

IFC SADI Agri Sectors

**Value Chain Analysis for
The NTT Coffee Industry**

May 2007

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Executive Summary

NTT Coffee Industry: Summary of Industry Potential, Issues and Recommendations

Industry Potential

The sector profile and value chain cost analysis identifies the potential for improved smallholder coffee returns. The main factors that give the NTT province potential in this regard are summarised below.

- Indonesian coffee has natural low acidity and high body flavour due to the soils and climate. This style is different to the natural high acidity-low body coffee produced in Brazil and Central America. Consumers in the largest export market (USA) prefer the Indonesian style putting the industry in a favourable position. One of the main barriers to increasing exports is the wide range in quality, largely due to poor on-farm post harvest practices.
- There has already been interest shown in parts of NTT, namely Flores, as a region producing distinctive flavoured “Juria” Arabica coffee and will invest in developing and improving supply in the region (Flores is 35-40% Juria). The nature of Flores soils, climate, tree varieties and climates in growing areas give coffee this distinctive flavour. Small volumes of Grade 1 coffee were exported from Ngada in 2006 for Rp 24,000 kg, over 30 percent higher than equivalent coffee from other regions.
- There may be potential for other parts of NTT (e.g., Sumba) to also take advantage of this opportunity to supply lead firms such as Starbucks for the benefit of smallholders.
- The mountain climate in some areas reduce pest and disease challenge and current production practices have very low inputs. This production system produces a heavier bean (favoured by buyers and receiving 10% better price for parchment) and would make the transition to organic production and certification relatively smooth if viable market opportunities became available.
- There are areas of undeveloped land that could potentially be planted in coffee and areas that require rehabilitation that would increase the region’s total production.
- Smallholder farm gate prices are affected by world prices. World coffee prices are currently strong, supported by high demand for mild flavoured coffees such as Arabica. The demand for specialty and differentiated coffee is growing rapidly. The short to medium term price outlook is favourable for these styles.
- The analysis shows that there is potential to lift smallholder returns by improving post harvest fermentation practices and working with existing buying groups (e.g., Komodo Jaya) to improve smallholder returns.

- Anecdotal evidence suggests that farmers could improve returns by increasing yields of Arabica and Robusta varieties with improved access to finance for inputs and crop husbandry.

Industry Issues and Value Chain Analysis

The following points summarise the main issues for the coffee industry, as they relate to the needs of smallholders.

- Current coffee crop yields are low due to a lack of tree management and pruning, reducing yields and producers returns. In lowland areas farmers lack an understanding of pest and disease management and access to inputs to lift yields and bean quality.
- The quality of bean and parchment sold by farmers varies greatly between villages and seasons and is also affected by poor post harvest practices. The variation in bean quality forces traders to use mixing practices that reduce the overall farm gate price.
- Farmers in upland areas rely heavily on Arabica coffee for cash income (proximity to markets and limited arable land limits other cash enterprises). Farmers relying on coffee for cash income are exposed to the risk of poor coffee yields due to changeable seasonal weather. Anecdotal evidence suggests that weather patterns are becoming less predictable.
- There is no 'open market' for smallholders to sell coffee and the practice of making 50 percent advance payments through collectors (Ijon) can result in a lack of transparency on the final price. Anecdotal evidence suggests that the "Ijon" (and final price) can depend on how urgently the smallholder needs the money.
- A risk for the Indonesian industry is the current lack of processing capacity to handle increasing volumes of coffee being produced. This puts the industry at risk of developing a reputation as low quality producer.
- The local port of Reo doesn't have a container ship facility so coffee must be shipped in sacks to Makassar (for current speciality buyer) and containerised there before export.
- Current post harvest practices mean that parchment must be dried and sold within a few days otherwise beans developed a "musty" taint. Improved drying practices (drying parchment down to 12% moisture) reduce the need for farmers to immediately sell coffee and provide farmers with more flexible marketing options.
- There are currently no local institutions able to ensure the geographical authenticity of NTT coffee exported under a specific geographical identity such as "Flores

Coffee". Despite place names being the main point of quality differentiation for importers and roasters in export markets (according to previous studies), place names are applied to coffee at the site of export and is to a large extent, arbitrary. Recent moves by corporate coffee buyers to establish geographical identity for Flores Coffee (primarily Starbucks and the use of FairTrade certification) appear to be positive steps in ensuring that price premiums reach producers.

- The coffee supply chain is relatively efficient although current collector and trader handling practices (e.g., poor processing, mixing coffee grades) distort price-quality signals and reduce the incentive for most farmers to undertake best practice post-harvest handling.
- Current post harvest practices promoted by Indonesian Centre of Coffee and Cocoa Research (Jember) are not favoured by private sector buyers.
- NTT coffee producers are susceptible to world price fluctuations in world commodity markets for green bean coffee.
- The current mixed quality of coffee produced in NTT makes farmers susceptible to heavy price discounts from collectors and traders and puts them in a weak selling position.
- Smallholders face a number of other barriers to improving returns associated with supporting structures and related industries:
 - Farmers have little or no access to working capital to purchase necessary agri-inputs in a timely manner;
 - Low availability of improved seedlings to begin a cycle of replacing old and senile trees;
 - A low level of extension services provided by government Ministry of Agriculture or DINAS;

Recommendations for IFC TA

The following points summarise the key recommendations that arise out of the value chain analysis and field research. The recommendations are aimed at improving smallholder returns through a long-term (3-10 year) Technical Assistance (TA) program.

- Work with existing buying groups and processors (e.g., Lion Lestari) to expand Flores operation and/or replicate farmers accreditation and improved post harvest practices in Sumba.
- Provide business development services to the Komodo Jaya buying group to manage current financial and operational problems and improve its level of service to smallholders.
- Include risk management strategies for farmers in demonstration and improved practices programme such as having a mix of Robusta and Arabica trees. This

can help to manage market (price fluctuations) and production risks that can result from unseasonably wet or dry weather at flowering. An unseasonably wet flowering season has the opposite effect on Robusta as it does on Arabica. Having a mix of Arabica and Robusta coffee can be a good way for farmers to manage this risk.

- Undertake further research into the home consumption and cash income needs of smallholders in coffee producing areas so that IFC TA can be directed at reducing smallholder-dependence on coffee for income by developing other potential crops/enterprises.
- Undertake further research into the environmental sustainability of the current coffee producing practices to minimise environmental degradation and ensure farmers have long-term future in economically viable coffee growing.
- Improve smallholders' access to working capital by assisting the development of improved farmer loan capacity within local banks and PUSKUD. The IFC A2F program will have an important linking role in this TA intervention. New models of making capital available to smallholders via farmer associations and marketing mechanisms should be explored.
- Engage the BEE component of the IFC SADI subprogram to investigate and understand what institutional support is required to ensure geographical authenticity of coffee produced in NTT and exported from Makassar under specific geographical identities.
- Establish a demonstration farm with existing lead buying firms and farmers' buying groups to improve coffee quality, growing and post harvest practices. A demonstration farm program should include the following components:
 - Training on tree pruning and management of agri-inputs
 - Replacement of senile trees, seedling selection and planting
 - Nutrient and pest and disease requirements
 - Safe handling of agri-chemicals and principles of sustainable agriculture and environmental protection (e.g., the Good Agricultural Practices (GAP) standard).
 - Improved post harvest handling to pulping, fermentation and drying practices
 - Inter-row cropping in newly planted areas
 - Farm planning and budgeting
- Engage local DINAS in demonstration farm field days so that the DINAS becomes an initiator of future smallholder training sessions.

An Overview of Agribusiness in NTT

East Nusa Tenggara (Nusa Tenggara Timur / NTT)

NTT province consists of 566 islands with a land area of 47.3 thousand km². the provincial population is around 4.1 million (2004), spread over 42 islands. The main islands in NTT include Flores, Sumba, Timor, and Alor. The West Timor region, which is directly adjacent to the Democratic Republic of Timor Leste, constitutes 32 percent of the total area and is inhabited by around 38 percent of the total population of NTT.

There is no single common "culture" to be found in NTT with the populations on the different islands of the province making up at least 40 different ethno-linguistic groups. The cultural traditions of Sumba are different from those of Timor, Alor, or Flores. Compared with most other Indonesian provinces, NTT is notable for its diversity.

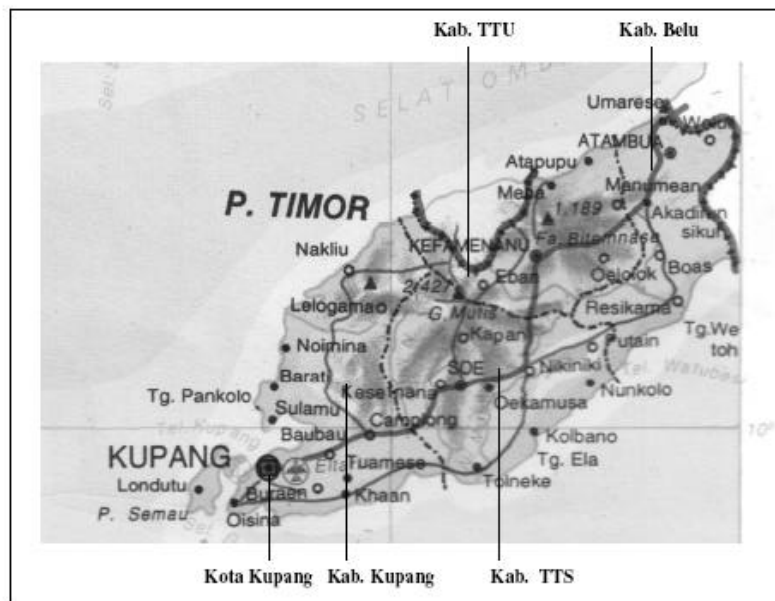
Administratively, the NTT province is divided into 15 *kabupaten* and one *kota*. Out of them, four *kabupaten* and one *kota* are located in West Timor. They are Kab. Kupang, Kab. TTS, Kab. TTU, Kab. Belu, and Kota Kupang. The demographics and map of the West Timor region is shown below.

Table 1 Profile of NTT and the Five Kabupaten/Kota in West Timor, 2004

Description	NTT Province	Kabupaten				Kota Kupang
		Kupang	TTS	TTU	Belu	
Area (Km ²)	17,349.9	5,898.3	3,947	2669.7	2,445.6	160.3
Population	4,188,774	337,406	405,993	197,174	352,176	258,104
Population Density/ Km ²	88	57	103	74	144	1,610
# of Kabupaten /Kota	16	-	-	-	-	-
#of Kecamatan	203	28	21	9	17	4
# Villages & Kelurahan	2,569	186	212	159	166	45

Source: SMERU Research Institute (October 2006)

Figure 1. Map of West Timor region



Agriculture is an important part of the regional economy in East Nusa Tenggara making up more than 40 percent of Gross Regional Domestic Product (GRDP) (Ministry of Agriculture 2006). However due to stronger growth (relative to agriculture) in other sectors, agriculture's share of GDRP declined from 51 to 42 percent from 1990-2003. The livestock sub-sector makes the largest contribution to agriculture in NTT at around 42 – 45 percent and or around 13 – 14 percent of GRDP. Agriculture is also important for regional employment where smallholder farming, transport, trading and downstream services account for around 80 percent of total employment. The major agricultural products of NTT include cattle, corn, tamarind, candlenut, tubers, nuts, betel nut and coconut. Kabupaten Kupang is the main producer of cattle in NTT; almost 25 percent of the total cattle in NTT come from this *kabupaten*.

The Dutch are identified NTT has "minus-area" of limited development potential 300 years before the Indonesian government officially classified the province as a "daerah-minus". NTT has the poorest soils and lowest rainfall in all of Indonesia and the mountainous terrain on many of its islands limits the possibilities for extensive agriculture. The province also experiences pronounced El-Nino weather patterns ensuring that once every few years (on average, one year in three) there is likely to be a drought. A number of droughts have had a significant impact on the province over the past century with the 1997 98 drought being one of the worst on record. Under these conditions farmers must strive to minimise risk rather than maximise production and with low investment in the province there are few alternative forms of employment.

Most of NTT's population (86 percent during the 1990s) is involved in agriculture and engaged in some of the least productive forms of agriculture in Indonesia Fox, J, 2007¹.

The limited economic activities in NTT are reflected from the low GRDP per capita figures of only Rp2.2 million (2003), while on West Timor the GRDP per capita ranged between Rp1.7-1.9 million. NTT has a high rate of poverty and the number and proportion of the poor are shown in the table below.

Table 2
The number and proportion of poor people in West Timor, 2004

Kabupaten	# of poor in Kab. (000s)	% of Kab. pop'n
Kupang	109	33%
TTS	149.5	37%
TTU	62.7	31%
Belu	70.4	21%
Kota Kupang	27.8	11%
NTT Province	1,152.10	28%
National		17%

Source: SMERU Research Institute (October 2006)

NTT has only a small manufacturing industry (3.2 percent of GRDP, 2003) with limited scope for generating employment opportunities and the region has a heavy reliance on imported manufactured goods from Java. With agriculture forming the basis for such a large share of economic activity in NTT, improving this sectors' performance will have a relatively large impact on poverty alleviation.

The climate in this region is semi-arid climate, with the relatively low rainfall and the low indigenous vegetation. The main agricultural activities are livestock and estate crops. Local authorities estimate that there is around 740,000 hectares of dry meadow areas that have potential for development into cattle grazing, however anecdotal evidence from field research suggests that the area available for grazing is decreasing and being used for other uses such as horticultural crops. NTT is a major livestock producing region and is the second largest producer of beef cattle producer in Eastern Indonesia, behind South Sulawesi (DGLS, 2006). Cattle fattening is a traditional farming enterprise and a major source of cash income for farmers, especially on West Timor Island. The dry climate and steep terrain on West Timor Island lends itself to livestock production and the region has a history of producing high quality Bali cattle for export to Java. A major industry issue has been the decline in cattle populations in NTT due to high demand for beef and unsustainable slaughter rates.

¹ SMERU newsletter article- James, J. Fox, professor at the Research School of Pacific and Asian Studies, the Australian National University.

Estate crops such as coffee and cocoa grow well in NTT. The province has recently been identified by major coffee buyers as a producer of high grade Arabica coffee and various donor funded programs are seeking to catalyse development of the coffee sector on Flores. The historical lack of smallholder access to fertiliser and agrichemicals and the pristine mountain environment may provide significant marketing opportunities for Arabica coffee if the industry is able to organise reliable supply.

Aquaculture and fisheries, in various forms (open water, brackish water pond, fresh water pond, paddy field and seaweed culture) is also a major primary industry and mainly located on Flores.

With the province spread over 566 islands the cost of transport for NTT between the districts and with other parts of Indonesia is high and is a barrier to trade and further economic development. The role of sea transportation is important for the province. A major problem is the poor condition of roads during periods of high rainfall. Official state data indicates that only 20 percent of the region's regency and village roading are in good condition while other roads can be prone to slips and closure during heavy rain (BPS NTT, 2003).

The limited size of local markets for the sale of agricultural products (due to very low levels of local consumer disposable income) highlights the importance of the region's infrastructure for trade. In general, smallholders can capture the best returns by supplying export (including inter-regional export) markets. With high transportation costs and a lack of investment in NTT processing capabilities agricultural products for interregional and export market have been limited to traditional products e.g., cattle, cashew nut, sea weed and coffee. Other products such as banana, orange and avocado struggle to compete in Java markets due to the high cost of transportation.

The fieldwork conducted for the VCA of priority commodities covered the areas of Kupang, and TTS Sub District for Beef Cattle, Ruteng, and Bajawa (Manggarai Sub District) for Coffee and West Manggarai Sub District for Cassava.

Business Operating Environment in NTT

The business operating environment in NTT, with respect to the level of informal and formal charges and taxes that farmers, middlemen and traders are required to pay was found to be a significant frustration of local business people although not necessarily a significant barrier to business. Further field research in this area is required to identify the impact that local charges have on the beef cattle industry.

A recent study on the NTT business operating environment by the SMERU Institute found that the NTT cattle industry has been the subject of various regulations and excessive charges, starting at the village level. Most regulations include charges, such as: the certification of calves and a permit to export, *retribusi* to cover the administration cost, a quota limit on the number of cattle exported, and the SPK charge for issuing a

permit for import and export, the services of slaughtering houses, the services of livestock markets, the services of livestock health checks, and quarantine.

Other findings include that the presence of many middlemen and traders at the village and sub-district (*kecamatan*) levels has very limited impact on price information, since product prices are mostly determined by a small number of inter-island or large traders that form a monopsony market structure. The recent increase in the number of traders and exporters coming to Kupang, has not fully benefited farmers, due to the limited information on product location and excessive inspections that give rise to informal charges and uncertainty.

The study found that the regional governments in NTT persist with imposing charges and regulations to agricultural products although the contribution of these charges to regional government revenues is very small. Some progress has been made on reducing regulations and charges for agricultural food crops, however less progress has been made in the beef cattle industry. The regulations and licensing have drawn out informal charges applied at various levels that distort the marketing of cattle (amongst other agricultural products) and in turn limit the opportunity of farmers to receive better prices and incomes.

Coffee Sector Profile and Value Chain Analysis

1. Indonesia within the Global Coffee Industry

Indonesia is a major coffee producer

Indonesia is a major producer and exporter of coffee. Approximately 93 percent of Indonesian production is made up of Robusta coffee which is grown in low land areas. Arabica makes up just 7 percent of total production and is grown in high altitude areas above 2,000 ft asl. The table below shows the country's position as an international coffee producer and the seasonal fluctuations that can occur from to year.

Table 3

World Coffee Production (tonnes)

			2001	2002	2003	2004	2005	2006	% of total
Brazil	(A/R)	Apr-Mar	1,850,220	2,917,020	1,727,220	2,356,320	1,976,640	2,550,720	34%
Vietnam	(R)	Oct-Sep	787,980	693,300	913,800	850,440	809,940	900,000	12%
Colombia	(A)	Oct-Sep	719,940	713,340	671,820	722,520	717,540	696,000	9%
Indonesia	(R/A)	Apr-Mar	409,980	407,100	394,260	452,160	519,540	411,000	6%
Ethiopia	(A)	Oct-Sep	225,360	221,580	232,440	300,000	270,000	330,000	4%
India	(A/R)	Oct-Sep	300,600	275,280	270,480	280,320	277,020	300,300	4%
Mexico	(A)	Oct-Sep	266,280	261,000	252,000	232,020	240,000	270,000	4%
Guatemala	(A/R)	Oct-Sep	220,140	244,200	216,600	222,180	220,500	240,000	3%
Peru	(A)	Apr-Mar	164,940	174,000	158,460	201,300	145,200	210,000	3%
Honduras	(A)	Oct-Sep	182,160	149,820	178,080	154,500	192,240	162,000	2%
Other Producers			1,372,260	1,353,240	1,309,200	1,273,860	1,294,740	1,359,300	18%
World Production			6,499,860	7,409,880	6,324,360	7,045,620	6,663,360	7,429,320	100%

Source: International Coffee Organisation

The data above also shows how Brazil and Vietnam have rapidly increased their share of world coffee exports. Brazil produces strong flavoured Arabica and Vietnam mainly produces Robusta. Vietnam is emerging as a competitor to Indonesian Robusta production however; the Arabica produced in Brazil is a strong flavoured style distinct from the mild flavoured Arabica produced in Indonesia and particularly NTT.

The tables below provide a breakdown of coffee exporting countries and volumes over 2006 to 2007, showing exports of Arabica and Robusta coffee. Indonesia is a relatively small producer of Arabica coffee at just below two percent of world exports in 2006 exporting approximately 68,000 tonnes. Brazil and Columbia are the main producers and exporters of Arabica coffee with 39 and 18 percent of world exports in 2006 respectively.

Indonesia is however a major exporter of Robusta coffee. A recent report on the Indonesian coffee industry² reported that in 2006, Indonesia exported approximately 283,960 tons of Robusta, down from the previous year when it exported 331,788 tons, making it the second largest exporter of Robusta coffee (16.5 percent of world production) behind Vietnam. Vietnam dominates world exports of Robusta coffee with over 45 percent of the world Robusta exports. India is also emerging as a major Robusta producer with eight percent of the world production in 2006.

Table 4

Top 10 Coffee Exporting Countries (tonnes)

Country	Type	2005/06	% of total	2006/07	% of total
Brazil	A/R	1,542,367	30%	1,683,909	30%
Vietnam	R	777,468	15%	956,679	17%
Colombia	A	622,884	12%	661,877	12%
Indonesia	A/R	410,208	8%	301,852	5%
Peru	A	135,786	3%	241,359	4%
India	A/R	169,999	3%	219,678	4%
Guatemala	A	200,937	4%	199,284	4%
Ethiopia	A	143,191	3%	176,128	3%
Honduras	A	150,888	3%	169,562	3%
Mexico	A	120,961	2%	161,798	3%
Others	A/R	881,493	17%	887,631	16%
Total		5,156,183	100%	5,659,757	100%

Table 5

Robusta coffee exports by country 2005

Country	2005	2006	
Vietnam	839,646	787,370	46%
Indonesia	331,788	283,960	16%
Brazil	162,016	149,771	9%
Uganda	119,025	85,157	5%
Côte d'Ivoire	117,494	125,051	7%
India	104,884	139,871	8%
Cameroon	33,227	34,230	2%
Ecuador	32,538	30,591	2%
Thailand	20,526	33,517	2%
Tanzania	13,293	12,118	1%
Other	36,351	39,904	2%
TOTAL	1,810,788	1,721,540	100%

² Integrated Value Chain Analysis for Coffee Production in Indonesia. Global Development Solutions, LLC. January 2007.

Table 6

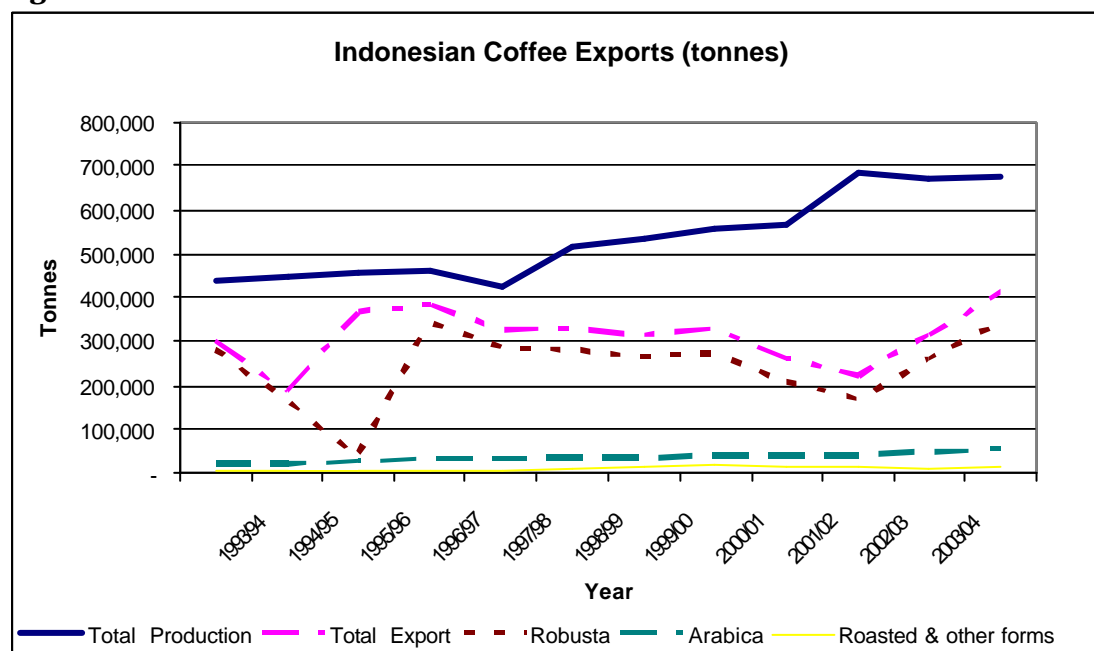
Arabica coffee exports by country 2005

Country	2005	2006	% of total
Brazil	1,477,541	1,367,108	39%
Colombia	660,271	644,131	18%
Guatemala	207,442	200,892	6%
Peru	175,292	177,861	5%
Ethiopia	157,197	160,488	5%
Honduras	143,714	175,714	5%
Mexico	114,441	150,460	4%
Costa Rica	90,590	74,781	2%
El Salvador	78,718	76,115	2%
Papua New Guinea	67,012	59,382	2%
Other	335,057	355,508	10%
Indonesia	55,515	68,517	2%
Total	3,562,790	3,510,957	100%

Source: Global Development Solutions, 2007

The graph below shows the breakdown and growth of Indonesian coffee exports between 1994 and 2004. The growth in exports shows the increased international demand for coffee, especially mild flavoured coffee styles such as Arabica, and increased production. The most significant increases have been from Arabica exports, (from 18,000 to 52,000 tonnes) and from added value forms such as roasted and ground coffee (6,000 to 13,000 tonnes).

Figure 2



The US has quickly become Indonesia's largest coffee export market.

The United States, Japan and Germany are the primary export destinations for both Arabica and Robusta coffee from Indonesia. Specifically, the United States is the largest importer of both Arabica \$32.5 million (37.3%) and Robusta \$19.4 million (20.2%) from Indonesia. Japan prefers strong flavoured or Robusta style coffee whereas the North American markets favours the mild flavoured coffee, such as the natural flavour of the coffee produced in Indonesia.

Table 7

Volume Destination of Indonesian Robusta Coffee 1999 - 2004

Country	1999	2000	2001	2002	2003	2004
Volume (000 MT)						
USA	62.3	23.1	20.2	22.5	28.6	61.5
Germany	46.3	42.4	22	48.3	51.8	47.9
Japan	48.9	61.6	49.1	46.3	45.1	50.5
Singapore	0.9	1	7.6	19.1	7.7	9.3
Netherland	1.1	1.9	2.6	2.9	0.3	0.02
Others	158.4	171	99.3	134.4	143.1	135.9
Total	317.9	301	200.8	273.5	276.6	305.12
Average Price (c/kg)	\$1.28	\$0.87	\$0.55	\$0.49	\$0.64	\$0.79

Source : Kustiari, Reni (2007)

2. Size and structure of the NTT Coffee Industry

NTT is a relatively small coffee producer

There is a range of data existing on the regional spread of coffee production in Indonesia. The Ministry of Agriculture (Estates Crops Division) estimates that NTT has around 5 percent of Indonesia's total planted area, and due to lower than average yields (52 percent of the national average) only 3 percent of total production. The total estimate of NTT planted area ranges between 61,000 and 113,000.

Table 8 Indonesian Harvested Area by Province, 2005

Province	Area (ha)	% of area
1. Aceh	100,263	8%
2. North Sumatra	51,353	4%
3. West Sumatra	51,600	4%
4. South Sumatra	273,451	22%
5. Bengkulu	122,844	10%
6. Lampung	168,006	13%
7. Central Java	41,993	3%
8. East Java	92,488	7%
9. East Nusa Tenggara	61,437	5%
10. South Sulawesi	68,577	6%
11. Others	212,879	17%
Indonesia	1,244,891	100%

Source: Director General of Estate Crops, Indonesian Ministry of agriculture, 2006

For both Arabica and Robusta, production of coffee is dominated by smallholder farmers, where the average size of a farm ranges from 1.0 – 1.5 hectares. The coffee sector generates direct employment for over 2 million farmers in Indonesia.

Table 9 Coffee Sector Profile for Indonesia

Area Under Cultivation (ha)	1,307,043			
Arabica (2005)	Smallholder	Gov't	Private	Total
Total hectares planted	99,499	6,672	4,315	110,486
Total hectares mature trees	54,424	5,751	1,592	61,767
Total production (ton)	40,931	4,458	1,641	47,030
Average yield/ha (kg)	752	775	1,031	761
Number of farmers				224,414
Average output/farmer (kg)				239
Robusta (2005)	Smallholder	Gov't	Private	Total
Total hectares planted	1,150,056	19,925	21,576	1,191,557
Total hectares mature trees	877,399	18,678	15,468	911,545
Total production (ton)	606,123	12,549	9,149	627,821
Average yield/ha (kg)	527	639	424	527
Number of farmers				1,824,628
Average output/farmer (kg)				334
Total number of farmers				2,049,042
Total production – 2005 (ton)				674,850
Average farm size				1.0 – 1.5 ha

Source: Integrated Value Chain Analysis for Coffee Production in Indonesia.
Global Development Solutions, LLC. January 2007.

Manggarai and Sumba are the major producing sub-districts in NTT

The table below shows the total production and productivity of smallholder coffee farms in NTT. NTT coffee production is relatively concentrated in Manggarai and Sumba districts accounting for around 55 and 22 percent respectively of the total NTT coffee area. Manggarai has higher yields per hectare, (closer to the Indonesian average of 518kg per hectare) while most other regions are below the national average.

Table 10 Production profile of NTT smallholder coffee (2002)

Regency	Productive Plant Area (ha)	Production (ton)	Productivity (kg/ha)	# of Farmer (household)
1. Sumba Barat	6,300	1,850	293.7	20,966
2. Sumba Timur	290	58	200.0	946
3. Kupang	93	13	139.8	263
4. Timor Tengah Selatan	70	41	585.7	930
5. Timor Tengah Utara	157	26	165.6	1,000
6. Belu	179	45	251.4	536
7. Alor	305	144	472.1	749
8. Flores Timur	1,329	332	249.8	3,983
9. Lembata	297	104	350.2	1,244
10. Sikka	1,098	141	128.4	2,350
11. Ende	1,106	389	351.7	3,430
12. Ngada	2,372	1,633	688.4	5,079
13. Manggarai	16,612	8,474	510.1	40,917
East Nusa Tenggara	30,208	13,250	438.6	82,393

Source : Statistical Estate Crops of Indonesia, 2002

3. Productivity and Performance of NTT Coffee Industry

NTT farmers manage coffee with low inputs

Coffee is grown at both low altitudes (mainly Robusta variety) and in elevated mountain regions. Smallholder coffee producers in high altitude locations of NTT such as Manggarai (Flores) are able to produce viable yields and quality Arabica coffee without applying fertiliser or undertaking pest control. In these areas the trees are grown under indigenous forest while more productive land close to the village is used for subsistence foods crops.

The mountain climate reduces the pest and disease challenge for trees in these locations and farmers often have no access to synthetic fertilisers. The current lack of fertiliser reduces bean size and yields for farmers (unfavourable for selling parchment) but improves the bean density which is desired by processors and exporters. There is current high demand from two leading coffee processors/exporters for NTT Arabica coffee due to the unique flavour produced.

Highland farmers rely on coffee for cash income

Coffee yields (both Arabica and Robusta) are affected by weather conditions at flowering (at the end of the dry season). Higher than usual rainfall during flowering can reduce yields by up to 30 to 40 percent and can be a major cause of fluctuating yields from year to year. This can be a problem for farmers in mountain areas who rely heavily on coffee production for cash income. The limited areas of arable land are usually used for subsistence food crops. In lowland and coastal areas of Flores farmers have more options for cash crops (e.g., vanilla, cashew, cocoa, nutmeg, rice, cassava, coconut).

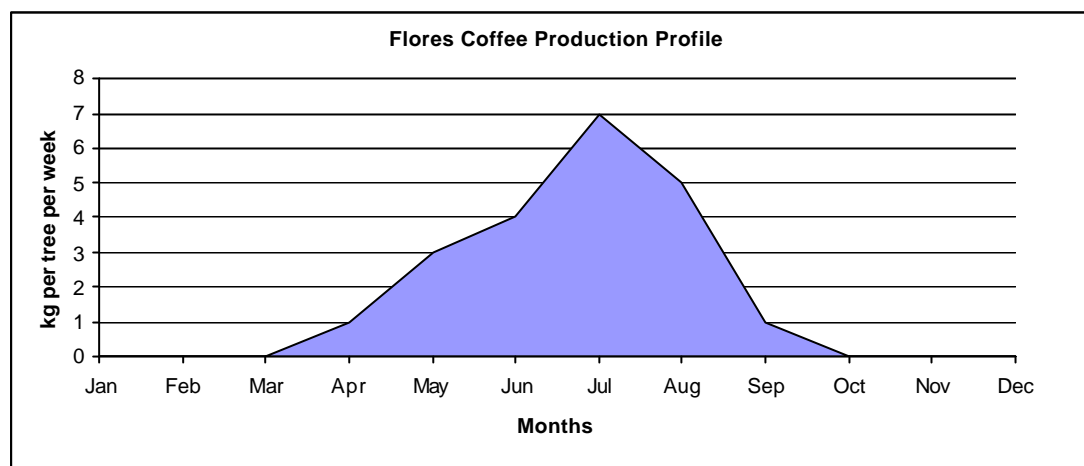
The affect of season (wetter or drier than normal dry season) usually has an opposite affect on Robusta coffee. Having a mix of Arabica and Robusta coffee can be a good way for farmers to manage this risk.

Harvesting usually takes place from April to October with the peak around April-May for Arabica and June-October for Robusta. Immediately following harvest the red cherries are pulped or peeled to free the bean of the skin using a traditional wooden pulping machine (*luvak*) and skins are spread under trees for fertiliser and the parchment is dried down to a safe moisture content for transport.

Coffee yield and quality is also affected by the timing of cherry picking, and a common problem for processors is receiving beans with a wide range of ripeness. Cherries that are picked while still green (as opposed to red) reduce the final quality of the green bean. Coffee cherries picked at a green stage also have lower bean weight and parchment yield than fully ripe beans.

The affect of harvest time also impacts the parchment yield with yields as high as four to six litres of parchment per kilogram of cherry during the peak harvest period in May and closer to 2.5 to 3.5 in July (heavier beans). The graph below shows the production profile in Flores.

Figure 3



Farmers in Manggarai undertake on-farm fermentation by either traditional dry fermentation; pulped beans are stored in a sack over night and spread out for drying over three days; or wet fermentation. In wet fermentation pulped beans are soaked in the water over night, washed the following day then sun dried for three days. Providing the pulping process it correctly done, processors and buyers prefer the dry fermentation as it results in a stronger flavoured coffee. Best practice drying is for 21 days down to 12 percent moisture content. Both processes are illustrated in the Appendix.

Both forms of fermented coffee are received by buyers and processors (e.g., PT Lion Lestari). Moisture content is the major determinant of quality and (maximum 16% and minimum 12%) and coffee is often re-dried by farmers associations or collectors (e.g., PD Komodo Jaya) to meet buyer standards.

Pocoranaka is the main coffee producing district in Manggarai

The central coffee producing area in Manggarai is the Pocoranaka district producing 3,000 tonnes of processed green bean per year. There are three main coffee varieties grown in Manggarai, with Robusta being the most common variety in lower elevations (up to 700 metres) and Arabica grown in mountain areas (above 800 – 1,500 metres).

Variety	Area	Production (tonnes)
Robusta	17,000 hectares	7,000
Arabica Hyrbid	5,000 hectares	3,500 – 5,000
Arabica Juria	N/A	1,000

While coffee is a main source of income, fieldwork research indicates that smallholders rely on mixed rice and corn for daily consumption (roughly 1 kg of rice (Rp5,000/kg) and one 1kg of milled corn (Rp 3,000/kg) for a family unit of seven to eight people. Corn is usually planted twice a year with cassava, while rice is generally purchased in local markets.

Productivity in NTT is relatively low compared to other regions

In the coffee producing areas around Manggarai, Flores, farmers have been producing coffee for many years. Smallholders living in the high altitude areas of Flores view the old coffee trees (some up to 100 years old) as their family heritage. These trees are a unique old variety “Juria” (originally from Sulawesi) and without adequate pruning have become very large. Arabica *Juria* was brought to the region in the 19th century from Sulawesi and has remained a pure variety in the Mountain regions having never been cross-bred with Robusta.

The Juria-Robusta Hybrid (Arabica S-795) is also grown in pockets of Flores. Juria is a later maturing variety producing cherries after five years while hybrid Arabica can be harvested after two years. While able to produce high yields per tree coffee in these areas is grown on rocky hill-sides with wide tree spacing 5-10 metres resulting in low yields per hectare. Coffee crops are usually grown under shade trees such as dadap (*erythrina spp*) and sengon (*paraserianthes sp*). The Juria variety is the favoured variety by PD Komodo Jaya (farmer buying group) supplying to international coffee traders.

Given the mountainous terrain in NTT, a higher proportion (than the national average) of coffee grown is the lower yielding Arabica variety. The variety mix, the fact that some areas are too rugged for close spaced planting and a lack of inputs for increased production all contribute to a lower regional yield than the national average. The table below shows the regional areas and productivity.

Table 11
Regional harvested area, production, and yields
Indonesia, 2005

Province	Area (ha)	Production (ton)	Productivity (kg/ha)
1. Aceh	100,263	35,012	349
2. North Sumatra	51,353	41,493	808
3. West Sumatra	51,600	24,705	479
4. South Sumatra	273,451	140,463	514
5. Bengkulu	122,844	61,187	498
6. Lampung	168,006	142,761	850
7. Central Java	41,993	14,216	339
8. East Java	92,488	43,009	465
9. East Nusa Tenggara	61,437	16,467	268
10. South Sulawesi	68,577	29,992	437
11. Others	212,879	87,682	412
Indonesia	1,244,891	636,987	511.7

Source : Directorate General of Estate Crops, Indonesian Ministry of Agriculture, 2006

4. Market Conditions for the NTT Coffee Industry

Coffee is a global commodity where prices are affected by supply and demand conditions in world markets. Prior to 1989, traded coffee volumes were based on agreed quota levels in producer and consumer countries. One of the objectives of the quota system was to stabilise international market prices as well as to ensure reliable supply for major importing countries. This system was administered by the International Coffee Organization (ICO) under an agreement of 42 producer countries and 16 consumer countries. The quota system began to breakdown as producer countries increased production putting pressure on world prices. Indonesia was one of producer countries affected the said condition. In 1989 the system was abandoned and world prices continued to be depressed (Kustiari, 2007).

Domestic coffee trade in Indonesia is regulated by the Indonesian Ministry of Trade who set requirements and guidance for local and international exporters³. In 2001 coffee export taxes were removed to enhance market competitiveness and foreign exchange earnings (Kustiari, 2007).

While the domestic trade is regulated by central government, the nature of regional coffee trade is determined by production systems, processing practices, and relationship among farmers and traders. The majority of the coffee “marketing channel” in Indonesia is under control private traders and exporters. Industry studies estimate that the proportion of production and marketing volumes owned by state owned estate crop companies is only three percent (Jong, 1997).

The main factors that affect regional coffee supply chains are: (1) topography and geographical location of producing areas (i.e., smallholders receive less per kg in very remote areas where traders or collectors must pay for parchment to be transported by donkey to central towns and cities); (2) trader capital (e.g., if trader capital is not limited they have more ability to buy larger volumes of coffee from farmers and influence prices within small areas); and (3) the distance of rural and urban areas (Kustiari, 2007).

Domestic coffee consumption in Indonesia has increased significantly over the past decade driven almost entirely by soluble coffee (mainly lower grades and Robusta). Consumption fell sharply after the start of the Asian crisis and has never fully recovered to pre-crisis levels. Consumption fell from about 120,000 tonnes to about 78,000 tonnes during the crisis and is thought to have reached 102,000 tonnes in 2004.

³ Other industry organizations include *Dinas Perkebunan* (Estate Crops Office)- guide *PBS* (*Perkebunan Besar Swasta*/Private Estate Crops Enterprise), *PTPN* (*Perkebunan Negara*/State Owned Estate Crops Company). The *AEKI* (*Asosiasi Eksportir Kopi Indonesia*/Indonesian Coffee Exporter Association) assists the industry by organising exporters and providing as market development and research services.

The Indonesian coffee industry has undergone significant changes

The buying and trading of coffee within the industry has undergone significant changes over the past ten years. These changes have in general improved the transparency of coffee purchases and helped to improve farm-gate prices. During the late 1990s, quality concerns of green bean shipments resulted in major coffee buyers in the United States and Europe only sourcing coffee from large traders. A major concern being that if a container was rejected by a major US buyer small traders would inevitably attempt to reshipe the container at a later date.

For Indonesian coffee exporters, changes to buying and exporting occurred in a dramatic way as the country's largest buyer and traditional trader of coffee was found to be:

- concealing farm gate prices;
- forcing smallholders to supply on credit;
- mixing good quality Arabica with inferior grade coffee and Robusta; and
- tampering with shipment samples.

These practices kept farm gate prices down for the entire industry in Indonesia.

As a result of corrupt trading practices some traders and exporters were able to earn profits of USD\$5,000 – \$10,000 per container shipment or around 50 cents per kilo (Green Bean). Established industry stakeholders report that lead coffee buying firms made changes to the way they sourced coffee. Since the introduction of improved transparency systems average margins are around USD 10 cents per kilo.

Starbucks has helped changed the way Indonesian traders and exporters source coffee

In 2005 Starbucks made the largest recorded order from a lead exporter of Indonesian Robusta and Arabica (Sumatra, Java and Sulawesi). The exporter had for many years been using the practices outlined above and earning super-profits from trading coffee. The bean mixing practices often misled buyers and damaged the reputation of Indonesian coffee producers. Before the recent changes, exporters of this type were able to ship poor quality coffee to small buyers (mainly in Europe) without fear of rejection due to the cost that can cause buyers.

When Starbucks uncovered the corrupt buying and exporting practices, it made an additional order of the same size from other Indonesian exporters at a new higher price (i.e., 50 percent higher than the previous order) while maintaining the first order at the lower price. With the large volumes that Starbucks buy from Indonesia, it had a significant influence on the overall price for Indonesian exporters. With new higher priced contracts in place the exporter has had to honour the original contract at a significant loss.

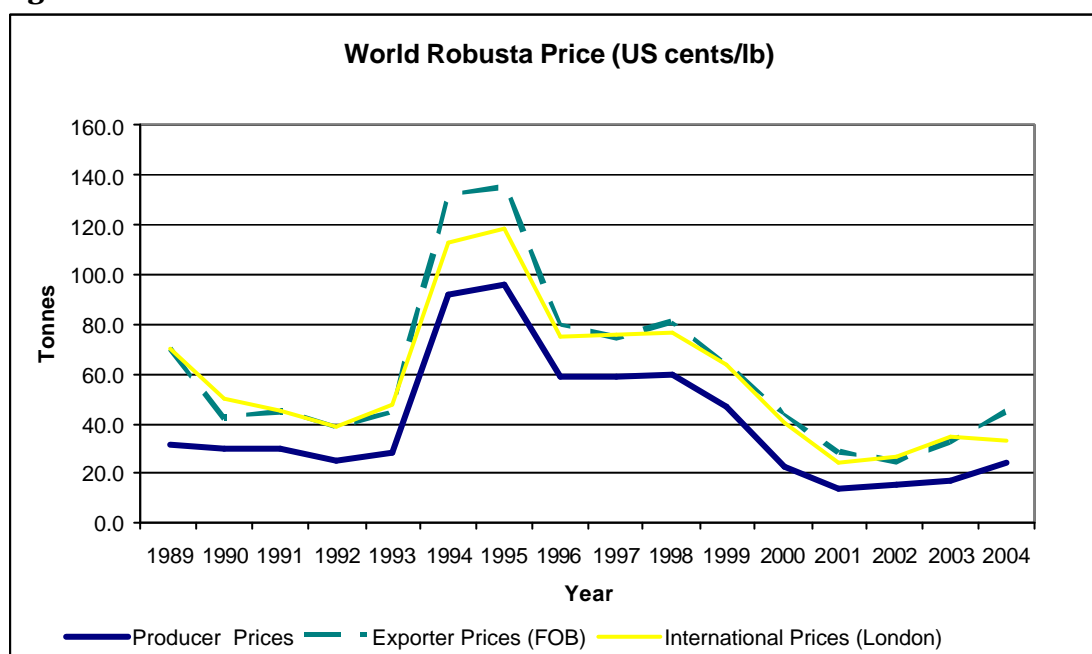
The new higher price was accompanied with a 'Starbucks certification' program of improved supply chain transparency and traceability that ensures price premiums are paid directly to accredited farmer associations. This program is equivalent to Fair-

Trade programs and is a positive step made by the largest buyer of specialty coffee to improve smallholder returns and improve the sustainability of its supply base. Starbucks is currently sourcing Arabica in small volumes from Flores, NTT. Starbucks is now the largest buyer of specialty coffee to the USA and sets the standards for Arabica prices and quality requirements.

Smallholders are very dependent on world coffee prices

A number of reports have documented the significant impact the coffee price crisis has had on the economic well being of smallholders in developing countries. The figure below shows the fluctuations in world coffee prices between 1989 and 2004 and demonstrates how closely correlated producers prices (and therefore returns) are with world coffee prices.

Figure 4

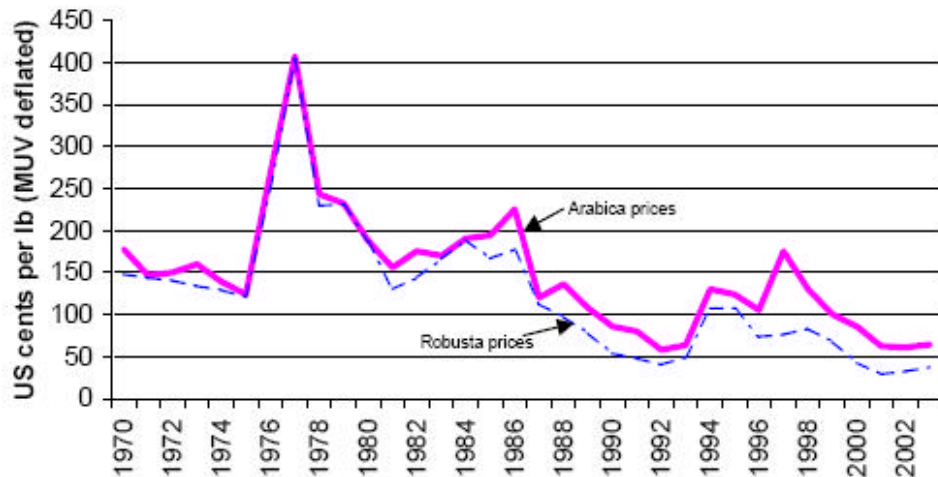


Source : Kustiari, Reni (2007)

International coffee markets have changed over the past few years

Since 1970 world coffee prices have declined at an average of 3 percent per annum for Arabica and 5 percent for Robusta. This trend has resulted in a coffee price crisis and has had significant economic and social impacts for coffee producing countries (which are predominantly developing countries). The decline in prices has been largely caused by continuing production increases without a corresponding increase in world consumption, until recently. The figure below shows the decline in world coffee prices.

Figure 5
Arabica and Robusta prices, 1970 - 2002



Source: Lewin *et al.*, 2004 (from ICO database)

Price volatility between years is mainly caused by weather shocks in the main producing countries (e.g., Brazil). However, the long-term trend has been declining coffee prices since the 1970s.

In recent years, significant structural changes have emerged to manage price volatility. One area of structural change has been increasing share of world supply from Brazilian, Vietnamese and Colombian producers combined with quality improvements. Increased access to financial and futures markets in these countries have also enabled some producers to manage risk and smooth shipments across cyclical production swings.

World prices have steadily declined while world production has increased

World production, as estimated by the USDA, has been rising by an average of 1.8 percent per year over the past 40 years. The main cause of these production increases has been a combination of:

- producer responses to sudden big price increases,
- falling production costs,
- new low-cost entrants, and
- inconsistent policy responses to price falls that delay market exit but encourage market entry.

Most of the recent growth in world supply has come from increases in Brazil, Vietnam and recently Colombia. Production has also changed since 1994 – 1995 when the price rises caused by the Brazilian frost encouraged some countries to expand production rapidly.

World markets have experienced growth in specialty coffee

Due to the unique location of remote highland villages and largely unspoiled growing environment NTT coffee producers (e.g., in Flores and Sumba) have an opportunity to market coffee as a specialty product from a distinct location. A number of industry studies have identified the specialty coffee industry as the fastest-growing segment of the global coffee market (Nielsen, J. 2004). The large number and popularity of roaster-retailer chains, offering coffee beans from various regional origins, supports the increased use of geographical identification within the specialty coffee sector. There is also an assumption with specialty coffee that producers capture a larger proportion of the final price.

Specialty and differentiated coffee has benefits and limitations (Lewin et al., 2004)

Emerging markets in non traditional markets (Asia, Eastern Europe, and the former Soviet Union) are experiencing rapid growth in consumption. This is mainly for inexpensive, soluble coffees, though tastes are changing toward improved quality and characteristics.

Soluble types are important to developing these traditionally tea-drinking markets because most consumers are unfamiliar with coffee-brewing methods. North America and Japan are growing slowly. Northern European consumption, particularly in Germany is stagnant, but in southern Europe, there are some increases with the differentiated product market (specialty coffee) growing the fastest.

The differentiated product market requires that producers distinguish their products by distinct origin, defined processes, or exceptional characteristics, such as superior taste or few defects. These can be traded through more lucrative channels than the typical industrial grades that flow in the undifferentiated commodity channels and include:

- Geographic Indications of Origin (appellations)
- Gourmet and specialty
- Organic
- Fair trade
- Eco-friendly or shade grown
- Other certified coffees

While these differentiated segments can provide some producers with competitive advantages and added value, they are not necessarily easy to access and are still relatively small. They are also important because of their potential to provide better social, economic, or environmental benefits for farmers. While price premiums are currently attractive, it should not be the only reason for entering these markets as at least in some cases these premiums will diminish.

Other benefits of this market segment include:

- Increased use of rural labor and organizational development
- Crop diversification and reduced input costs minimize financial risk
- Better natural resource management and biodiversity conservation

- Reduced risk due to improved drought and erosion resistance
- Crop resilience to adverse weather
- Fewer health risks due to potential mishandling of agrochemicals

While coffee market analyses point to strong growth in specialty and differentiated coffees, there is a potential for market saturation to reduce prices at current growth rates. These markets are still small and even modest changes in supply and demand can impact prices. Most of the major coffee companies are instituting increased requirements for sustainable growing practices that will require further adoption and certification of these practices. Several very large buyers that are now testing the market with these products claim that supply limitations will constrain expansion of this market (Lewin et al., 2004).

Geographical Identification of Toraja Arabica coffee has been established (through their investment in marketing) and is owned by Key Coffee for export to the Japanese market. Previous analysis (Neilson, J. 2004) of the Sulawesi coffee industry indicates that while this strategy achieves 50 percent price premiums for Key Coffee in the Japanese market, the benefits of the geographical identity do not reach producers.

Local market issues

Currently smallholder farmers sell coffee as either fresh cherries, pulped and fermented parchment, or cherries that have been fermented and dried then processed to remove skins (Asalan). There is no 'open market' for smallholders to sell coffee (e.g., at local markets) all coffee buyers have collectors that collect coffee directly from farmers. Buyers can make advance payments to smallholders "Ijon" through their collectors and is usually 50 percent of the expected crop. This practice ensures supply for buyers but can result in a lack of transparency on the final price. Anecdotal evidence suggests that the "Ijon" (and final price) can depend on how urgently the smallholder needs the money.

The PD Komodo Jaya buying group, with the help of lead coffee buying firms, had early success in encouraging farmers to produce fermented parchment, improving the quality of the final coffee bean and farm gate prices. The returns of various marketing and added-value activities are shown in Section 4.6.

Encouraging best practice handling of coffee beans at the village level has been little in important for the ability of PD Komodo Jaya to offer higher prices and deliver improved quality to its buyers. Transport time from village to processing sites is a maximum of 1-2 days before parchment (50 percent moisture) needs to be dried down to 12 percent moisture and processed to green bean.

PD Komodo Jaya and PT Lion Lestari are working to improve farmers' trading conditions

PD Komodo Jaya was established as a local government company to buy coffee through farmers' groups. Coffee is being sold to Starbucks through PT Lion Lestari in Makassar. Starbucks and PT Lion Lestari are buying the unique Juria Arabica from upland villages and are working through Komodo Jaya to improve farmers' growing, harvest and post harvest practices.

Komodo Jaya provides three main services to farmers: marketing; transportation and construction services; and farmer credit. In 2003, PD Komodo Jaya approached PT Lion Lestari (coffee processor and exporter) about sending Juria Arabica, Hybrid Arabica and Robusta coffee samples via one of PD Komodo Jaya's customer in Surabaya.

Lion Lestari organised field visit for major coffee buyers, near Ruteng, Flores and thereafter conducted training on harvest and post-harvest practices.

In 2004 and 2005 Komodo Jaya facilitated the sale of three, and seven containers respectively (20 tonnes per container) of parchment at between Rp 4,000 and 5,000 per litre of parchment (0.25kg per litre). The coffee is being purchased through farmer groups and farmers are receiving prices of approximately 10 percent higher than traditional marketing channels. While Komodo Jaya was successful in working with Lion Lestari, internal management problems have reduced their involvement with farmer-groups.

PT Lion Lestari began buying coffee from Flores in 2001 (previously growing coffee in Toraja). The company has established new environmental standards for their coffee purchased from Komodo Jaya. Lion Lestari does not buy coffee: (1) that was planted in conservation areas in 2004; (2) planted in the surrounding watershed areas; and (3) that may cause environmental degradation especially (e.g., waterway pollution).

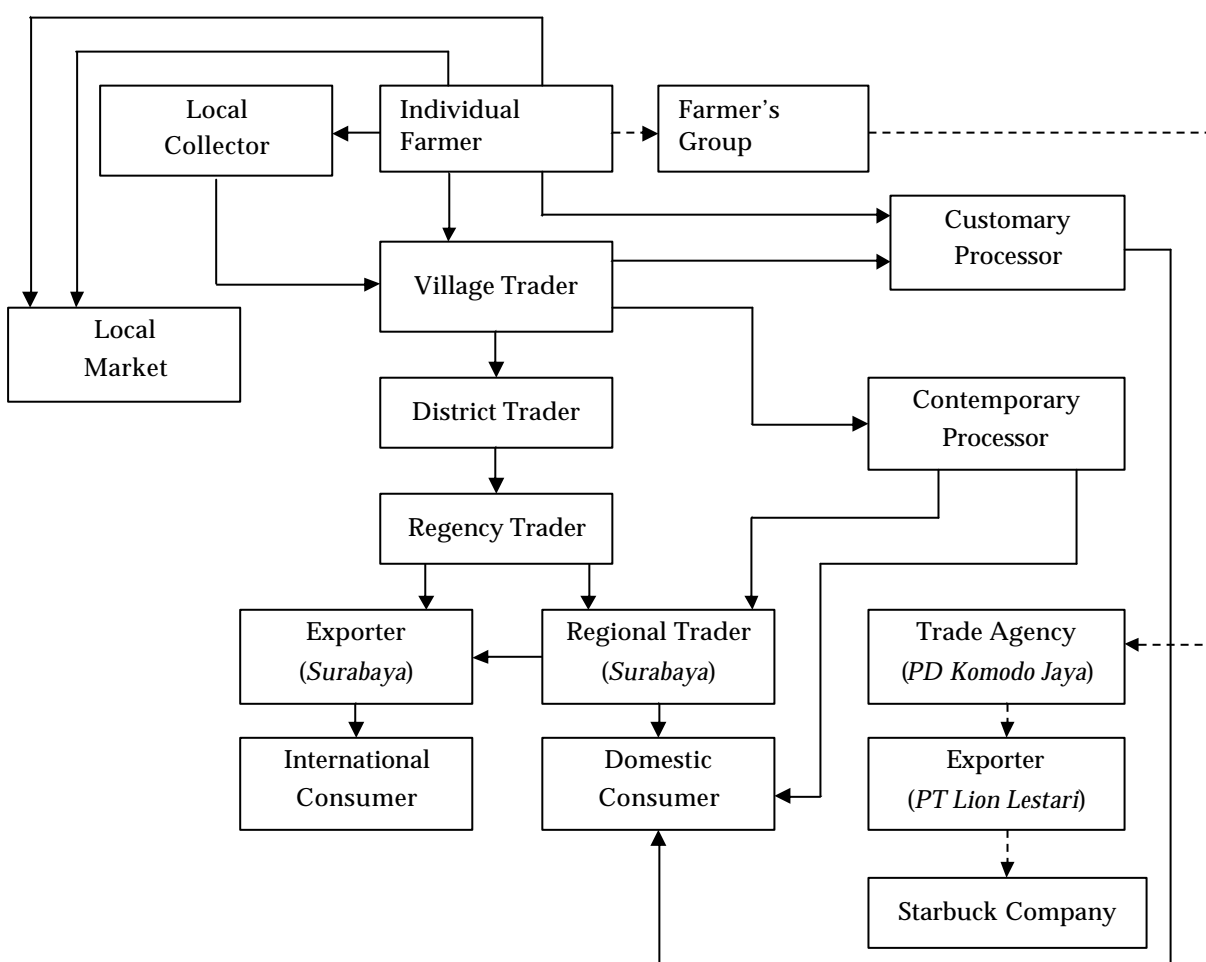
PT Lion Lestari is currently working to certify smallholder farmers in Flores for organic and fair-trade certification. There are 3,300 farmers from the three Flores regions certified or close to achieving full certification status. These farmers are organized into farmers' groups (at the village level around 45-50 farmers per group) and larger farmers co-ops containing around three farmers' groups. Buying through farmer co-ops is a requirement of fair trade certification and traditional growing practices are very close to organic product requirements. USAID has also shown interest in assisting the program with achieving farmer certification. The cost of verification experts are currently paid by E-Com (Lion Lestari's main buyer). The size of the program is outlined below.

Table 12 Size of PT Lion Lestari's Program in Flores Island, NTT, 2007

Item	Quantity	Remark
No of farmers (person)	3,300	
Average area per farmer (hectare)	1.0	
Total growing area in the program (hectare)	3,300	
Expected cherry production (kg/ha)	2,100	
Parchment per hectare (litre)	700	1 litre = 3 kg

Marketing channel of coffee in Manggarai is presented below. Individual farmers can perform the roles of producer, local collector, village trader and also be part of a farmer's group. Usually farmers with higher social status adopt the roles of local collector and village traders. The complexity of the marketing channel illustrated below shows that implementing supply chain transparency programs, such as FairTrade, can be challenging and is likely to require reducing the involvement of intermediaries.

Figure 6 Marketing channel of coffee in Manggarai Regency, NTT



Source: Field research

There is strong demand for Flores NTT coffee

While the export volumes of branded Flores Arabica have been low to date, lead buyers (e.g., Starbucks) have recognised the region as a producer of unique flavoured coffee and expressed a willingness to develop the name as specialty coffee producing region. This interest extends to improving on-farm and post harvest practices to improve bean and parchment quality. Small amounts of Grade 1 coffee (Arabica juria) were exported from Ngada in 2006 for Rp 24,000/kg, 30 percent higher than equivalent coffee from other regions.

Starbucks lead the industry in terms of price and quality standards. Being the largest buyer for the largest specialty coffee market (USA) Starbucks can pay up to Rp13,000/l of parchment for the right quality coffee, nearly three times current average prices in Flores (Rp4,500 – 5,000/l).

Indonesian coffee has natural low acidity and high body flavour due to the soils and climate. This style is different to the natural high acidity-low body coffee produced in Brazil and Central America. Consumers in the largest export market (USA) prefer the Indonesian style putting the industry in a favourable position. One of the main barriers to increasing exports is the wide range in quality, largely due to poor on-farm post harvest practices.

Currently coffee produced in Flores is not differentiated as Flores coffee and mixed with Sumatran or Kalosi coffee and sold as such. The practice of mixing coffees from a number of regions is common as it has been very difficult for exporters to buy and market small volumes of coffee from unknown regions such as Flores. Large companies with the resources to adopt a long-term strategy for the purchase and marketing of regional coffee, are now able to invest in the local supply channels.

A major buyer is now working to assist farmers gain certification (Fair-trade, Starbucks certification) and developing the brand as producing region. Anecdotal evidence (*pers comm.* K. Gartner) indicates that there is very high demand (and 30% premium) for Fair-trade organic coffee in the USA, Japan and Europe. A leading exporter of Flores coffee (ECom Ltd) is using Fair Trade Organic and Starbucks certification to build the reputation of the region. Trading conditions in Sumba (the other main producing region) were not researched.

In March 2007 Fair-trade certification attracted a premium of around USD50 cents per kilo for green bean or 15 percent over non-certified coffee for exporters. This premium must be given back to farmers otherwise the supply chain loses certification. Equally certification can open up new markets for the coffee. Fair-trade and Starbucks certification focus on supply chain transparency, traceability and ensuring that price premiums reach smallholders. Organic certification is for on-farm practices only.

5. Coffee Industry Supporting Structures and Related Industries

The National Cocoa and Coffee Research Institute provides technical assistance to growers

The local government of Manggarai Regency has collaborated with *Puslit Koka* (Research Institute for Coffee and Cacao) of Jember (East Java) to develop coffee production in the district over a five-year programme, beginning in 2004/2005. It is funded by local government (APBD (*Anggaran Pendapatan dan Belanja Daerah*)). The programme focuses on smallholder coffee technology development, particularly harvest and post harvest handling. The programme is implemented through farmer's groups in the form of training of picking, processing, and packaging of dried coffee bean (*ose*).

Introduced technologies include, (1) pulping; (2) washing methods; (3) improved coffee drying equipment (21 days); and (4) handling for transport (at 12 percent moisture). Anecdotal evidence indicates that farmers have been reluctant to adopt the improved practices due to additional labour requirement without significant price increases. To address the situation the local government (Estate Crops Office/ *Dinas Perkebunan*) is collaborating with a private company in establishing *UPH* (*Unit Pengolahan Hasil/Processing Unit*) and providing a loan of approximately Rp 120 million to farmer's groups to purchase 60 tons of fresh coffee bean (@ Rp 2,000/kg) and processing through *UPH* (farmers normally receive Rp 2,500 for fresh bean from the market). The outcomes of the processing venture are not known yet. *UPH* has also purchased parchment coffee from farmers with the price of Rp 14,000/kg (water content 12%), which is twice the price for standard quality parchment.

The local government has also introduced other development programmes (such as the farmers' empowerment programme to improve farmers' bargaining power) and appears to be relatively active in encouraging growth in the industry. The farmers' empowerment programme also provided price quality and market information to farmer groups and is implemented by the Cooperative Office (*Dinas Koperasi*) and collaborating with *PD Lahir Sejati Unggul* (exporter).

In order to increase *PAD* (*pendapatan asli daerah/locally-generated revenue*), the local government of Manggarai Regency had implemented the regulation of *SPPMK* (*sumbangan peningkatan produksi dan mutu kopi/contribution for increasing production and quality of coffee*). However, this regulation has been annulled because it was contradictory with central government regulation. Hence, local government launched new regulation called third party (businessmen) contribution of about 2.5 percent of the quantity of trading coffee based on the price of Rp 100 per kilogram fresh coffee bean.

Farmers lack access to finance from well functioning financial institutions

Farmers have little or no access to working capital for the timely purchase of quality agri-inputs, such as pulping machines, fertiliser for low land Robusta varieties and new seedlings. Farmers can obtain informal credit from local traders and collectors although this system often lacks transparency.

Local banks have had poor lending experiences with farmers in the past and also lack an understanding of rural finance requirements and sources of loan security (see earlier section on rural credit).

The industry also lacks investment in processing facilities to handle the increasing volume of coffee being produced. This puts the industry at risk of developing a reputation as a low quality producer.

6. Value Chain Cost Analysis

The following tables allocate costs and returns for coffee industry stakeholders at various stages of the supply chain. The estimates are based on a field assessment and are verified with previous research undertaken in the sector. Assumptions have also been verified by industry stakeholders.

Table 13
Smallholder selling Arabica traditional dried bean "Asalan" (per hectare)

Income (per hectare)	Unit	Volume	IDR/Unit	IDR	USD
Trees per hectare		250			
Harvested cherries/tree	kg	21			
Harvested cherries	kg	5,250			
Conversion of cherries to parchment			kg/l 1.8		
Parchment		2,917			
Conversion of parchment to Asalan GB			litre/kg A 4.0		
Dry fermented bean "Asalan" 12%WC		729	14,000	10,208,333	
Total Income				10,208,333	1,134
Production Costs (per hectare)					
Labour pruning + weeding	lbr days	13	15,000	195,000	22
Labour harvest	days	250	15,000	3,750,000	417
Trad pulping process (luvak)	kg	729	100	72,917	8
Fermentation and drying		5,250	100	525,000	
Total Production Costs				4,542,917	446
Gross Profit/Margin per hectare				5,665,417	688

The returns for best practice growing, harvesting and marketing through the Komodo Jaya company shows the returns achievable by improving post harvest practices and establishing direct links with coffee buyers.

Table 14
Smallholder selling Arabica parchment through Komodo Jaya buying group (per hectare)

Income (per hectare)	Unit	Volume	IDR/Unit	IDR	USD
Trees per hectare		250			
Harvested cherries/tree	kg	21			
Harvested cherries	kg	5,250			
Conversion of cherries to parchment			kg/l 1.8		
Parchment	litre	2,917	5,500	16,041,667	1,782
Total Income				16,041,667	1,782
Production Costs (per hectare)					
Labour pruning	lbr days	13	15,000	195,000	22
Labour harvest	days	250	15,000	3,750,000	417
Pulping	kg	5,250	100	525,000	58
Fermentation, drying & handling	kg	5,250	100	525,000	58
			1,533 Rp/l		
Total Production Costs				4,470,000	497
Gross Profit/Margin per hectare				11,571,667	1,286

Collector of fresh cherries and processor

The table below shows the estimated returns for a local collector buying fresh cherries undertaking pulping, fermentation and drying to parchment stage and selling to local buyers. Some farmers with better access to labour and capital (such as a head of farmer group) also fulfil the collector role for their local villages as a means of improving their income.

Table 15

Income (per tonne)	Unit	Volume	IDR/Unit	IDR	USD
Fresh cherries collected	tonnes	60			
Harvested cherries	kg	60,000			
Conversion of cherries to parchment			kg/l 1.8		
Parchment		33,333	5,500	183,333,333	
Waste from fermentation		1,538	13,000	19,994,000	
Total Income				203,327,333	22,591.93
Production Costs (per tonne)					
Fresh cherry	kg	60,000	2,500	150,000,000	16,666.67
Transport from farms	kg	60,000	50	3,000,000	333.33
Pulping cherries	kg	60,000	100	6,000,000	666.67
Fermentation, wash and dry	kg	15,000	500	7,500,000	833.33
Transport and handling	kg	15,000	150	2,250,000	250.00
Restribution	kg	15,000	100	1,500,000	166.67
Total Costs				170,250,000	18,916.67
Gross Profit/Margin (per tonne)				33,077,333	3,675.26

Coffee processor for Flores coffee- parchment to green bean for export

The table below shows indicative returns for processors undertaking contract processing an exporter. Profitability for this intermediary is based on the quality of parchment (i.e., defects and waste material), transport costs and volumes.

Table 16

Income	Unit	Volume	IDR/Unit	IDR	USD
Yield from parchment to kilos (grade 1)		3.25			
Processing fee (grade 1 G Bean)	kg	1.00	2,300	2,300	0.26
Total Income				2,300	
Production Costs					
Processing	kg	1	2,100		-
Densmtris testing	kg	1	40	40	
Hulling	kg	1	50	50	
Drying	kg	1	131	131	
Sorting	kg	1	300	300	
Other processing costs	kg	1	79	79	
Total Processing Costs	kg			-	
Transport (Flores-Makassar)	kg		480	480	
Overheads (e.g., warehouse)	kg		1,000	1,000	
Other costs					
Total Production Costs				2,080	0.23
Gross Profit/Margin per kilo green bean				220	0.02

Coffee exporter buying parchment and exporting green bean

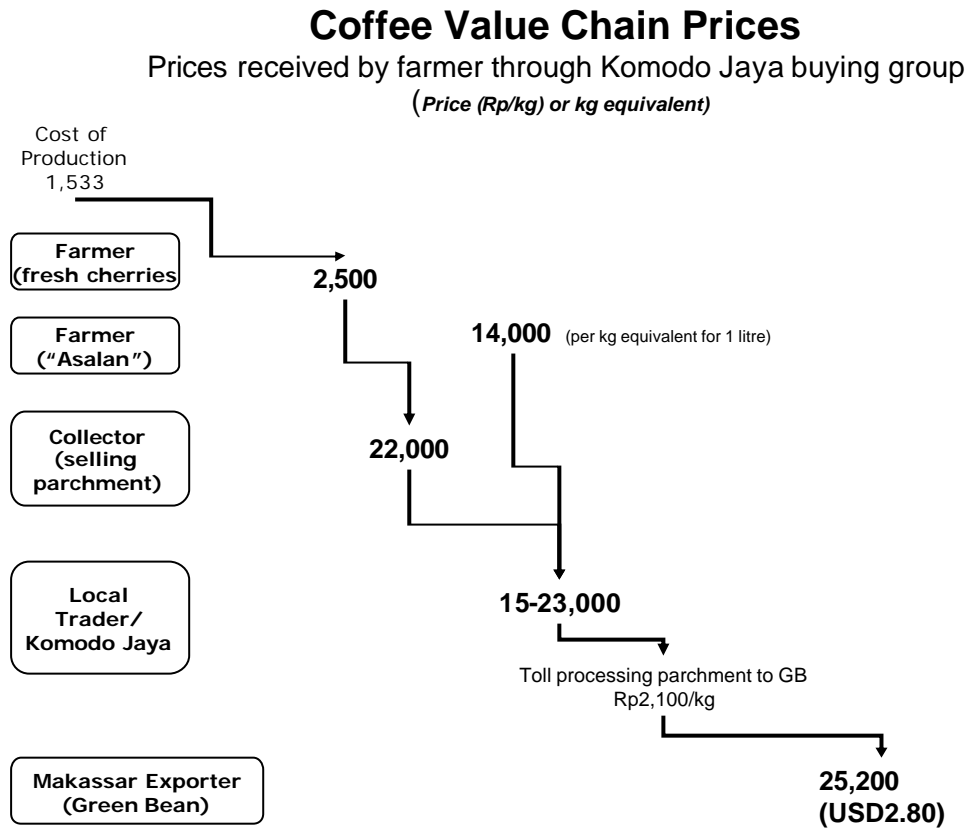
The table below shows indicative returns for exporters buying parchment direct from farmers and paying collectors, a contract processor to process from parchment to green form and exporting on international markets.

Table 17

Income	Unit	Volume	IDR/Unit	IDR	USD
Export sales of Green Bean	kg	1.00	25,200		
Total Income				25,200	2.80
Production Costs					
Raw materials (parchment)	litre	3.25	5,500	17,875	1.99
10% loss- hand grading	litre	0.33	5,500	1,788	0.20
Operational Cost Collector	litre	3.58	600	2,145	0.24
Processing fee	kg	1	2,100	2,100	0.23
Other costs	kg	1		-	-
Total Production Costs				23,908	2.66
Gross Profit/Margin per kilo green bean				1,293	0.14

The diagram below illustrates how value is distributed along the coffee value chain from the farmer to the exporter. This diagram, in combination with the estimate of economic returns made in the tables above, show that farmers are able to capture a higher proportion of the final export price by selling parchment as opposed to selling fresh cherries. This value-added activity can be achieved without significant increases in total costs (see tables above). What is not shown in the figure below are the margins made by roasters and coffee retailers (selling coffee drinks) in the US market. Indonesian coffee industry experts believe that roasting adds a further (USD) \$23 dollars per kilo and processing into finished coffee drinks adds a further \$45 per kilo.

Figure 7



7. NTT Coffee Product Value Chain Table – From Smallholder Perspective

INBOUND LOGISTICS		
Observations	Issues	Recommended Strategies
HUMAN RESOURCE MANAGEMENT		
<p>Farmers are able to produce coffee in highland areas with no synthetic fertiliser inputs or pesticides.</p> <p>Farmers view the Juria variety as their family heritage and so have traditional knowledge of managing coffee trees.</p> <p>Farmers usually share coffee harvest duties and other major events.</p>	<p>Farmers generally lack knowledge of the best practices for managing trees (e.g. pruning and harvest).</p>	<p>Assist key stakeholders (e.g., Lion Lestari, PD. Komodo Jaya, DINAS, etc.) to improve local farmers knowledge and skills through demonstration and extension programmes.</p> <p>Include farm budgeting skills and training programmes so that farmers are able to save cash for any necessary farm inputs.</p>
TECHNOLOGY AND DEVELOPMENT		
<p>Knowledge and access to on-farm pulping machines are poor.</p> <p>The quality of seedlings provided by government can be poor.</p>	<p>A reliance on family labour and other labour from the village can mean it's difficult to train farm labour to select only the best quality cherries.</p>	<p>Assist key stakeholders (e.g., Lion Lestari, PD. Komodo Jaya, DINAS, etc.) to improve local farmers knowledge and access to pulping machinery and best practice harvest management.</p> <p>Involve key stakeholders in improving quality of seedling</p> <p>Establish demonstration farm to improve region specific knowledge of input use and culture selection, including leverage IFC's Sulawesi program</p>

INBOUND LOGISTICS		
PROCUREMENT		
Farmers lack capital for routine expenses due to a lack of cash income from other crops.	Farmers lack capital to pay for improved technologies and improved seedlings and lack the time and knowledge to train harvest labour	Use existing farmer groups to research opportunities to improve farmer-access to finance through IFC SADI's A2F program. Explore the feasibility of a warehouse receipts program and how it could be applied for NTT coffee growers to improve access to finance.
OPERATIONS (Production)		
Observations	Issues	Recommended Strategies
HUMAN RESOURCE MANAGEMENT		
Lack of understanding of post harvest produces poor quality coffee beans.	Poor harvest practices and post harvest fermentation practices produces a wide range of coffee quality and creates incentives for traders to mix high quality was poor quality coffee. The result is that market opportunities are limited by these practices.	Work with existing stakeholders (e.g. buyers and farmer groups) to expand the current coverage of supply chain programs, such as FairTrade and Starbucks certification. Working with "model farmers" may help to change farmers attitudes to traditional post harvest practices (e.g., encouraging the use of field pulping with the traditional luvak pulper)

TECHNOLOGY AND DEVELOPMENT		
Best practice field luvak pulpers are not always available for farmers.	Buyers accept poor quality of coffee pay low prices and therefore the supply chain has adapted to sell a wide range of coffee quality.	<p>Work with existing stakeholders (e.g. buyers and farmer groups) to expand the current coverage of supply chain programs, such as FairTrade and Starbucks certification.</p> <p>Collaborate with CV. Lion Lestari to establish demonstration farm with farmer groups to improve the knowledge of best practices.</p>
PROCUREMENT		
<p>Access to agri-inputs for low land Robusta coffee producers can be limited by a lack of capital.</p> <p>Farmers also lack capital for harvest and routine household consumption.</p>	A lack of access to capital and for on-farm practices reduces coffee quality.	<p>Use existing farmer groups to research opportunities to improve farmer-access to finance through IFC SADI's A2F program. Collaborate with national research institutions (e.g., Coffee and Cocoa Research Centre in Jember) to improve on-farm practices.</p> <p>Establish demonstration farm to improve region specific knowledge of input use and culture selection, including leverage IFC's Sulawesi program.</p>

OUTBOUND LOGISTICS		
Observations	Issues	Recommended Strategies
HUMAN RESOURCE MANAGEMENT		
Farmers understand that improved quality is likely to result in higher prices.	A lack of knowledge and capital limit farmers' ability to improve coffee quality, production and coffee returns.	Establish a demonstration farm to improve region specific knowledge of input use and culture selection, including leverage IFC's Sulawesi program. Work with local traders and collectors to helping them understand the potential benefits of improved pricing and mixing practices may improve the overall quality of coffee produced in target sub-districts.
TECHNOLOGY AND DEVELOPMENT		
Current pulping and post harvest fermentation practices result in poor quality coffee. The topography can be a major barrier to deliver coffee to central collectors and processors due to the risk that dry fermented coffee can become tainted.	In remote areas which is transportation became a constraint, coffee farmers usually produce Ose green bean (asalan), resulting in poor prices and a wide range of quality.	Conduct further research on whether current coffee transport and collection systems in NTT can be improved through investment in infrastructure or provision of finance to supply chain intermediaries. Encourage ACIAR (SP 3) to identify best practices technology for post harvest and processing with existing industry buyers and stakeholders.
PROCUREMENT		
The seasonal nature of cash income for smallholder farmers can mean that farmers lack cash for routine household consumption and lab	Current system of Ijon for forward payment and finance can conceal actual market prices from smallholders.	Use existing farmer groups to research opportunities to improve farmer-access to finance through IFC SADI's A2F program.

OUTBOUND LOGISTICS		
Observations	Issues	Recommended Strategies
<p>for harvest.</p> <p>The current marketing channels can be complex resulting in a number of transactions prior to processing.</p>		<p>Explore the feasibility of a warehouse receipts program and how it could be applied for NTT coffee growers to improve access to finance.</p> <p>Encourage agreement between buyers and farmers on required coffee quality.</p>
MARKETING AND SALES		
Observations	Issues	Recommended Strategies
HUMAN RESOURCE MANAGEMENT		
<p>Knowledge of prices can be limited in remote areas.</p>	<p>Farmers are often in a weak bargaining position at the time of sale.</p>	<p>Explore the feasibility of a warehouse receipts program and how it could be applied for NTT coffee growers to improve access to price information and timely capital.</p>

TECHNOLOGY AND DEVELOPMENT		
<p>Poor methods of transportation from fields to village and central buying stations can reduce coffee quality. A lack of adequate telecommunication facilities can limit price information.</p> <p>Existing roading infrastructure does not seem to present a barrier to transporting coffee around Ruteng however, more remote areas are affected by poor infrastructure.</p>	<p>Coffee quality can be reduced from beans developing a musty taste while stored in bags at moisture levels above 12%.</p> <p>Farmers only have limited access to price information.</p>	<p>Conduct further research on whether current coffee transport and collection systems in NTT can be improved through investment in infrastructure or provision of finance to supply chain intermediaries.</p> <p>Research the benefits of improved telecommunications in remote areas to improve price information to farmers.</p>
PROCUREMENT		
<p>In highland areas farmers mainly rely on coffee for cash income.</p>	<p>A reliance on coffee for cash income can expose smallholders to the risk of price fluctuations and seasonal effects on production.</p>	<p>Investigate how smallholders can improve their total annual income by diversified and their sources of income by developing an integrated farming system.</p>

SERVICE		
Observations	Issues	Recommended Strategies
HUMAN RESOURCE MANAGEMENT		
<p>Lack of understanding by local government (e.g., DINAS and BAPPEDA) on smallholder needs and issues.</p> <p>A lack of understanding and inability of coffee chain intermediaries to provide for smallholder coffee farmers' basic imports and marketing services.</p> <p>A strong traditional socio hierarchy exists at the Village and sub district level.</p>	<p>Local government usually design program using a top down approach</p> <p>Market failures mean that the private sector doesn't usually require a high standard of coffee.</p>	<p>Involve local government institutions (e.g., DINAS and BAPPEDA) and private sector collectors and traders in demonstration farm and extension programmes to improve the industry's understanding of farmers' needs and issues; and vice versa.</p>
TECHNOLOGY AND DEVELOPMENT		
<p>The involvement of local government in technology dissemination is poor.</p>	<p>Current private sector buyers believe that existing post harvest practice recommendations from national research institutes do not result in improved coffee quality.</p>	<p>Engage national research providers with existing lead buying firms to reach agreement on optimum recommended harvest and post harvest practices.</p>
PROCUREMENT		
<p>The role of financial institution in funding the smallholders farmer is very limited</p>	<p>Limited access to finance in the off-season means that farmers lack cash for routine household consumption and are forced to rely on "Ijon" for forward payment on expected coffee harvest.</p>	<p>Encourage collaboration between IFC SADI's A2F program, lead coffee buyers and farmer groups to develop smallholder finance programs.</p>

8. Summary of Industry Potential, Issues and Recommendations

8.1. Industry Potential

The sector profile and value chain cost analysis identifies the potential for improved smallholder coffee returns. The main factors that give the NTT province potential in this regard are summarised below.

- Indonesian coffee has natural low acidity and high body flavour due to the soils and climate. This style is different to the natural high acidity-low body coffee produced in Brazil and Central America. Consumers in the largest export market (USA) prefer the Indonesian style putting the industry in a favourable position. One of the main barriers to increasing exports is the wide range in quality, largely due to poor on-farm post harvest practices.
- There has already been interest shown in parts of NTT, namely Flores, as a region producing distinctive flavoured “Juria” Arabica coffee and will invest in developing and improving supply in the region (Flores is 35-40% Juria). The nature of Flores soils, climate, tree varieties and climates in growing areas give coffee this distinctive flavour. Small volumes of Grade 1 coffee were exported from Ngada in 2006 for Rp 24,000 kg, over 30 percent higher than equivalent coffee from other regions.
- There may be potential for other parts of NTT (e.g., Sumba) to also take advantage of this opportunity to supply lead firms such as Starbucks for the benefit of smallholders.
- The mountain climate in some areas reduce pest and disease challenge and current production practices have very low inputs. This production system produces a heavier bean (favoured by buyers and receiving 10% better price for parchment) and would make the transition to organic production and certification relatively smooth if viable market opportunities became available.
- There are areas of undeveloped land that could potentially be planted in coffee and areas that require rehabilitation that would increase the region’s total production.
- Smallholder farm gate prices are affected by world prices. World coffee prices are currently strong, supported by high demand for mild flavoured coffees such as Arabica. The demand for specialty and differentiated coffee is growing rapidly. The short to medium term price outlook is favourable for these styles.
- The analysis shows that there is potential to lift smallholder returns by improving post harvest fermentation practices and working with existing buying groups (e.g., Komodo Jaya) to improve smallholder returns.
- Anecdotal evidence suggests that farmers could improve returns by increasing yields of Arabica and Robusta varieties with improved access to finance for inputs and crop husbandry.

8.2 Industry Issues and Value Chain Analysis

The following points summarise the main issues for the coffee industry, as they relate to the needs of smallholders.

- Current coffee crop yields are low due to a lack of tree management and pruning, reducing yields and producers returns. In lowland areas farmers lack an understanding of pest and disease management and access to inputs to lift yields and bean quality.
- The quality of bean and parchment sold by farmers varies greatly between villages and seasons and is also affected by poor post harvest practices. The variation in bean quality forces traders to use mixing practices that reduce the overall farm gate price.
- Farmers in upland areas rely heavily on Arabica coffee for cash income (proximity to markets and limited arable land limits other cash enterprises). Farmers relying on coffee for cash income are exposed to the risk of poor coffee yields due to changeable seasonal weather. Anecdotal evidence suggests that weather patterns are becoming less predictable.
- There is no ‘open market’ for smallholders to sell coffee and the practice of making 50 percent advance payments through collectors (Ijon) can result in a lack of transparency on the final price. Anecdotal evidence suggests that the “Ijon” (and final price) can depend on how urgently the smallholder needs the money.
- A risk for the Indonesian industry is the current lack of processing capacity to handle increasing volumes of coffee being produced. This puts the industry at risk of developing a reputation as low quality producer.
- The local port of Reo doesn’t have a container ship facility so coffee must be shipped in sacks to Makassar (for current speciality buyer) and containerised there before export.
- Current post harvest practices mean that parchment must be dried and sold within a few days otherwise beans developed a “musty” taint. Improved drying practices (drying parchment down to 12% moisture) reduce the need for farmers to immediately sell coffee and provide farmers with more flexible marketing options.
- There are currently no local institutions able to ensure the geographical authenticity of NTT coffee exported under a specific geographical identity such as “Flores Coffee”. Despite place names being the main point of quality differentiation for importers and roasters in export markets (according to previous studies), place names are applied to coffee at the site of export and is to a large extent, arbitrary. Recent moves by corporate coffee buyers to establish geographical identity for Flores Coffee (primarily Starbucks and the use of FairTrade certification) appear to be positive steps in ensuring that price premiums reach producers.

- The coffee supply chain is relatively efficient although current collector and trader handling practices (e.g., poor processing, mixing coffee grades) distort price-quality signals and reduce the incentive for most farmers to undertake best practice post-harvest handling.
- Current post harvest practices promoted by Indonesian Centre of Coffee and Cocoa Research (Jember) are not favoured by private sector buyers.
- NTT coffee producers are susceptible to world price fluctuations in world commodity markets for green bean coffee.
- The current mixed quality of coffee produced in NTT makes farmers susceptible to heavy price discounts from collectors and traders and puts them in a weak selling position.
- Smallholders face a number of other barriers to improving returns associated with supporting structures and related industries:
 - Farmers have little or no access to working capital to purchase necessary agri-inputs in a timely manner;
 - Low availability of improved seedlings to begin a cycle of replacing old and senile trees;
 - A low level of extension services provided by government Ministry of Agriculture or DINAS;

8.3 Recommendations for IFC TA

The following points summarise the key recommendations that arise out of the value chain analysis and field research. The recommendations are aimed at improving smallholder returns through a long-term (3-10 year) Technical Assistance (TA) program.

- Work with existing buying groups and processors (e.g., Lion Lestari) to expand Flores operation and/or replicate farmers accreditation and improved post harvest practices in Sumba.
- Provide business development services to the Komodo Jaya buying group to manage current financial and operational problems and improve its level of service to smallholders.
- Include risk management strategies for farmers in demonstration and improved practices programme such as having a mix of Robusta and Arabica trees. This can help to manage market (price fluctuations) and production risks that can result from unseasonably wet or dry weather at flowering. An unseasonably wet flowering season has the opposite effect on Robusta as it does on Arabica. Having a mix of Arabica and Robusta coffee can be a good way for farmers to manage this risk.
- Undertake further research into the home consumption and cash income needs of smallholders in coffee producing areas so that IFC TA can be directed at reducing smallholder-dependence on coffee for income by developing other

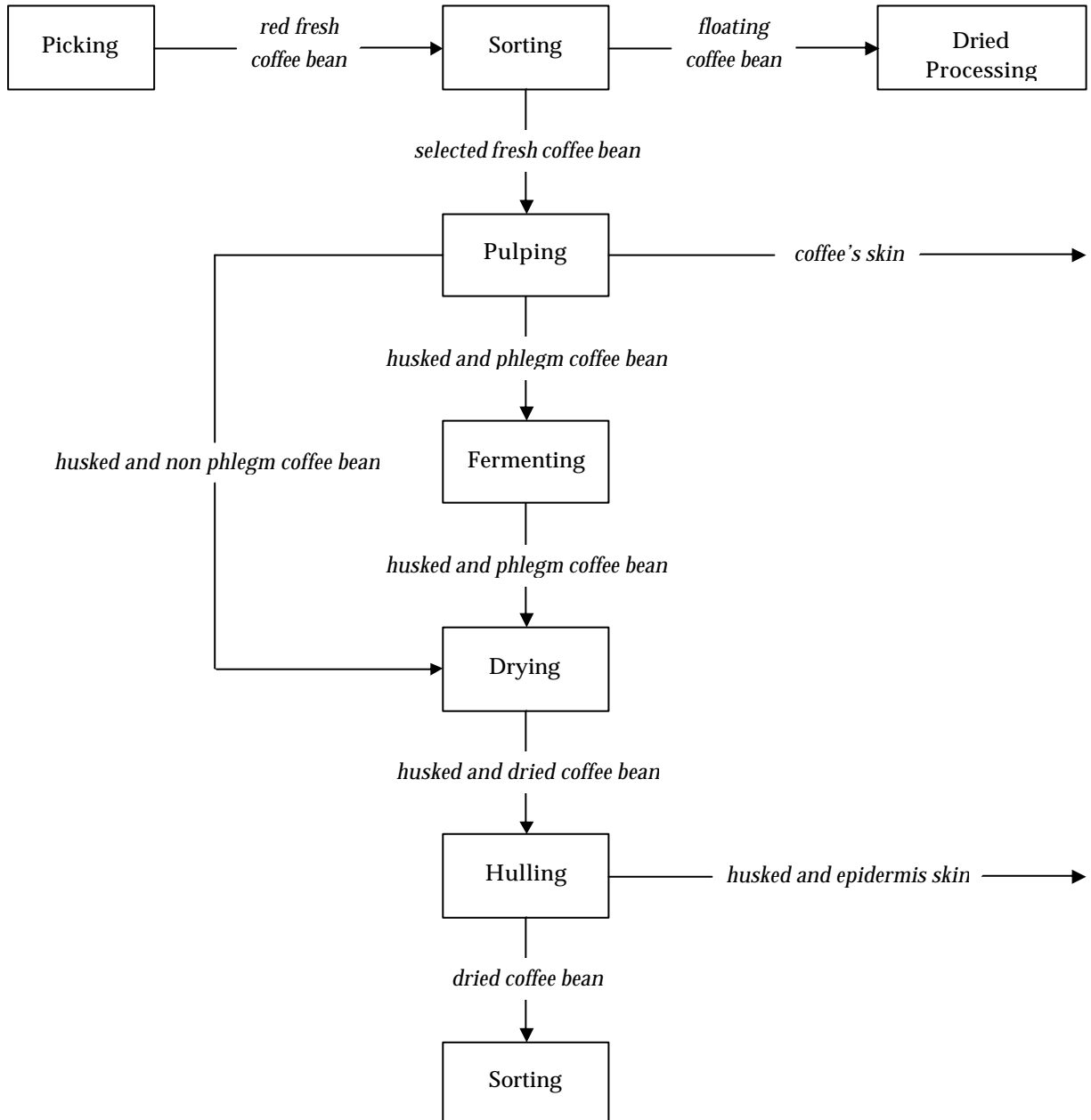
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- potential crops/enterprises.
- Undertake further research into the environmental sustainability of the current coffee producing practices to minimise environmental degradation and ensure farmers have long-term future in economically viable coffee growing.
 - Improve smallholders' access to working capital by assisting the development of improved farmer loan capacity within local banks and PUSKUD. The IFC A2F program will have an important linking role in this TA intervention. New models of making capital available to smallholders via farmer associations and marketing mechanisms should be explored.
 - Engage the BEE component of the IFC SADI subprogram to investigate and understand what institutional support is required to ensure geographical authenticity of coffee produced in NTT and exported from Makassar under specific geographical identities.
 - Establish a demonstration farm with existing lead buying firms and farmers' buying groups to improve coffee quality, growing and post harvest practices. A demonstration farm program should include the following components:
 - Training on tree pruning and management of agri-inputs
 - Replacement of senile trees, seedling selection and planting
 - Nutrient and pest and disease requirements
 - Safe handling of agri-chemicals and principles of sustainable agriculture and environmental protection (e.g., the Good Agricultural Practices (GAP) standard).
 - Improved post harvest handling to pulping, fermentation and drying practices
 - Inter-row cropping in newly planted areas
 - Farm planning and budgeting
 - Engage local DINAS in demonstration farm field days so that the DINAS becomes an initiator of future smallholder training sessions.
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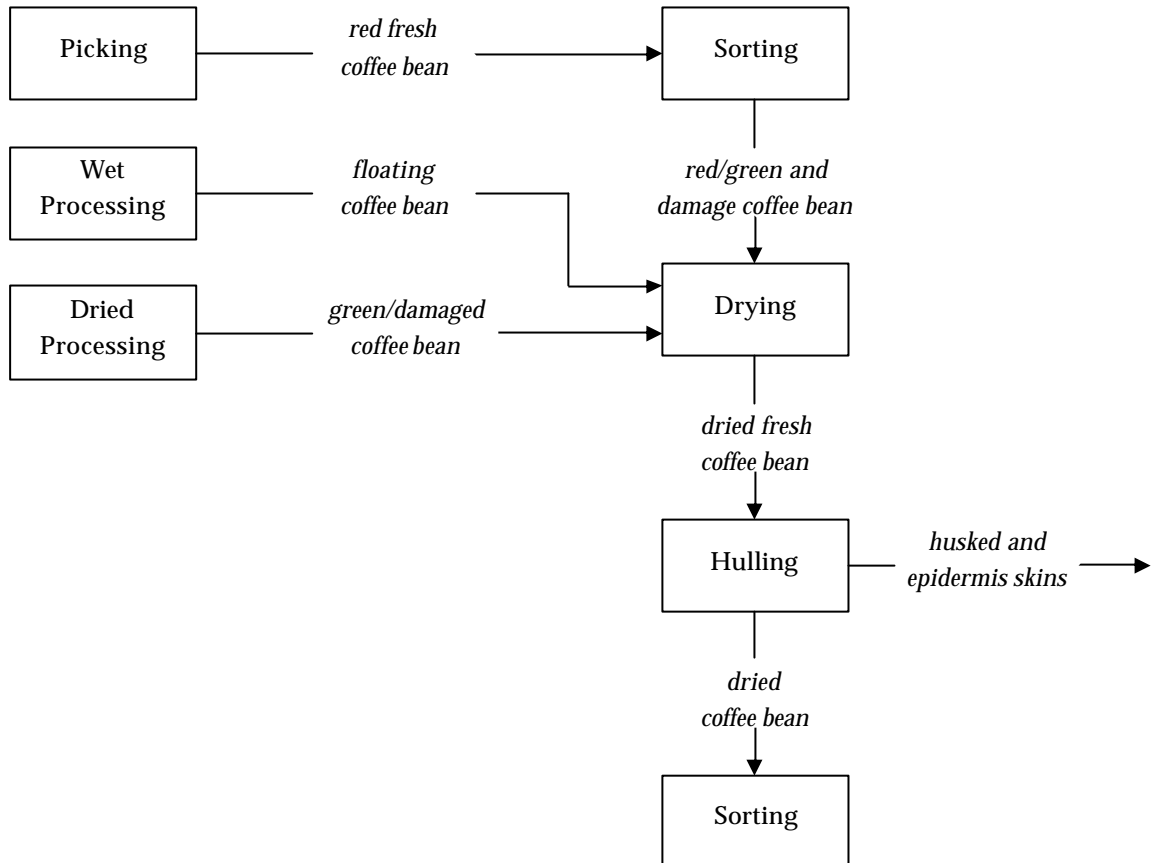
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APPENDIX 1

Wet Coffee Bean Processing



Dried Coffee Bean Processing



List of people met

Kornel Gartner, Coffee Processing and Exporter. Jl. Tulip C1 No. 31. Makassar 90231, South Sulawesi, Indonesia

Pak Donsius, Komodo Jaya Company, Ruteng, Flores NTT.

Carolus (Biting Village, Pocoranaka District, Manggarai Regency), coffee farmer/local collector

Carolus is coffee farmer and local collector trader as well as head of farmer's group (100 members who own 1 hectare of coffee farm averagely). Carolus informed that the price of coffee farm land in his village is about Rp 7.5 million/250 m² (Rp 300 million/ha). Male hired labour cost is Rp 15,000/person/day (8 hours/day, excluding meal cost), while female hired labour is less about 75 percent than male hired labour cost.

As a local collector trader, Carolus just purchased Robusta Coffee from farmers in his village. Carolus received coffee from farmers in his house on Monday to Friday and sold it to Ruteng every Saturday. Trading capital derived from trader in Ruteng (*Kelimutu Shop*) of about Rp 25-30 million per week

Carolus purchased coffee from farmers based on standard price which has been determined by trader (Rp 8,000-10,000/kg). Carolus obtained net profit about Rp 500/kg after reducing transportation cost to Ruteng of about Rp 10,000/sack (100 kg/sack). Averagely, Carolus purchased 2.5-3 tons of coffee per week during peak harvested period (June-August) and about 700-800 kg per week during lean harvested period (April, May, September, and October). Carolus informed that there are 15 local collector traders in his village.

Coffee purchased farmer's coffee which was simply dried within two weeks on the ground. Carolus processed coffee using his pulper equipment without sorting. Processing cost was about Rp 10,000/sack (Rp 400/kg).

Carolus has one unit of pulper equipment which was bought Rp 3 million six years ago. The capacity of pulper was about one sack (100 kg) per hour. This pulper was used to process Carolus' coffee and other farmers' coffees with the cost of Rp 400 per kilogram.

Carolus informed that some people in his village cultivated rice and aqua culture (rice and fish in wet land). The cropping pattern was once a year. Apart from that, most of people in the village cultivated dry land with vegetable and secondary crops such as squash, string bean, tomato, chili, and cassava. Most of productions were consumed by farmers' household. Cassava, in particular, was consumed by households and for feeding the swine.

At present, farmer's group is being rearranged. One of farmer's group activities is making organic fertilizer under the guidance of local church organization. Organic fertilizer is sold Rp 40,000/sack (50 kg) as income source of farmer's group.

Ben Milo (Susu Village, Ngadabawa District, Ngada Regency), coffee farmer, trader.

Beni Milo is coffee's farmer, trader, and head of farmer's group. Sometime in July 2004, *PD Komodo Jaya* approached local community in Susu Village, Ngadabawa District, Ngada Regency. However, people were not interested. Even *PD Komodo Jaya* tried to provide milk and tested Beni's pulper, people were still uninterested. After socializing to community and sending processed coffee sample to *PD Komodo Jaya*, people were interested and willing to carry out coffee transaction with *PD Komodo Jaya*.

Currently, there are two farmer's group which are dealing with *PD Komodo Jaya*, namely "*Karya Kasih*" (25 members) and "*Maju Bersama*" (20 members). The average of coffee farm was 0.5-1 hectare per member. Both farmers' groups are located in the districts of Bejawa and Golewa (central coffee producing areas of Ngada Regency).

Farmers' coffees were processed at Beni's House. Processing coffees are as follows : (1) fresh coffee beans were collected and weighted at farmers' house. Transportation cost to Beni's house was about Rp 100/kg (15 km distance) and Rp 50/kg (5-6 km distance); (2) coffees were processed using pulper equipments (capacity of 2-3 tons/hour). Beni Milo has three units of pulper which was bought Rp 5 million per unit; (3) coffees were soaked in fermented trough (size of 2.5 x 1.75 x 0.80 meters and capacity of 2-3 tons) – cost for constructing fermented trough was Rp 3 million per unit; (4) coffees were washed and sorted in washed trough (size of 2 x 2.5 x 1 meters) and floated coffee beans were separated); (5) coffees were filtered and dried using plastic canvas (size of 60 x 25 meters and capacity of 8 tons) – dried process was normally carried out within one day; (6) coffees were sorted (broken coffee beans were separated) and kept in the store (size of 2.5 x 11 meters and capacity of 5 tons) for two days; and (6) handling process of coffees needed 20 workers which were hired Rp 25,000/person/day (without meal).

Coffees were transported to *PD Komodo Jaya* in Ruteng (96 km distance) with transportation cost of about Rp 850,000/truck (5-5.5 tons capacity). Local tax (retribution) was Rp 100 per kilogram of fresh coffee bean price. There were no illegal taxes since Beni had authorization letter of legal tax.

Selling price of coffee was Rp 5,000 per litre of parchment coffee (1 litre of parchment coffee is equal to 1.8 kg of fresh coffee bean). Farmer's group obtained trading fee Rp 100 per litre, while Beni Milo gained profit of about Rp 500 per litre. Payment from *PD Komodo Jaya* had been conducted through Bank transfer or direct cash payment. Meanwhile, floated and broken (retained) coffee beans were milled and sold it Rp 13,000-14,000 per kilogram. Approximately, Beni Milo gained gross profit of about Rp 50 million per year with total hired labour costs of about Rp 15 million per year.

Beni Milo had ever-unpleasant experience with *PD Komodo Jaya* in 2006. At that time, *PD Komodo Jaya* refused Beni's coffees due to full capacity of the store of *PD Komodo Jaya*. Beni Milo sold his coffees to Chinese trader in Ruteng with the price of Rp 5,500 per litre (higher than the price of *PD Komodo Jaya*). The Chinese trader was a subscribed buyer of Beni's fresh coffee beans previously (2001-2002). At that time, Beni gained average profit of about Rp 100 per kilogram.

Even though Beni had unpleasant experience with *PD Komodo Jaya*, he was more interested in dealing with *PD Komodo Jaya*. Aggregately, he gained higher profit as compared to other coffee transactions such as Chinese trader. Apart from that, Beni perceived that he was provided by technical assistant from *PD Komodo Jaya* and his coffees were traded to international market (Starbuck).