated prices distorts the market and does not capture the realities on the ground as in rice production (accounting for quality differences), while initiatives of consumer protection such as price labelling regulations are not fully implemented (in the vegetable sector). Exporters of rice face burdensome bureaucratic processes in the form of non-tariff-barriers and domestic requirements. Access to finance for private investors in agricultural value chains is constrained by the current legislation.

**104 > Based on the summary of findings, three action areas for policy consideration are highlighted: (i) value chain linkages; (ii) regulatory environment; and (iii) investment.** The sections below elaborate upon each area and provide examples. Summarizing at the end, Table 20 links the action areas to the identified cost drivers.



## A. Value chain linkages

**Incentivizing closer contacts between value chain participants and facilitating stronger coordination**

**105** > **Government can play an important role as facilitator between producers, processors, service providers, and traders.** For example, in Champassak Province under an FAO-executed project, the Lao government and a Thai-based company successfully collaborated to establish and operate a small packing house in a vegetable production area.<sup>33</sup> The government made available a plot of land on which the project constructed a small packing house for the postharvest treatment and retail packaging of produce for export. Small-scale farmers in the area were trained to produce herbs and vegetables under contract for the Thai-based company. The company signed a six-year lease with the provincial administration of Champassak Province to use and operate the packing house. The crops produced (i.e., coriander, Thai basil, strawberries, and others) are delivered to the packing house where they are cleaned, sorted, graded, and retail-packaged, mainly for ethnic European and Japanese markets. Infrastructure of this type is required in most rural areas if farmers are to be linked to international markets, especially in the vegetable sector. The role of the government would be to ensure that basic infrastructure, such as electricity, potable water supply, and road access, is available, as well as a long-term lease for a site suitable for packaging or processing facilities. The location of packing house facilities in the production areas is often key to lowering the cost of logistics.

**106** > **Another example of closer contacts between value chain participants is the informal contracts between farmers and Khammouane rice miller groups, which benefit both stages of the value chain.** Public support of such kind of arrangements in the form of public-private partnerships could complement the provision of public extension services with the aim to increase the competitiveness of the rice chain and to support the establishment of farm groups and farm clusters around the stronger rice mills. Based on the nature of these informal contracts, an important recommendation is to increase investments in trust-building and collaborative activities. This would have the highest chance of success when supported by mechanisms for contract enforcement, as these can to some extent replace the need for constant interaction or supervision by the mills, which have scarce capacities (see below).

**107** > **A third example for public support to value chain development would be improving the environment in which the operation of machines is cost-effective.** Important aspects for the cost-effective operation of machines are the availability of spare parts, access to repair services, low energy costs, and reliable energy supply. All stages of the value chain would benefit but this area would be particularly relevant in view of the need for the milling sector to upgrade its equipment to access new markets and increase competitiveness. It would also help farmers who are currently incurring high hired labor costs to reduce their dependence on hired labor and move into mechanization. However, the 2017 Enabling the Business of Agriculture report stresses the poor performance of Lao PDR in the machinery indicator, affecting mechanization (World Bank 2017b). Reducing restrictions and regulatory requirements in this area would be important to support

<sup>33</sup> "Vegetable farmers in the Bolovens are reaching international markets." See <http://www.fao.org/laos/programmes-and-projects/success-stories/bolovens/en/>

mechanization. Also in this area, government could play a role as facilitator by actively supporting and building the skills of mechanics, importers of machines, and service providers and bringing them together with potential clients. Removal of the notoriously lengthy procedure to obtain import licenses for vehicle spare parts, which also applies to agricultural equipment, would contribute to increasing access to such parts as it would increase competition among importers for spare parts.<sup>34</sup>

**108 › A fourth example would be addressing constraints for agribusiness development.**

Underinvestment of the private sector in lowering milling costs and reducing losses leads to large losses for society, thereby justifying targeted public support in some areas. Such support could entail strengthening rice mills' capacity to prepare business and investment plans for upgrading their processing and postharvest handling facilities, and their management capacities to improve product quality, increase operational efficiency, reduce physical losses, and link them with farm groups to improve marketing of farm produce. These business plans can be used to borrow from commercial banks or receive support from donor projects.<sup>35</sup>

**Strengthening contract enforcement and alternative dispute resolution mechanisms to ensure timely resolution of commercial disputes**

**109 › Interviews conducted with foreign banks and private businesses during the field investigation revealed that lengthy judicial proceedings in resolving commercial disputes, even for small claims, increase the cost and risk of conducting business in the country.** While many have sought out-of-court proceedings such as arbitration and mediation to resolve

commercial disputes, undue delays by local courts in settling and reopening cases for additional review undermine the effectiveness of these mechanisms. Implementing reforms of existing regulation, for example, by setting time limits and imposing sanctions for delaying tactics, can significantly reduce the length of time in reaching a settlement or resolution to commercial disputes. Implementing these measures can play a significant role in increasing private sector participation and better linking value chain actors, as well as possibly increase private banks' readiness to finance activities in this sector.

**110 › Extension service authorities can be linked with producers and processors to offset high production and labor costs.**

Many farmers do not employ machinery for land preparation, necessitating the use of hired labor. This, coupled with incorrect fertilizer application, contributes to Lao PDR's low score of labor and land productivity. As evidenced in the analysis, the highest costs are created at the farm production stage. Therefore, setting this as an entry point for advisory and technical services would improve the overall competitiveness of the end-product. Improved access to knowledge and technical expertise can contribute to an overall increase in productivity, and can indirectly increase farmers' profit margins. This holds true for rice production as well as for vegetables, where the current state of processing is low due to a lack of knowledge on processing techniques, limited access to finance, and lack of necessary labor. Vegetable farming also faces losses due to detrimental packing technologies, and insufficient inspection, which can be reduced through appropriate support. This would require shifting public expenditure away from irrigation, where it is currently concentrated, to improving services such as extension.

34 <http://www.laotradeportal.gov.la/index.php?r=searchMeasures/view&id=326>

35 The World Bank-supported Lao Agriculture Competitiveness Project, which became effective in June 2018, seeks to establish an agricultural value chain facility to support interested rice mills in strengthening their operational and management capacity and entering into formal contract arrangements with farm clusters established with the support of the project. Another example is a similar project being prepared by the Asian Development Bank.

## B. Regulatory environment

**Streamlining and simplifying business compliance and transaction costs associated with dealing with government to create a more business-friendly environment**

**111** > While the previous section prescribes ways in which the government can become more involved in the value chains of rice and vegetables, there is a concurrent need for the government to step back from certain practices, and for heavy bureaucracy to be neutralized to create a more business-friendly environment.

For instance, speeding up processing times at licensing offices would enable transport companies to comply with the law and bring down transport prices. Dismantling tedious bureaucratic practices at export-related offices will also create an environment more conducive to profitable international sale.

**112** > Transparency in the provision of public sector services to business should be improved through measures such as publication of all fee schedules, permits, and licensing requirements.

This would also help to establish a more predictable playing field for the private sector, with consistent implementation of publicly available legislation, rules, and regulations and with reduced bureaucratic discretion. For instance, it would be beneficial to extend the validity period of transport licenses to five years, as in Thailand.

**Strengthening enforcement of price labelling and display regulations and phasing out price controls for paddy and rice**

**113** > In recent years, the government administered price controls as a means to improve the affordability of foodstuffs, and guaranteed a minimum price for producers; however, no evidence suggests that these measures have had success in achieving their intended objectives.

Variance in consumer prices across markets persists, forcing consumers to effectively function as price takers with limited information on the market. For example, the transparency in consumer prices varies from market to market. Consumer protection standards aimed at promoting price discovery and curbing unfair trading practice and monopolistic behavior among value chain actors can play a significant role in enabling consumers to control for this variance. While the government has taken some steps in increasing transparency in retail markets, namely via product labeling regulation (including price display), application and enforcement of these measures remain weak. For instance, for rice retail markets in Vientiane Capital, retailers consistently displayed prices for their product but a lack of compliance persists among retailers in vegetable markets. The intent to establish a Business Competition Control (BCC) Commission and Secretariat as outlined in the country's new Business Competition Law to address business competition violations and ensure compliance is an important step toward this goal; however, no promulgating decree has been issued for the new law. The government could take steps to establish these supervising entities and ensure the establishment of a dedicated inspection unit within the BCC Secretariat for addressing grievances and violations in agricultural markets. This would allow phasing out minimum prices set up for paddy and rice, removing unnecessary distortions and potential entry barriers for new investors.

## C. Investment

**Adopting a more balanced approach to ensure that existing budgetary allocations for agriculture are administered more efficiently in support of production-enhancing investments**

**114 › Significant scope remains for improving the quality and capacity of farming activities, but the share of existing public expenditure and the dedicated budget line for agriculture are heavily skewed toward irrigation investments.** Little has been spent on improving the quality of research and extension services, seeds, cooperatives, mechanization, business incubators, and other public goods needed to increase the productivity and competitiveness of agricultural production. This needs to be drastically changed, with funds shifted to the above-listed areas, which are critical to addressing market failures in support of commercialization of agricultural value chains.

**Reviewing indirect regulatory controls and policies that impede agribusinesses' ability to access affordable credit and benefit from state budget allocation for their investment capital needs**

**115 › Recent reforms enabling entry of private and foreign banks in the banking sector helped introduce some level of competition, but state-owned banks continue to dominate the sector.** This dominance is even more pronounced at the district and provincial level as most private banks do not have presence in those markets. Collateral requirements set by banks' lending activities are prohibitively high. Interest rate subsidies exist but the process is cumbersome. Existing regulations favor state-owned banks (for example, only borrowers of the state's leading agricultural banks are eligible for the interest rate subsidy), while frequent interventions via foreign currency controls and caps on lending rates increase the riskiness

and cost of banking operations. Reforms aimed at introducing branchless banking activities (such as e-money and agent-banking) and enabling asset financing (as opposed to asset-based financing) can create significant scope in extending private banks' outreach in rural markets and increasing access to investment capital for agribusinesses.

**Providing capacity building for mill owners and farmers to improve their business and communication skills**

**116 › Supportive capacity-building activities to improve the business and communication skills of mill owners and farmers would enable these actors to approach banks and avail themselves of financial services.** This form of support would contribute to the improvement of market infrastructure. It may also enable smaller, traditional mills to achieve mid-size status and modernize their equipment and processes, thereby increasing profitability.<sup>36</sup>

**Removing barriers to investment in modern retail and wholesale markets**

**117 › Traditional small-scale trading is a key source of employment in Lao PDR but clearly adds costs to food consumers.** The main factors driving costs per ton are the high transaction costs associated with each on the spot business deal and very small quantities. Consolidation is highly desirable to bring down costs and increase efficiency and profits. However, this is currently not happening as small traders are reluctant to enter into long-term contracts with business partners due to the risk of defaulting. Needed improvements in the area of contract enforcement and access to finance are highlighted above. Investments in modern retail and wholesale markets by outsiders could help too, but it is unclear whether they face informal barriers to enter the market. A more detailed investigation is required.

<sup>36</sup> Refer to paragraph 108 for specific activities that could be supported by the public sector.

**Table 20 > Cost drivers and key recommendation**

Cost driver	Action area for policy consideration	Specific recommendations
High cost of production at farm stage	Value chain linkages	<ul style="list-style-type: none"> <li>• Incentivize closer contacts between value chain participants and facilitate stronger coordination</li> <li>• Link extension service with producers and processors to offset high production and labor costs</li> </ul>
	Investment	<ul style="list-style-type: none"> <li>• Adopt a more balanced approach, shifting funds from infrastructure to research and extension services, seeds, and cooperatives/farm clusters, and promote mechanization</li> <li>• Improve quality of public programs</li> </ul>
Barriers to entry and private investment at milling stage	Value chain linkages	<ul style="list-style-type: none"> <li>• Strengthen contract enforcement and alternative dispute resolution mechanisms to ensure timely resolution of commercial disputes</li> </ul>
	Regulatory environment	<ul style="list-style-type: none"> <li>• Increase transparency and improve pricing rules</li> <li>• Phase out regulated prices for paddy and rice</li> </ul>
	Investment	<ul style="list-style-type: none"> <li>• Introduce greater competition in the banking sector, particularly in support of rural markets and agribusinesses</li> <li>• Build capacity in proper accounting and recordkeeping among mills to facilitate access to private finance</li> </ul>
High profits and high transaction costs associated with an inefficient trade and marketing system at the traditional wholesale and retail stage, as well as poor management of wet markets and lack of value chain organization	Value chain linkages	<ul style="list-style-type: none"> <li>• Incentivize closer contacts between value chain participants and facilitate stronger coordination or consolidation</li> <li>• Strengthen contract enforcement and alternative dispute resolution mechanisms to ensure timely resolution of commercial disputes</li> </ul>
	Regulatory environment	<ul style="list-style-type: none"> <li>• Streamline and simplify business compliance and transaction costs associated with dealing with government to create a more business-friendly environment</li> <li>• Strengthen enforcement of consumer protection standards</li> </ul>
	Investment	<ul style="list-style-type: none"> <li>• Introduce greater competition in the banking sector, particularly in support of rural markets and agribusinesses</li> <li>• Study informal barriers to investment in modern retailing to address them</li> </ul>
Costs associated with mechanization and maintenance of vehicles and machinery	Value chain linkages	<ul style="list-style-type: none"> <li>• Incentivize closer contacts between value chain participants and facilitate stronger coordination</li> </ul>
	Regulatory environment	<ul style="list-style-type: none"> <li>• Remove import licenses for vehicle spare parts</li> </ul>



## Detailed cost data for sticky rice value chain

Detailed cost per data for sticky rice value chain	LAK/ton at farm-gate	% of total
<b>Variable Costs</b>		
Seed	85,714	4.5%
Fertilizer	173,143	9.1%
Irrigation costs	-	0.0%
Machinery O&M	328,571	17.2%
Packing materials	32,857	1.7%
Hired labor	978,571	51.2%
Land rent/tax	255,714	13.4%
<b>Total Variable Costs</b>	<b>1,854,571</b>	<b>97.0%</b>
<b>Fixed Investments</b>	<b>57,143</b>	<b>3.0%</b>
<b>TOTAL</b>	<b>1,911,714</b>	<b>100.0%</b>
Total in US\$	232.65	100.0%

Detailed cost per ton of assembled paddy	LAK/ton SV assembled	% of total SV
<b>Variable Costs</b>		
Purchase from grower	2,167,000	96.9%
Packaging	20,000	0.9%
Storage and depot costs	-	0.0%
Vehicle O&M	30,000	1.3%
License and permits	-	0.0%
Crop levies	11,364	0.5%
Hired labor	-	0.0%
Overhead and management	-	0.0%
Interest	-	0.0%
<b>Total Variable Costs</b>	<b>2,228,364</b>	<b>99.3%</b>
<b>Fixed Investments</b>	<b>15,000</b>	<b>0.7%</b>
<b>TOTAL</b>	<b>2,243,364</b>	<b>100.0%</b>
Total in US\$	273.01	100.0%

Detailed cost per ton of processed paddy	LAK/ton SV processed	% of total SV
<b>Variable Costs</b>		
Purchase from assembler	2,334,000	94.2%
Energy and machine operation	10,286	0.4%
Packing and consumables	10,714	0.4%
Storage	-	0.0%
Repairs and maintenance	6,857	0.3%
Vehicle O&M	17,143	0.7%
Hired labor	37,714	1.5%
Tax and licenses	-	0.0%
Interest	20,571	0.8%
<b>Total Variable Costs</b>	<b>2,437,285</b>	<b>98.3%</b>
<b>Fixed Investments</b>	<b>41,667</b>	<b>2%</b>
<b>TOTAL</b>	<b>2,478,952</b>	<b>100.0%</b>
Total in US\$	301.69	100.0%

Detailed cost per ton traded sticky rice wholesale	LAK/ton	% of total
<b>Variable Costs</b>		
Purchase from processor	4,000,000	95.2%
Energy and machine operation	-	0.0%
Packing and consumables	-	0.0%
Storage	-	0.0%
Repairs and maintenance	-	0.0%
Vehicle O&M	142,480	3.4%
Hired labor	42,000	1.0%
Tax and licenses	-	0.0%
Interest	8,000	0.2%
<b>Total Variable Costs</b>	<b>4,192,480</b>	<b>99.8%</b>
<b>Fixed Investments</b>	<b>10,100</b>	<b>0.2%</b>
<b>TOTAL</b>	<b>4,202,580</b>	<b>100.0%</b>
Total in US\$	511.45	100.0%

Detailed cost per ton sticky rice retail stage	LAK/ton	% of total
<b>Variable Costs</b>		
Purchase from wholesaler	5,000,000	96.9%
Licenses, permits, taxes and duties	72,000	1.3%
Other overhead	321,030	5.8%
Storage	-	0.0%
Repairs and maintenance	-	0.0%
Vehicle O&M	-	0.0%
Hired labor	-	0.0%
Interest	-	0.0%
<b>Total Variable Costs</b>	<b>5,393,030</b>	<b>97.8%</b>
<b>Fixed Investments</b>	<b>121,545</b>	<b>2%</b>
<b>TOTAL</b>	<b>5,514,575</b>	<b>100.0%</b>
Total in US\$	671.12	100.0%

## Detailed cost data for vegetables value chain

Detailed production cost per ton of coriander	LAK/ton at farm-gate	% of total
<b>Variable Costs</b>		
Seed	160,000	3.8%
Fertilizer	381,143	9.0%
Chemicals	97,143	2.3%
Spraying costs	-	0.0%
Irrigating costs	2,857	0.1%
Machine O&M	214,286	5.1%
Packing materials	24,686	0.6%
Selling expenses	-	0.0%
Hired labor	3,192,857	75.6%
Family labor	-	0.0%
Overhead and management	-	0.0%
Seasonal credit	43,429	1.0%
Land rent/tax	41,429	1.0%
<b>Total Variable Costs</b>	<b>4,157,829</b>	<b>98.5%</b>
<b>Fixed Investments</b>	<b>65,257</b>	<b>1.5%</b>
<b>TOTAL</b>	<b>4,223,086</b>	<b>100.0%</b>
Total in US\$	513.94	100.0%

Detailed production per ton of lettuce	LAK/ton at farm-gate	% of total
<b>Variable Costs</b>		
Seed	120,968	2.3%
Fertilizer	537,903	10.0%
Chemicals	129,032	2.4%
Spraying costs	-	0.0%
Irrigating costs	16,129	0.3%
Machine O&M	302,419	5.6%
Packing materials	29,032	0.5%
Selling expenses	-	0.0%
Hired labor	3,930,242	73.1%
Family labor	-	0.0%
Overhead and management	-	0.0%
Seasonal credit	53,226	1.0%
Land rent/tax	70,565	1.3%
<b>Total Variable Costs</b>	<b>5,189,516</b>	<b>96.6%</b>
<b>Fixed Investments</b>	<b>184,194</b>	<b>3.4%</b>
<b>TOTAL</b>	<b>5,373,710</b>	<b>100.0%</b>
Total in US\$	653.97	100.0%



Detailed production per ton of coriander wholesale	LAK/ton	% of total
<b>Variable Costs</b>		
Purchase from processor	16,666,667	97%
Loading and reloading	100,000	1%
Storage	100,000	1%
Transport to delivery point	-	0.0%
Duties and tax	-	0.0%
Cleaning fees	-	0.0%
Licenses and permits	150,000	1%
Other overhead	-	0.0%
Interest	-	0.0%
<b>Total Variable Costs</b>	<b>17,016,667</b>	<b>99%</b>
<b>Fixed Investments</b>	<b>128,750</b>	<b>1%</b>
<b>TOTAL</b>	<b>17,145,417</b>	<b>100%</b>
Total in US\$	2,086.58	1.0%

Detailed production per ton of lettuce at wholesale	LAK/ton	% of total
<b>Variable Costs</b>		
Purchase from processor	7,777,778	94%
Loading and reloading	100,000	1%
Storage	100,000	1%
Transport to delivery point	-	0.0%
Duties and tax	-	0.0%
Cleaning fees	-	0.0%
Licenses and permits	150,000	2%
Other overhead	-	0.0%
Interest	-	0.0%
<b>Total Variable Costs</b>	<b>8,127,778</b>	<b>98%</b>
<b>Fixed Investments</b>	<b>128,750</b>	<b>2%</b>
<b>TOTAL</b>	<b>8,256,528</b>	<b>100%</b>
Total in US\$	1,004.81	100%

Detailed production per ton of coriander retail	LAK/ton	% of total
<b>Variable Costs</b>		
Purchase from wholesaler	24,444,444	90%
Loading and reloading	600,000	2%
Storage	69,000	3%
Transport to delivery point	300,000	1%
Duties and tax	150,000	1%
Cleaning fees	-	0.0%
Licenses and permits	-	0.0%
Other overhead	839,550	3%
Interest	-	0.0%
<b>Total Variable Costs</b>	<b>27,023,994</b>	<b>99%</b>
<b>Fixed Investments</b>	<b>224,250</b>	<b>1%</b>
<b>TOTAL</b>	<b>27,248,244</b>	<b>100%</b>
Total in US\$	3,316.08	100%

Detailed cost per ton of lettuce retail	LAK/ton	% of total
<b>Variable Costs</b>		
Purchase from processor	9,222,222	83%
Loading and reloading	375,000	3%
Storage	150,000	1%
Transport to delivery point	187,000	2%
Duties and tax	600,000	5%
Cleaning fees	-	0.0%
Licenses and permits	-	2%
Other overhead	322,388	3%
Interest	-	0.0%
<b>Total Variable Costs</b>	<b>10,857,110</b>	<b>98%</b>
<b>Fixed Investments</b>	<b>224,250</b>	<b>2%</b>
<b>TOTAL</b>	<b>11,081,360</b>	<b>100%</b>
Total in US\$	1,348.59	100%

## References

- Bank of Lao PDR. 2016. "Monetary Statistics Report for Quarter 4." Vientiane, Lao PDR.
- Bordey, F., P. Moya, J. Beltran, and D. Dawe. 2016. "Competitiveness of Philippine Rice in Asia." PhilRice and IRRI, Manila, Philippines.
- CASRAD. 2015. "Cross-Border Trade of Glutinous Rice Between Lao PDR and Vietnam." Background paper prepared for the World Bank for rice policy discussions in the Greater Mekong Region. Center for Agrarian Systems Research and Development, Vietnam's Academy of Agricultural Sciences, Hanoi, Vietnam.
- Food and Agriculture Organization, International Rice Research Institute, and World Bank. 2012. "Lao PDR Rice Policy Study." Rome, Manila, and Washington, DC.
- IDE-JETRO. 2015. "Logistics Costs in Lao PDR." Institute of Developing Economics – Japan External Trade Organization, Chiba, Japan.
- Imboden, A., and M. Hoppe. 2017. "Formal Informality: Informal Practices of Formal Firms as a Key Business Constraint." Available at: <https://hubs.worldbank.org/docs/imagebank/pages/docprofile.aspx?nodeid=28129110>
- Mekong Institute. 2016. "Mekong Development Report." Vientiane, Lao PDR.
- Ministry of Industry and Commerce (2018). "Review of Policy Measures for Maintaining Price Stability of Key Sensitive Products in Lao PDR." Vientiane, Lao PDR. <http://t4dlaos.org/index.php/en/resources/category/113-department-of-domestic-trade-ddt>
- Reardon, T., K. Chen, B. Minten, and L. Adriano. 2012. "The Quiet Revolution in Staple Food Value Chains: Enter the Dragon, the Elephant and the Tiger." Asian Development Bank, Manila, Philippines.
- Weinberger, X., C. Genova, T. Chanthasombath, B. Inthalungsee, K. Sanatem, and K. Somsak. 2008. "Postharvest Loss in the Supply Chain for Vegetables: The Case of Tomato, Yard long Bean, Cucumber, and Chili in Lao PDR." The World Vegetable Center (AVRDC) Working Paper 17, Tainan, Taiwan.
- World Bank. 2014. "Lao Development Report: Expanding Productive Employment for Broad-Based Growth." World Bank, Washington, DC.
- World Bank. 2016. "Leveraging the Rice Value Chain for Poverty Reduction in Cambodia, Lao PDR, and Myanmar." World Bank, Washington, DC.
- World Bank. 2017a. "Doing Business 2018: Reforming to Create Jobs." Washington, DC: World Bank.
- World Bank. 2017b. "Enabling the Business of Agriculture 2017." Washington, DC: World Bank.
- World Bank. 2018. "Doing Business in Lao PDR: Constraints to Productivity." Available at: <https://hubs.worldbank.org/docs/imagebank/pages/docprofile.aspx?nodeid=29579731>
- World Bank. Forthcoming. "Transport Costs and Prices in Lao PDR, Vientiane." World Bank, Washington, DC



**WORLD BANK GROUP**

**The World Bank Group Lao PDR Country Office,  
East Asia and Pacific Region**

Xieng Ngeun Village, Chao Fa Ngum Road,  
Chantabouly District, Vientiane, Lao PDR

[worldbank.org/lao](http://worldbank.org/lao)