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THE FRESH VEGETABLE VALUE CHAIN IN TIMOR-LESTE

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INTRODUCTION

This value chain analysis of the fresh vegetable value chain in Timor-Leste describes how the value chain is currently working, and identifies business opportunities, problems, and constraints at each level.[1] It also suggests solutions that the private sector, Government, and donors can use to strengthen the performance of the sector. Developing the horticulture sector[2] is important for increasing incomes, providing employment, improving food security, and building the non-oil economy.

[1] See Annex 1 for a basic overview of value chains and why understanding them is important.

[2] Horticulture sector includes vegetables, fruits and flowers. This report focuses on fresh vegetables.

TIMOR-LESTE OVERVIEW

GEOGRAPHY, GEOLOGY AND SOILS

The mountainous island of Timor, which is divided between Indonesia and the independent nation of Timor-Leste, is the furthest island in the Lesser Sunda chain. Unlike many of the other islands in the Sunda chain, Timor is not volcanic. It was formed through uplift resulting from the collision of the Australian and Eurasian tectonic plates. The island is rising at a rate of 5 to 10 mm per year. This has resulted in steep slopes, many at 40 degrees or more, which are subject to erosion. The soil on much of the island is thin, gravely, acidic, low in nutrients and organic material and difficult to cultivate.[3] Of the nation's 14,874 square km of land, 4% is planted in permanent crops such as coffee and only 10% is arable with irrigation available on only 346.5 square km; 86% of the land is too steep to use.[4] Many production areas are suffering overuse and topsoil erosion which further reduces fertility. Using compost regularly will greatly improve soil quality and yields, and along with increasing irrigation can increase the amount of potentially arable land.

Timor-Leste's mountainous terrain has diverse pockets of micro-climates that could enable production of a wide variety of vegetables throughout the year. Areas of high-land (above 1,000 meters, 35% of total land area), mid-land (500-1000 meters, 44% of total land area) and low-land (below 600 meters, 21% of total land area), have varying temperature ranges including some areas of occasional frost. Rainfall increases with increasing altitude. The island has wet seasons and dry seasons of different lengths on the south side and the north side.

POPULATION

The population of Timor-Leste is 1,172,390 people and rising with an annual growth rate of 2.47%. Total fertility rate is 5.22 children born /woman, well above the global replacement rate of 2.33 births/woman. The population is very young with 62% of the population aged 0 to 24 years of age. The population pyramid below provides a snapshot of the population's age and gender distribution.

Life expectancy at birth in Timor is 67.06 years. Food and waterborne diseases are a major threat to Timor-Leste's population since only 69% of the population has access to improved water and 47% have access to sanitation facilities. Vector borne diseases such as malaria and dengue fever also threaten the population.[5] Healthcare is scarce, with only 1 physician per 10,000 people.

Achievements in gender equality in Timor-Leste are mixed. Major gender gaps exist in education, health, and income, and there is a high level of domestic violence against women. In agriculture, however, division of work and control of income is more equal. While they have different roles, both men and

[3] S. J. Thompson, "Geology and Soils in Timor-Leste," Seeds of Life, 16 December 2011, http://seedsoflifetimor.org/wp-content/uploads/2013/01/Geology-and-Soils-in-Timor-LesteA4.pdf.

[4] Ibid

[5] Ibid.

women work in the fields. Research on commercial vegetable farmers shows that the resulting income is seen as income for the entire family, and that women have more control in decision making over its use.

ECONOMY

Timor-Leste's economy is one of the fastest growing in the world, and also the most dependent on oil revenues. Total GDP in 2012 was $10.63 billion, but non-oil GDP was $4.214 billion.[6] Driven primarily by government spending, non-oil GDP is growing rapidly, at 10.6% in 2012 and 2011, and 9.5% in 2010. It is projected to continue growing at 10% for 2013-2014.[7]

According to the Timor-Leste Household Income and Expenditure Survey 2011, the average per capita income is $62/month.[8] The urban population's average income is $93/month while the average income in rural Timor is $50/month.[9] However, even in the rural areas there is an unequal distribution of income. While the average income in rural Timor is $50/month, the median is only $32/month.

In rural areas agriculture provides 56% of annual income while in urban areas agriculture only accounts for 12%. Wages, 59% of which are paid by the government, only account for 25% of annual incomes while business and other income and transfers from abroad account for the rest.[10] A major strain on all household incomes is inflation which was at 13.5% in 2011 and 9% in 2012.[11]

Timor-Leste's GDP composition by sector is 25.6% agriculture, 18.1% industry, and 56.3% services. Employment of the country's 419,000 person labor force is 64 % in agriculture, 26% in government and services, and 10% in industrial pursuits such as the oil sector.[12] While oil provides most of the government's revenue, it is agriculture that provides the livelihoods for the majority of Timorese.

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[6] Ibid.

[7] Asian Development Bank, http://www.adb.org/countries/timor-leste/economy

[8] "Understanding Timor-Leste's Context," La'o Hamutuk, 13 June 2013. http://laohamutuk.blogspot.com/2013/06/understanding-timor-lestes-context.html.

[9] According to the World Factbook, 28% of Timor's population, or 328,269 people, live in urban areas. 51% of those people live in Dili.

[10] "Timor-Leste Household Income and Expenditure Survey 2011," National Statistics Directorate General Directorate for Analysis & Research, Ministry of Finance Timor-Leste. http://www.laohamutuk.org/DVD/DGS/HIES2011Apr2013en.pdf

[11] "Timor-Leste," CIA World Factbook, https://www.cia.gov/library/publications/the-world-factbook/geos/tt.html.

[12] ibid

DESCRIPTION OF FRESH VEGETABLE VALUE CHAIN RESEARCH

Market research was conducted in 2012 to get information about fresh vegetable production and sales.[13] An intensive market survey was carried out in Dili at five major outdoor markets. The survey collected data from 270 vegetable vendors about 46 different vegetables. The survey questionnaire collected information about the quantities available for sale, the wholesale price and retail price, and the District origin of the vegetables. It also gathered information about how the vendors conducted their business with traders and with customers. The survey was done in rainy season (January/February) and again in dry season (July/August). In order to compare domestic production with imports, data about imported fresh produce was provided by the Ministry of Finance Directorate-General for Customs and the Ministry of Agriculture and Fisheries (MAF).

Extensive interviews and focus groups were held with all types of businesses in the fresh vegetable value chain, including input suppliers, farmers, traders, wholesalers, retailers, and large buyers such as supermarkets and catering companies. Interviews were conducted with 5-10 businesses at each step in the value chain.[14]

In addition to these two types of research, this value chain analysis draws significantly from the experience and expertise of the staff of the United States Agency for International Development (USAID) funded Dezenvolve Setor Privadu (DSP) and Dezenvolve Agricultura Comunitaria (DAC) projects, who have been working diligently to develop the vegetable value chain for six years. It also benefits from the value chain analysis of the horticulture sector in Ainaro District developed by the BOSS project.[15]

OVERVIEW OF FRESH VEGETABLE VALUE CHAIN

The fresh vegetable value chain includes all of the companies and individuals that play a role in producing, trading, and selling fresh vegetables. All of these businesses are impacted by government policies, laws, regulations and donor activities - this is called the business enabling environment. In general, the fresh vegetable value chain in Timor-Leste is a simple or short value chain. There are only a few types of businesses between farmers and consumers. One individual or business might have to play many different roles because important links in the chain are either missing or poorly developed. There are very few input suppliers with limited inventory, production quantities are small, quality is low, and consolidation (wholesaling), storage and processing are non-existent. Producers are primarily subsistence

[13] The market research report Fresh Vegetable Market in Dili, Timor-Leste – Market Research 2012 is available from USAID Timor-Leste at http://www.usaid.gov/where-we-work/Asia/Timor-Leste or from the Ministry of Agriculture and Fisheries, Director of Horticulture and Agriculture.

[14] See Annex 7 for a list of interviews.

[15] Business Opportunities and Support Services project funded by Irish Aid and implemented by International Labour Organization (ILO) and Government of Timor-Leste Institute of Business Support (IADE).

farmers selling small amounts of surplus product, although there are increasing numbers of smallholder farmers beginning to link with commercial traders and produce according to market demand.

OVERVIEW OF CONTRACT FARMING

Links between producers and buyers have become stronger through a system called contract farming.[16] In a contract farming operation, groups of farmers make a formal agreement to work together with a commercial buyer. This agreement, or Memorandum of Understanding, outlines the roles and responsibilities of each partner.

Generally, the commercial buyer agrees to provide inputs and technical assistance (extension services) at no up-front cost, and the farmers agree to grow the vegetables and sell them only to this buyer. The farmers and the buyer negotiate a price list for the vegetables the farmers will grow. The buyer guarantees that he will buy all of the groups' production at the agreed upon price. Farmers report that the most important benefits are the guaranteed purchase, and the on-site pick up, which saves them from the cost and difficulty of transportation.

If either side "breaks the agreement", for example if the buyer fails to provide the inputs, or the farmers sell the product to a different buyer, the agreement may be cancelled. The buyer then loses the investment in organizing and training the farmers, and the farmers lose a reliable, committed buyer which, at the current stage of development of the vegetable value chain, would be very difficult to replace.

Since 2006, USAID supported programs have experimented with contract farming operations for vegetable production, and the model has spread to other donor programs including World Vision's LIFE program and the Business Opportunities and Support Services project funded by Irish Aid.[17]

As of September 2013, three contract farming businesses are making steady progress. The largest, Kmanek Supermarket / Kmanek Agriculture, a licensed agriculture input supply importer, provides inputs to and buys produce from approximately 400 farmers in Aileu District. The newest player is Dilimart, partnering with 50 farmers in the lowland areas of Aileu District. Josephina Farms is a contract farming business focused on organic production, with approximately 100 farmers in Ainaro District.

[16] For more information on contract farming, see the DAC report What Is Contract Farming? available from USAID Timor-Leste at http://www.usaid.gov/where-we-work/Asia/Timor-Leste

17 Implemented by International Labour Organization (ILO) and Government of Timor-Leste Institute of Business Support (IADE).

MARKET OPPORTUNITIES FOR FRESH PRODUCE

The supply and demand of fresh vegetables in Timor-Leste has been growing along with increasing incomes, population and economic growth. Statistics are available on domestic production from the Ministry of Agriculture and Fisheries (MAF) and on imports of fresh vegetables from the Ministry of Finance Directorate-General for Customs (MoF Customs). Unfortunately, it is acknowledged that there are significant problems with the data quality since the Government of Timor-Leste is still developing its capacity for accurate data management. No data is available earlier than 2011, so no trend analysis is possible. However, this value chain report uses the data that is available to present at least a general understanding of the market.

The Ministry of Agriculture and Fisheries (MAF) estimated national vegetable production to be 29,234 tonnes in 2011 and 34,012 tonnes in 2012. This estimate includes production for self-consumption and for sale.

Primary research conducted during the wet and dry seasons of 2012 estimates total annual sales in the Dili outdoor markets of 6,134 tonnes, of which 5,393 tonnes were produced domestically. The total value of sales was $7,825,884. The HIES 2011 survey shows Dili purchases of 7,649 tonnes (no sales figures available).

Using these two estimates, national sales figures would reach 41,474 - 51,498 tonnes. Including vegetables grown for self-consumption, an estimated 81,322 - 101,000 tonnes of vegetables are produced annually in Timor-Leste.[18] Average per capita consumption is 1.73kg per week. However, domestic production remains limited and seasonal. As a result, prices remain high compared with neighbors such as Indonesia.

The market research collected data about wholesale purchases and retail sales. It revealed that there is approximately an 85% weekly turnover rate among the vegetable vendors in the outdoor markets in Dili. This means that of all the vegetables the vendors purchased, they sold 85% of those vegetables during the same week. Taking wastage and inventory carried over into consideration, it seems that all vegetables made available for sale are rapidly sold.

To compare domestic production to imports, data was used from the MoF Customs. Total imported fresh vegetables in 2010 were 5,830 tonne and in 2011 were 4,758 tonne. These imported vegetables are sold in outdoor markets[19], supermarkets, and to restaurants, hotels and catering companies. There is a clear opportunity for import substitution that should be an important focus for agricultural development, improving incomes, and diversifying the economy.

[18] Calculations based on HIES 2011 results that 51% of vegetables consumed are purchased for cash; urban vegetable consumption 63% of total vegetable consumption; and 51% of total urban population is in Dili.

[19] 24% of the fresh produce sold in outdoor markets is imported, primarily potatoes, onions, and garlic.

END MARKET SEGMENTATION

The final consumers of fresh vegetables can be segmented as follows:

- Average rural consumer: Grows own vegetables, may make occasional purchases at nearest small outdoor markets
- Average consumer in District towns/cities: May grow small plot of vegetables or share in family plots in outlying areas. Will make regular purchases of local vegetables at outdoor markets, frequency/amounts vary by family income.
- Average poor consumer in Dili city: May collect local vegetables like papaya leaf or banana flower. May share in family plots in outlying areas. Will make regular purchases of local vegetables at outdoor markets, frequency/amounts vary by family income.
- Average middle class consumer in Dili city: Includes Timorese small businesspeople, employed staff at businesses or NGO/donor/UN programs, civil servants, and regional expatriates (Filipino, Indonesian, Thai, Chinese). Will make regular purchases of local vegetables at outdoor markets and occasionally at supermarkets. Will purchase primarily traditional local vegetables, but also interested in new products such as broccoli, red capsicum, and different varieties of leafy greens. Purchases meals (particularly lunch during work day) at local/regional cuisine restaurants.
- Average wealthy consumer in Dili city: Includes Timorese government management and leadership; Timorese and regional expatriate businessmen and Government/NGO/donor/UN staff; and all Westerners. Will make regular purchases at supermarkets and Tasi Ibun outdoor market, and infrequent purchases at other outdoor markets. Purchase meals at regional/European cuisine restaurants regularly. Represent the main market for non-traditional vegetables such as beetroot, broccoli, cauliflower, and zucchini.

MARKET DEMAND FOR VEGETABLES

The Ministry of Finance Household Income and Expenditure Survey 2011 (HIES 2011) provides information about spending on vegetables.[20] Total vegetable consumption includes vegetables purchased and vegetables produced by the household.

- Total vegetable consumption had a value of $50, 592,123.
- Total vegetable sales are estimated at $25,687,043 (51% of all consumption)
- Rural households spend 7% of their total income on fruits and vegetables, while urban households spend 5% of total income.
- Rural households consume 40kg of vegetables per month, with a value of $19.40. Urban households report consuming 47kg, with a value of $32.68. Therefore, urban markets provide better returns on a per kilo basis if farmers are able to market directly.

[20] This is the first HIES survey for Timor-Leste, so no trend analysis is possible.

The annual population growth rate of 2.47% and economic growth rate of 10% will translate to increased demand for vegetables. The table below assumes that the urban/rural division of population will remain the same, and that household spending on vegetables, as a percentage of income, will remain the same.

ESTIMATED INCREASED DEMAND FOR VEGETABLES

	Estimated Consumption	Estimate of Increased Demand	
	2012	2013	2014
Rural	73,336 tonnes	3,579 tonnes	3,668 tonnes
Urban	30,135 tonnes	1,471 tonnes	1,507 tonnes
Total	103,471 tonnes	5,050 tonnes	5,175 tonnes

	Estimated Cash Expenditures	Estimate of Increased Spending	
	2012	2013	2014
Rural	$18,424,701	$2,343,069	$2,641,037
Urban	$10,817,155	$1,375,618	$1,550,555
Total	$29,241,857	$3,718,687	$4,191,592

Along with a large domestic market opportunity, the countries of Southeast Asia can provide a market for vegetable export from Timor-Leste. With growing populations and increased land-use competition, many countries in the region are looking for new suppliers. Since Timor-Leste is below the equator, the wet and dry seasons are the opposite of those in the major regional horticulture exporting countries of Malaysia, Vietnam and Thailand, which could provide an opportunity for Timor-Leste exporters to take advantage of seasonal price variations. Significant areas of uncultivated arable land provide opportunity for organic production that could meet a niche market demand in Asia and Australia. At this time, however, Timor-Leste's current quantity is far from meeting domestic demand, quality is far from meeting export standards, and costs of production are higher than in the rest of the region. There is much work to be done before exporting will be viable.

KEY END MARKET OPPORTUNITIES

As discussed above, the domestic and export market opportunity for vegetable production is large. Several specific opportunities provide an example of how the private sector can make decisions about which products to invest in.

VEGETABLES MOST IN DEMAND

The table below shows the 15 vegetables in the Dili outdoor markets that have the largest sales by dollar value and by kilos.

TOP VEGETABLES IN DILI OUTDOOR MARKETS

Sales by Value	Sales by Kilo
Red beans (dried)	Cabbage
Tomato	Pumpkin
Red Onion	Tomato
Cabbage	Carrot
Carrot	Red beans (dried)
Mustard leaf (white)	Papaya (green)
Eggplant	Long beans
European Potato	Eggplant
Garlic	Cucumber
Long Beans	Green Beans
Pumpkin	Red onion
Green beans	Mustard leaf (white)
Cucumber	European Potato
Mustard leaf (black)	Mustard leaf (black)
Papaya (green)	Garlic

MOST PROFITABLE VEGETABLES

The table below shows the vegetables that command the highest gross margin (difference between wholesale and retail price)

SIX HIGHEST GROSS MARGIN VEGETABLES

Vegetable	Average Gross Margin	Kilos Sold 2012 – Dili Market Estimate	Sales Revenue 2012 – Dili Mkt Estimate
Cauliflower	203%	2,236	$9,125
Papaya Flower	168%	10,463	$52,925
Chayote	158%	430,176	$98,685
Chili	149%	39,763	$150,334
Papaya Fruit	139%	201,905	$150,451
Large Chili	129%	23,156	$53,704

VEGETABLES WITH LARGEST SEASONAL VARIATION

There is a large difference between supply of vegetables in the wet season and the dry season. As described above, regardless of the time of year, it seems that all available vegetables will be sold in the local markets. Assuming that year round demand is stable, particularly among urban consumers, achieving consistent year round supply of these vegetables is a key opportunity.

SEASONAL SUPPLY VARIATION – RAINY SEASON VS. DRY SEASON

Vegetable	Percentage Difference	Potential Opportunity Kilos*
Greater Supply in Rainy Season		
European Potato (domestic production)	99%	70 tonnes
Large chili	99%	13 tonnes
Basil	99%	6 tonnes
Pumpkin Leaf	99%	16 tonnes
Chayote	97%	221 tonnes
Papaya Leaf	95%	8 tonnes
Greater Supply in Dry Season		
Chinese Cabbage	89%	59 tonnes
Yam	83%	71 tonnes
Tomato	76%	120 tonnes
Black Mustard Leaf	70%	35 tonnes
White Mustard Leaf	44%	21 tonnes

*Potential Opportunity calculated at daily “unmet demand” (reduced supply) multiplied by 100 days (period of reduced supply).

REPLACING IMPORTED VEGETABLES

Most fresh produce is imported at high cost compared to domestic production. If domestic supply can compete on price, quality and consistency, there is a large opportunity for import substitution. The table below shows the quantity imported during 2010-2011, and some examples of comparative prices. It is interesting to notice that garlic, while widely used throughout Timor-Leste, is probably not a good market opportunity since costs of local garlic are much higher than imported garlic. Potatoes and onions are other imported products which have only a slight price advantage for local products.

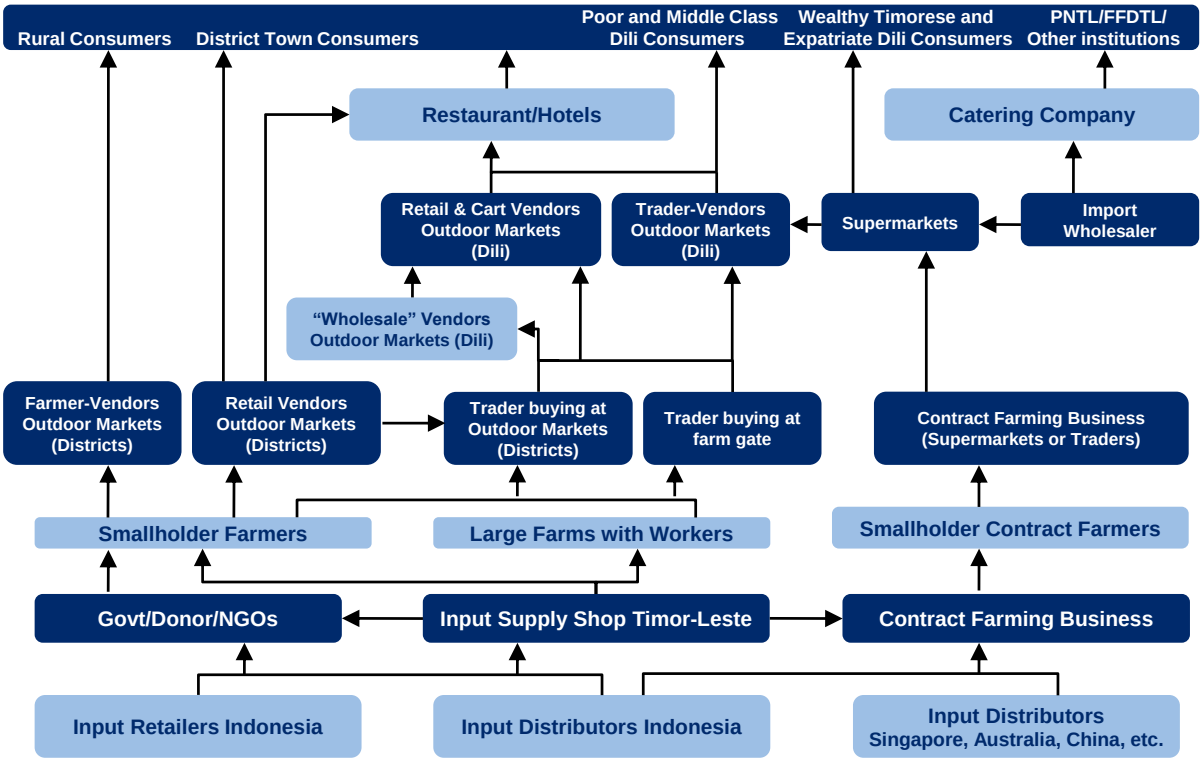
PRICE COMPARISON OF IMPORTED AND DOMESTIC VEGETABLES

Vegetable	KGs	Retail Price	
		Imported*	Domestic*
Broccoli/Cauliflower fresh	1,413,898	$5.90	$3.00/$2.00
Tomato fresh	1,138,579	$3.54	$2.00
Mushrooms fresh	753,388		
Onions/shallots fresh	735,755	$4.02**	$3.08**
Carrots fresh	708,182	$3.52	$1.75
Peas fresh	697,380		$4.57
Cucumbers fresh	687,619		$2.10
Lettuces fresh	673,539	$2.32	$1.40
Celery fresh	619,621		
Potato fresh	609,639	$1.40	$1.46
Beans fresh	494,630		$2.88
Garlic fresh	268,145	$4.33	$8.15
Beetroot fresh	230,387		$5.10
Asparagus fresh	118,469		
Cabbages fresh	73,697		$1.37
Capsicum fresh	52,811	$6.96	$3.00
Other vegetables	11,860		
Leeks fresh	4,464		
Spinach fresh	882		
Other vegetables fresh	995,250		
TOTAL	10,288,194		

*Price shown for red onion only

FRESH VEGETABLE VALUE CHAIN ANALYSIS

This diagram shows all of the businesses involved in the vegetable value chain, and how the vegetables are produced, traded, and sold by these businesses. The arrows show the buying and selling relationships between businesses at each level of the value chain. The rest of this report provides more detail on activities at each of these levels.



Since "Consumers" may buy from different vendors at different times, the chart above shows them all within the same box. They are placed where they are more likely to buy product, but they can buy from any one of the different types of vendors.

INPUT SUPPLY

VALUE CHAIN LEVEL 1: INPUT SUPPLY

The supply of all agricultural inputs in Timor-Leste is very limited. Prices are high, inventory is unreliable, and access is difficult outside of Dili. Inputs including seed, fertilizer, pesticides, fungicides, planting media, UV plastic, irrigation equipment, and tools/equipment must be imported, most often from Indonesia. This is a constraint for the agriculture sector in general, but particularly for commercial vegetable production. Seed for new varieties and new types of vegetables must be imported[21] and year-round production requires the use of equipment such as irrigation and plastic tunnels.

INPUT SUPPLY COMPANIES

In 2011 and 2012 Planet Agriculture operated the only dedicated agriculture input supply retail shop in Dili, but it closed in December 2012. Director of the Planet Group, Reynold Samara, assured researchers that the closure was not a reflection of the feasibility of the agriculture input supply business, but was purely based on the loss of the lead technical manager. Mr. Samara correctly identified one of the major constraints facing the agriculture input business – a lack of educated technical staff that can make informed decisions about inventory and provide the right technical advice and recommendations to farmers. Planet Agriculture continues to operate as a wholesale supplier but only to fulfill large orders from the government or NGO/donor projects.

Two small agricultural input suppliers opened in Dili in the first quarter of 2013. Loja Agricultura Dili is an input supply business operating in Bemori. The shop carries a fairly large assortment of seeds, fertilizer, and pesticides as well as livestock feed and supply. The owner has some prior work experience in input supply but is not trained in agronomy or animal husbandry. Jupiter Agri is primarily a motorcycle parts and repair shop located on busy Comoro Road in Dili. The shop carries a limited selection of seeds, pesticides, and medical supplies for livestock in a small (approximately 60cm x 60cm) display case on the parts counter. However, they are advertising and promoting their input supply business. Loja Agricultura Dili and Jupiter Agri purchase their inventory from distributors or retail shops in Indonesia. The opening of these two new stores is a hopeful sign of market development.

Other sources of input supply in Dili are general importers or retail shops that stock some occasional inventory, mostly "leftovers" from fulfilling large orders from government or NGO/donor programs. For example, Boa Ventura is a large general importer that also stocks a small amount of seed, pesticide and fertilizer – until 2012 Boa Ventura was the main source of input retail stock in Dili. Two building supply companies also import some agriculture equipment like UV plastic or drip irrigation. Some smaller players operate in the neighborhoods, particularly on the west end of the city near the agriculture production areas along the Comoro River. However, these would not likely be identified as "agriculture

[21] New seed varieties can provide important benefits such as better quantity and quality, and pest/disease resistance. See Annex 3 for a discussion of seed types: open pollinated, hybrid, and genetically modified.

input suppliers" – they are multi-purpose retail shops selling Super Mie instant noodles and shampoo alongside urea and vegetable seeds.

Outside of Dili, Loja Agrikultura in Baucau District and Fini Diak in Liquica District are the only dedicated sources of agricultural inputs. Both of these District based stores were initiated and supported by donor programs, Loja Agrikultura by GIZ and Fini Diak by the Instituto Marques de Valle Flor (IMVF). During interviews, neither business expressed the interest or the capacity to expand.

Loja Agricultura Baucau opened in 2004 with support from GIZ's Food Security Program. Their main products are vegetable seed, small equipment, hand tools, sprayers, plastic mulch, shading net, fertilizer, pesticides and fishery equipment. They source inventory from Indonesia over the land border. Loja Agricultura Baucau supplies large orders to donor and government program. The retail shop is open twice a week on market days only.

Fini Diak opened in 2011 with initial stock and working capital supplied by IMVF. Their main products are seeds and small equipment (watercans, handsprayers, polybags, drip irrigation material, etc.). They source inventory from shops in Dili, or from Indonesia over the land border. Fini Diak's innovation has been a mobile sales service, using a "Tigaroda" (motorbike with three wheels and a trailer) to take their products to several markets and more isolated areas. Fini Diak also provides credit to farmers, generally $40-$50 for regular good customers. Peak sales are May through August, with very few sales during the rainy season. The IMVF continues to provide a partial salary subsidy for the two employees.

In addition to these dedicated input suppliers, small kiosks, shops or market vendors throughout the country may carry small amounts of seed, urea, and/or pesticides along with their other food and household products. Mercy Corps has undertaken a successful pilot with 8 kiosks in Ainaro and Manufahi Districts. They provided a small display case and a $250 initial inventory stock, including vegetable seeds, compost accelerator/liquid fertilizer, and small tools. The majority of the kiosks have re-stocked their seed supply after only two months, and have invested in new stock at their customers request including organic fertilizer, round up (herbicide), rotone (growth hormone for pruned coffee tree), and, interestingly, "doping" chemical used for fighting cocks. A recent USAID OFDA funded Seed System Security Assessment found ample quantity of vegetable seeds in Ainaro and Baucau districts sold at 20% of normal imported seed price, but with only Chinese character information it is difficult to assess quality (expiration date, climate requirements, production standards). These are all promising signs of the possibility of developing better input supply in the Districts.

CONTRACT FARMING INPUT SUPPLY

The contract farming lead firms (Kmanek, Dilimart, Josephina Farms) buy from input shops in Dili, or import seeds, pesticides, and fertilizers for their contracted farmers, but do not make inputs available for sale to others. In order to streamline their import of input supply, Kmanek Supermarket invested in creating a new firm, Kmanek Agriculture, with the proper license for importing agriculture inputs.

GOVERNMENT AND NGO INPUT DISTRIBUTION

Some NGOs such as Care International, World Vision, and Hiam Health that support vegetable production distribute inputs at low or no cost to their farmer groups. The items distributed include improved variety seeds for crops such as tomatoes, cabbage, leafy greens, cucumbers, and assorted herbs. Some programs or NGOs don't provide seed, but offer equipment such as plastic tunnel, drip irrigation, and seed nurseries.[22] Data provided by the MAF for January-June 2012 shows the government distributed 133 kg of vegetable seeds (25 different types) to groups throughout the country. See the Enabling Environment section of this report for a more in-depth discussion of the role of government and NGO subsidies.

CONSTRAINTS FOR INPUT SUPPLY

Overall, Timor-Leste faces a large challenge to developing private sector agriculture input supply. Staple crop subsistence farmers, who currently make up the vast majority of the potential market for input supplies, suffer from poor yields and low incomes. Therefore, they cannot afford to use inputs and input suppliers don't see any reason to increase their inventory or services. However, vegetable farmers linked to commercial markets are increasing their input demand as their incomes and technical capacity grows. They can provide a catalyst for improving availability and affordability of input supply.

Lack of Technical Knowledge

The technical knowledge of the current input suppliers is poor, though all of the shops recognize that recommending the right products could be important to their business. In shops where agriculture input supply is a small portion of the total retail business, there is little emphasis on building staff skills and knowledge. In the Loja Agrikultura Baucau and Fini Diak Liquica shops, which were facilitated by donor funded projects, the staff is better trained and able to provide technical advice and recommendations to farmers. In the new stores such as Jupiter Agri and Loja Agrikultura Dili, the staff is working to improve their capacity.

Lack of technical knowledge results in poor customer service and inappropriate inventory stocks. From seed to fertilizers to pesticides, retailers do not stock items based on local conditions, requirements, or farmer needs but simply buy whatever is available. Often, products are improperly handled and stored causing contamination and reducing quality and effectiveness. Poorly informed staff cannot promote their products, or build customer loyalty.

Regulatory Challenges to Importing Input Supplies

In the past, business registration for an agriculture input supply business required recommendation letters from the MAF, and has reportedly taken over two years to process. The reformed business registration service, SERVE, now provides a streamlined service that should be completed in five days.

No specific qualifications, documentation, or paperwork is required to register as an agriculture input supplier – the business license process is the same as for any type of business.[23] The registration application offers the following "type of business" choices:

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[22] These include DAC, GIZ, Spanish Cooperation, and IMVF.

[23] Businesses must submit a letter of request to the National Director of Domestic Commerce at Ministry of Tourism, Commerce and Industry; company statutes; company act of incorporation; company structure; logo, initial inventory, and map of location.

- Import, Supply and Sale of:
    - Agricultural Materials and Equipment
    - Agriculture Seeds
    - Organic and Chemical Fertilizer
    - Insecticide
    - Fisheries Materials and Equipment

Requesting and processing import permits for seeds, fertilizer, soil amendments and pesticides is slow and difficult, requiring endless follow up, resulting in delays of 1-2 months. The National Directorate of Quarantine and Bio-Security (NDQB), that issues the import permits and also clears the goods, has very low capacity for either task. Mistakes are common on import permits, and when a mismatch between the permit list and the actual goods arises, even a simple spelling error, the result can be additional extensive delays, confusion, and loss of goods. In addition to the problems with Quarantine, imports coming through the sea port often require improper payments to facilitate clearance. The on-going debate within the MAF and civil society about the proper role for non-organic fertilizer and pesticides creates uncertainty about importing these products. These difficulties encourage many input suppliers and producers to unofficially import inputs, particularly seed, in suitcases from various points in Indonesia, Singapore or Australia without clearing Quarantine. This may be an effective "work around" for individual businesses, but it hinders the growth of the input supply industry.

Subsidies

Interviews show that the commercial input suppliers identify free input distribution by the government and donors as one of the key reasons they do not invest more to improve inventory. They are unsure whether there will be growing retail market demand for inputs. When NGOs, aid agencies, and the government import seed and other inputs for free distribution, it reduces the potential commercial demand. Ironically, existing commercial input suppliers bid on these large orders and rely on them to drive their own supply, generally building a bit of extra inventory in the shipment to stock their shop. But, this does not result in market-oriented suppliers that stock inventory according to customer demand.

Reliance on Indonesian Retail Suppliers

Rather than buying directly from authorized distributors in the region, East Timor input importers most often purchase inventory from retail shops in Kupang or Surabaya, Indonesia and arrange for transport to Dili. None of the input suppliers interviewed sourced product direct from distributors, or from other countries such as Singapore or Australia. This has hampered the growth of the input supply market in several ways.

Family, ethnic, and cultural barriers limit Timorese access to Indonesian markets – many Timorese and Indonesians currently involved in agriculture input supply in Timor openly admit that most Timorese would never get the terms and conditions needed for business – the right price, quality, payment terms, credit, or reliability. This creates a "barrier to entry", limiting the growth of a competitive market in Timor-Leste.

Indonesian government subsidies affect the supply and price of some agriculture inputs.[24] Currently, UREA, SP36, ZA, NPK and organic fertilizer are subsidized (as well as rice/maize/soybean seed). Subsidized inputs cannot be legally exported, but Timorese input suppliers still rely on the unreliable black market trade across the land border.[25] Additionally, since the subsidized prices are so low, Timorese input suppliers perceive that buying from Australia, China, or Singapore would be "too expensive". However, given the limited supply, border problems, and transport costs, the final price to the consumer remains very high.

When placing large orders in advance, Timorese suppliers can arrange to fill the order properly via the Indonesian retail shops or distributors. However, for smaller orders (such as the amounts required for a contract farming operation) or for their own inventory, the Timorese input suppliers purchase "as available" in the Kupang shops. Consequently agriculture input inventory is limited and unpredictable, costs are high, and quality is compromised by long and difficult transportation. Orders placed, particularly for vegetable seed, with the existing input suppliers can take from several weeks to several months for delivery, and the order is often incomplete, incorrect, or damaged by heat and humidity.

Small Market

The current size of the Timorese market is too small to attract direct distributors of agriculture input supplies. Unfortunately this problem will continue for the foreseeable future. It is a particular challenge for the commercial high quality vegetable seed market. Limited input supply and distribution networks, along with reliance on traditional practices and varieties, means that vegetable farmers rely more heavily on saving their own seed than on purchasing seed. This has advantages for farmers, but also reduces the potential demand for commercial seed.

In 2009, a USAID funded project invited several regional seed companies to East Timor.[26] The firms expressed clearly that this small market would not support a direct distributor in the foreseeable future, and even failed to follow up with linkages facilitated with local shops. To become a direct distributor for East West Seed Indonesia (EWS), for example, requires annual net sales of $400,000.

OPPORTUNITIES FOR CHANGE

Better Sources of Supply

An important step is for input supply shops to identify better sources of supply and begin ordering directly from input supply distributors, particularly for seed, in Singapore, Australia, and other countries. Working with international standard, legal sources of supply will improve consistency and reduce delays. Distributors can provide advice on inventory which can lower costs and improve stocks. Though direct costs, such as shipping, may be higher than ordering from Indonesia, the savings realized from dependable supply and the benefits to customers using recommended, tested, high quality seed that is appropriate for the climate will more than offset these costs. However, streamlining the NDQB import process is crucial to making this change.

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[24] Pesticide and seed subsidies were lifted in 2008.

[25] Much of the fertilizer smuggled through Timor-Leste is then shipped to Malaysia, since Indonesian government has tightened controls on the direct Indonesia to Malaysia routes.

[26] Kent, Tony. *Consultant Report: Horticulture Inputs–Seed Supply, Dezenvolve Setór Privadu*. Dili, Timor-Leste. 31 March 2009. Available from USAID Timor-Leste at http://www.usaid.gov/where-we-work/Asia/Timor-Leste

Better Market Information

Improving information about the private sector supply and demand for agriculture inputs, especially in the Districts, is important. Efforts by donors, government or the private sector to facilitate information sharing and commercial linkages can help to close the gap. Input supply shops, farmer groups, NGOs, technical assistance providers, and government need to communicate to better understand potential market demand and stock the right products. Input suppliers need to develop marketing strategies that inform growers about the availability of input supplies and do more to promote the proper use of inputs. Mercy Corps, IMVF, RDP3, and USAID/DAC have all taken some of these steps.

Improving Technical Capacity

Trainings are needed on specific input supplies, including seeds, fertilizers, and pesticides, and how they should be used in the field. Facilitating linkages with farmers and farmer groups allow input suppliers to learn about farmers' technical needs and challenges. In one specific example, the DAC project met with input suppliers to explain that different elevations require different seed varieties. DAC distributed lists of the most successful varieties tested at various elevations and conditions in Aileu District. Several of these seed varieties are now being carried in the shops. The next step is to ensure that the shop staffs can competently recommend these seeds to farmers from areas with similar conditions. Mercy Corps, IMVF, SAI and USAID/DAC are all taking steps to increase input suppliers technical knowledge.

One anecdote shows that the input supply market will develop if given the chance. Bok choy is a recent introduction to the local vegetable market. Similar to the traditional modo metin & modo mutin, for the last several years bok choy has been grown and sold more widely. A farmer from the Districts was overheard in an input supply shop asking for bok choy seed. The clerk handed him a package of a different leaf vegetable. As the farmer looked at the packet, a by-stander kindly interrupted and said "Excuse me, but that isn't bok choy seed. You can tell from the picture on the package that it isn't bok choy". The farmer looked confused, and then said "I don't even know what bok choy is – I just heard that if you grow it, you can make a lot of money." Growing customer demand for more and different vegetables is leading to increased demand for input supplies that allow farmers to meet that demand.

VEGETABLE PRODUCTION

Vegetable production is a good economic opportunity for farmers. Vegetable production has high value per area of land, and productivity can be high when farmers use good quality seeds and improved production techniques. Farmers can earn very good incomes on small parcels of land.[27] Since most farmers are smallholders, commercial vegetable production is a good option.

PRODUCTION STATISTICS

This analysis uses data about vegetable sales in Dili markets as a proxy for data about the production of fresh vegetables nationwide. Based on the HIES 2011, 50% of all vegetables consumed are purchased for cash, while 50% are grown for self-consumption. Spending on vegetables in Dili represents 20% of all cash spending on vegetables.[28] Primary research conducted during the wet and dry seasons of 2012 estimates total annual sales in the Dili outdoor markets of 6,134 tonnes. The HIES 2011 survey shows Dili purchases of 7,649 tonnes. These figures result in estimated national sales figures of between 41,474

[27] The average income for contract farmers in Sukos Seloi Malere and Seloi Kraik in 2012 was $1,025/year from vegetable production. The HIES 2011 shows median rural income from crops at $175/year.

[28] 51% of vegetables consumed are purchased for cash. Dili population is 51% of total urban population.

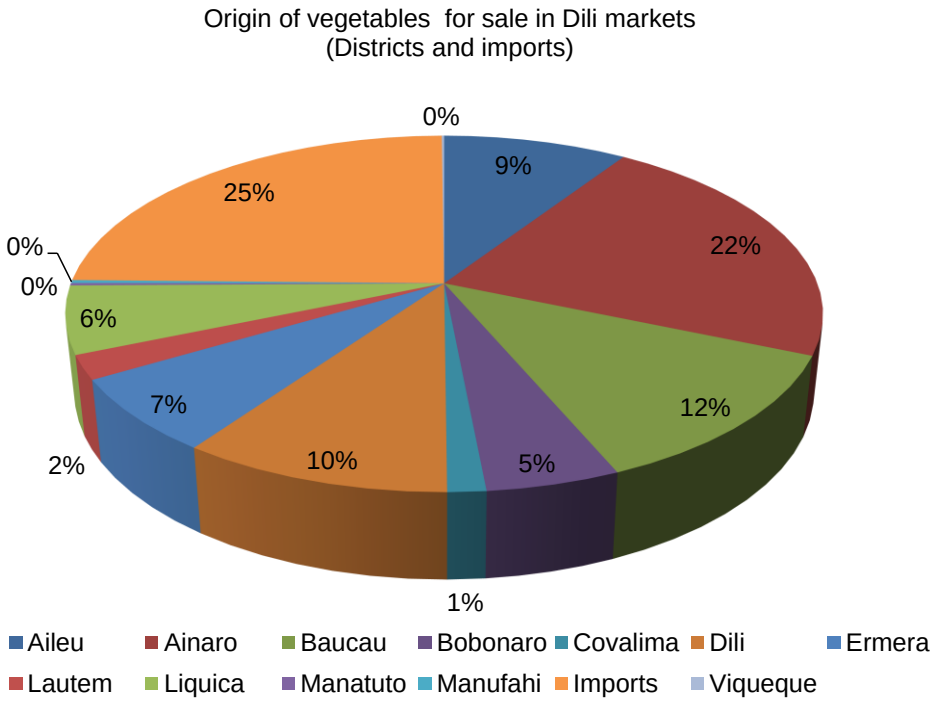
- 51,498 tonnes. Including vegetables grown for self-consumption, an estimated 81,322 - 101,000 tonnes of vegetables are produced annually in Timor-Leste. Average per capita consumption is 1.73kg per week. The data and charts below summarize the results from the market research conducted by the DAC project in 2012, which collected data during dry season and wet season from 5 outdoor markets in Dili.[29]

The table below shows the top fifteen domestically produced vegetables sold in the Dili market. The first column shows the vegetables people spent the most money on. The second column shows the vegetables of which the largest number of kilos was sold. Annex 7 also contains a list of all vegetables identified for sale in the Dili markets.

Top Vegetables in Dili Outdoor Markets	
Sales by Value	**Sales by Kilo**
Red beans (dried)	Cabbage
Tomato	Pumpkin
Red Onion	Tomato
Cabbage	Carrot
Carrot	Red beans (dried)
Mustard leaf (white)	Papaya (green)
Eggplant	Long beans
European Potato	Eggplant
Garlic	Cucumber
Long Beans	Green Beans
Pumpkin	Red onion
Green beans	Mustard leaf (white)
Cucumber	European Potato
Mustard leaf (black)	Mustard leaf (black)
Papaya (green)	Garlic

Districts with large vegetable production include Ainaro, Aileu, Baucau, and Dili Districts. Some specific areas, such as Hera and Hatubulico, are known for more intensive market oriented vegetable production. However, even in these areas only a few types of vegetables are produced, and traditional growing practices result in low productivity. The figures below illustrate the District origin of vegetables available for sale in the Dili markets, according to dollar value.

[29] The complete market research report Fresh Vegetable Market in Dili, Timor-Leste – Market Research 2012 is available from USAID Timor-Leste at http://www.usaid.gov/where-we-work/Asia/Timor-Leste or from the Ministry of Agriculture and Fisheries, Director of Horticulture and Agriculture.



Vegetable production is highly seasonal. Market research conducted in 2012 showed that almost twice as many kilos were available for sale during February than during August.[30] Rainy season is generally from December through April, and dry season from May through November. Some vegetables are available in larger quantities during rainy season (chili, basil, pumpkin leaf, chayote, papaya leaf), and others during dry season (Chinese cabbage, tomato, mustard leaf). Farmers grow vegetables when they have enough water, and when they are not focused on staple crop production. Farmers without year round access to water will start to plant early in rainy season, and harvest around the peak of rainy season when the rains become too intense for further production. When the rains taper off, and water remains plentiful, farmers will grow vegetables until water runs out, when production will drop again. Farmers will focus less on vegetable production during the planting of maize (early in the rainy season) and rice (depends on location), and during the harvest of maize (towards end of rainy season) and rice (depends on location). More regular market research would need to be done to gather more detail on the annual calendar of vegetable production nationwide.

VALUE CHAIN LEVEL 2: PRODUCTION

Smallholder Farmers	Large Farms with Workers	Smallholder Contract Farmers

[30] Market research results from 2012 survey of Dili outdoor market sales: 4,058 tonne in the wet season versus 2,076 tonne in the dry season.

The three types of producers in the fresh vegetable value chain are independent smallholder farmers, large land owners using farm labor, and smallholder farmers involved in contract farming operations. Men and women are involved in vegetable production. Very small subsistence kitchen gardens are women's responsibility, except for the initial plowing. In larger scale subsistence fields that generate surplus, or in commercially oriented production, men and women have different roles but they share the work and the income. Men are generally responsible for plowing the soil, creating raised beds, installing equipment such as water pumps, irrigation, or plastic tunnels, creating compost and fertilizing crops. Women germinate and plant seedlings, water, weed, and spray pesticide. In the contract farming groups it is frequently the women that are literate and responsible for the groups' bookkeeping systems and meeting notes. In the Kmanek operation, 30% of the group members are women, and 35% of the group Presidents, Secretaries and Treasurers are women.[31]

SMALLHOLDER FARMERS

Vegetable farmers are primarily subsistence farmers growing local vegetable varieties using traditional planting techniques on very small plots. Surplus production is sold into local markets to generate a small cash income. Farmers growing specifically for cash income will cultivate small, widely scattered plots of 100 to 200 square meters. Farmers may be working on their own land, may have an informal use agreement with a neighbor who has better land or water, or may be working on land that is known to belong to a large absentee landowner.

Smallholder vegetable farmers have limited knowledge of even basic modern production techniques, such as using raised beds, spacing seed to maximize production, and maintaining soil fertility. Important techniques for larger scale, sustainable commercial production such as organic fertilizer and integrated pest management are not in use. The vast majority of vegetable seed is saved from the farmers' own crops, with only limited purchases of commercial packaged seed. Most labor is provided by family members and is done by hand, with very limited use of tractors (hand tractors or conventional). Many vegetable farmers use urea purchased in the local markets, but because they are not trained on proper usage they contribute to soil stripping and nitrogen leaching while continuing to have poor yields. Vegetable farmers will use any pesticide or fungicide they can purchase without any information about proper application.

Research conducted for this analysis showed that among smallholder vegetable farmers, both women and men have a role in resolving problems or conflicts in the community or in farmer groups. Men may take a more public leadership role, but women's "behind the scenes" leadership and input is significant. None of the households surveyed reported that financial decisions were solely delegated to the husband. Every woman interviewed had at least some authority over money, either making decisions with their husbands, or making them alone, especially in urgent situations or situations concerning the needs of their children.

LARGE FARMS WITH FARM LABOR

Large farms are not common in Timor-Leste, but two larger operations focused on vegetable production were identified. In Baucau approximately 10 hectares (ha) of land and in Loes approximately 24 ha are in vegetable production with a single businessperson leading each operation. These growers employ field

[31] Kmanek and the DAC project did not promote or influence the involvement of women in the contract farming operations.

labor at approximately $3 per day,[32] and use equipment such as tractors, backpack sprayers and spreaders, as well as irrigation systems. Production is sold to local traders or taken directly to Hali Laran market in Dili. The advantages that larger farms have over smallholders include the ability to use machines to reduce labor costs, rotate crops more effectively, grow more product, and mitigate losses from pests/diseases or other natural micro-disasters by spreading risk over a larger area and more crop varieties.

CONTRACT FARMERS

Contract farmers are similar to other smallholder vegetable farmers, but have better access to inputs and technical assistance. As described above, there are currently approximately 500 smallholder contract farmers. Contract farming agreements differ, but in general smallholder contract farmers may receive seed, fertilizer and pesticide from the commercial buyer partner. Their decisions about what to grow are made by the buyer, based on the seed distributed. Often in collaboration with donor projects, smallholder contract farmers receive technical assistance on production techniques such as raised beds, seedling nurseries, and compost. They receive some subsidies of materials and equipment, such as plastic tunnels or drip irrigation. They are introduced to new types of vegetables – for example, Kmanek contract growers produce 27 different vegetables, while the average smallholder vegetable farmer would grow 2-3 different crops.

Since contract farmers have a guaranteed, year round buyer and consistent access to inputs, their incomes are greater than the average smallholder vegetable farmer, and also greater than the national average.

CONTRACT FARMING INCOME COMPARISON

	Annual Median Income	Annual Average Income
Kmanek contract farmers (vegetable sales only)	$895	$1,025
National Average Rural Income (all sources)[33]	$384	$600

[32] The operation in Loes has 40 permanent and up to 25 seasonal workers. The operation in Baucau has 4 full time managers and 150 daily workers.

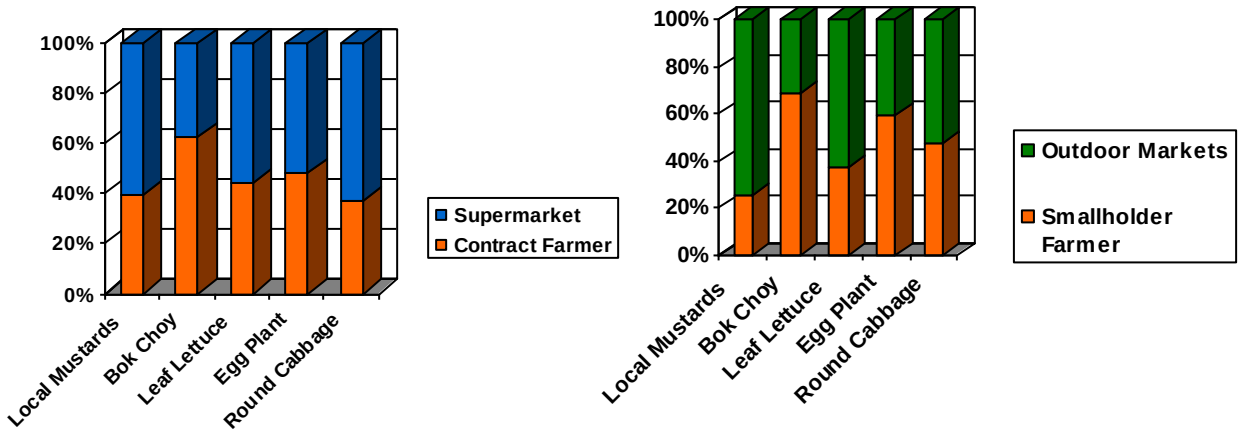
[33] Ministry of Finance 2011 National Household Income Survey http://www.dne.mof.gov.tl/TLSLS/HIES/HIES_2011/HIES_%202011/HIES2011_Report%20-%20Final.pdf, also available at http://laohamutuk.blogspot.com.au/2013/06/understanding-timor-lestes-context.html.

Household incomes will vary according to each farmer's land, water, ability and interest. The table below shows the highest and lowest annual incomes from a sample of 8 groups (total 164 farmers) in the Kmanek contract farming model. Each farmer had access to the same inputs and had been working with the program for at least 2 years.

SAMPLE OF HIGHEST AND LOWEST CONTRACT FARMER INCOMES

Five Highest Farmer Incomes	Five Lowest Farmer Incomes
$ 3,446.45	$ 36.00
$ 2,225.80	$ 195.40
$ 2,210.70	$ 195.48
$ 1,858.59	$ 219.20
$ 1,772.50	$ 234.31

A survey of five products currently in the market indicates that contract farmers are receiving 33%-47% of the supermarket retail price, with an average of 41%. Non-contract farmers receive between 24%-67% of the outdoor market price, with an average of 45%. The tables below compare the amount the farmers receive for their product to the final sale price amount from the vendors/supermarkets.



CONSTRAINTS TO INCREASING PRODUCTION

Knowledge and Training

Lack of good extension services or adequate education programs seriously restricts farmers output. Hard working vegetable farmers have no way to learn about modern agricultural techniques, most importantly integrated pest and disease management, improving soil fertility, using new or improved seed varieties, and techniques for year round production.

Input Supply

Timorese farmers cannot significantly increase their yields, or expand the months of production, without access to improved seed varieties, organic and chemical pesticides and fungicides, fertilizers and other soil amendments, and materials for irrigation and plant protection, along with the training on how to use these inputs. Plastic tunnels to protect vegetables from heavy rains, water pumps and other irrigation equipment, and organic fertilizer are all investments that would quickly result in improved productivity and incomes.

Poor Infrastructure

Especially for fresh vegetables, the poor road infrastructure creates a serious bottleneck to the growth of production in the Districts. If farmers have to carry their production in carts or with horses, they cannot produce more than they can carry. The lack of any electricity for cooling and the lack of storage capacity mean that farmers must sell their product as soon as possible after harvest, which also discourages larger production.

Irrigation systems are also a critical need for scaling up production of vegetables which are a water intensive crop. Government provided irrigation systems were destroyed during the final retreat of Indonesian forces in 1999, or have deteriorated since then due to lack of maintenance. Some farmers use innovative bamboo or canal systems, but knowledge, training and support is limited. Access to materials and use of drip irrigation is rare. Any larger scale irrigation solutions would rely on government funding and implementation.

Food Insecurity

It is difficult for farmers to allocate land to vegetable production when they face serious food insecurity every year. Although cash income from vegetable production can also improve food security, subsistence farmers are risk averse (particularly in relation to food security) and resist reducing their staple food production. Food prices can be volatile, and producing sufficient food for the household is a priority for Timorese farmers. Therefore, production is limited by the amount of productive land that farmers are willing to devote to vegetable cultivation.

OPPORTUNITIES TO INCREASE PRODUCTION

Contract Farming

Contract farming is one way to overcome the multiple constraints to improving production. Contract farmers have the benefit of a steady supply of inputs, a dependable market, and a stable price for their crops. They also benefit from technical assistance (currently subsidized by donor projects). Contract farmers, with steady income and a secure market, have the cash and the confidence to invest in their operations and increase production by purchasing irrigation equipment, plastic tunnels, commercial fertilizer and other inputs.

Consistent Annual Production

Being able to produce a range of vegetables during the whole year is possible with the right knowledge and equipment. Farmers need training in the use of irrigation and water storage systems to enable dry season production and in the use of protective plastic tunnels and drainage systems for production during

the intense rains. These simple and affordable changes would have a large impact on farmer incomes and supply of vegetables.

Education and Training / Agriculture Technical

Some pieces are in place to support improved agriculture technical knowledge for the horticulture industry, but all of them need to be expanded and strengthened. The National University of Timor-Leste (UNTL) and the Universidade Oriental Timor Lorosae (UNITAL) offer degrees in Agronomy and Agribusiness but does not provide specialized horticulture training. Dili Institute of Technology (DIT) has an agribusiness diploma, and National University da Pas (UNPAS) has an agriculture technology diploma. East Timor Coffee Institute offers an agronomy degree also considered a university level diploma. Technical agriculture high schools are located in Maliana (Bobonaro), Natarbora (Manatuto), Suai (Covalima) and Fuiloro (Lautem), and include specific coursework and practical experience in horticulture. The National Employment and Vocational Training Center (CNEFP) in Tibar has a strong horticulture program, but the number of students is minimal (less than ten in each six month program). In Hatubuliko, the Rae Hatu Foundation is planning a vocational training center for organic horticulture. SEPFOPE has announced the establishment of a horticulture training center in Leorema (Liquica). Farmer Field School and other farmer trainings are provided by donor programs and NGOs.

In terms of agriculture extension, the Ministry of Agriculture with support from donors is continuously working to improve the skills of the extension service, but very little of that capacity building is focused on vegetable production.[34] With only one extension agent per suco, specialization is not possible at this time. Donor programs such as the USAID DAC project and Mercy Corps make a conscious effort to include MAF extension agents in their horticulture trainings, but more needs to be done.

Education and Training / Agribusiness

Transforming subsistence farmers' practices to meet the demands of a commercial market requires more than improved agricultural techniques. It requires changing behavior around the traditional seasonal planting calendar and developing the capacity to manage vegetable production as a small business. Making agribusiness training available more widely for farmers and farmer groups is important.

[34] MAF Rural Development Program Phase 4 implemented by GIZ and Camoes provides overall capacity building; Seeds Of Life funded by AusAID engages extension agents with focus on improving support to informal seed producer groups and improved seed users; FAO supports improving extension service role in food security monitoring

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the DAC project and Timor Aid have developed two versions of an important "Agricultura Nudar Negocio" or "Farming as a Business" training that helps farmers to transition to market production. This training is available for any donors or NGOs through Timor Aid, and GIZ will be using it in the extension program and agriculture high school training programs. Students at the agricultural high schools also benefit from the USAID developed "Building Agribusiness Capacity in East Timor (BACET)" curriculum and the GIZ Young Farmers Program. The Government of Timor-Leste Institute for Business Support (IADE) provides a one week Start Your Business Training for the agriculture sector, and a two day training on price setting and contract farming for horticulture farmers.

Credit

To make investments in their small businesses, farmers need access to credit. Fortunately, vegetable production can provide continuous weekly income, allowing farmers to pay back loans regularly without requiring a grace period. The Timor-Leste National Commerce Bank (BNCTL) has recently begun lending to Kmanek partner farmers for the specific objective of purchasing agricultural equipment that will increase their yields and incomes from their farming activities. Vegetable producers are an excellent potential market segment for other microfinance institutions in Timor-Leste.

Improving Input Supply

As described in the Input Supply section, improving access to seed, fertilizer, pesticides, materials and equipment is vital to increasing the area in vegetable production and improving yields.

Improving Food Security

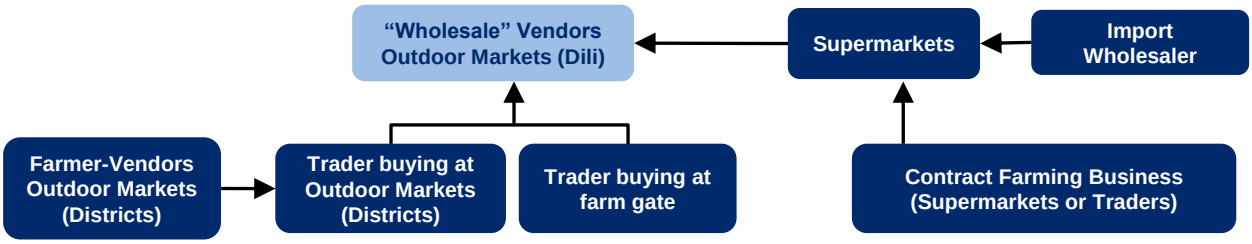
Improving political security, stability, and economic growth along with improving staple crop yields will all contribute to improved food security for Timorese farmers. As security, stability, and economic growth lead to increased incomes and improved access to stable food supply, vegetable farmers will be more comfortable using more of their productive land for vegetables. This will be the foundation from which commercially oriented larger scale vegetable production can be built.

MARKETING

Marketing of fresh vegetables in Timor-Leste currently addresses domestic markets only - there are no exports. The marketing chain for fresh vegetables is short and lacks consolidation points. Farmers and small/mid-size traders sell directly to retail vendors. Unlike in more developed markets, the value chain in Timor-Leste does not include multiple layers of "middlemen" that consolidate and distribute produce, such as larger inter-city traders or wholesalers. Contract farming operations are vertically integrated, purchasing, transporting, and selling vegetables wholesale and retail.

Non-contracted buyers and sellers lack market information. They do not make agreements to trade according to specific type, quantity, or quality of product. The vast majority of trading is simple open market transactions, and market research indicates that almost all available products are sold. There are no clear grading or quality standards, although very poor quality produce may get a lower price.

VALUE CHAIN LEVEL 3: MARKETING - TRADERS & WHOLESALERS



FARMERS

Timorese vegetable farmers usually market their own limited produce individually, and in that sense are "traders" also. This activity is almost always done by men. They often bring their product (walking with carts or using horses) directly to local markets where they may sell to retail vendors or directly to consumers. They may also bring their product to the nearest main road where they can sell it to a trader, or take transportation themselves to a larger market. If they live near enough (within several hours walk) to a larger population center, they may sell their product directly by walking around the city with their vegetables carried on poles over their shoulders. Farmers do not sell their product to truck drivers and do not send product unaccompanied to the market.

Individual farmers may have regular arrangements to sell their produce to specific traders. This agreement is called a "langganan", meaning a regular, on-going business relationship in which prices and quantities are discussed in advance. In rare cases, traders may even provide seed to farmers. However, these arrangements are not very common or consistent.

SMALL TRADERS

Small traders based in the Districts buy product from farmers at local and roadside markets, and pay for truck transportation to bring the product to the nearest large city market. Produce is packaged in large sacks or buckets, or rolled into large tarps. These traders may either sell their product to retail vendors with stalls at the city market, or set up outside the "official" market displaying their produce in sacks, buckets or tarps on the ground. Although detailed research could not be conducted nationwide, the research team's knowledge of small traders in Aileu shows that most of these traders are women. This is also supported by the findings of the BOSS project horticulture value chain research in Ainaro.[35]

MID-SIZE TRADERS

Traders servicing the markets in larger cities such as Dili, Baucau, Maliana, and Los Palos, will collect produce from farmers in outlying areas, either at the farm gate or at smaller local markets. They will sell directly to retail vendors in the outdoor markets. Research did not identify any other "middlemen"

[35] "Surprisingly the majority of individual small-scale collectors/retailers interviewed are women in the age range of 25-30." Report on Value Chain Analysis of the Horticulture Sector in Ainaro District, Timor-Leste, BOSS project funded by Irish Aid and implemented by ILO and IADE, 2012

relationships, such as wholesalers buying from multiple smaller traders, or traders in one city selling to traders in another city. Research also did not identify any contracts or agreements between traders and large buyers, such as restaurants, hotels or catering companies.

Typically, traders will travel to the Districts once, twice or three times a week, particularly around market days. Traders travel to the District on a bus, and then rent trucks (called an angguna – typically an open bed truck, some with benches, that will carry almost anything or anyone for cash) to drive them through agricultural areas to collect vegetables; no traders who owned their own truck were identified in the research for this report. The traders travel on the truck buying the produce themselves and they accompany it back to the markets, typically to Hali Laran. If traders believe they cannot buy or sell enough produce to justify the cost of renting an entire truck themselves, they will work with other traders and split the cost. Because each trader can only be on one truck at a time, they rent only one (or part of one) truck per trip. Traders interviewed did not envision the possibility of scaling up by hiring staff and renting multiple trucks.

Mid-size traders' business turn-over ranges from $400 to $1,000 per week. They buy whatever is available, usually paying cash immediately. Given the limited supply, traders often compete with each other to buy product which results in higher prices to the farmers. As described above, traders may have "langannan" agreements with farmers in specific areas, and in rare cases may even distribute seed. The research did not reveal any credit arrangements between farmers and traders.

In the Dili market specifically, traders bring the product to the main market, Hali Laran, for sale to retail vendors. Retail vendors from markets throughout the city come to this main market to buy product, either directly from the traders or from the Hali Laran vendors. It is common for traders to have on-going langannan relationships with specific retail vendors, who will receive "first pick" of the available product.

The research team identified 62 mid-size Dili traders, and selected 4 for in-depth interviews. In trading women are well represented, despite the challenges posed by travelling regularly away from home and family responsibilities. Of the 62 traders, 68% were men and 32% women. The majority traded from Aileu, Ainaro and Baucau, with smaller numbers working in Ermera, Bobonaro, Lautem. Traders interviewed identified two main constraints to growth: a lack of working capital and a lack of available product. The table below summarizes traders' business costs and volumes.

District	Male	Female	Total	Transport Cost Bus to District (per person)	Transport Cost Truck to Dili (per 30kg sack)	Transport Cost Truck to Dili (rent whole truck)	Average Purchase (rough estimate of kgs)
Aileu	8	6	14	$4.00	$2.00	$120.00	8-12 sak 240-360 kgs
Ainaro	14	2	16	$14.00	$2.50	$150.00	20-25 sak 600-750 kgs
Ermera	5	2	7	$6.00	$1.00	$100.00	10-15 sak 300-450 kgs
Bobonaro	4	2	6	$16.00	$2.00	$150.00	15-20 sak 450-600 kgs
Baucau	8	4	12	$8.00	$1.00	$120.00	18-25 sak 240-360 kgs
Lautem	3	4	7	$16.00	$1.50	$200.00	20-25 sak 600-750 kgs
Total	**42**	**20**	**62**				

CONTRACT FARMING

Contract farming operations purchase product from individual farmers or farmer groups, and provide their own transportation to Dili. These businesses use cool box trucks to maintain quality. Refurbished cool box trucks require an investment of $30,000 - $50,000. Company cost estimates of the cost of bringing one cool box truck from Maubisse or Aileu to Dili range from $75 to $55, and from Ermera $35. Given the terrible roads, maintenance and repair costs on the trucks are very high.

Some of the contract farming operations sell their products directly in their own supermarkets (Kmanek and Dilimart). Others sell to supermarkets or restaurants and hotels. The large container ships docked at Dili port are another market served by contract farming businesses.

WHOLESALERS

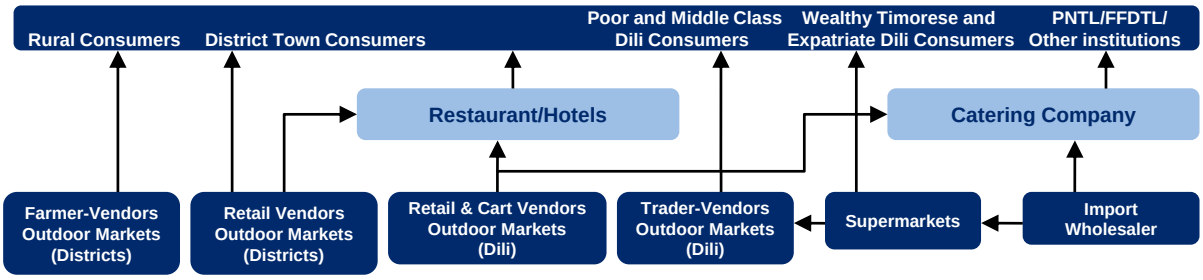
For domestic produce, there are no “true” wholesalers, that consolidate large quantities and re-sell at a wholesale (lower than retail) price. The largest outdoor retail market in Dili, Hali Laran, could be considered a wholesale market where many traders arrive from the Districts to sell their produce, and where retail vendors from smaller markets in Dili come to purchase inventory. In the Hali Laran market, larger retail vendors will serve a “wholesale” function when they sell to vendors from smaller neighborhood markets or to cart vendors at a negotiated price that is slightly less than retail. 14% of vendors in Hali Laran market reported selling as a “wholesaler” to other retail and cart vendors.

Imported vegetable wholesalers include one regional firm that deals exclusively in fresh produce (Posha Imports), supermarkets, and general wholesalers. These wholesalers sell imported produce to restaurants, hotels, catering companies, supermarkets, and outdoor market vendors.

PROCESSING

The main steps in processing fresh vegetables are grading, washing, trimming and packaging. In the outdoor markets vegetables are washed and trimmed, and simple grading is done, mostly for size. The cart vendors wash, cut, and package varieties of vegetables together into plastic bags. For the contract farming businesses, washing is often done on the farm before sale. Grading is done by the contract farming buyer on the farm before purchase. Trimming and packaging are done in Dili at the supermarket sites. The Fini Diak group in Liquica has trained farmer groups to trim and package their own products for sale to Pateo Supermarket. In this analysis of the fresh vegetable value chain, we do not consider other vegetable products such as chips, sauces, etc. which are produced on a very small scale in Timor-Leste.

VALUE CHAIN LEVEL 4: MARKETING - RETAILERS



There are three retail segments for fresh vegetables. Outdoor retail markets, supermarkets, and food service firms (catering companies/restaurants/hotels) all sell vegetables to the final consumer.

OUTDOOR MARKET VENDORS

Outdoor markets exist in every town and city. Vegetables may be available most of the time, but there will also be one or two days during the week commonly known as “market day” where there is much more available for sale. Roadside markets are also common at major intersections, particularly where the secondary road to a vegetable producing area meets the main road.

Outdoor markets are very basic, without any cooling, storage, or hygiene facilities. In some markets, concrete stalls in an open air concrete market buildings have been provided by the government. Around those stalls, and outside of the market building, vegetables are simply sold from a cloth on the ground, or from a bamboo table. Some markets are constructed wholly of bamboo or wood tables, sometimes with a zinc roof over the area.

In the retail segment, women vegetable sellers dominate the outdoor markets in Dili and the Districts. In Dili, 77% of the outdoor market vegetable vendors are women. Women and their children often live in the markets, sleeping at their stalls and using public bathroom facilities. The majority of their incomes are sent back to their families in the Districts. The vast majority of cart (gerobak) vendors, however, are male.

Vegetables are sold by units, not by weight. Depending on the vegetable, sales may be made by the piece, bunch, pile, bucket, sack, etc. Prices per unit in any given market are relatively consistent. Price increases are generally implemented by reducing the size of the unit while selling for the same price, rather than by increasing the price of the same size bunch or pile.

Retail vendors in small District markets generally wait for farmers to bring product to them for sale. They don’t travel to farming areas to buy products. In larger cities, retail vendors may buy from farmers or from traders that bring product to the market, but they may also take on the role of a trader and do more active buying at the farm gate for later sale at their retail stall.

Networks of retail vendors work together to make bulk purchases from traders, and divide the product among themselves. These networks are often linked to specific traders who deliver the available produce on a regular basis. In Dili, these networks of vendors are usually working in Hali-Laran market. They have their own retail stalls, but they also sell to smaller retail vendors from other outdoor markets or from neighborhood kiosks.

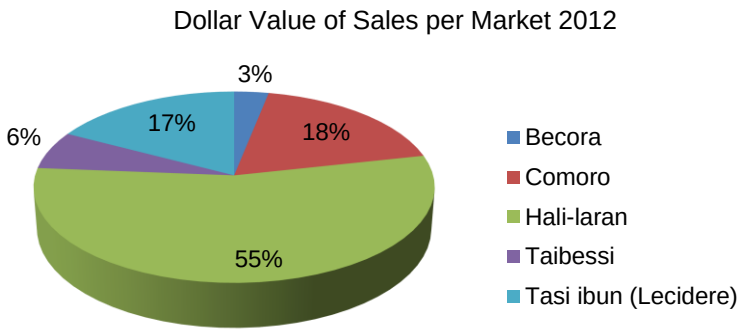
Farmers may also sell their product retail – directly to consumers. If they live near enough (within several hours walk) to a larger population center, they may sell their product directly by walking around the city with their vegetables carried on poles over their shoulders. This activity is almost always done by men.

A final actor in the outdoor market retail segment is the cart (gerobak) vendor. These cart vendors are usually linked to specific retail vendors – sometimes they are their children – and are almost always men. The cart vendors buy their inventory at Hali Laran market in the very late night/very early morning. They trim and package the vegetables in plastic bags, even making mixed packages of different vegetables. They spend the day walking through residential areas, or congregating in front of supermarkets, or gathering in specific areas that are known as vegetable selling areas - the former Comoro Market area, Kampung Alor (near the mosque), and in front of the Presidential Palace. The gerobak vendors include battery powered music and lights on their carts for night sales. Research indicated that there are more than 100 cart vendors in Dili. Cart vendors daily inventory purchases range from $41-$132, and they have an average daily turnover of almost 100%.

Market Research Results from Dili Outdoor Market Vendors

Market research in Dili identified a total of 315 retail vegetable vendors in five local markets: Hali Laran, Becora, Comoro, Taibessi, Tasi Ibun.[36] 270 of the vendors (86%) participated in the study. Of the 270 vendors, the overwhelming majority are women (208 women, 62 men). The great majority of the vendors (237) range in age from 20 to 50 years old. Only 13 are younger than 20 and 32 were older than 50.

DISTRIBUTION OF SALES PER MARKET 2012



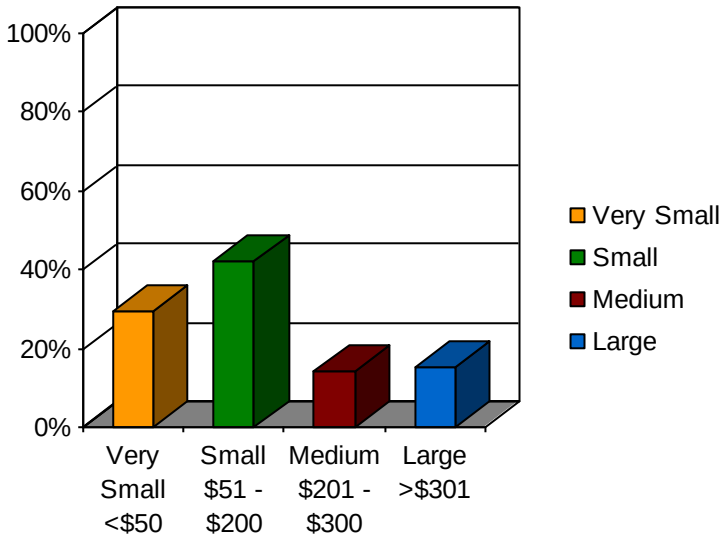
ANNUAL SALES ESTIMATES 2012

Market	Kg	($)
Becora	258,153.55	$244,493.43
Comoro	1,055,432,.05	$1,443,392.50
Hali-laran	3.586,990.05	$4,280,086.73
Taibessi	517,655.78	$504,121.58
Seaside (Lecidere)	715,796.03	$1,353,790.48
Total	6,134,018.45	$7,825,884.70

[36] Between the first and second round of the market research, one of the major vegetable markets, Comoro market, was relocated to Manleuana. The relocated market was not thriving at the time of the second round of research, but the research team identified many of the Comoro vendors dispersed across the city. As of September 2013, the "Comoro market" seems to be re-establishing itself on the opposite side of the street!

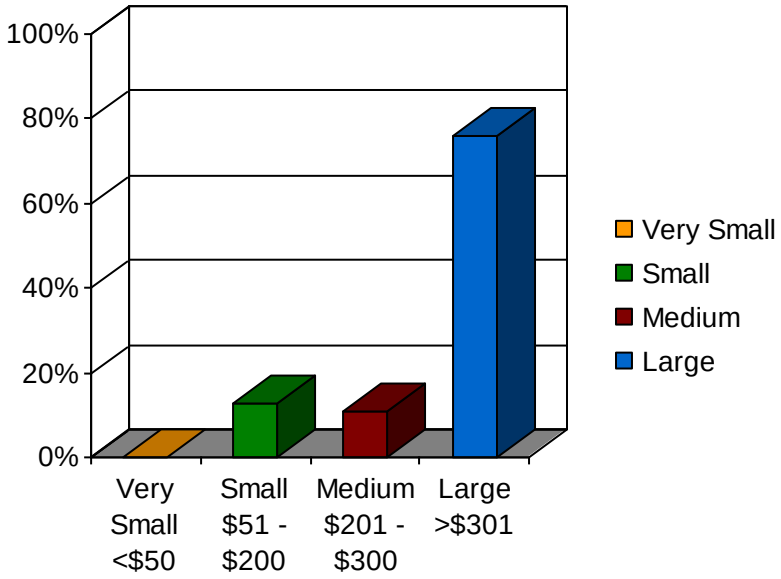
The following chart illustrates what vendors reported about the size of their businesses. Business size was based on the vendors' average reported inventory purchases per week, ranging from very small at less than $50 per week to large at over $300 per week. This chart combines results from wet season and dry season.

VENDORS REPORTED BUSINESS SIZE



However, the in-depth market research, which measured the actual inventory purchases and retail sales of a representative sample of vendors, showed a very different result. We selected our representative sample according to the chart above. However, the table below shows the results from the representative sample of 46 vendors, combining results from wet season and dry season.

VENDORS ACTUAL BUSINESS SIZES



The market research results from the 46 vendors shows weekly inventory purchases of $56 to $1,110 in the wet season, and $151 to $1,189 in the dry season. Using these ranges to calculate annual totals, we can estimate annual inventory purchases of $5,382 to $59,774.

Vendors costs include rent for the stall, water for washing and freshening vegetables, electricity, payments for security, cart transport for the inventory from the truck to her stall, plastic bags for customers, labor, or losses for vegetables she does not sell (15%-25% industry average). A sample of these costs as reported by vendors is shown in the table below. In Hali Laran market, no rent is collected but vendors are compelled to pay for “security” provided by local gangs that control different sections of the market. These costs can range from $1,000-$4,000 per year.

OUTDOOR MARKET VENDOR ESTIMATED EXPENSES

Monthly Costs	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Vendor 6	Vendor 7	Vendor 8
Water for washing/freshening vegetables	$30.00	$30.00	$30.00	$45.00	$45.00	$30.00	$90.00	n/a
Plastic bags for customers	$15.00	$120.00	$60.00	$100.00	$180.00	$15.00	$60.00	$45.00
Pay cart for transport vegetables from truck stop to stall	$16.00	n/a	$60.00	$45.00	$30.00	$16.00	$50.00	$30.00
Food for family	$75.00	$450.00	$210.00	$90.00	$180.00	$75.00	$210.00	$90.00
Pay to use wash room (toilet/shower/wash clothes)	$22.50		$20.00	$45.00	$22.50	$22.50	$22.50	$22.50
Electricity	$5.00	$5.00	$2.50	$5.00	$5.00	$5.00	$2.50	$5.00
Stall rental	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Car rental for buying vegetables	n/a	n/a	n/a	n/a	$62.50	n/a	n/a	n/a
Security payments	$100.00	$300.00	$200.00	$200.00	$300.00	$100.00	$200.00	$100.00
Labor	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00
Total	$353.50	$995.00	$672.50	$620.00	$915.00	$353.50	$725.00	$382.50

Notes:
Water costs = $1.00 per 50 liter delivered
Security payments are contributions to the neighborhood gang that controls each section of the market.
Payments are collected sporadically to support ceremonies, funerals, etc.
Vendors report annual security payments totaling $1,000-$4,000 depending on the size of business
Wash room costs = $0.25 toilet use, $0.50 shower, $1.00 wash clothes
Vendors in Dili markets often live, with their children, in the market.

The next table shows the average gross margin for a sample of vegetables (combining wet season and dry season results). Gross margin is the difference between what the vendor paid for the vegetables, and what they sold them for. It does not include all of the costs shown above.

HIGHEST GROSS MARGIN VEGETABLES

Vegetables	Average Gross Margin
Cauliflower	203%
Papaya Flower	168%
Chayote	158%
Chili	149%
Papaya Fruit	139%

During the wet season, when product is abundant, prices are low, and sales are high, the average gross margin for all vegetables is 112%. As supply shrinks in the dry season and prices increases, the vendors' gross margins are reduced to 81%.

Using the data above, we can make some very general estimates of revenue and income for outdoor market vendors. Detailed calculations are shown in Annex 4.

	Median Business	Smallest Business	Largest Business
Annual Revenues (estimated from inventory purchases minus 25% wastage plus gross margin)	$32,746	$7,645	$87,874
Gross Income (revenues minus inventory purchases)	$16,074	$3,608	$43,034
Other Costs (see Annex 5)	$7,440	$4,242	$11,940
Net Income	$8,634	($634)	$31,094

Other Costs includes labor cost at $3/day. As shown above, the smallest business loses money if this cost is subtracted, showing that the smallest businesses' profits return less than $3/day to the vendor.

SUPERMARKETS

There are seven large supermarkets in Dili with cold storage for fresh produce.[37] Many smaller supermarkets, serving a lower income customer base, do not sell fresh produce but often have large numbers of vegetable cart vendors outside their stores.

The seven large supermarket retailers sell a combination of domestic and imported produce. Several supermarkets have linkages to local suppliers such as Josephina Farms, and their domestic produce is labeled as such. Kmanek and Dilimart have their own contract farming operations. Pateo is linked to the Fini Diak producer groups in Liquica, and to Josephina Farms. All supermarkets report a preference for selling local produce, but the problems of limited production and inconsistent quality make it extremely difficult to do so regularly.

The research was unable to gather data on supermarket vegetable sales quantity. However, according to the DAC project Kmanek Supermarket contract farming operations produced 150 tonnes of fresh

[37] Lita, Leader, Kmanek, Landmark, Pateo, Jacinto, and Dilimart.

vegetables in 2012. As the largest local produce retailer, it is important to notice how this volume compares with the estimated Dili outdoor market sales volume of 6,134 tonnes.

Supermarket retailers offer clean and well lit shopping spaces, cold storage for produce, and convenient packaging. Supermarket customers are generally from the growing Timorese middle class (businesspeople, civil servants, staff of international organizations), and expatriates. Supermarket prices are typically higher than local outdoor market prices for similar product. The exception can be found at Kmanek Supermarket, whose brand/market position has always been "the lowest price." As a result, Kmanek's pricing is competitive with the outdoor markets.

FOOD SERVICE

The food service sector is mainly divided among restaurants, hotels and catering companies, with a small additional market segment serving the many large container ships docked at Dili port. The normal purchasing behavior for the food service companies is to buy directly from outdoor markets on a daily basis. They do not have on-going arrangements with fresh produce traders or vendors and report great difficulty in sourcing the quantity, quality, and diversity of vegetables that they need throughout the year. Therefore, many will buy imported vegetables from supermarkets or importers.

Catering Companies

DAC market researchers interviewed three catering companies: Nelayan, Caimaleloqui and Cadoras. The catering companies bid on government contracts to provide meals to the military (F-FDTL), the national police force (PNTL), and the National Hospital. Catering companies report spending $ 20,000 to $ 30,000 per month on fresh produce. This is approximately 10% of all vegetable sales in the Dili outdoor markets. The companies generally send staff to the local outdoor markets to purchase vegetables on a daily basis. A perception exists in the catering community that supermarket prices are high and the quantity is not sufficient to meet their needs. However, catering companies will purchase from supermarkets those products that are not available in the local markets such as broccoli and red cabbage. During interviews, the catering company executives did not indicate they would import produce themselves, preferring to buy from an importer such as Posha Food Industry or Kmanek.

Catering companies operating in Dili do not have on-going supply arrangements with fresh produce traders or vendors. Caimaleloqui reported that they had attempted to establish these sorts of relationships without success; there were no traders or vendors that could ensure adequate supply at a competitive price to satisfy the caterer's needs. In 2012, IADE and DAC project worked together to facilitate business matchmaking meetings between catering companies and vegetable traders. From the traders' perspective, the prices offered by the catering companies did not provide enough incentive for them to abandon their normal

practice of selling to Hali Laran market vendors. The traders did not plan to expand their businesses further in order to serve both markets (see constraints below).

Catering companies are constrained by their contract pricing, which was unrealistic for the procurement of the quantity and consistency of fresh produce they need. In the current market, buyers actually have to pay a premium to obtain large quantities and consistent supplies throughout the year. The catering companies' bid pricing did not anticipate these costs. It would be helpful for the government to provide better oversight of the bids to ensure that they are reasonable for delivering the product, and to sanction firms that do not fulfill the contract requirements because they bid too low.

Restaurants

DAC market researchers interviewed eight restaurants classified by type of cuisine and customer base (Chinese/Timorese, Padang, Chinese, Asian, and European). Restaurants reported average monthly produce purchases of $715. Similar to the catering companies, most restaurants do not have on-going arrangements with fresh produce traders or vendors, but send staff to the local outdoor markets to purchase vegetables on a daily basis. They also source imported vegetables from supermarkets, using both fresh and frozen vegetables.

CONSTRAINTS TO MARKETING

Working Capital

Traders and retail vendors identified lack of working capital as a constraint to expanding their businesses. Traders need cash for purchasing vegetables and for transportation costs. Retail vendors must also pay cash at the time of purchase and are limited by their cash on hand. None of the traders or retailers interviewed had staff – working capital could also be used to pay salaries so that businesses could grow.

Difficulty Identifying Sources of Supply

Identifying supply sources is difficult due to limited and expensive telecommunications and bad roads. The lack of business orientation of most farmers limits their ability to pro-actively market their product or form on-going supply relationships. As a partial solution to these problems, traders develop informal networks and learn what products will be available where and when. Retailers learn which growers and traders they can rely upon to supply them. However, incomplete information leads to constant gaps between supply and demand.

Infrastructure

Poorly maintained or non-existent roads increase costs of transportation dramatically. The quality of vegetables is reduced drastically because of the time required for transportation under hot, humid, and rainy or dusty conditions, as well as the physical damage from constant bumps and shocks.

OPPORTUNITIES TO IMPROVE MARKETING

Sales in Kilos

The contract farming models are changing how the produce trade is conducted in districts and in Dili. Rather than buying by units (number of pieces, or a container such as a sac or bucket), the purchasers are

buying product by the kilogram. This system is more transparent and consistent.[38] It has been very popular with the farmers who feel it is clear and fair. Although small scale trading and retail sales may be managed easily enough using the count (number of pieces) or volume (size of sac/bucket/pile) methods, larger volume trading would require the transparency and control of a kilo based system. A kilo system would facilitate formal or informal "contracts" or agreements, since the quantity required would be clear and easy to verify by buyer and seller.[39]

Identifying Supply Sources

The contract farming model provides a solution to the problem of identifying supply sources. Kmanek, Dilimart, and other retailers are developing their own supply chains through the contract farming model which, through the supply of inputs, gives them some control over supply. The spread of communication technology can also change the way supply sources are identified. As cell phone and internet services proliferate and become more affordable growers, traders, and retailers will be able to communicate supply and demand more efficiently. Buyers would no longer have to travel to each farm or market to find out what was available. They could target their purchases to match their demand, rather than simply buying whatever was available. They could better inform growers of their purchasing requirements in advance, and therefore ensure larger scale and more consistent supply to their customers.

Business Expansion / Access to Credit

Trading in larger quantities, and wholesaling, would help to meet some of the large, unmet demand in the market and encourage large buyers such as supermarkets and catering companies to use domestic produce instead of imports. Traders interviewed for this research did not express a keen interest to expand – it seemed outside their capacity to plan and implement. Business support services might be able to assist some more entrepreneurial traders to grow their businesses. Access to credit from BNCTL, Moris Rasik, or other financial service providers would be critical for expansion.

[38] In the United States and Canada, sales by count (number of pieces) and volume (size of package) are clearly defined and enforced through regulation and regular business practice.

[39] A "sales by weight" system would be easy to implement between buyers and sellers. Eventually, very large scale trade with more middlemen would require the creation of a weights and measures inspection and enforcement authority at either the national or District level.

ENABLING ENVIRONMENT

The enabling environment is all of the public sector laws, policies, and projects that impact the fresh vegetable value chain. This analysis includes government and donor activity as part of the enabling environment. The enabling environment also includes overall conditions in the country that impact the value chain, such as the education sector, security, stability, and economic growth.

ENABLING ENVIRONMENT FOR AGRICULTURE

Issues of public sector impact on agriculture generally include:

- Security and political stability improving which encourages longer-term planning and investment
- Economic growth brings increasing demand for agriculture products, which drives growth in all value chains
- Lack of land law and secure land title for all farmers discourages investment, limits use of land as collateral for investment credit, and limits land leasing or purchasing for larger scale production
- Weak MAF extension services limit farmers' technical knowledge and problem solving
- MAF and donor program subsidies of equipment and inputs that are meant to catalyze improved production create a culture of reliance on government subsidies and discourage commercial input/equipment supply
- Lack of soil testing facilities limits appropriate site selection and use of soil amendments to improve yields
- Poor quality education at University level with little practical, experiential learning
- Poor infrastructure including roads and irrigation systems

ENABLING ENVIRONMENT FOR VEGETABLE PRODUCTION

Some enabling environment issues have a more direct or specific impact on vegetable production.

Good Agricultural Practices (GAP) and Organic Certification

GAP and organic certification would create and publicize standards that could improve quality and safety of vegetables for the domestic market, and facilitate access to export markets. Both GAP and organic certification programs can be costly to create and administer but there are many international bodies such as Quality Assurance International, OneCert International, and Bureau Veritas Group, which provide these services. In addition, some governments, Singapore for example, partner with countries in bilateral inspection and certification agreements.

Regulation for Vegetable Trade

To effectively encourage trade, regulations must protect the parties involved without hindering the flow of commerce. An example would be the United States' Perishable Agricultural Commodities Act (PACA) that sets the ground rules for fresh market trade and creates a dispute resolution mechanism.

Specialization in Horticulture in Education Sector and MAF Extension

Expanding horticulture specific training in the agriculture technical high schools and establishing a horticulture specialization at UNTL, DIT, and UNPAS would create a large number of farmers, trainers, and extension agents with the right skills and knowledge. It is important that these students also receive practical internships, whether through MAF, private sector firms, or donor programs working in horticulture.

The current MAF extension structure assigns generalist extension agents at the suco level. Creating "roving" extension agents with specialized horticulture knowledge that could train extension agents nationwide and also provide direct technical consulting in the fields, could improve the quality of extension support to vegetable farmers.

Infrastructure

Fresh produce must move quickly from farm to market. Repairing and maintaining decent road access throughout the country is vital. Fresh produce requires consistent cooling, which requires reliable and affordable electricity. Vegetable production is water intensive, and requires improved irrigation systems.

A specific investment in infrastructure has been the MAF funded construction of 4 greenhouse complexes for commercial horticulture in Hatubuliku, Ululefa, Remexio and Ermera. Unfortunately, as of June 2013, none of the greenhouses are operational.

Sanitary/Phytosanitary (SPS) certification

SPS certification would facilitate the development of an export market for Timor horticulture, but is not yet established. In mid-2010, the World Bank conducted an assessment of current SPS Certification capacity and outlined the steps necessary to develop this critically important role for the National Directorate of Quarantine and Bio-Security (NDQB). The NDQB has developed a comprehensive plan with costing for all the prerequisites and basic requirements to establish basic SPS Certification capacity, but no budget is yet allocated.

DONOR ACTIVITY IN HORTICULTURE

There are three main types of donor activity in the horticulture sector: donors supporting commercial horticulture; donors supporting horticulture for improved nutrition; and donors supporting training programs (described elsewhere in this report). Annex 6 provides more detailed information on specific donor programs.

Commercial Horticulture

Donors supporting commercial horticulture emphasize market linkages, ensuring that production meets end market demand and that a commercial buyer commits to long term engagement with producers. This requires technical assistance for the farmers and for the commercial buyer. Programs that do not build the

capacity of the buyer generally have weak performance, with inconsistent purchases leading to discouraged farmers and limited production or scaling up.

The most successful model for supporting commercial horticulture has been the contract farming model, which requires intensive commitment of resources from the buyer. Donor approaches to building these systems has varied, from providing significant subsidies for extension services and equipment grants to farmers (USAID), to providing some material support and technical assistance to the buyer only (ILO), to simply facilitating the market linkage (World Vision).

A "lighter touch" commercial linkage model in which buyers commit only to purchasing available product that meets quantity and quality standards has been used successfully by the Spanish Cooperation and BFZ (through Chamber of Commerce). However, since the buyer does not drive the production activities, the results have been less consistent and much smaller scale.

Horticulture for Improved Nutrition

Donors supporting kitchen gardens or community gardens with the main purpose of improving household nutrition have played a large role in distributing free seed and providing training. There have been some disappointing results for both farmers and donors. These programs generally don't have strong horticulture training programs, resulting in poor production results. The quantity of seed distributed often doesn't make sense for household consumption alone. Farmers will plant all of the seed, but not have a market – often mistakenly assuming that the donor program will purchase the product. After one season of planting with free seed, the activity generally ends.

Some programs that provide more intensive engagement with farmers and stronger horticulture training, such as Hiam Health and Mercy Corps, are now getting better results. However, they are also often disappointed that the vegetable production is sold in order to purchase more rice or other less nutritious foods. There is a serious need for nutrition education to accompany vegetable production – this need should be considered for the commercial horticulture programs as well.

CONCLUSION

This value chain analysis provides a broad overview of the current fresh vegetable market in Timor-Leste. Good business opportunities are already available, and as problems are solved at each level of the value chain all of the businesses can grow – including the "businesses" of smallholder farmers. Many farmers, traders, vendors, private sector businesses, donors, NGOs and government can play different roles in helping to improve the value chain. This report can help all actors to understand better how all of their activities fit together. The Horticulture Working Group convened by the Ministry of Agriculture and Fisheries can help everyone involved to prioritize problems and take responsibility for finding solutions.

ANNEX 1: UNDERSTANDING VALUE CHAINS

The concept of a *value chain* is used to understand how products are created and sold. A value chain includes the whole series of linked activities that bring a product from inputs (raw materials), through production and processing, through trading and marketing, to the final consumer. It is called a "value chain" because each step in the process *adds value* to the end product.[40] On the next page is a general diagram of a value chain. Notice that the very top of the diagram is the "Consumer – End Market". This is important because it shows that the end market is the most important part of the value chain – everything that producers, processors, traders and seller do should target what the consumer wants, in terms of quantity, quality, and price. This will maximize the sales and profits of the whole value chain.

In addition to directly creating or marketing a product, all value chains also rely on support services such as advertising companies or banks that give loans. These *support services* are not directly involved in the production and sale of the product, but they are important to understand the value chain. Also important is the *enabling environment*, or the role that the government or donors play in the value chain. Examples are the laws or regulations affecting businesses, policies about taxes and imports/exports, or government and donor support for infrastructure improvements and for the development of the private sector.

Value chain analysis (like this report) collects information about all of the production and marketing activities, studying each step, interviewing all of those who are involved in the value chain from beginning to end, and using the results to explain problems and provide solutions.[41] Value chain analysis can help to improve how a value chain works, so that all of the businesses in the value chain can increase their competitiveness and improve profitability.

Value chain analysis tries to explain *what* is happening, but also *why*. To understand why, we need to understand the how the "market" is working – are supply and demand matching up at each step of the value chain? If not, why not?[42] We also need to understand the relationships between businesses at each step of the value chain. The analysis should help to explain:

- How do businesses work together? Do businesses trust each other? Do they have continuous relationships, or just buy and sell to anyone?
- Do businesses share information? Is it easy to identify businesses in the value chain? Do businesses know about supply and demand, and about prices at each step in the value chain?

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[40] For example, a farmer buys seeds and fertilizer, and through his labor is able to create a vegetable that he can sell for more money than he spent on the seeds and fertilizer. This is his profit, or "added value".

[41] For a helpful overview of value chains and development, see USAID's Value Chain Wiki at http://microlinks.kdid.org/good-practice-center/value-chain-wiki

[42] For example, farmers have difficulty getting inputs such as seed and fertilizer. That is "what" is happening. To understand "why", we need to understand that even though there is a big demand for seed in the Districts, the input suppliers are mostly in Dili. They do not carry any consistent supply of seed, because there isn't a lot of demand in Dili. It's too expensive for farmers to come to Dili to buy inputs. This is a problem that needs a solution!

- Which parts of the value chain have more bargaining power? Do the producers, or the traders, or the retailers have the most power? Which businesses get the greatest share of the profits? Why?

One type of value chain is a food value chain. A food value chain would include all of the activities needed to bring farm products to consumers. These can include:

- Providing inputs like seed and fertilizer
- Producing the food using farmer's labor and machines
- Storing the food after it is harvested
- Selling the food from farmers to traders
- Transporting the food from the farm to the market or to another business for packaging or processing
- Sorting the food according to quality
- Packaging the food
- Processing the food into other products (making tomatoes into tomato sauce, or making cassava into cassava chips, or making mangoes into mango juice) or into cooked meals (such as at restaurants or catering companies)
- Distributing the food to traders to wholesalers or retailers
- Selling the food to the final consumers

Understanding how the food moves from one step to the next, assessing the businesses at each step and understanding their relationships to each other, and identifying the problems or obstacles at each step can help all of the businesses involved in the value chain work together to find solutions.

ANNEX 2: VEGETABLES INCLUDED IN 2012 MARKET RESEARCH SURVEY

Modo	Vegetable
Abakate	Avocado
Agriaun	Watercress
Ai farina tahan	Cassava leaf
Ai-ata	Soursop
Aidila fuan	Papaya fruit (green)
Aidilia funan	Papaya flower
Aidila tahan	Papaya leaf
Ai-manas	Chili
Alfase	Lettuce
Baria	Bitter gourd
Bayaun	Spinach (Australian type)
Bombay	Yellow onion
Brinjela	Eggplant
Cenoura	Carrot
Chinese cabbage	Chinese cabbage
Cowliflower	Cauliflower
Derok masin	Lime
Ervilha musan	Snow peas (out of shell)
Ervilha nurak	Snow peas (in shell)
Fehuk europa import	White potato (import)
Fehuk europa local	White potato (domestic)
Fore tali	Long beans
Hudi dubun	Banana flower
Kangkung	Water spinach / Morning glory
Koto mean	Red beans (dried)
Koto nurak	Green beans
Lakeru dikin	Pumpkin leaf
Lakeru fuan	Pumpkin
Lakeru mutin	Chayote
Lis mean import	Red onion (import)
Lis mean local	Red onion (local)
Lis mutin import	Garlic (import)
Lis mutin local	Garlic (local)
Lis tahan	Spring onion
Malagetas	Large chili
Melansia	Watermelon
Mostarda metan	Mustard leaf black
Mostarda mutin	Mustard leaf white
Pak choy	Bok choy
Pimentaun	Capsicum (bell pepper)
Pipinu	Cucumber
Repolho	Cabbage
Ruku	Basil
Salsa	Parsley
Talas isin	Yam
Tomate	Tomato

ANNEX 3: OVERVIEW OF NEW VEGETABLE SEED TYPES

New varieties of vegetables can provide important benefits such as better quantity and quality, and pest/disease resistance. New types of vegetables, not usually grown in Timor-Leste, such as broccoli, cauliflower, zucchini, and beetroots can offer new kinds of nutrition and diversity farmers' income and consumers' diets. If farmers choose to purchase seed, vegetables can be grown from 3 different seed types: open pollinated, hybrid, and genetically modified (GM). It is important to understand how these different types can be used by farmers.

Open Pollinated: These seeds will grow plants that will naturally pollinate and grow vegetables and seeds. Farmers can save seed for planting in the next season from any open pollinated seed. Some open pollinated seed can self-pollinate, which means that all of the next generation of seed would have the exact same characteristics as the original seed. This will result in consistent production season after season. Some open pollinated seed will "cross pollinate" with other plants, resulting in a mix of the characteristics of the two varieties. Sometimes that mixture of characteristics will produce a better vegetable crop, but sometimes it will produce lower quality or quantity of vegetables.

Hybrid: These seeds are produced by cross pollination of two varieties of the same species. Each plant will have some good characteristics that the farmer wants to combine, such as large fruits or strong stems. The resulting plant, the first generation plant or "F1", has all the desirable traits of the parents. However, if a farmer saves the seed and then plants that second generation "F2" seed, the resulting plants will produce, but will not have the same good characteristics. Only the original "F1" seeds are guaranteed to have all of the quality and productivity that the farmer wants. That is why farmers may choose to buy new seed every season.

Genetically Modified: GM seeds have DNA from different species. New DNA is added to the plant in a laboratory and then seeds are created for sale. Most GM seeds in the world are used for staple crops such as rice, corn, and soy. GM seeds are patented and strongly protected by the companies that produce them. GM seeds are not easy to purchase in any normal market in the world, and are totally banned in Europe. There are no GM vegetable seeds available in Timor-Leste.

ANNEX 4: RETAIL VENDOR INCOME ESTIMATES

Smallest business			
	Wet	Dry	Total
Inventory purchase weekly	56	151	207
Inventory Purchase Annual	1,456	3,926	5,382
Deduct 25% wastage	1,092	2,945	4,037
Revenues (Inventory x Gross Margin)	2,315	5,330	7,645
Wet season markup 112%, dry season 81%			
Gross Margin	1,223	2,385	3,608
Minus other costs (see Annex 5)	2,121	2,121	4,242
Net income	(898)	264	(634)
Largest business			
	Wet	Dry	Total
Inventory purchase weekly	1,111	1,189	2,300
Inventory Purchase Annual	28,873	30,914	59,787
Deduct 25% wastage	21,655	23,186	44,840
Revenues	45,908	41,966	87,874
Wet season markup 112%, dry season 81%			
Gross Income	24,253	18,780	43,034
Minus other costs (see Annex 5)	5,970	5,970	11,940
Net income			

	18,283	12,810	31,094
Median business			
	Wet	Dry	Total
Inventory purchase weekly	425	430	855
Inventory Purchase Annual	11,050	11,180	22,230
Deduct 25% wastage	8,288	8,385	16,673
Revenues	17,570	15,177	32,746
Wet season markup 112%, dry season 81%			
Gross Income	9,282	6,792	16,074
Minus other costs (see Annex 5)	3,720	3,720	7,440
Net income	5,562	3,072	8,634

ANNEX 5: RETAIL VENDOR COST ESTIMATES

Monthly Costs	Vendor 1	Vendor 2	Vendor 3	Vendor 4	Vendor 5	Vendor 6	Vendor 7	Vendor 8	Vendor 9	Vendor 10	Vendor 11
Water for washing/freshening vegetables	$30.00	$30.00	$30.00	$45.00	$45.00	$30.00	$90.00	n/a	n/a	$45.00	$60.00
Plastic bags for customers	$15.00	$120.00	$60.00	$100.00	$180.00	$15.00	$60.00	$45.00	$30.00	$30.00	$135.00
Pay cart for transport vegetables from truck stop to stall	$16.00	n/a	$60.00	$45.00	$30.00	$16.00	$50.00	$30.00	$30.00	$30.00	n/a
Food for family	$75.00	$450.00	$210.00	$90.00	$180.00	$75.00	$210.00	$90.00	$150.00	$75.00	$150.00
Pay to use wash room (toilet/shower/wash clothes)	$22.50		$20.00	$45.00	$ 22.50	$22.50	$22.50	$22.50	$22.50	$32.50	$22.50
Electricity	$5.00	$5.00	$2.50	$5.00	$5.00	$5.00	$2.50	$ 5.00	$2.50	$2.50	n/a
Stall rental	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	$50.00	n/a
Car rental for buying vegetables	n/a	n/a	n/a	n/a	$62.50	n/a	n/a	n/a	n/a	n/a	$120.00
Security Payments	$100.00	$300.00	$200.00	$200.00	$300.00	$100.00	$200.00	$100.00	$100.00	$100.00	$200.00
Labor	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00	$90.00
Total	**$353.50**	**$995.00**	**$672.50**	**$620.00**	**$915.00**	**$353.50**	**$725.00**	**$382.50**	**$425.00**	**$455.00**	**$777.50**

NOTES:
Water costs = $1.00 per 50 liter delivered
Security Payments are contributions to the neighborhood gang that controls each section of the market.
Payments are collected sporadically to support ceremonies, funerals, etc.

Vendors report annual security payments totalling $1,000 - $4,000 depending on size of business
Wash room costs = $0.25 toilet use, $0.50 shower, $1.00 wash clothes
Vendors in Dili markets often live, with their children, in the market

ANNEX 6: REVIEW OF NGO / DONOR PROGRAMS

Name of NGO or Donor Program	Area of Operation	Number of Beneficiaries	Type of Program	Volume of production	Type of vegetables	Input supplier	Market
BELUN	Atauro, Baucau, & Viqueque	75 farmers, 6 groups (15 farmers/group)	Food Security	Unknown	Spinach, Kangkung, Mustard, Green Cabagge, Egg Plant, Carrot, Chili, & Tomato	Local Suppliers & MAF	Local Markets
BOSS Program funded by Irish Aid implemented by ILO/IADE	Maubisse (Ainaro)	100 farmers	Support to Josephina Farms contract farming - organic	Unknown	Organic	Provided by contract farming lead firm	Contract farming lead firm
CARE International - Timor Leste	Target subdistricts in Ermera, Liquica, Bobonaro	140 farmers, 7 groups (2500 households)	Food Security	Unknown	Green Cabagge, Kangkung, Lettuce, Mustard, Tomato, Chili, etc.	Local Supplier (Boaventura , Planet shop), seeds distributed for free	Local Market and Self Consumption
Chamber of Commerce and Industry - BFZ - Projetu Ha	Hatubilico & Ainaro	9 groups - 150 farmers	Business Farming (facilitating linkages)	2000 kg/month (sporadic - unconfirmed if still operating)	Chinese Cabbage, Green Cabagge, Local Potato, Tomato, & Letucce	Farmers purchasing own inputs	Hotel Arbiru, Hotel Timor, Lita & Leader Supermarkets, Local markets
DAC/USAID	Aileu District	500 farmers in 25 groups	Contract Farming	200 tons/year	27 varieties	Contract farming businesses Kmanek Agriculture and Dilimart	
FAO - program ending Aug 2012	Baucau	4000 households	Food Security	Not Recorded	Kitchen Gardens Local Products	Provided by FAO	Self Consumption
Fundasaun Halarae	Dili Manatuto, Bobonaro (Natarbora, Soibada, Laklo no Atabae)	Horticulture activities ended in 2009	Unknown	Include business skills training	Unknown	Unknown	Unknown
GIZ - Youth Employment Promotion through agriculture technical high schools	Suai, Maliana, Manatuto, & Baucau	500 student farmers	Food Security and Business Farming, Ag-Entrepreneur Training	n/a	Tomato, Bitter Gourd, Onion, Leafy Greens, Asparagus	Indonesia, Australia and Local Suppliers	Dili, Local Market
Leewincare-Centru St Bakhita	Ermera, Letefoho, & Eraulo	Office located in Letefoho, Ermera	Unknown	Unknown	Green Cabagge, Kangkung, Lettuce, Mustard, Tomato, Chili, etc.	Unknown	Unknown
Hiam Health	Dili, Baucau, Liquica, Ermera,Aileu, Viqueque & Manatuto	12 Families Garden & 29 Communities Garden	Nutrition, kitchen gardens, community gardens for income generation	Unknown	Round Cabbage, Kangkung, Pak Choy, Leafy Green.	Local suppliers as available	Local markets

IMVF (program ended) & Spanish Cooperation	Liquisa	3 farmer groups + input shop	Business Farming	n/a	Local varieties, leafy greens, snow peas, etc.	Provided by donor or by Fini Diak input shop	Pateo
Knua Buka Hatene (KBH)	Aileu (Sub-district Liquidoe)	30 farmers, 2 groups	Business Farming	Unknown	Lettuce, Mustard, Egg Plant, Chili	F2 Seed (collected by farmers)	Dili Market (Hali-Laran)
Mercy Corps	Dili, Ainaro & Manufahi	1) 9 ag input retailers (1 Dili based, 8 District kiosks) 2) 4000 rural households	1) TA and grants to input suppliers 2) Community development includes some vegetable production	Unknown	Local varieties	Local suppliers, seed saved by farmers	Local markets
OXFAM International - Timor Leste	Dili, Covalima, Oecusse, Liquisa, & Manatuto	Covalima 39 groups, Liquica 10 groups, Oecusse 72 groups, Manatuto 1 group	Food Security and Business Farming	Unknown	Mustard, Egg Plant, Tomato, Onion, Kangkung, Lettuce	Local Suppliers	Dili, Local Markets
Permakulture Timor Leste (PERMATIL)	Baucau (Turiscai & Laga)	160 households	Organic and sustainable, no input farming methods for food security	Unknown	Mustard	MAP (free)	Local Markets
Smallholder Agriculture International	National - collaborates with GIZ, Hiam Health, DAC and others	n/a	Training on horticulture and use of drip irrigation	n/a	na/	n/a	n/a
Spanish Cooperation	Venilale & Ossu	unknown	Food security & business farming	unknown	Leaf greens, eggplant, chili, tomato, etc.	Loja Agrikultura Baucau, F2 seeds saved by farmers	Local traders Baucau area
Timor Aid	Dili, Liquisa, Maubara, Manufahi	156 farmers	Food Security and Business Farming	1800 kg from 1st harvest	Chinese Cabbage, Green Cabagge, Onion, Tomato, & Bitter Gourd	Local Market & MAF	Dili Mart and Local Market
Unity Service Cooperation Canada Timor Leste (USC-CTL)	Manatuto & Aileu	Aileu 556 households, Manatuto 240 households, Total 796 households	Food Security and Business Farming	Unknown	Pak Choy, Kangkung	Local Suppliers	Local Markets
World Vision	Aileu District	51 farmers	Food Security and Business Farming	Sales by weight 2,450 kg/month, Sale Value by value $1,500/month	Egg Plant, Head Lettuce, Chinese Cabbage, Cucumber, Kailan, Parsley & Tomato	World Vision gives UV plastic tunnels, seed provided by contract farming business Kmanek Agriculture	Kmanek Agriculture, Leader/Lita, occasional buyers

ANNEX 7: LIST OF INTERVIEWS

Name/Naran	*Company/Organization Entreprise/Organizasaun*	*Role in VC/Posisaun iha Value Chain*
Armando de Deus	Local trader	Mid-Size Trader
Eva da Cruz	Local Trader	Mid-Size Trader
Feliciano Mendonca	Local trader	Mid-Size Trader
Guido Siquera	Josefina Farm	Trader/Contract Farming
Erwan Thomas	Jupiter Agri	Input Supplier
Joao Bosco Carceres	Alu Unip. Lda.	Input Supplier
Fernando	Lucky Strike	Input Supplier
Florida	Boaventura	Input Supplier
Reynold Samara	Planet Agriculture	Input Supplier
Silvianus Siri	Manfat	Input Supplier
Thomas	Loja Agrikultura Baucau	Input Supplier
Supri	Loja Mantane Aileu	Input Supplier
Almeida Lopes	Fini Diak Loes	Input Supplier
Prasetyo	Kmanek Agriculture	Input Supplier / Contract Farming
Ashley Rees	Esplanada	Restaurant
Johny Cheng	Restaurant 88	Restaurant
Chef Heng	Early Sun	Restaurant
Armando Barros	Padang Bobonaro	Restaurant
Melani	Starco Caffe	Restaurant
Radja	Spicy Hut	Restaurant
Lilis	Lilis	Restaurant
Mene	Castaway	Restaurant
David Jong	Dilimart	Supermarket / Contract Farming
Zairy Nilton do Carmo	W Four	Supermarket
David	Phoenix	Supermarket
Vasco Godinho	Pateo	Supermarket
Cathleen Goncalves	Cadoras Unip. Lda	Catering Services
Rui Castro	Caimalolequi	Catering Services
Yohanes Mu	Nelayan Restaurant	Catering Services
Heinz Helle	GIZ	Donor
Joanna Walse	Mercy Corps	Donor
Kate Horwood	World Vision	Donor
Jenny Ikelberg	ILO	Donor
Leonor Melo	IMVF	Donor
Rosalia Martins	Hiam-Health	Local NGO
Gil Rangel da Cruz	MAF	Government

Auritu K. R. Bahan	IADE	Government
Dominggas Oliveira	SERVE	Government