



LORIKO

Aggregator Study: Viqueque, Baucau & Bobonaro

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Abbreviations & acronyms

IDR	Indonesian rupiah
MCIE	Timor-Leste Ministry of Commerce, Industry, and the Environment
TOMAK	To'os ba Moris Di'ak (Farming for Prosperity) Program
USD	United States dollar

Main Report

1. Introduction

The purpose of this study¹ was to gather information on aggregators – traders who buy and consolidate goods for onward sale, facilitating the movement of agricultural commodities from producers to consumers at various levels of the domestic market. The study focused primarily on mung beans, red rice, red beans, peanuts, and red onions, but also includes details of some other crops where there is useful information on how the market system in Timor-Leste operates.

Field work was undertaken in May 2017 in the municipalities of Viqueque, Baucau, and Bobonaro, though some interviews with traders from these areas were conducted at Taibessi market in Dili. Fifteen traders identified by the TOMAK regional offices contributed information for the study, and one additional informal interview was conducted with a market agent in Baucau. None of the contacted traders kept written records of their business activities, but information was cross-checked whenever possible (i.e. reported purchase quantities per week compared to quantities transported per week) to validate the accuracy of their estimates. Most commodities are sold by volume, so aggregators were asked to estimate the conversion rates for the units that they used (i.e. how many *enaak* (Indonesian sweetened condensed milk) tins of mung beans per sack) and these were then compared to known volume-to-weight ratios where available to standardise costs and prices from the different respondents.

2. Overview of aggregator activity

The aggregators interviewed varied greatly in scale, reporting total annual commodity purchases from \$3,120 to \$83,000. Excluding the largest traders, most aggregators buy directly from farmers who bring their products to local or municipal-level markets. Small-scale aggregators then sell these products retail in the same or nearby market places. Medium-scale aggregators transport goods (often 20-30 sacks per week) to sell both wholesale (“*offer*” in Tetum) and retail in markets further afield. This usually means operating on a circuit where produce is bought at a weekly market in a municipal capital, and then sold through a series of larger and smaller markets over the next several days. Medium-scale aggregators use public transport to move their produce, with bus or *angguna* (tray truck) operators providing labour for loading/unloading and pick up/delivery directly from the point of purchase or sale. These aggregators all traded fresh produce, as well as one or several of the five target crops. There was little specialisation at this level, with most aggregators trading in a wide variety of different products. Aggregators reported shipping approximately standard amounts of produce throughout the year, with the contents varying according to what they thought they could sell. There is seasonal variation in availability of all crops, but many aggregators reported trading in off-season crops at higher prices.

Large-scale aggregators either had their own transport or regularly rented trucks, and primarily focused on rice but with some also trading in mung beans, peanuts, or red onions. These traders sometimes make purchases at farmgate, but preferred to buy from farmers bringing produce to their storage facility. One aggregator was selling white paddy rice to the Ministry of Commerce, Industry, and the Environment (MCIE), but all of the large-scale aggregators sold red rice to supermarkets, Dili traders, or directly to consumers. This was the only level that reported paying any labour costs.

There was very little processing or value-adding done by any level of aggregator except for the milling of rice. This results in a business model where material costs make up 94% of total costs for mung beans, 91% for peanuts, 93% for red onions, and 95% for red beans. Nearly all produce was shipped in reclaimed rice or sugar sacks and bought/sold by volume with only plastic bags provided for packaging at retail level. Transport was the highest cost, though at an average rate of \$1 per 25 kg sack it amounted to only a small percentage of the final sales price. In the Baucau market, tomatoes and some fresh produce are now being shipped in plastic

¹ This study was conducted by consultant Joseph Freach with the initial report prepared in June 2017.

crates owned by market agents (“*ajente*” in Tetum), who are the first level of consolidation of produce in the value chain.

Many of the aggregators expressed their belief that the government somehow influences the prices that must be paid to farmers for their produce². This was mainly true in relation to rice and mung beans, but was also vaguely referred to for other crops. All but one aggregator interviewed bought and sold only through the private sector. One notable finding which could be a result of aggregator’s misunderstanding of market prices is that while 86% of respondents reported that there is competition among traders for farmer’s produce, only 8% felt that this affected the price that they paid. When questioned further, respondents said that when a farmer brings produce to sell in the market, aggregators ‘shout’, ‘push’, and ‘grab’ to get the produce but that neither the sellers nor the buyers expect this competition to change the price. Scarcity reportedly had some effect on the price of goods such as mung beans, though in a standardised way with set higher prices paid in off-season months.

For fresh vegetables, the effect was more pronounced. Table 1 shows the average prices paid to farmers for each commodity, and the standard deviation across all aggregators trading in each crop. The standard deviation shows how consistent the price of each commodity is, with a lower amount indicating a more consistent price. All prices were converted to a price per kilogram, and it should be noted that the wide variety of volume measurements used by different aggregators has likely contributed to some of the variation. Some aggregators were able to take advantage of buying in kilograms and selling by volume to make high margins. For example, two traders paid \$0.80-\$1/kg for mung beans in 50kg sacks in the West, and then sold them in Taibessi market for \$1.25-\$2.00/SKM tin (approximately 500g). These traders sold at approximately double the margin compared to mung bean traders who both bought and sold by volume.

Table 1: Average prices and standard deviation for all crops

Crop	Average paid to farmer (kg)	Standard deviation* (% price paid to farmer)	Average sale price (kg)
Mung beans	\$1.31	\$0.46 (35%)	\$2.19
Red rice*	\$0.73	\$0.17 (23%)	\$0.95
Peanuts ⁺	\$1.80	\$0.54 (30%)	\$2.95
Red onion [□]	\$1.54	\$0.77 (50%)	\$2.66
Red beans	\$3.38	\$1.70 (50%)	\$4.56

* Equity price for milled rice, converted from the paddy price paid to the farmer at a 65% milling rate. This rate is based on local standards for white rice plus 10% to account for the bran layer not being removed.

⁺ Shelled

[□] This figure includes purchases of imported red onions by some aggregators

* Standard deviation was calculated in Excel using the n-1 method: $\sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}}$

3. Gross margins for the five target crops

Because the volumes of trade varied greatly among the aggregators, gross margins have been calculated on a per kilogram basis. The majority of aggregators used public transport on a price per sack basis to move their goods, so transport costs remained nearly standard regardless of the quantity of goods shipped. Distance travelled did affect this cost, but only minimally as a percentage of the sale price. There was some economy of scale in packaging, but this too had minimal effect on the

² Possibly due to Indonesian traders operating a relatively rigid pricing system with farmers pre-Independence, compounded by the effect of subsequent government grain purchase programs (which operate at fixed prices). The combined result is that farmers have a relatively limited understanding of how markets operate.

sale price. The gross margins for the following crops are the averages of purchase price, transaction costs, and sale price of all aggregators trading in the relevant crop.

Aggregators reported very few costs between buying and selling their products. Retail sellers in local markets must be registered but do not pay a fee for their stalls. Goods were stored either in the market stalls, or in the aggregator's homes (excluding two large rice traders who had dedicated storage facilities). One aggregator shelled and boiled peanuts, but otherwise no processing costs were reported for non-rice commodities.

Gross margins for the four non-rice crops averaged 32% while the margin for red rice was only 7%. This was due to the high material cost of buying paddy which made up 77% of the final sale price, and increased costs of processing (milling) and labour. For non-rice crops, the average material cost was 63%.

3.1. Mung beans

Eight aggregators reported that they traded in mung beans. Most bought and sold by volume in either *enaak* or SKM tins.



Mung beans for sale by tin in a local market

Exceptions to this were one larger aggregator who bought and sold in kg (buy \$1.00/kg, sell \$1.50/kg standard throughout the year), and two traders who bought in 50kg sacks and sold by the tin. Aggregators reported average purchase quantities ranging from 50kg to 250kg when they buy from farmers with a median of 75kg per transaction. All traders reported buying *ad hoc* instead of working consistently with certain growers. Most of the mung beans traded came from western areas (Balibo, Maliana, and Loes) with the majority being sold either in the municipality where they were bought, or in Dili. The peak season for trade in mung beans is May-July for North coast municipalities, and three months later for South coast areas. Traders reported buying from an average of 50 farmers per year. Table 2 outlines the average gross margin for mung beans across all respondents.

Table 2: Gross margin for mung beans by kg

Price paid to farmer		\$1.31
Costs	Transport	\$0.04
	Packaging	\$0.03
	Labour	\$0.02
Sale price		\$2.19
Profit		\$0.79
Gross margin		35%

3.2. Red rice

Red rice was traded by three aggregators in Baucau and Viqueque and either sold locally or shipped to Dili. All traders handling red rice bought paddy from farmers and milled it before selling it to consumers, with the exception of one medium-scale trader who bought and sold milled rice. Milled rice prices have been used to calculate the gross margin, but this represents an average price of \$0.47/kg paid for paddy to the farmer. All red rice traders bought and sold by weight, except one small market trader who purchased red rice paddy by volume (in 10 litre cooking oil tins). The average purchase per transaction with farmers was 1.1 tons, but there was great variation between two large volume traders and a small market trader. The large traders reported an average purchase of 1.6 tons from each farmer, while the market trader bought 75kg per transaction.

Processing costs were significantly higher for traders who did not mill their own rice. One large trader from Viqueque reported processing costs of \$25/ton using his own mill, while a similarly sized trader in Baucau reported \$100/ton in processing costs to have his red rice milled by another business. A market trader in Viqueque town who moves only small quantities of red rice reported \$40/ton milling costs (\$1/25 kg sack), but with transport to the mill included this cost rose to \$120/ton.

One large red rice trader does not appear to be making a profit on his sales. No trader kept written records of their business data, but subtracting this trader's reported costs from his reported sales price results in exactly a 0% gross margin. This trader also conducted other business and had his own transport, so may have viewed rice trading as a side line. His perception though, was that he was making a profit even though the numbers do not bear this out. If this trader were to be excluded from the dataset, the average gross margin for profitable businesses would be 11%.

Table 3: Gross margin for red rice by kg

Price paid to farmer (converted to milled)		\$0.73
Costs	Transport	\$0.05
	Processing	\$0.06
	Packaging	\$0.01
	Labour	\$0.04
Sale price		\$0.95
Profit		\$0.06
Gross margin		7%

3.3. Peanuts

Peanuts were normally traded in far smaller quantities, with an average purchase of 27.5kg from each farmer excluding one large-scale buyer in Marobo who reported buying up to 220kg per transaction. Traders reported buying from an average of 52 farmers per year. All but the large-scale trader only sold peanuts retail in SKM tins or small plastic bags, one of whom processed (shelled and boiled) peanuts for sale. The large trader was selling wholesale in Dili marketplaces, and to supermarkets. Peak season for peanuts was reported to be May-July, except for one trader from Bobonaro who reported buying in January-February (peanuts are usually grown in the rainy season and harvested in March-June). Four of the five aggregators dealing in peanuts were from Western municipalities, though Baucau is commonly perceived to be a peanut producing area. Table 4 shows the gross margin for peanuts based on the average of all responses.

Table 4: Gross margin for peanut by kg

Price paid to farmer		\$1.80
Costs	Transport	\$0.06
	Processing	\$0.01
	Packaging	\$0.04
Sale price		\$2.95
Profit		\$1.04
Gross margin		33%

3.4. Red onion

Half of the aggregators who traded in red onions were dealing only in imported onions sourced from supermarkets (W4 and Lita) in Dili. Traders buying imported onions were all based in the Eastern municipalities, while all traders in the West were dealing only in local onions. The only trader in the East who reported trading in local onions was moving very small quantities of 10 bundles (app. 1kg) per month at very high prices (buy \$3.33/kg, sell \$5.00/kg). The average price paid to farmers for local onions was \$1.94/kg, while traders buying imported onions paid an average of \$1.15/kg. All traders who bought imported red onions reported buying and selling throughout the year, while those buying local onions reported availability only around the end of the dry season. Red onions are normally grown as irrigated crops in the dry months, and harvested around September-October. Among the traders buying local onions, the average transaction was for 127kg of onions from each farmer. Among traders in the East buying imported onions, transactions varied from a single 10 kilogram sack per week to 150 kilograms per week. The gross margin in Table 5 is based on the average prices and costs for all onions across all respondents.

Table 5: Gross margin for red onion by kg

		All red onions	Imported only	Local only
Price paid to farmer (retail for imported)		\$1.54	\$1.15	\$1.94
Costs	Transport	\$0.07	\$0.09	\$0.04
	Packaging	\$0.03	\$0.03	\$0.03
Sale price		\$2.66	\$2.25	\$3.06
Profit		\$1.02	\$0.98	\$1.06
Gross margin		37%	42%	32%

3.5. Red beans

Red beans were mostly traded in small quantities with an average purchase transaction of 23kg excluding one larger trader who reported buying up to 275 kg at once. All aggregators trading in red beans came from Western municipalities. It is interesting to note that aggregators in Eastern municipalities reported instances of red beans being taboo (*Lulik* in Tetum) for cultural groups in the Baucau-Viqueque corridor. Conversations with TOMAK staff in Baucau revealed that many different types of beans (i.e. black gram, rice bean, red kidney bean, etc.) are taboo in specific areas, and that the taboo prevents both the consumption and cultivation of whichever type of bean is banned in these areas. Peak season for buying beans was reported to be May-July when both fresh and dried beans could be purchased, but dried beans were available throughout the year. As with other crops, all aggregators reported that they did not buy consistently from the same producers.

Table 6: Gross margin for red beans by kg

Price paid to farmer		\$3.38
Costs	Transport	\$0.05
	Packaging	\$0.04
Sale price		\$4.56
Profit		\$1.10
Gross margin		22%

4. Value chains

Three types of value chains have been devised based on the transport distance and complexity of the system. The amount of turnover tends to increase as the complexity increases, though the most profitable medium-scale aggregators had higher turnover than the least profitable large-scale aggregators. All of the five target crops were found to be moving through each of the value chain types.

4.1. The small-scale value chain

The small-scale value chain was used by market sellers who purchased directly from producers who brought their produce to market places for sale. Six respondents fit into this category. Some

aggregators at this level travelled short distances to buy in municipal level markets and then sold at smaller local markets, and some bought and sold from a single location. These traders bought produce from an average of 8 farmers per week, and moved an average of 19.25³ sacks of produce per month. These aggregators traded mainly in fresh vegetables, but all of the 5 target commodities were also found to be traded at this level. Most of the purchases from farmers were for small quantities of a few kilograms per transaction, but some small-scale aggregators reported buying up to 5 sacks (app 125kg) of mung beans in a single purchase. Market sellers reported high rates of spoilage of fresh produce. Traders at this level were divided on whether they felt there was competition among buyers with half responding that there was, and half that there wasn't. The value chain at this level is short and simple, with producers selling to aggregators who then sell directly to consumers. Figure 1 below shows the small-scale value chain.



Figure 1: Small scale value chain

4.2. The medium-scale value chain

The medium-scale value chain is made up of aggregators who purchased goods in a large municipal market and then sell them both wholesale and retail through one or more larger or smaller markets. Four respondents operated in the medium-scale value chain. Some of these traders moved produce between two locations on a weekly basis, while others travelled a weekly circuit where they purchased large quantities once per week and then travelled to a series of other markets over the subsequent 4-6 days. Respondents at this level found it difficult to quantify the number of farmers they purchased from per month, with several responding “many”. This is most likely due to an additional level of trader, referred to as an agent, who is the first level of consolidation in the value chain. These agents buy from farmers at a local marketplace on the day/evening before the official market day. The agents repack produce and then sell to medium-scale aggregators at the market on the following day. One aggregator at the Baucau market was willing to participate in an informal interview on how they operate, and several aggregators provided information on buying from agents. The average amount of produce moved by a medium level aggregator was 65 sacks/crates of produce per month.



Aggregators buying from an agent in Baucau market

³ Aggregators found it difficult to quantify the amount of produce they moved, but could readily estimate the amount they transported if they purchased in one market and sold in another.

While the five target commodities were traded through the medium-scale value chain, some interesting lessons can be learned from fresh vegetables moving through this system. Unlike the target commodities, traders reported that competition has a significant impact on the prices paid for fresh vegetables⁴. A 20 litre bucket of tomatoes, for example, varies in price from \$8-\$10 in season (paid to the producer) to \$17-\$22 out of season. Supply and demand reportedly affects the price paid to both the farmer and the agent on a given day. Some respondents correlated price increases in Dili with price increases in Baucau. Agents provide not only consolidation, but also packaging services for the aggregators who buy from them. Plastic crates are now used to ship tomatoes and other fresh produce from Baucau to Taibessi market in Dili. These crates are owned by the agents and returned to them empty by bus drivers.



Bus loaded with produce

Bus drivers play an important service provider role in the medium-scale value chain. Bus drivers travel with 4-5 workers who both manage the passenger fares and provide loading/unloading labour for aggregators who ship produce. For a price of \$1/sack or crate in addition to the trader's bus fare, bus drivers will pick up produce at point of purchase, transport it between municipalities, and deliver it to point of sale. For aggregators working a circuit of markets, *anggunas* provide a similar service for shorter or more remote trips. Bus drivers provide cost-, reliable transport which is critical to the medium-scale aggregator's business model.

The medium-scale value chain was typically based on the farmer bringing produce to sell in a large marketplace, an agent buying and repacking the produce, an aggregator buying from multiple agents and transporting the goods elsewhere where they are sold either wholesale to a market trader or retail to the consumer. Nearly all aggregators at this level sold both wholesale and retail. Eastern municipality aggregators sometimes purchased red onions from supermarkets, but all sold their goods only through local market places. Figure 2 shows the medium-scale value chain.

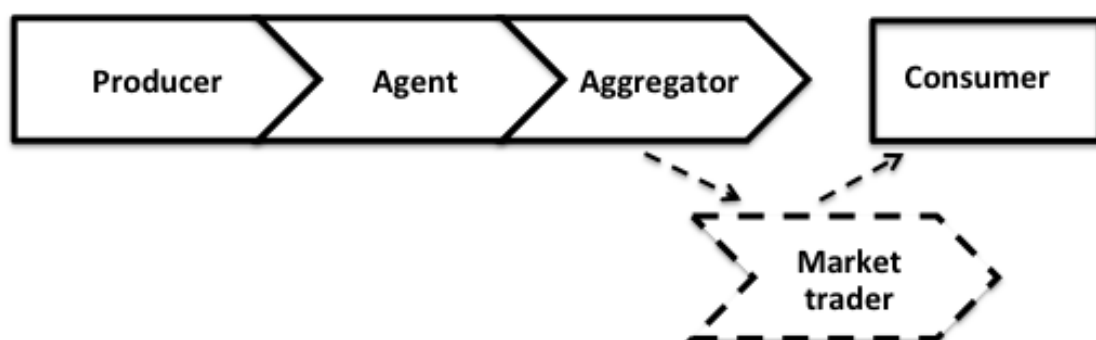


Figure 2: Medium-scale value chain

⁴ It is possible that price competition has more of an effect on fresh vegetables than on other crops due to perceptions of government price setting carried over from the BULOG (Indonesian government logistics board) system which operated in Timor-Leste during the Indonesian occupation. BULOG price standardisation focussed mainly on rice and staple crops.

Case study: A medium-scale aggregator from Baucau

One interviewed aggregator from Baucau operates a business through the medium-scale value chain on a weekly circuit from Baucau to Meger (near Atabae). Each Thursday, she buys up to 20 sacks and crates of fresh vegetables, fruit, mung beans, and red rice and transports them immediately to Taibessi market in Dili. She sells there for two days, both wholesale and retail, and then moves her remaining produce to the terminal at Tasi Tolu where she sells it wholesale to people boarding buses and *anggunas*. On Saturday night she rides the bus to Loes where she sells at a local market. Here she sometimes buys mung beans to ship back to Dili and Baucau, or sometimes continues on to Meger if she has additional produce to sell. When all of her produce is sold, she returns to Taibessi, and then to Baucau to begin the circuit again. Based on her quantity and price data, she has an estimated monthly turnover of \$2,500.

This scenario was typical of several medium-scale traders based in Baucau and Maliana.

4.3. The large scale value chain

The large-scale value chain is characterized by traders who either own or rent dump trucks and purchase commodities, usually rice and mung beans, for transport from rural areas into Dili. Five large-scale traders provided information for the study. The size of these aggregators ranged from a trader moving \$4,000 worth of red and white rice per year, to one claiming to move \$83,000 worth of white rice, maize, and mung bean for sale to MCIE each year⁵. They made purchases from an average of 38 farmers per month around harvest time. These were the only aggregators who made farmgate purchases, though all reported that they often required farmers to transport their crops to the aggregator's place of business. Half of the large-scale aggregators had dedicated storage sheds on their property, while the other half used their homes to store up to 5 tons of crops at a time. One owned a rice milling machine, and one owned a dump truck. Among those hiring trucks for transport, it cost an average of \$283 to ship 5 tons of product to Dili. One aggregator said that he sometimes hired an *angguna* for \$150-\$200 to ship quantities around 1 ton if he did not have enough product to justify the hire of a dump truck. All but one aggregator had other sources of income, two of which were private businesses which in part subsidised the transport of goods to Dili. Among all of the respondents, only large-scale aggregators reported regularly buying by weight, and often quoted quantities in kilograms or tons.

Large-scale aggregators were the only level reporting that they sold to supermarkets in Dili. Leader, Lita, and Jacinto were mentioned as buyers of peanuts, red onions, and red rice. Some large-scale aggregators shipped large quantities to sell wholesale to market traders in Dili, and some had word-of-mouth reputations and sold red rice directly to consumers from their trucks in Dili. In Viqueque, two large-scale aggregators bought red rice from farmers' groups or cooperatives, and were willing to provide transport for these goods from the farmgate. Traders at this level tended to be more

⁵ To the consultant's knowledge, MCIE has not purchased maize or mung bean for the last several years so the respondent may have been referring to a remarkable past year rather than an annual trend. The prices for sales to MCIE have not been included in the data tables in this report as they do not reflect the private sector market.

specialised with none trading in fresh vegetables, though all of the five target crops were traded by at least one large-scale aggregator. Figure 3 shows the large-scale value chain.

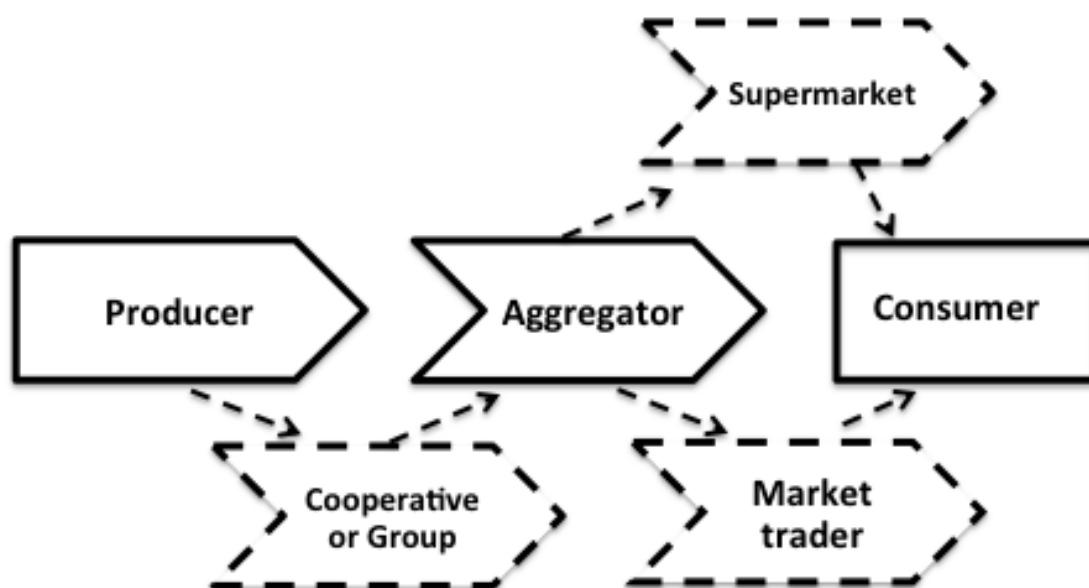


Figure 3: Large scale value chain

It is worth noting that a trader in Balibo reported that he is no longer dealing in agricultural commodities. Previously acting as a large-scale aggregator including exporting to Indonesia, he has ceased trading since 2009 citing the falling USD-IDR exchange rate (he quoted the exchange rate on the day which proved to be within 1% of the rate published on Oanda.com) and the lack of a 'place for a trader' in the market. When asked about this latter point, he explained that farmers will not sell mung beans at a price that leaves a margin for the trader. The quantities that are produced by each farmer are so small that they use public transport to move them to Dili where they receive a higher price. They will not lower their price, so it is not worth it for him to trade any more. He speculated that if production levels increased and farmers had to arrange larger scale transport, that they might be willing to deal with a trader.

5. Recommendations

1. **Train aggregators on numeracy and units of measure** – Aggregators who traded by both weight and volume were able to capitalise on the conversion and sell at a higher margin. Those who traded only by volume were disadvantaged (as are consumers) by standard volume measures being sold for standard prices regardless of the crop (i.e. some traders sold an *enaak* tin of any product for the same price).
2. **Promote record keeping among aggregators** – No respondent kept written records of their transactions. In at least one case, analysis of revenue and expenses based on the survey responses indicated that the business was not profitable. Record keeping would improve aggregator's business practices and understanding of their profit margin.
3. **Investigate transport for collective selling** – Most aggregators bought in local market places from farmers who brought their own produce to sell, and few aggregators had their own transportation. While working with farmers to consolidate their produce for collective sale would likely be worthwhile, it may be necessary that the farmer organises transportation of the collective goods to a marketplace, rather than trying to attract an aggregator to buy in bulk at another location. Organising sales in advance would be critical to ensure that a buyer is found.
4. **Work to improve long-term relationships between growers and aggregators** – Nearly all traders reported buying *ad hoc* from farmers, and very few bought consistently from the same people. Farmers or farmer's groups who could consistently supply products to aggregators would be innovative in the Timor-Leste market and would likely both provide and receive benefits from this more efficient system. Aggregators tended to buy at consistent intervals, and farmers could capitalise on this by providing them with a consistent supply of products.
5. **Don't subsidise transport costs** – Transportation was not found to be a major constraint for any level of aggregator, and was largely standard across all levels. A medium-scale aggregator shipping goods at \$1/25kg sack pays \$0.04/kg while a large-scale aggregator renting a 5-tonne dump truck for \$250 pays \$0.05/kg. The latter assumes the dump truck is shipped full, and mentoring on the economy of scale necessary to minimise transport costs might be necessary for some aggregators. Most aggregators interviewed were based in larger municipal centres, so this could be more of a constraint for aggregators operating in remote areas.
6. **Provide training on basic economics, specifically on market prices** – The misunderstanding of market prices creates disadvantages for both buyers and sellers along the value chain. It stifles competition, and therefore innovation among both growers and traders. All stakeholders would benefit from training, using locally appropriate methods, on how the market economy operates.
7. **Encourage the development of collective marketing among farmers** – Farmers currently transport small quantities of goods that are bought by aggregators or agents at municipal marketplaces. Supporting the development of collective marketing groups (or the addition of this capability to existing producer's groups) would empower farmers, add efficiencies of scale, and streamline the market system for local products.



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