

**Fair Trade Coffee Supply Chains in the Highlands of Papua New Guinea:
Do They Give Higher Returns to Smallholders?**

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Abstract

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This research focussed on Fair Trade (FT) coffee supply chains in Papua New Guinea. Three research questions were asked. First, do smallholders in the FT chains receive higher returns than the smallholders in the conventional chains? Secondly, if smallholders in the FT coffee chains receive higher returns from their coffee than the smallholders in the conventional chains, what are the sources of these higher returns? Finally, if smallholders in the FT chains don't receive higher returns than in the conventional chains, what are the constraints to smallholders receiving higher returns from the FT coffee chains than the conventional chains?

A conceptual framework for agribusiness supply chain was developed that was used to guide the field work. A comparative case study methodology was selected as an appropriate method for eliciting the required information. Four case study chains were selected. A paired FT and conventional coffee chains from Okapa and another paired FT and conventional chains from Kainantu districts, Eastern Highlands Province were selected for the study.

The research found that smallholders in the FT chains and conventional chains receive very similar prices for their coffee (parchment price equivalent). Hence, there was no evidence that smallholders in the FT chains received higher prices or returns from their coffee production than smallholders in conventional chains. This study also found that there was no evidence of FLO certification improving returns to smallholders in the FT chains over those returns received in the conventional chains, but the community that the FT smallholder producers come from did benefit. The sources of these community benefits lies in the shorter FT chains and the distributions of the margin that would have been otherwise made by

processors to producers, exporters and the community. In addition, this study found that constraints associated with value creation are similar in all the four chains studied. However, there are some added hurdles for the FT chains in adhering to FT and organic coffee standards. Moreover, FT co-operatives lacked capacity to trade and their only functions were to help with FLO certification and distribute the FT premium to the community.

The findings of this research support some aspects of the literature, but not others. The research contribution is the finding that in this period of high conventional coffee prices, returns to smallholders from FT chains were no better than the returns gained in conventional chains, which leads to opportunism and lack of loyalty by smallholders in the FT chains. The other contribution of this research is in identifying a particular type of free rider who is not a member of the FT co-operative but has right to the community benefits generated by the FT chain.

Keywords: Papua New Guinea, Agribusiness Supply Chains, Coffee, Fair Trade, Conventional, Smallholder Coffee Producers

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Acronyms

ACIAR	Australian Centre for International; Agriculture Research
EHP	Eastern Highlands Province
FLO	Fair Trade Labelling Organisations
ICO	International Coffee Organisation
IFAD	International Fund for Agricultural Development
NASAA	National Association for Sustainable Agriculture Australia
SG	Small-holder Grower
SCAA	Specialty Coffee Association of America
USAID	United States Agency for International Development
MTDS	Medium Term Development Strategy 2005-2010
NADP	National Agriculture Development Plan 2006-2011
USA	United States of America
PNG	Papua New Guinea
Km	kilometres

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Chapter 1 Introduction

1.1 Rationale

Coffee is an important international commodity produced by 25 million smallholder coffee producers in 50 developing countries (Kaplinsky & Fitter, 2004:13; Millford, 2004:4). For PNG, coffee is an important export commodity produced by 280 000 smallholders and is the major source of their livelihoods (Gimbol, 2001:3). Smallholder production accounts for 85% of the PNG coffee export volume while the rest comes from plantations (Murray-Prior & Batt, 2006a; ACIAR, 2007:10). Arabica coffee grown in the highlands accounts for 95% of the export and Robusta coffee grown in the lowlands accounts for 5% (Gimbol, 2001:2). Therefore, coffee is particularly important for smallholder's livelihoods in the highlands provinces of PNG.

The importance of the coffee industry and the problems faced by smallholders is recognized by the PNG Government, which has placed high emphasis on it. This was evident with the export driven policy initiatives, Coffee Industry Corporation Amendments, National Agriculture Development Plan, annual budget allocation, infrastructure developments and access to credit facilities (MTDS, 2004; NADP, 2007; Manning, 2007; CIC, 2008).

The majority of PNG coffee is thought to be exported through the conventional commodity chain (Gimbol, 2001:1; ACIAR, 2007:15). This conventional chain is a long chain where coffee flows through many intermediaries from smallholders to the exporter and beyond to the international markets (ACIAR, 2007; Batt & Murray-Prior, 2006a). Almost all of the smallholders are involved with this chain (ACIAR, 2007).

There are a number of constraints affecting smallholders who operate in the conventional chain. The world coffee prices are volatile and have been declining over time (Calo & Wise, 2005:5; ICO, 2008). In addition, there are some issues in PNG that lead to high cost in this chain, such as poor infrastructure and lawlessness (Gimbol, 2001:10; ACIAR, 2007:49). Therefore, smallholder coffee producers who market through the conventional chain face these volatile and declining prices, and relatively high transaction costs. The issue of low coffee price has affected smallholders around the world as well as PNG. This has led to

international concern about fair returns to smallholders, social justice and environmental sustainability (Muradian & Pelupessy, 2005:2030; Batt & Murray-Prior, 2006b).

Recently, Fair Trade (FT) coffee chains have begun to emerge in PNG. This is an alternative to the conventional chain and is designed to improve smallholder's returns and their livelihoods (Murray-Prior & Batt, 2006; TransFair USA, 2008a). The Fair Trade chain is a shorter chain where coffee flows from smallholders more directly to overseas customers without intermediaries (Dietz et al 2001:7). This chain has emerged internationally to create more equal trading through direct relationship with customers in order to guarantee a sustainable return to smallholders (Develtere & Pollet, 2005:3; Barrientos & Dolan, 2006:6).

There may be other ways of improving smallholder's returns, such as chains targeting specialty markets. Such specialty chains are based on the gourmet coffee market in consuming countries and are based on the concept that coffee is differentiated by product origin, unique quality, a distinctive taste and is superior to common coffee and attracts higher price (Gimbol, 2001:8). This chain is similar to FT, but its focus is not necessarily on smallholders and it does not have Fair Trade Labelling Organisation International (FLO) certification (Kaplinsky & Fitter, 2004; Reynolds, 2008). The intention of FT chains is to improve smallholders' returns. While this might also be achieved through specialty chains, this research is limited to the FT coffee chains.

Studies note that, in general, returns to smallholders are higher in the FT chain than the conventional coffee chain in PNG (CIC, 2002; Dempsey & Campbell, 2006; ACIAR, 2007). More general studies on FT show that returns to participants in all chains are higher at retail end and decrease towards the production end (Dietz et al, 2001; Oxfam, 2002; Kaplinsky & Fitter, 2004). The major sources of differences in smallholder returns between FT and conventional chains are thought to be:

- i) FT FLO certification: this guarantees a FT *floor* and a fixed *premium* price with payment conditions (Taylor, 2005; Renard, 2005; Van Roekel et al., 2002).
- ii) Chain functions: smallholders, cooperatives and their exporting agent link and integrate production, processes; quality control and information to create differentiated product value (*effectiveness*) at low cost (*efficiency*) (ACIAR, 2007; Niederhauser et al., 2008).

- iii) Relationships: linking along the chain provides *trust and commitment* for long-term success in creating customer value and sharing benefits amongst the partners (Dunne, 2001; Fitter & Kaplinsky, 2001; Bacon, 2005).
- iv) Horizontal coordination: players cooperate and collaborate to improve capacity building, upscale, access facilities, share logistics and cost, and free information sharing (Milford, 2004; Taylor, 2005; Niederhauser et al., 2008).
- v) Changing power dynamics: a move from chain leader holding power through information asymmetry to empowerment of smallholders through more equal relationships (Kaplinsky & Fitter, 2004; Renard, 2003; USAID, 2005).

Despite these sources for improving smallholder returns through FT chains, one feature that can cause smallholders to revert back to the conventional chain is hold up problem. This is a cash payment delay from the date of coffee delivery to the date of payment and can reduce the benefit of the FT chain to the cooperative member (Milford, 2004:55). In PNG, any hold up factor could lead smallholders to revert to the traditional relationship (spot market) in the conventional chains, which harnesses PNG culture where people value immediate cash payment (Gimbol, 2001; Batt & Murray-Prior, 2006ab).

While it is thought that returns are likely to be higher in FT chains than the conventional chains, there are some constraints faced by FT chains. Studies on these chains from elsewhere describe a number of these challenges. They relate to difficulties associated with FLO certification systems, product differentiation, chain efficiency and effectiveness, relationship trust and commitment, and chain coordination (Tallontire, 2001; Oxfam, 2002; Lewin et al., 2004; Taylor, 2005; Muradian & Pelupessy, 2005; Imhof & Lee, 2007; Niederhauser et al., 2008; Van Roekel et al., 2002; Lewin et al., 2004).

Based on the above discussion, there is a scope for a detailed analysis on whether better returns to smallholder coffee producers are derived by a differentiated product and so a 'fairer' coffee price in FT coffee chains than in the conventional coffee chains in PNG. Given the significance of the coffee industry as major source of smallholder's livelihoods in the highlands of PNG, research on this topic would be useful.

1.2 Statement of the Problem

The general perception is that smallholder's returns from FT chains in PNG (and elsewhere) arises from the key value creating functions of the FT chain and the distribution of returns derived from these value creating functions. In particular, a key FT chain function that improves smallholder returns is thought to be the FLO certification system that guarantees a fairer price to smallholders. Some other FT coffee features that could provide a potential mechanism for improving smallholder returns above those in the conventional coffee chains are differentiated coffee product attributes and also higher prices.

Therefore, the *primary proposition* for this study is that the value creating activities of the FT chain and its key chain functions (FLO certification system, direct buyer – smallholder relationship, coordination and information) can provide higher returns to smallholders than the conventional coffee chains.

1.3 Research Questions

The following research questions have been posed in order to address this proposition.

- i) Do smallholders in the FT coffee chains receive higher returns from their coffee than smallholders in the conventional coffee chains?
- ii) If smallholders in the FT coffee chains receive higher returns from their coffee than smallholders in the conventional coffee chains, what are the sources of these higher returns?
- iii) If they don't receive higher returns than the conventional coffee chains, what are these constraints to smallholders not receiving higher returns from FT coffee chains?

1.4 Organization of the Thesis

This thesis contains seven chapters. Chapter 1 provides the research rationale, the research proposition, aims and research question. Chapter 2 presents the coffee supply chain in PNG and discusses coffee growing areas, government support for the industry, and description of both conventional coffee supply chains and FT coffee supply chains in PNG. Chapter 3 presents the literature and theoretical framework underpinning the study. Chapter 4 outlines

the methodology used in this research. Chapter 5 presents the results of the study. Chapter 6 shows the analysis of the results and discussion while Chapter 7 is the conclusion.

Chapter 2 Coffee Supply Chain in the Context of PNG Coffee Industry

2.1 Introduction

This chapter looks at the context of the coffee industry in PNG and has five sections. Section 2.2 outlines the overview of coffee growing areas in PNG for Arabica coffee. Section 2.3 provides background on government support for the coffee industry. Section 2.4 is the description of Fair Trade and conventional coffee supply chains in PNG and section 2.5 is the conclusion.

2.2 Coffee Growing Areas in Papua New Guinea

In PNG, two species of coffee are grown. *Coffea Arabica* (known as Arabica) is grown mostly in the highlands region and *Coffea Robusta* (known as Robusta) is grown in the lowlands. This study focuses on Arabica coffee growing in the highlands provinces. Almost all Arabica coffee exported from the highlands region comes from the Western Highlands Province (WHP) and Eastern Highlands Province (EHP), while a relatively small quantity comes from Simbu Province, Enga Province, Southern Highlands Province (SHP), and also some high altitude areas of coastal provinces. The major Arabica growing provinces are shown in the inset box in the map in Figure 1.0.

The highlands region has a fragmented topography, but with highly fertile volcanic soil and suitable climate conditions for growing Arabica coffee (Ghodake, 1994; CIC, 2008). Arabica grows well between 1000 to 1800 metres above sea level (masl). The climate has low humidity, 12 hours day length, temperature between 16°C to 25°C and average rainfall of 1900 mm per year (Murray-Prior & Batt, 2006:374).

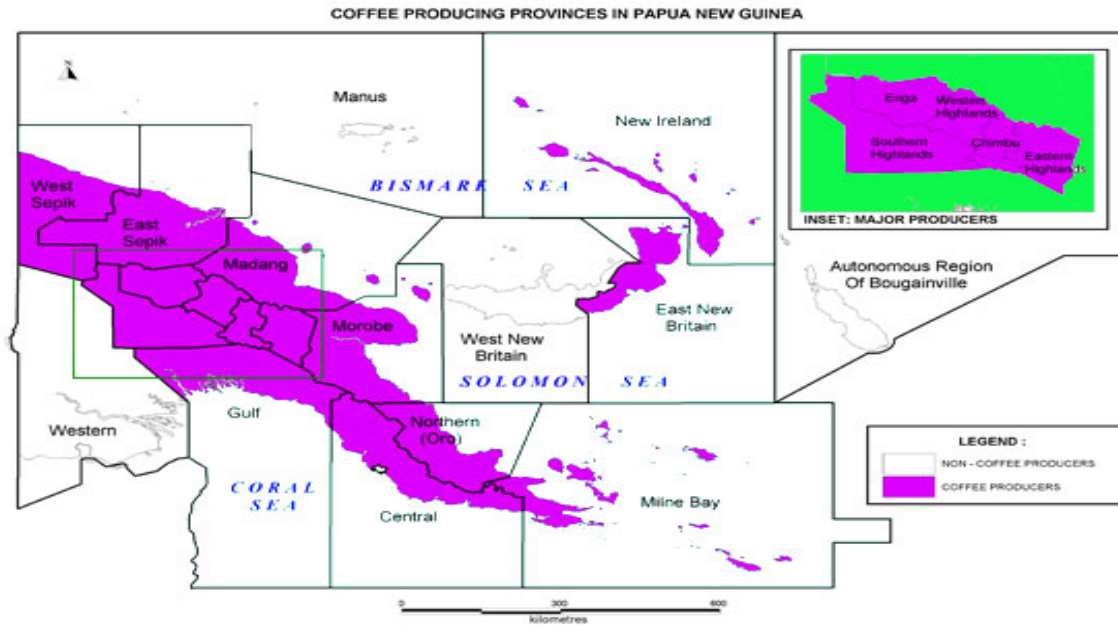


Figure 1.0 Coffee growing area in PNG

(Source: www.coffeecorp.org.pg/pngmap.html)

2.3 Government Support for the Coffee Industry

There has been some variation in the PNG government’s support to the coffee industry over time. From pre and post independence (since 1975 to early 1980s), coffee was the main export commodity and a major source of foreign exchange for PNG (Manning, 2005: 160-3). Manning pointed out that from the 1980s, the mineral boom began to play a leading role in the PNG economy and this was followed later in the 1990s by petroleum. This mineral and petroleum development shifted the government’s priority and focus from coffee and other cash crop commodities to these industrial products (Manning, 2005:146).

To support the coffee industry, the government established Coffee Industry Corporation (CIC) as the centralised institution in 1964. It grew in size and provided a range of services, and there were some organisational changes over time, with the latest change being made by the PNG Government in 2003 (CIC, 2008). The current CIC’s organisational structure has two main divisions: (i) Research and Growers Services Division and (ii) Industry Operations Division (CIC, 2008; 2009). PNG government’s funding to CIC stopped in 1987 and the CIC functions since then have been supported by export levy with the larger share of the levy

derived from the 85% of export volume produced by smallholders and 15% of export volume produced by block-holders and plantations (ACIAR, 2007:146).

Major factors that are said to impede the coffee industry have been poor road infrastructure, poor rural airstrips, lack of Government support to improve small coffee growers' capabilities, and the small land size (Gimbol, 2001; ACIAR, 2007). While these impediments have affected the coffee industry generally, it has survived due to smallholder coffee producers' commitment to the industry because coffee has been their major source of livelihoods (Gimbol, 2001). Studies done on PNG economic development have indicated that smallholders are now the backbone of the coffee economy (Hughes, 2004; Manning, 2005). This is because about 280 000 smallholders coffee producers now contribute 85% of export volume compare to plantations (Gimbol, 2001; Murrery-Prior & Batt, 2006).

With this perspective, the government of PNG has taken some policy initiatives in its Medium Term Development Plan, with its export oriented focus since 2002 (MTDS, 2004) and has established the National Agriculture Development Plan in 2006 to help the 80% of PNG's population living in the rural areas (NADP, 2007). In addition, the PNG Government has recently taken the step to support the agriculture sector through the NADP with an annual budget of K¹100 million over the next ten years (NADP, 2007; The National February 5th, 2008; Post Courier February 28, 2008). Pertinent to coffee, it has improved its regulation on export permits, which allows organised smallholder cooperatives to sell their coffee direct to overseas buyers (Gimbol, 2001).

2.4 Description of Conventional and Fair Trade Coffee Supply Chains in PNG

2.4.1 The Conventional Coffee Chain

The conventional coffee chain is a long chain with many participants or intermediaries linking smallholders to exporter and beyond. This chain originates with the multiple smallholder coffee producers in the PNG Highlands region. The players internal to PNG are smallholders, intermediaries, processors and exporters while external players are overseas bulk buyers /brokers, roasters, distributors, retailers and consumers (ACIAR, 2007).

¹ K is the currency code for Kina, the Papua New Guinea currency.

The chain players who link smallholders to exporters are located in both rural and central locations near the towns, and along the highlands highway. This conventional market chain is structured as follows:

- i. smallholders sell processed parchment coffee to intermediate traders at road sides or to plantations in the local area (Gimbol, 2001; Murray-Prior & Batt, 2006)
- ii. traders from rural areas deliver the parchment to central processors or exporters and sell the parchment coffee to them (Gimbol, 2001; Kobla, 2002)
- iii. processors process the coffee and sell green bean to exporters (Gimbol, 2001)
- iv. exporter sells green bean coffee to overseas bulk buyers/ importers and roasters (ACIAR, 2007; Murray-Prior & Batt, 2006)

Each participant in this chain performs some value creating activities and supplies the value enhanced coffee to the next customer at a profit, and this process extends beyond the exporter (Kobla, 2002; CIC, 2008). The value creating activities performed by each chain players is as follows:

- i. Smallholders use minimal farm inputs to grow coffee under shade, maintain it and harvest coffee cherries regularly during the coffee season (ACIAR, 2007)
- ii. Chain participants engaged in processing carry out three vital value creating activities (Calvert, 1998; 1999; Kobla, 2002; Batt & Murray-Prior, 2006ab; ACIAR, 2007) as follow.
 - a) Parchment is derived by initial processing of the coffee cherries. Smallholders in the rural areas use basic processes for this, which are a hand pulping machine, fermenting, fully washing and sun-drying. In few cases, a cherry traders or plantations with wet processing plants may buy smallholders' cherries and process them (de-pulp, ferment, fully wash and sun-dry) using more sophisticated equipment.
 - b) Green bean is derived by further processing parchment. This is done by intermediaries, processors and exporters with green bean processing plants through machine drying, hulling, polishing, winnowing and sorting.
 - c) Green bean quality enhancement is then usually carried out by exporters based on the quality attributes required by customers. The casual hired labours manually clean the green beans (hand pick discoloured and black beans, stones and dirt) and grade them into different sizes.

There is a perception that the conventional chain provides low coffee prices to smallholders. It is claimed that these low coffee prices are due to a general decline in coffee prices over time and also because smallholders' coffee is of low quality (Gimbol, 2001:9). Murray-Prior & Batt (2006:376) asserted that smallholder's coffee is assumed to be low quality and buyers automatically offer a low price based on Y grade coffee. The coffee price volatility and the declining price over time flows back to smallholders and low quality coffee moves upstream to exporters, which puts the smallholders in a dilemma, where low quality leads to low prices and low prices create an incentive to produce low quality.

There are a range of issues that are thought to affect the conventional coffee chains. These are:

- i. Production issues: aging coffee trees, small land size, environmental degradation, lack of basic resources and knowledge (competency), lack capacity, and persistent debt (Murray-Prior & Batt, 2006)
- ii. Market issues: lack or high price trigger, price volatility and markets inaccessible (Coeli and Fleming, 2003; Murray-Prior & Batt, 2006; ACIAR, 2007;)
- iii. Logistics issues: lack of road and communication infrastructures (poor road conditions) and high transport cost (Gimbol, 2001; Kobla, 2002; ACIAR, 2007).
- iv. Quality control issues: low coffee qualities because of lack of capacity and resources (Murray-Prior & Batt, 2006; ACIAR, 2007)
- v. Relationship issues: more of opportunistic spot market relationships and lack of farmer groups to upscale coffee quality and quantity (Wheeler, 2002; Murray-Prior & Batt, 2006; ACIAR, 2007).
- vi. Coordination issues: power, control and information distortion and asymmetry with exporters (Kobla, 2002; ACIAR, 2007).

Various solutions to overcoming these constraints have being suggested. Some potential solutions suggested that could improve coffee production, processing and coffee quality issues through smallholders are agronomic practices, capacity building, farm investment, and better coffee price (Gimbol, 2001; Murray-Prior & Batt, 2006; ACIAR, 2007). Other opportunities suggested are information sharing, relationship, coordination, and marketing are vertical integration, partnership alliances, free information sharing, clear chain coordination, forming market groups, and maintaining culturally appropriate spot market relationships (Gimbol, 2001; Wheeler, 2002; Murray-Prior & Batt, 2006; ACIAR, 2007). Solutions to

constraints associated with logistics, information, quality control and specific issues like lawlessness, poor road conditions and communication infrastructure, capacity and debt requires government intervention (ACIAR, 2007).

The conventional coffee chain is a long chain with many intermediaries between smallholders and final consumer. In this chain, the smallholders face many problems: price volatility over time puts smallholders into lower price and low coffee quality production dilemma, and constraints to value creation activities such as production, processing, logistics, quality control and relationships result in lower returns to smallholders.

2.4.2 Fair Trade Coffee Chains

The term Fair Trade (FT) is synonymous with the ethical trade. The difference is that the ethical trade view is narrower than FT. The most agreed definition of FT is the one that has been postulated by the umbrella organization, FINE¹ (Develtere & Pollet, 2005:3; Barrientos & Dolan, 2006:6; Imhof & Lee, 2007:8). This definition is:

Fair trade is a trading partnership, based on dialogue, transparency and respect, which seeks greater equity in international trade. It contributes to sustainable development by offering better trading conditions to, and securing the rights of, marginalised producers and workers – especially in the South. Fair Trade organisations (backed by consumers) are engaged actively in supporting producers, awareness raising and in campaigning for changes in the rules and practices of conventional international trade².

Pertinent to democracy, communication, participation and transparency, the standards for smallholder's cooperatives to follow and campaigns for change in international FT trading rules are described in detail by a range of authors (Dietz et al., 2001; Milford, 2004; Imhof & Lee, 2007) .

¹ FINE is a forum that brings together the following Fair Trade organizations: Fair Labelling Organization International (FLO), International Fair Trade Association (IFAT), Network of European World Shops (NEWS) and European Fair Trade Association (EFTA).

² Imhof and Lee (2007:6) cited <http://www.eftafairtrade.org>. Emphasis added.

Some FT coffee promoters perceived that the FT coffee chains emerging in the highlands of PNG change the rules of conventional coffee trading in PNG in the following ways:

- i) involving smallholders directly with overseas customers
- ii) smallholders to participate democratically in their cooperatives
- iii) improving returns to cover their cost of production and living
- iv) improving their social and environmental conditions (Transfer USA, 2008ab)

With these perspectives, FT coffee chains have emerged recently as 2000s in the highlands of PNG. This section describes a typical FT coffee chain in the context of PNG. These FT chains are shorter than the conventional coffee chain. The internal chain players in such chains tend to be smallholder coffee producers, smallholder cooperatives and an exporter. The external chain players are importers and roasters who are based in coffee consuming countries (TransFair USA, 2008ab).

In these FT chains, it is perceived that the smallholders' coffee passes through chain players such as the cooperative and exporter, who then exports it to overseas FT coffee buyers (Jasper Coffee, 2007; TransFair USA, 2008b; PNGCC, 2008).

In general, the FT smallholders and their cooperative are located in the rural area while the exporter is located in the town. The typical operations of the FT coffee chains internationally are as follows (Calvert Foundation, 2008; PNGCC, 2008; TransFair USA, 2008ab):

- i. Smallholders process the coffee cherries into parchment coffee and supply this coffee without payment to their cooperatives.
- ii. The smallholder cooperative then consolidates smallholders' parchment and delivers it to the central location of their exporter's facilities.
- iii. The private exporter processes the parchment coffee into green bean (just like the processor and exporter in the conventional chain above) and exports these green beans to overseas FT coffee buyers.
- iv. Roasters further process the coffee and supply the roasted or ground coffee to distributors or retailers.

The attributes of FT coffee are based on organic coffee production, the fact that smallholders receive a fair return, as well as environmental sustainability and other quality attributes (Gimbol, 2001; ACIAR, 2007). It is noted that intermediaries (traders) and processors are

eliminated in those FT chains but not their functions and activities. FT smallholders carry out basic parchment processing just like in the conventional chain. In these conventional chains, the processor and exporter buy the smallholders' parchment coffee and process it into green bean before exporting (Batt & Murray-Prior, 2006ab).

Some of the constraints related to production, markets, logistics, quality control, relationships and coordination in the conventional chain are also likely to occur in the FT chains. In PNG, holdup problems are not likely to affect the FT chains. This is because the smallholders receive first payment of money upon delivery of coffee and the second payment as premium is paid later (TransFair US, 2008ab; Jasper Coffee, 2008; Calvert Foundation, 2008). However, the FT chains in PNG appear to face some of the constraints as the conventional chains (Batt & Murray-Prior, 2006a).

Some suggestions of potential solutions to overcome these constraints in FT coffee chains that may be applicable in PNG are listed below.

- i. Production: provide capacity building (training) on coffee growing, harvesting and processing according to FT coffee standard (Grundy, 2005; Batt & Murray-Prior, 2006a)
- ii. Market: one market channel with organizational ownership for social-cultural and economic changes (TransFair US, 2008ab; Schmelzer, 2006)
- iii. Logistics: sharing of facilities and logistics (Tracy-White, 2005)
- iv. Relationships: alliances and vertical integration (USAID, 2005)
- v. Coordination: changing power structure and free information sharing (Muradian & Pelupessy, 2005; Murray-Prior & Batt, 2006).

These potential solutions show what might be possible with FT coffee chains to create value for the customer and improve returns to the smallholders. Such solutions might be enhanced by cooperatives playing a pivotal role in securing and improving returns to smallholders. Studies done on FT cooperatives in coffee producing countries indicates that the cooperatives consolidate resources and facilitate movement of coffee, payment of fair price, credit services, access processing facilities and direct involvement in social and community development (Grundy, 2005:11; Schmelzer, 2006:26-31). However, it is unclear whether the FT cooperatives in PNG play such roles.

The FT chain is a shorter chain with fewer intermediaries and this is thought to improve coffee price and a fair return to smallholders. However, FT smallholders seem to face some of the problems of conventional chain associated with value creation activities such as production, processing, logistics, quality control and relationships that may affect the returns.

2.5 Conclusion

Arabica coffee is produced mostly by smallholder coffee producers in the highlands and is important for the PNG economy. The PNG Government supports the coffee industry through organizational change, policy initiatives and funding to the agriculture sector. From the literature, there appears to be two views of coffee marketing. The first view is that the conventional coffee supply chain appears to involve most smallholders, but it has many constraints that mean low returns to smallholders. The other view is that FT coffee supply chain that involves some smallholders has solutions to those constraints faced by smallholders in the conventional coffee chains and so gain higher returns for smallholders. However, there has been no research done on the FT coffee chain in PNG to ascertain whether claims of FT coffee chain actually removes the constraints and give a greater returns to FT smallholders than the conventional coffee chains.

Chapter 3 Literature and Theoretical Framework

3.1 Concepts and Context of Coffee Supply Chains

There are a number of definitions of a supply chain and value chain. In this study, an agribusiness supply chain is defined as the value creating activities of individual partnering firms through operations, processes, logistics and quality control involving upstream flow of product and service and downstream flow of finance, and supported by information bi-flow, and includes relationship management (Hobbs & Young, 2000:9; de Moura, 2002:32; Martin & Jagadish, 2005:5). This encompasses other definitions that incorporate raw product transformation and relationships (Kaplinsky & Morris, 2001: 4), vertical and horizontal integrations and coordination (Sonka, 1995:14; Fugate et al, 2007:1) that include the concept of a value chain as an overarching framework.

The agribusiness supply chain definition above is derived from definitions proposed by scholars such as Gattorna & Walters (1996); Lambert et al (1998); Lambert & Cooper (2000); Mentzer (2001); Mentzer et al (2001); Bowersox et al (2002); Handfield & Nicholas, (2002). These authors seem to have common understanding of what is a supply chain. For example, they propose that a supply chain is the vehicle for integrated operational processes, logistics, and quality control by linking suppliers upstream and customers downstream with the flow of product, service, finance and information. They suggest that the span of chain includes raw material producers at one end and the final consumer at the other end. The incorporation of relationships and chain coordination as the governing mechanisms is recognised in the agribusiness literature in general (Westgren, 1998; Trienekens & Willems, 2007) and have been focused on with coffee as a global commodity supply chain (Gereffi, 1994; Muradian & Pelupessy, 2005; Neilson, 2008).

In agribusiness supply chains, there are often many business partners or players in the value creating processes, who are linked and aligned along the chain to create value for the end consumer (Martin & Jagadish, 2006:3). Pertinent to coffee supply chains, Niederhauser et al (2008: 242-3) pointed out that understanding agricultural supply chains requires a detailed description of value creating functions and activities, and mapping of product and service flows upstream, money flows downstream and information bi-flows through relationship and coordination along the chain.

For the purpose of this study, there are two types of coffee supply chains that will be considered: the conventional coffee and Fair Trade (FT) coffee supply chains. Each have a number of players taking part in the value creation processes that link smallholder coffee producers and the final consumers of coffee. The conventional coffee chain has been documented as a long chain with producers, traders (cherry and parchment), processors and exporters in producer countries, and importers, distributors and retailers in consumer countries with players linked by different value creating activities along different segments of the entire chain (Fitter & Kaplinski, 2001:76). Studies on conventional coffee chains have evaluated whether regulatory implications caused coffee prices to collapse giving lower income for coffee producers before 2005 and rebounding back thereafter, with its sustainability is unclear at this stage (Ponte, 2002; Osorio, 2004; Muradian & Pellupessy, 2005). Other studies argued that the conventional coffee chain has many intermediaries and inherent sources of chain inefficiency and ineffectiveness yielding poor returns to smallholder coffee producers (Dietz, et al., 2001; Fitter & Kapalinski, 2001; Oxfam, 2002).

In contrast, FT coffee chains have shorter spans with intermediaries being replaced by a producer cooperative (Milford, 2004; Calvert Foundation, 2008). It is claimed that FT chains have improved chain efficiency and smallholder returns are above production cost, and in addition these chains have achieved additional benefits to the community such as social justice and environment sustainability (Dietz et al., 2002; Milford, 2004; Grundy, 2005; Schmelzer, 2006; Imhof & Lee, 2007). Other studies on FT coffee chains argue that the current market developments are signalling demand for differentiated coffee products and smallholder coffee producers' organisation are entering this high value market segment (Dempsey, 2006:5; Niederhauser et al., 2008:243). Hence, FT coffee chains appear to provide an alternative shorter chain that links producers and final consumers, and also fosters social-cultural values (solidarity, cooperation and equality) (Schmelzer, 2006:26-32).

One study showed that an Ethiopian FT coffee cooperative tailored its value creation through product differentiation to meet customers different product preferences (quality coffee, consistency and quality service) for higher return from the FT market (Dempsey, 2006:5). Other authors noted that FT cooperatives seem to use closer relationships and coordination to reduce cost (efficiency), deliver differentiated coffee on time (effectiveness) and that consumers willingly pay a higher price (Milliford, 2004:59; Taylor, 2005:59; Schmelzer, 2007:27).

Oxfam (2002) has had a vigorous campaign to inform the coffee consumers in coffee consuming countries about the hardships faced by smallholders in the coffee producing countries. Recent studies on smallholder coffee producers and their cooperatives have described some factors and some sources that are affecting coffee in Ethiopia (Dempsey & Campbell, 2006; Dempsey, 2006), Bolivia (Imhof & Lee, 2007), Mexico (USAID, 2005) and several other coffee producing countries (Lewin et al., 2004; Oxfam, 2005). Likewise, some problems pertinent to PNG smallholders were evident in literature cited (for example, Gimbol, 2001; Wheeler et al., 2003; Batt & Murray-Prior, 2006ab; ACIAR, 2007).

Claims of FT chains' superior value creation and higher returns for members of the chain are disputed by other scholars. Ponte (2002) argues that the rationale for the value creation contradicts some of the evidences from FT chains. Some of these issues are:

- i) FT supposed to be differentiated from the conventional coffee market but appears to be competing in the same market (Tiffen, 1999; DFID, 2000; Raynolds, 2008)
- ii) FT is claimed to be alternative chain to the conventional chain but only 1% of the global coffee market trades with FT coffee (Oxfam, 2001; Schmelzer, 2007)
- iii) multinational corporations (Starbucks, Procter, Nestle, etc) are entering the FT market to improve traceability, competition, better returns and smallholder participation in value creation upstream but at the detriment of FLO standards (DFID, 2000; Raynolds, 2008)
- iv) multinational corporation using FLO standards to offer better price to smallholder but with conditions of high quality differentiated products and they have power to self regulate price that does not guarantee price to cover smallholders' production cost (Schmelzer, 2006; Nielson, 2008)
- v) not all smallholders receive premium because there is no intermediaries for competition (Imhof & Lee, 2007)
- vi) up-grading FT chain and over supply to small FT market demand may cause a price drop hurting smallholders (Oxfam, 2002, 2005; Lewin et al., 2004)
- vii) not all chain players are able to have FLO certification for segregating (safety and quality), traceability (trace value creating activities) and identity purpose (origin and uniqueness) because of rigorous conditions and high FLO inspection cost (Muradian & Pelupessy, 2005; Niederhauser et al., 2008; Nielson, 2008)

- viii) up-grading of differentiated coffee for higher returns does not guarantee a FT floor price and premium in a long run (Muradian & Pelupessy, 2005; Nielson 2007) since it can encounter complex land tenure and social issues (ACIAR, 2007)
- ix) while FT chains seems to improve economic equality, social justice and environmental sustainability, its impact on smallholders is very difficult to trace and quantify (Tallontire, 2001; Schmelzer, 2007; Neilson, 2008)
- x) FT chains rely on individual choices and consumer preferences for socially and environmentally ethical products without challenging whether these promote a more sustainable economy (Tallontire, 2001)
- xi) up-grading value creating activities of a FT differentiated product and smallholders' participation for empowerment suffers with FT private export firms distorting free information sharing on product specification, differential coffee product prices and have spot market relationships with personal interests (Milliford, 2004; Dunn, 2006; Reynolds, 2008)

3.2 Conceptual Framework

There are two key outcomes of FT value creation. They are the customer's values and the customer's needs, which are analysed in a conceptual framework here. Customer's needs (conditions) refer to the product origin, uniqueness, and benefit to smallholders in terms of economic, social and environmental factors (Develtere & Pollet, 2005:2; Imhof & Lee, 2007:8). Customer's values (worth) refer to coffee quantity, quality, continuity, efficiency (cost), customer responsiveness (lead time), consistency and price (Murray-Prior & Batt, 2006). These perspectives are echoed by Martin & Jagadish (2005) and Ross (1998) and they form the customer's differentiated preferences (Nix, 2001; Dunn, 2006).

When considering chain value creation, the perspectives of participating firms (players) and employees' (farming family) is vital. Payne & Holt (2001:169) asserted that a firm's value must be considered in terms of better return to cover production cost and employee (family) living conditions. While the primary focus is the customer, equally important is the value for employees and the firm in order to achieve a win/win situation (Payne & Holt, 2001). Hence, the interests of these three groups (customer, firm as player and employees as family members) are linked for the sustainability in value creation to occur (O'Malley, 1998:5).

Bearing in mind this perspective, Porter’s generic value creation concept, which includes “primary activities” and “support activities” (Porter, 1985: 33) is useful and restated in an agribusiness context by Martin & Jagadish (2005:4). They conceptualise value creation by a firm or chain player as:

- (a) Firms operations (product processing, and product enhancement)
- (b) Links with input suppliers (input purchase, inward logistics, product maintenance)
- (c) Links with customers (product sales, outward logistics, and product maintenance)

They envisaged a chain as an interlinking value creation processes (logistics and quality product maintenance), supported by information flows and achieved through vertical integration and relationship mechanisms (Martin & Jagadish, 2005; Hobbs et al., 2000). In practice, however, a chain may not always operate smoothly and usually face constraints. Muradian & Pelupessy (2005: 2039-40) in their study on the coffee chain pointed out that there are inherent constraints of regulation, policy, chain functions and upgrading with the FT coffee chain. The regulation and policy issues as noted above are beyond the scope of this research.

The concept of value creation and the range of issues identified above have been used to derive a conceptual framework for this research. The two core outcomes are *value creation* and *return* while the four fundamental components that impact on these are *chain participants, activities, relationships, and coordination* and *constraints*. This agribusiness supply chain framework is shown as a conceptual model in Figure 2.0.

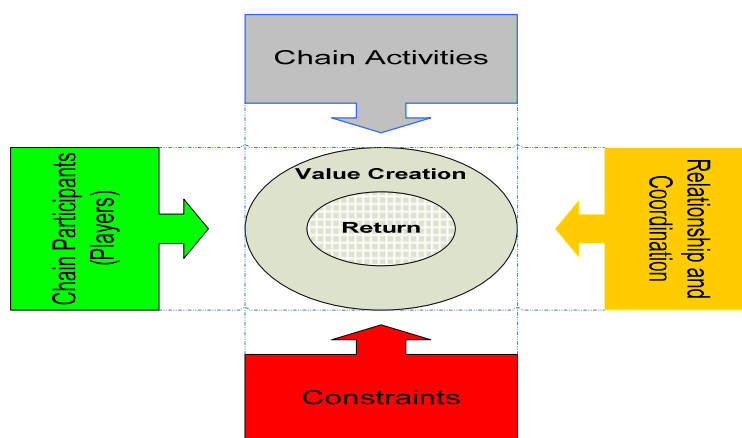


Figure 2.0 Coffee supply chain’s conceptual model

Core elements of the agribusiness supply chain model are:

- i) *Return*: the aim is for smallholder coffee producers and other players to get higher income
- ii) *Value creation*: smallholders produce the coffee, other chain players add further value and customers are willing to pay for the product

Supporting components that may have an impact on value creation and returns are:

- i) *Chain players*: participating firms or partners across the span of chain.
- ii) *Activities*: primary (functions and value creating activities) and support activities (player's capability - knowledge and skill, assets, resources)
- iii) *Relationship* (vertical and horizontal integration or relationships) and *coordination* (vertical and horizontal cooperation, power and information asymmetry)
- iv) *Constraints*: source of constraints that are present across the span of chain.

3.2.1 Returns

Return can be synonymous with profit, rent, and margin but without agreement these terms can provide confusion. The term 'return' as it is used in this research relates to the financial value realized by the chain player. Bowman & Ambrosini (2000:13), when integrating different strands of the supply chain literature, pointed out that financial value for the participating firms is realized when exchange of use value, such as product and service to customer and the customer willingly pays that price is realized. Sustainable return is realized by creating win/win partnerships between the customer, firm (chain player) and employees or farm family (O'Malley, 1998:10; Kapalinsky & Morris, 2006:16; Raynolds, 2008:5).

Return can be considered in the context of FT and conventional coffee supply chains. In the conventional coffee chain, it has been alleged that the smallholder's return is below the cost of production, while the worlds big roasters like Kraft, Nestle, Procter & Gamble, Sara Lee, and Tchibo are booming, despite low coffee prices over the last 30 years (Oxfam, 2002:2; Waridel, 2002:53). It has also been claimed that these companies were using a buyer-driven commodity chain (Ponte, 2002; Taylor, 2005) to buy low-quality-mix coffee from smallholders at a low price (Osorio, 2004) and then using the latest technological innovation and capability in downstream processing to differentiate coffee products (Lewin et al., 2004:20). Such a claim is supported by an Oxfam (2002; 2005) studies on the distribution of

returns in the FT global coffee chain. Oxfam (2002: 22) pointed out that the distribution of Arabica coffee returns amongst participating firms linked in the value chain in descending order as: retailers (57%), roasters and wholesalers (33 -50%), importer (9%), exporter (7%), processor (5%) and smallholder and cooperatives (2-3%). Similar results were echoed by Kaplinsky & Fitter (2004). If this is the case then in the global chain, it could be concluded that the international corporations are getting better returns than the smallholders. The sharing of return is highest at the export end and decreases to lowest at smallholder coffee producers (Oxfam, 2002:22; Kaplinski & Fitter, 2004: 13).

A similar observation has been made on a segment of a coffee producing country's internal chain, where the return to the exporter was found to be higher than the smallholder's return (Muradian & Pelupessy, 2005: 2033). This trend was noted with conventional, specialty and FT chains in coffee producing countries (Muradian & Pelupessy, 2005). However, in PNG, one study found that the processors pay a price of 80% of the fob (free on board - Lae) for parchment coffee to smallholders and 90% of the fob price for red cherry price and return a profit margin of 2-3%, while also taking ownership risk (ACIAR, 2007:2). Murray-Prior & Batt (2006: 374-5) noted that processors and exporters pay low quality Y grade price to smallholders and they enhance the quality of the coffee they buy to get a higher return.

Some studies show differences in smallholder returns between FT and conventional chains. For example, studies on FT chains alluded to the fact that smallholder returns are higher than the conventional chains (Oxfam, 2002; USAID, 2005; Grundy, 2005; Dempsey, 2006; Imhof & Lee, 2007). For instance, it has been noted that in Bolivia, Starbucks and Nestle have doubled the conventional market price for fairly traded coffee (Imhof & Lee, 2007:2). In PNG, Batt & Murray-Prior (2006a) citing Dambui et al., (2006) reported that FT gets 32% more over Y grade fob (Lae) price as high return. However, other studies noted that improved FT benefit may not only be in better smallholders' returns but may be also other benefits such as community projects (social and environmental aspects), that do not occur with the conventional chain (Dietz et al., 2002; Milford, 2004; Grundy, 2006; Imhof & Lee, 2007).

One distinction worth noting is that there are chains other than FT chains that might give better returns to smallholders, such as the specialty coffee chains. There appear to be two key differences between the specialty and FT chains. First, specialty coffee is not traded on commodity exchange, but the overseas buyers (for example, Starbucks or Nestle) might be

willing to pay up to double the commodity price based on product differentiation that meets consumer's changing demands (Rickert, 2005; Taylor, 2005). Second, FT coffee has similar product attributes to specialty coffee but its difference lies in the FT Labelling Organization International (FLO) certification system. The FLO certification guarantees the established or floor price at US\$1.31/pound (K8.66/kg), fixed FT social premium at US\$0.05-10/pound (K0.32/kg) and fixed certified organic coffee premium at US\$0.15 to 20/pound (K0.95/kg) through direct coffee supply to overseas FLO certified buyers who provide the niche market (Oxfam, 2002:18; Milford, 2004:9 Raynold, 2002:416; Taylor, 2005:137; Raynolds, 2008:3).

However, the price paid by the consumer for both specialty and FT FLO certified coffee should provide high returns. This return is distributed to the participating firms for the value created at each segments along the whole chain (Bowman & Ambrosini, 2000; Fitter & Kaplinski, 2001). However, it is argued by some researchers on FT coffee that smallholders in FT chains may be vulnerable to the overseas buyer's power and associated information asymmetry, and this does not necessarily give them a price guarantee (Renard, 2002: 19-20; Muradian & Pelupessy, 2005:2039-40).

3.2.2 Value Creation

The return to smallholders and participating firms is derived from the value creation along the whole coffee chain. In fact, the term value chain is sometimes used to describe value creation within the chain (Martin & Jagadish, 2005: 2006). Lyn & Lyn (2006:95) postulated that value creation derives from collaborative supplier-employee-customer relationships. Value creation has been defined as achieving (a) "*customer perspective*, (which is) making products and services that is consistently useful, (a) *business perspective*, (which) entails maximizing long-term sustainable profit and (an) *employee perspective*, (which) entails motivating employees or farm family by treating them respectfully and involving them in decision-making" (O'Malley, 1998:5). The value chain is the vehicle that is used to maximize value creation, minimize cost and distribute profit along the chain (Kaplinski & Morris, 2006). Bowman & Ambrosini (2000: 13) argued that value creation is the assessment of customer's *use value* of product and service, and the firm's *value* (return) realized after sales. Value creation is a sustainable return when employers use their capital resources and employees' talents to meet customer's demand over the competitor (Lyn & Lyn, 2006:103).

Given this perspective, it can be concluded that customer value and firm returns in each of the two coffee chains are dynamic and can change over time. The firm's return at production level equates to the smallholder return (Ponte, 2002). The smallholders in conventional chains produced low quality coffee and received low prices with the price declining over the last 30 years (Ponte, 2002; Osorio, 2004). In addition to low price, smallholder's production is thought to be inefficient, which emanates from lack of investment and poor coffee growing, harvesting, processing and infrastructure (Batt & Murray-Prior, 2006ab). In addition, some authors argue that there are information distortions, poor relationships and coordination, and power asymmetry in the chains (DFID, 2000; USAID, 2005; Neiderhauser et al., 2008; Raynolds, 2008). These constraints could make value creation in the conventional chain inefficient and ineffective.

Alternatively, there are emerging FT (and also specialty) coffee markets in North America, Asia and Europe which have social and environmental concerns, and where consumers are willing to pay a premium price for high quality organic coffee produced by smallholders (Bacon, 2005:500; Lewin et al., 2004:7). The value creation in FT coffee chains is centred on high quality differentiated coffee product and service. This is claimed to be achieved by improving smallholder production efficiency through investment into coffee growing, capacity building for harvesting, processing, transparency, vertical integration, transparency, empowerment and tight coordination (USAID, 2005; Neiderhauser et al., 2008).

Value created through quality product and service in FT chain is achieved in two ways. First, the value created for the FT coffee products is based on the FT coffee market, which is differentiated from other markets based on the origin's unique quality, distinctive taste, consistency, superior to common coffee and for a higher price (Bolwig et al., 2009:2). However, the FT coffee product value is also created through FLO certification processes that guarantee a premium for smallholders, unlike other specialty coffee products (Kaplinsky & Fitter, 2001:78). The FLO premium relates directly to the coffee price and not necessarily the coffee quality (Bacon, 2005:506).

Second, there is evidence from some international studies that customer quality service (quality, cost and delivery on time) has been achieved in FT chains through chain efficiency and effectiveness (Milford, 2004:59; Taylor, 2005:59; USAID, 2005:9; Kaplinsky & Morris, 2006:12; Schmelzer, 2007:27). Though, this may have been achieved partially in PNG, there is a perception that the FT coffee chains are faced with similar issues of chain inefficiency

and ineffectiveness faced by the conventional chain (Gimbol, 2001; ACIAR, 2007). Hence, the value creation of differentiated FT coffee products and the returns to FT chain players appears to be affected by value creating activities and constraints.

3.2.3 Value Creating Activities

Value creating activities are an important component of value creation and return. Martin & Jagadish (2005; 2006) argue that value is created in agribusiness supply chains by operational processes, logistics, quality control and integrated processes, which is supported by information, and is achieved through relationships management and coordination. This conceptual framework proposed by Martin & Jagadish (2005; 2006) is adopted to provide the theoretical framework for evaluating value creation in the two coffee chains being studied in PNG: conventional and FT. These value creating activities and issues affecting them are discussed below.

Operations

Operations can create value in a supply chain (Martin & Jagadish, 2005; 2006). Waters (2007: 114) defined the supply chain operations as something that is actually done in a chain. The coffee chains value creating activities that results from operations are production (growing, maintenance and harvesting), processing (transformation) and product enhancement (cleaning, grading, sorting and packing) at each stages along the chain (Kilian et al., 2005; ACIAR, 2007; Batt & Murray-Prior, 2006ab; Dempsey & Campbell, 2006).

Bearing this theoretical framework in mind, there are large numbers of producers engaged with coffee production. Smallholder coffee producers in developing countries grow food crops as well as coffee. They can grow organic coffee under shade from seedlings and maintain (weeding, pruning, drainage, etc) the mature trees (Milford, 2004; Calo & Wise, 2005; USAID, 2005; Sexto Sol, 2007; ACIAR, 2007). The smallholders harvest the ripe red coffee cherries, then separate the black berries, sticks and dirt, and the ripe cherries are then processed into parchment (Fitter & Kaplinsky, 2001:7; ACIAR, 2007:12). Muradian & Pelupessy (2005:2023), citing literature on shade grown coffee, outlined its characteristics and benefits, such as reducing weed growth, increased microbial activities, serves as a carbon sink, lures birds and forest insects, requires less agrochemicals, increases fruit weight and

bean size, improves bean appearance, acidity, and body of brew. For example, shade grown coffee in Ethiopia has low cost and better quality (Dempsey & Campbell, 2006).

Product processing (transformation) includes the conversion of raw farm product into value added products. The coffee red cherries can be processed into parchment and then to green bean (Fitter & Kaplinski, 2001; USAID, 2005; ACIAR, 2007). Coffee processing techniques in PNG and elsewhere for Arabica coffee's fully washed method in terms of harvesting, pulping, fermenting, washing, drying parchment and hulling of green bean coffee with right timing and moisture are well documented (Calvert, 1998; 1999; Milford, 2004). Product enhancement includes sorting and grading of green bean into product specification for high quality attributes based on customer's preferences (Batt & Murray-Prior, 2006ab; ACIAR, 2007). Such specific value creating activities are the nuts and bolts of any supply chain (Hugos, 2003:44).

With respect to value creation through operations, there are inherent constraints in the conventional chain that relates to smallholder coffee production and processing efficiency. Studies on FT smallholders' value creation in Ethiopia (Dempsey & Campbell, 2006), Mexico (USAID, 2005) and PNG (Batt & Murray-Prior, 2006ab) note that the conventional coffee chain has problems with lack of capacity, extension service, farm investment, isolation, market information, and also poor transport infrastructure. These studies alluded to further limiting factors associated with smallholders, such as poverty, illiteracy, debt, land tenure, labour and resources constraints, lawlessness, lack of organization, information distortion, buyer self interest and a general decline in prices over time. Additional constraints to improving smallholders' coffee quality have been noted to be lack of new technology (techniques and equipment), microfinance, resources, and capacity and information distortion (Oxfam, 2002; Neilson, 2007; ACIAR, 2007).

Some of the above chain issues that are thought to be of lesser concern in FT chains but other issues seem to plague FT chains as well. The FT chains use direct overseas buyers to improve production and processing constraints with their assistance in capacity building, pre-financing, transparency, vertical integration and coordination (Renard, 2003; Ponte, 2002; Taylor, 2005). While there are claims that these FT chains provide higher returns, there are rigorous social and environmental conditions that have to be met, which can cause difficulties for smallholders, and there is no guarantee that their FT premium can be sustained in a long

run (Muradian & Pelupessy, 2005). It has been argued that the high cost of certification is justified if smallholders are organised in groups for up scaling (Oxfam, 2002:25), but other view suggests that this may create over supply, if there is small FT market demand (Lewin et al., 2004:6). It has also been suggested that the conventional market uses FLO prices without adhering to FT's key principles and opportunistic relationships (Raynolds, 2008:7). A further study noted that smallholders' situation of poverty, labour scarcity, debt and illiteracy can also limits them in adhering to the FT standards (Dietz et al., 2001; Bacon, 2005).

Logistics

Logistics creates value through the inward and outward movement of materials. In an agribusiness context, value is created through logistics (transportation of products from one location to another upstream) that facilitates inward (from input suppliers end) and outward product flow (from customers end), at low cost (efficiency) and in a timely manner (effectiveness) for the final consumer (Martin & Jagadish, 2005; 2006; Nix, 2001). This view echoes other studies that say that the key purpose of logistics is to deliver the right goods (product value) to the right place (customer service) at the right time (effectiveness) and at the right cost (efficiency) to meet customers need (Kaplinsky and Morris, 2006:12; Emmett and Crocker, 2006:48). This premise underpins the conventional and FT coffee chains' value creation efficiency and effectiveness, which in reality do face constraints.

Logistics value creating activities have been discussed in reports on the PNG coffee chain (Gimbol, 2001; Batt & Murray-Prior, 2006ab; ACIAR, 2007). Coffee chain logistics activities occur at the coffee production, processing, purchasing, transporting, warehousing, inventory (stock), packaging, and enhancement phases (Milford, 2004: 44-5).

In the conventional coffee chain, there are logistics constraints faced by smallholders. These logistics impediments are poor transport and communication infrastructure, lack of processing facilities, inadequate warehousing and lawlessness faced by smallholders during the transporting their product (Gimbol, 2001; ACIAR, 2007; Batt & Murray-Prior, 2006ab). These difficulties can have an influence on logistics value creation in terms of cost reduction, delivery time, quality control, information sharing, relationship and coordination (Millard, 2005; Dunn et al., 2006; Bloom et al., 2007)). Many studies have claimed that FT chains are trying to minimise the inherent logistic problems of the conventional chains through the FT cooperative but this is debatable (Niederhauser et al., 2008:247; Imhof and Lee, 2007: 85).

Quality Control

Value is also created through quality control. Quality control has many connotations but for this research, the following definition is used. In agribusiness, value is created through quality control where the product quality is maintained with inward and outward logistics at each stages through packing, transporting, and cold storage chain procedures (Martin & Jagadish, 2005). Quality control, in conjunction with traceability, can enhance product differentiation, quality service, transparency (free information sharing), reduce cost, reduce waste and or prevent defects (Enneking et al., 2007:343; Binner & Jansen, 2007:183).

In this respect, the conventional chain in PNG is long and involves many participants including smallholder, traders, processors and exporters (ACIAR, 2007). Quality control starts from coffee growing, harvesting, processing, and enhancement, and is supported by information sharing to reduce cost and waste (Batt & Murray-Prior (2006ab). The inherent issues for smallholders trying to create value through quality control are poor production, poor cherry harvesting, and poor parchment processing techniques which are described in detail by Batt & Murray-Prior (2006ab). It also appears that the conventional coffee trading lacks traceability, without price transparency and with self interested private owned buyers/exporters (Nielsen, 2008: 1616; Raynold, 2008: 8).

Parchment coffee is derived from the conventional smallholders' basic processing, which is supplied to intermediaries. Processor and intermediary traders are unable to accurately judge the moisture content and other quality attributes during spot market transactions so they pay a low price to smallholders (Batt & Murray-Prior (2006b). Smallholders located close to processing facilities or passable feeder roads, may sell cherries to the plantations or intermediaries who have a wet processing plant, and they use to transform cherry to parchment (ACIAR, 2007: 16). Either the processor or the exporter processes parchment into green bean coffee and stores this in a warehouse, and then further enhances the coffee by hulling, sorting and grading into different grade classifications based on price and customer requirements (Kilian et al, 2005; ACIAR, 2007:15; Imhof & Lee, 2007: 78).

Even in the conventional coffee chain, quality characteristics are essential for value creation and product differentiation. Upon delivery, smallholders automatically receive low Y grade price for their coffee from buyers with no screening done of their green bean coffee according to the classification of PNG's eleven grade (ACIAR, 2007:20). Studies done on the

coffee supply chain in PNG have noted the characteristics used to differentiate the eleven grades, which then determines the prices (Boot, 2006; Murraray-Prior & Batt, 2006; ACIAR, 2007). The grading of the coffee quality ranges from plantation coffee at top end with AA grade to smallholder Y grade at bottom end and the prices are offered accordingly from high to low due to the assumption that smallholders' coffee is of low quality (Boot, 2006; ACIAR, 2007).

The main obstacle to improving coffee quality in PNG has been said to be the conventional market system's failure to give the right price signals (through the 11 grades) to smallholders to trigger an improvement in parchment quality (Batt & Murray-Prior (2006ab). These authors also noted that the commodity coffee market dictates the ultimate quality by taste or flavor and consistency, and the PNG grading system fails to align this with its pricing strategy in the conventional chain (Murray-Prior & Batt, 2006: 377). They pointed out that taste and consistency is becoming a very important factor for specialty coffee price or even FT coffee price. This is because lack of consistency (poor processing and deficiencies in the grading system) results in the discounting of Y grade compared to New York C grade. Smallholders in coffee producing countries, including PNG, are also confused about coffee quality. They focus coffee quality feature on external features such as bean size and defects, without understanding internal features such as taste, on which price is determined and they lack the understanding of FT or specialty customer preferences (Murray-Prior & Batt, 2006:378; Niederhauser et al., 2007:245). One strategy that is used to improve this situation is coffee cup tasting held in the producer countries like Ethiopia (Dempsey & Campbell, 2006). This was also done by specialty coffee chain in PNG (Coffee Pacifica, 2007).

In contrast, a key feature of FT chain's quality control activity is the direct link to overseas FT coffee buyers. This appears to enhance free information sharing on market demands and price, tracing of product flow, reducing cost (efficiency) and improving quality through relationships and vertical integration with long-term relationships and coordination (Gimbol, 2001: 8; ACIAR, 2007:16). Direct overseas buyer-seller links enhance the ability of FT cooperatives to promote product differentiation through origin and organic production techniques (no chemical input) (Bacon, 2005: 500).

The FT FLO certification processes and traceability should enhance quality control. The certified smallholder coffee producers control quality through their coffee production

(growing and harvesting), processing and logistics (storage and transport) whilst the key chain players coordinate the tracking of physical flows of coffee, and information on all value creating activities and product origins (Muradian & Pelupessy, 2005:2039). Tracking will be used as a quality control mechanism in the coffee flow at each of the value creating stages: farm production, harvesting, processing, enhancing, transportation to export point and shipment to overseas (Niederhauser et al., 2008:248). However, it has been argued that FLO certification has become a tool for price rather than quality (Bacon, 2005: 507).

Some of the constraints faced by the conventional chain with quality control is thought to remain with FT chain in PNG such as lack of improved technology and processing techniques, poor road conditions, lawlessness and information distortion (Batt & Murray-Prior, 2006ab; ACIAR, 2007).

Integrated Processes

Good integration of processes along the chain also creates value. Integrated processes along the chain refers to the seamless meshing of operational processes as the product moves from one value creating stage to the next (Martin & Jagadish, 2006:3). Integrated processes also occur within an organisation, and is facilitated by the breaking down of boundaries (legal, organisation and operations) of a firm and the entire chain's independent functions creating flexibility and interdependency to create value for the customer as a whole (Waters, 2007).

It is possible that the FT coffee chain has well integrated processes but it is possible that processes may not be quite so well integrated. In the conventional chain, the individual chain players perform independent functions to create value to the coffee product without well integrating their activities with the next player. For example, in PNG, coffee flow from smallholders to exporter is through spot market relationships and product ownership with the chain leader (exporter) having power and information asymmetry (Murray-Prior & Batt, 2006ab).

In contrast, FT chains have more integrated processes designed to link direct with overseas buyers. For example, in a study on FT and specialty chains in Mexico, Bolivia and Ethiopia showed that the value creating activities performed by each player was shared with one or two partners and tightly coordinated. The FT co-operative concept is designed to more visibly coordinate activities through sharing of power and information (USAID, 2005:6-8; Dempsey & Campbell, 2006:6-7; Imhof & Lee, 2007:79).

However, there are some challenges to the argument that producer co-operatives and direct exporting can enhance process integration. In the Chiapas FT cooperative (Mexico) and Bolivian Coffee Producers, there appears to be little flexibility and differentiated coffee products due to lack of capacity in co-operatives. Because of this, Starbucks developed horizontal integration (introducing a new entity at processing or exporting stage) to enhance the chain by improving the market capability of the cooperative (USAID, 2005:9). Horizontal integration of processes also focuses on improving customer service and differentiation of product by the smooth flow of product and information, removal of inventory and logistics barriers to reduce overall cost and deliver on time (USAID, 2005:9). However, the study done by Imhof & Lee (2007:86) in Bolivia found that horizontal integration does not necessarily correlate with higher returns to smallholders as this depends on overall chain efficiency. In PNG, the FT chain seems to have a degree of vertical and horizontal integration (TransFair USA, 2008ab) but the chain problems noted above appear to prevail (ACIAR, 2007; Batt & Murray-Prior, 2006b).

Information

Information supports value creation (Martin & Jagdish, 2005:10). Flows of information facilitates each supply chain function: operations, logistics, quality control, and the integrated processes, and also enables relationships and coordination (Burt, et al 2003: 131; Hugos, 2003:16) within firms and along the entire chain. With this theoretical focus, information in the conventional and FT coffee chains is now considered.

The conventional coffee chains appear to have major issues with information supporting value creating activities. In the conventional coffee chains in most coffee producing countries, foreign owned processing and exporting firms are thought to inhibit market information since it is argued that these firms maximise profit through information asymmetry and therefore, smallholder are vulnerable to exploitation (Oxfam, 2002, 2005; Sexto Sol, 2007). In PNG, it has been reported that chain leaders inhibit the flow of on value creation processes, product flow, customer service (ACIAR, 2007; Murray-Prior & Batt, 2006) and market changes and coffee prices (Kobla, 2002). Similar information distortion through the chain leader's, activities elsewhere is said to impede smallholder's from improving coffee quality, upgrading chain efficiency, and lack of trust and commitment (Renard, 2003; Muradian & Pelupessy, 2005; Taylor, 2005).

Studies on FT chains (also specialty chain) appeared to show improvement in information flows over those in conventional chains. The following studies example of how information supports value creation in such chains:

- i) Tracking movement of value creating activities, product flow, transactions, customer service and information on quality, social and environmental standards (Muradian & Pelupessy, 2005:2031-8; Niederhauser et al., 2008:246)
- ii) Information exchange through FLO certification processes and upgrading the smallholders' activities (Kaplinsky & Morris, 2006:18-9).
- iii) Sharing information to enhance closer relationships (for innovation and upgrading of product, processes and functions, thus influencing supply chain efficiency and customer responsiveness (Muradian & Pelupessy, 2005:2031; Niederhauser et al., 2008:250; Kaplinsky & Morris, 2006:31-2)
- iv) Using information to enhance cost reduction (efficiency) of value creation processes (Fugate et al., 2006:3), increasing flexibility to improve product quality and timely supply of coffee (Niederhauser et al., 2008:250).
- v) Using information technology to enhance product flow, staff capability, supplier–buyer relationships and redefining coordination of functions (Fugate et al., 2006:3; Gibb et al., 2005:55).

It is clear from the above that information enhances management decision making, assisting firms to create value and meet customer needs through supplying of right quantity and quality of products (Martin & Jagadish, 2005). The benefits of information sharing are a very important component of FT chain functions that strive to create value to high quality differentiated coffee product that may give higher returns to smallholders and other players.

3.2.4 Relationships and Coordination

Value creation is achieved through relationship and coordination of chain participants, both within and between the firms. Some authors argue that relationships, partnerships and alliances are synonymous while other authors distinguish them according to strategic activities (Patterson & Wysocki, 1998; Dunne, 2001; Monczka et al., 2002; Hugos, 2003; Emmett & Crocker, 2006). Gattorna & Walters (1996:189) distinguish vertical relationship between buyer-seller at consecutive stages (farmers–processor and processor-exporter) as partnership and horizontal relationship between same parties at same level (processor-

processor) as alliances. Partnership in agribusiness has been said to refer to buyer and seller working together with relationship based on mutual trust, openness, shared risks, cost and benefits (returns) in order to enhance business performance (Cannon & Perreault, 1999; Dunne, 2001). A related view is that agribusiness *relationship* refers to buyer-supplier relationships based on strategic and operational partnerships and alliances to build trust and commitment (Dunne, 2001). It is further stated that the relationship's key objective is to enhance efficiency, effectiveness and to share benefits in the entire chain (Payne & Holt, 2001:173).

A successful buyer-seller business relationship facilitates the supply chain coordination. Coordination means working together across supply chain functions to create value and customer responsiveness, which then allows changes among the functions to occur through relationships (Min, 2001:376). Coordination mechanism refers to the tools used in the chain to address particular coordination problems (Fulgate et al., 2007:6). They argued that classifying tools required understanding of coordination problems and then proposed solutions since this is a complex and difficult task. Agribusiness literature provides examples of some coordination tools such as price or non-price; buy-back and return price, quantity flexibility, product quality, and conditions of exchange used to study buyer-seller or entire chain player's relationships to attain system coordination (Patterson & Wysocki, 1998; Fulgate et al., 2007). It is noted that the coordination mechanism is complex and the selection of coordination tools depend on the coordination problems (Cannon & Perreault, 1999).

With these perspectives on relationship and coordination, eliciting their features in the coffee supply chain is envisaged. Studies relevant to conventional coffee chain relationships found that the buyer-seller relationships appear to be fragmented (Ponte, 2002). For example, the coffee commodity chain is driven by international coffee commodity market dominated by large roaster corporations with retailing markets such as Kraft, Nestle, Proctor & Gable, Sara Lee and Tchibo (Ponte, 2002:1107).

In PNG, the conventional coffee chain relationship has been reported as transactional with product ownership changing hands along the chain, and loose coordination with chain leaders having power that creates information asymmetry (ACIAR, 2007; Murray-Prior & Batt, 2006). This PNG experience has similarities with features elsewhere in other research. Taylor (2005:133) asserted that the conventional coffee is characterized by discrete relationships

(personal interest), little inter-firm relationships and is highly transactional (spot market relationships) during the coffee season and with product ownership transferred to the intermediate customer who has a profit focus. This chain organisation is claimed to be detrimental to millions of smallholders coffee producers who earn less than US\$ 1 per day (Oxfam, 2002: 25). Thus, the buyer-supplier relationship in the conventional chain appears to be an adversarial one for smallholder coffee producers.

The smallholders in FT chains have moved from the adversarial relationships of the conventional chain (Taylor, 2005). Renard (2005: 423) pointed out that a growing number of roasters are moving away from the commodity market to directly link with FT smallholders, and these are characterized by inter-firm relationships that are more relational across the chain and encompass some vertical integration. Relational relationships are becoming prominent with specialty and FT coffee chains, which have progressed from vertical to horizontal cooperation to encourage up-scaling or upgrading (Milford, 2004). It is thought that upgrading smallholders through greater participation up the value chain may enhance their long term trust, commitment and collaboration (Imhof & Lee, 2007:95).

The term vertical integration has been used to describe the linking of two firms (processor-exporter) to form a partnership for sharing functions, cost, benefits (returns), or exchange resources and the term horizontal integration refers to bringing other individual and independent firms together at different value creating stages (farmers to farm, processors to processor) who are aligned (alliances) to improve entire chain coordination (Perez & Martinez, 2007:7). While upgrading in coffee chains involves three key aspects that impinge on relationships: (i) processes involved in upgrading of value creating activities, (ii) product upgrading that differentiates quality product and (iii) functional upgrading that cuts out middlemen and markets coffee more efficiently (Kaplinsky & Fitter, 2004:15). Thus, the benefits of moving from vertical to horizontal integration are up-scaling (economies of scale) achieved by selling more of the same product, economies of scope achieved by sharing common resources to produce different products, increased bargaining (market) power, reduce total cost and improved customer perception (Millard, 2005:10; Dunn et al 2006:iii; Bloom, et al., 2007: 20-2). The difficulties with horizontal integration are anti-trust implications and opportunistic behaviour with acquisition of competing markets, legal issues, and economic gains that do not always materialize with acquisition (Dunn et al 2006; Bloom, et al., 2007).

Benefits to FT coffee chain upgrading can be envisaged. Raynolds (2008:5-9) claimed that the conventional overseas importers (Starbucks, Procter & Gamble, and Nestle) are entering FT markets in partnership with FLO certified exporters in order to enhance high coffee quality (through training and reliability) and are moving toward traceability, which requires chain partnerships. This study noted that this approach seems to build long term collaboration and trust with FT coffee chain players in exporting countries. The FT FLO certified overseas importers-exporters and exporter-smallholders relationship is based on FLO conditions (social, ecological and economic) in order to pursue equality, transparency, stable price and pre-financing with buyer-seller coordination characterized by relational relationship (Raynolds, 2008:8-9). Raynolds further argued that major overseas buyers entering similar market niches to FT coffee chain are moving to traceability but without the FT conditions.

Bearing in mind the above theory, the coordination of FT and conventional chains has parallel features with relationships to facilitate value creation underpinning them. The coordination characteristics of these are discussed below, and this discussion draws on the theory of Patterson and Wysocki (1998) to describe the conventional and FT chains. One end of their coordination continuum fits the conventional chain. This conventional chain coordination has the characteristics of loose product specifications, impersonal transactions, highly competitive behaviour and invisible hand coordination, which determines the coffee price (Fitter & Kaplinsky, 2001, USAID, 2005). The coordination continuum on the other end of the spectrum outlined by Patterson and Wysocki describes the FT chain. FT chain coordination is characterised by tight product specifications, are less competitive, have vertical to horizontal integration with incentives (punishments), exporters share information freely and empower smallholders (Fitter & Kaplinsky, 2001; Millard, 2005). This smallholder empowerment is a source of social interaction that can be harnessed to consolidate coffee production, processing, and logistics to create value to meet customer's differentiated preferences (Renard, 2003:87).

A final aspect of relationships and coordination that requires discussion is a particular mechanism for horizontal integration, which is the FT cooperative. To put smallholder coffee producers' organization into perspective, a theoretical foundation is required. The International Cooperative Alliance defines a cooperative as:

‘An autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspiration through a jointly-owned and democratically controlled enterprise’ (Develtere & Pollet, 2005:10).

Develtere & Pollet (2005:10) described the seven key principles that accompanied this definition and these are: (i) voluntary and open membership; (ii) democratic member control; (iii) member economic participation; (iv) autonomy and independence; (v) education, training and information; (vi) cooperation amongst cooperatives; and (vii) concern for community. It is beyond the scope of this research to delve into the features of FT cooperatives. However, the features of smallholder cooperatives are discussed since this mechanism is important to enhance the functions of FT coffee chains.

A key role of FT cooperatives is to source coffee from smallholder producers in order to improve their livelihoods, which should occur through increasing the price paid; providing savings and credit schemes; consolidating products and improving access to processing facilities; and direct investment in community development projects (health, education, water supply, etc) (Grundy, 2005: 10-11). Furthermore, the smallholder cooperative’s functions and activities fall into five areas: vertical linkages (partnership) and cooperation; horizontal linkages (alliances) and cooperation; supporting FT markets with financial markets (micro-credit facilities), upgrading (production, processing, functions and relationships), and encouraging a more market enabling environment through influencing policy and direct links to overseas FT coffee buyers) (Milford, 2004:53-9; Millard, 2005: 7-8; Dunn et al 2006: 25-6; Muradian & Pelupessy, 2005:2039-40).

3.2.5 Constraints

The incorporation of constraints is an essential component of this theoretical framework in this study. Constraints are an important factor that affects value creation and smallholder coffee producers’ return, and are discussed further in this section.

Conventional coffee chain

Many constraints affecting the performance of conventional coffee chains have been observed in the literature. These constraints will have the impact on the smallholders’ returns. They are summarized in Table 1.0 and categorized according to constraints relating to

markets, production, processing, logistics, quality control, information, cooperatives, and relationships and coordination.

Table 1.0 Constraints affecting value creation and lower returns in the conventional coffee chains

Factors	Sources of low returns to smallholders in the conventional chain
Market	market inaccessibility, price volatility, lack of market capacity and information, multinational exporters control price (DFID, 2000; Oxfam, 2002; USAID, 2005; Batt & Murray-Prior, 2006ab)
Production	aging coffee trees, small land size, poverty, persistent debt and labour scarcity (Gimbol, 2001; Oxfam, 2002; Dempsey, 2006; ACIAR, 2007)
Processing	lack of capacity, farm investment, buildings, lack of technology and improved processing techniques; lack of extension services and micro-finance (Batt & Murray-Prior, 2006ab; ACIAR, 2007; Neilson, 2008)
Logistic	poor transport and communication infrastructure, poor road conditions, lawlessness; lack of timely supply (ACIAR, 2007)
Quality control	lack of quality control with harvesting, processing and transportation; lack of coffee product differential prices, lack of information on customer preferences to improve quality, and lack of traceability (Muradian & Pelupessy, 2005; Murray-Prior & Batt, 2006; ACIAR, 2007)
Information	distorted information flows, lack of transparency on market types and price, lack of tracking product flow and identity, lack of trust and commitment creating poor information flow (Taylor, 2005; Niederhauser et al., 2008)
Relationship and Coordination	traditional spot market relationships, long chain with players having self interest, loose coordination with invisible hand, exporters with power and information asymmetry (Fitter & Kaplinsky, 2001; Oxfam, 2002; Renard, 2003; Milford, 2004; ACIAR, 2007)
Cooperative	No smallholder institutions or organisation (USAID 2005; Raynolds, 2008)

Fair Trade (FT) coffee chain

The sources affecting smallholder's low return in the FT chain are in Table 2.0. Almost all the constraints in the conventional coffee chain are claimed by some authors above to have

been fully or partially removed in FT chains, yielding higher returns to FT smallholders (Raynolds, 2002; Milford, 2004; Dietz et al, 2006; Taylor, 2005; TransFair USA, 2008a). However, it is thought by many other authors that some of the constraints existing in the conventional chains remain with FT chains elsewhere and these are listed in Table 2.0.

Table 2.0 Constraints affecting value creation and lower returns in FT coffee chains

Factors	Sources of low returns to smallholders in the FT chains
Market	FT coffee entering non FT markets, less competition but less direct economic benefits, private exporter holds FLO certification right to recover cost (USAID, 2005; Imhof & Lee, 2007; Raynolds, 2008; Neilson, 2008)
Production	small land size, geographical isolation, poverty, illiterate, debt and labour scarcity, lack micro-credit schemes, rigorous FT standards (Oxfam, 2002; Millard, 2005; Muradian & Pelupessy, 2005; Neilson, 2008)
Processing	lack of capacity, lack of farm investment, lack of technology and improved processing techniques, lack of extension services and micro-finance (USAID, 2005; Imhof & Lee, 2007; Neilson, 2008)
Logistic	poor transport and communication infrastructure, poor road conditions, lawlessness; lack of timely supply (Imhof & Lee, 2007; ACIAR, 2007)
Quality control	lack of quality control with harvesting, processing and transportation, lack of product differential price, lack of customer's preferences to improve quality, lack of traceability (Dempsey, 2006; USAID, 2005; Neilson, 2008)
Information	distorted information, lack of transparency on market types and price, lack of tracking of product flow and identity(origin and uniqueness), lack of trust and commitment (Taylor, 2005; Raynolds, 2008; Neilson, 2008)
Relationship and Coordination	spot market relationship with self interest remains, private FT exporters have power and information asymmetry (Fitter & Kaplinsky, 2001; Renard, 2002; Batt & Murray-Prior, 2006ab; Raynolds, 2008), vertical and horizontal integration for upgrading were donor dependent or exporter driven (USAID, 2005; Dempsey, 2006; Neilson, 2008)
Cooperative	lack of capacity (capital resource and market skills) to trade, lack in providing services to members to upgrade and free riders sharing FT premium (Milford, 2004; Millard, 2005)

3.3 Conclusion

The proposed conceptual framework for evaluating FT and conventional coffee chains incorporates six key features. Within these components, there are two core elements. The first core element is the returns gained by the smallholders and other chain players for creating value to the coffee product and receiving payment for it. The second core element is the value creation in both FT and conventional chains; that is the activities that add value to the coffee product for the entire chain and customers (intermediate customers and final customers) who are willing pay a price that is then shared amongst the chain players. Then, the four supporting components are chain players, activities, relationships and constraints, which appear to have an impact on the value creation and returns through a mix of interactions.

The aim of this study is to gain an understanding of whether the value creating activities of FT chain and its key chain functions (FLO certification system, direct buyer-seller relationship, coordination and information) can give greater returns to smallholders than the returns to smallholders in the conventional coffee chains. If this is not so with FT smallholders, then the question must be asked 'what are the constraints that impede greater returns than the conventional chain'? In chapter 7, the above literature review will be related with the findings of the FT and conventional chains in this study. It is hoped that this will enrich the understanding of FT coffee chains emerging in PNG as an alternative to traditional conventional chains.

Chapter 4 Methodology

4.1 Introduction

The research methodology used in this study is based on the conceptual model of coffee supply chains that was discussed in the previous chapter. This model emphasises the coffee supply chain's return and value creation, which is influenced by four interacting components: the participants, value creating activities, relationships and constraints.

Section 4.2 discusses the research framework for field work and analyses of the coffee supply chains. Section 4.3 discusses the FT and conventional coffee supply chains and provides a description of the research location. Section 4.4 discusses the data collection, approaches and justification. Section 4.5 discusses the data analysis and report structure while Section 4.6 provides the conclusion to this chapter.

4.2 Research Framework

The research objectives in chapter 1 are restated here to underpin the research framework. The research questions have been restated slightly to give greater precision now that the literature review has been revealed. The research questions are:

- i) Do smallholders in the FT chains receive higher returns than the smallholders in conventional chains?
- ii) If smallholders in the FT coffee chains receive higher returns from their coffee than the smallholders in conventional chains, what are the sources of these higher returns?
 - a) In particular, is there evidence that FT coffee processes and relationships have created differentiated product attributes that capture higher prices than conventional coffee in the market place. Such processes and relationships include:
 - i. FT FLO certification
 - ii. Other differentiated product attributes
 - iii. chain relationships that exhibit greater trust and commitment than those in conventional chains

- iv. empowerment of smallholders and information sharing in FT coffee chains as opposed to power and information asymmetry
 - v. horizontal coordination amongst smallholders in FT coffee chains
- iii) If smallholders in the FT coffee chain don't receive higher returns than in the conventional coffee chains, what are the constraints to smallholders receiving higher returns from FT coffee chains?
- a) More specifically, is there evidence that constraints exist for FT coffee chains that are not evident in conventional coffee chains?

These research questions require a research framework. A conceptual model on coffee supply chains was developed in the previous chapter. This is shown again in Figure 3.0 below. The core outcomes are *value creation* and *return* while four interacting components are the *chain participants, activities, constraints, and relationships and coordination*.

These components interrelate with each other. The chain players in general and smallholder coffee producers in particular perform the value creating activities and the relationships and coordination between them has an impact on their performance of these activities, which enhances ultimate returns from their coffee. There are also constraints to how they can perform these value creating activities that can be related to the chain participants relationships and coordination and other factors. These components and their interactions were discussed in greater detail in chapter 3.

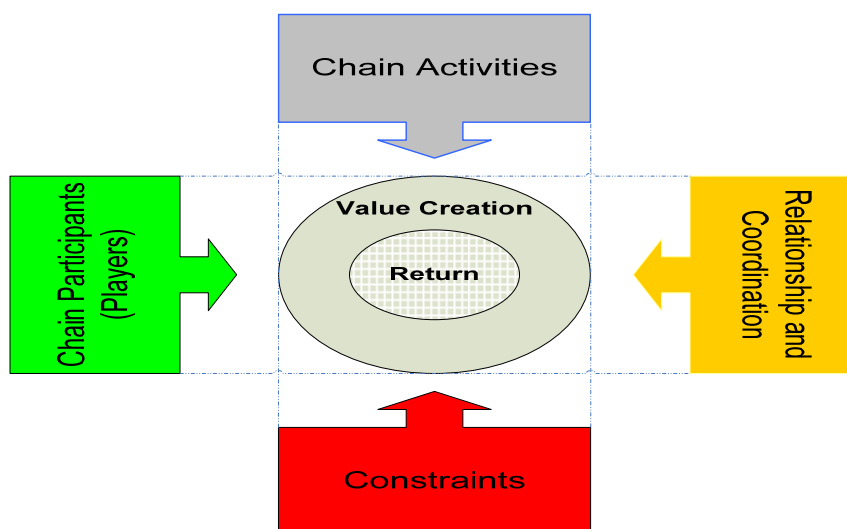


Figure 3.0 Coffee supply chain's conceptual model

4.3 Field Work Approach

In order to answer these research questions, the insights from the research framework developed in chapter 3 were operationalised. The methodology for doing this is described below.

4.3.1 Case Study Approach

The research questions were restated as research propositions. The primary proposition is that the value-creating activities of the FT chain and its key functions (FLO certification system, direct buyer-seller relationship, coordination and information) can provide higher returns to smallholders than conventional coffee chains. The secondary proposition is that there are particular facets of FT chains that follow them to yield higher returns for smallholders than in the conventional chains. If they don't receive higher returns than the conventional coffee chains, what are the constraints to smallholders receiving higher returns from FT coffee chains? More specifically, is there evidence that constraints exist for FT coffee chains that are not evident in conventional coffee chains.

In order to investigate these propositions, four case-studies were undertaken with one FT and one conventional coffee chain originating from Okapa district. Another FT chain and conventional chain were selected from Kainantu district. The reason for pairing a FT chain with a conventional chain in each district was to control factors that might confound the analysis if conventional chains were in different places to FT chains.

While it would be desirable to study the whole chain for each of the cases from PNG to overseas, this was not possible. Instead, the PNG part of the chain was used as the unit of analysis and much information as possible on the overseas part of the chain was obtained from the PNG chain players. The key part of the chain that was focussed on was the smallholder part of the chain, but it is necessary to study as much of the rest of the chain as possible in order to answer the research questions that were listed.

This case-study approach uses the Neuman (2000) and Yin (2003) case-study research strategy. With particular reference to agribusiness in-depth case study, this study adapted methodology used by Martin and Jagadish (2006) in fresh produce supply chains in the PNG

Highlands to understand FT and conventional coffee chains business processes that affect the chain players.

4.3.2 The Research Approach and Data Gathering

The conceptual model set up above was used to guide the empirical work. The research approach used structured interviews of key chain informants (David & Tolich, 2003; Babbie, 2004) in each of the four different chains. The structured questionnaires were based on the research questions and research framework, which is drawn up for each set of key respondents in FT and conventional chains.

Chain players or key respondents were interviewed in person and sometimes in groups when this seemed appropriate. Their responses were written on the questionnaire sheet. The interview in person was the best option for PNG due to poor telecommunication infrastructures and smallholder coffee producers having a low level of education. The interview questions were related to the business activities of participants and were not personal or political, thus ethics issues were minimized.

Representative sampling was used to select the respondents to the interview (Babbie, 2004). This means that the respondents in the conventional chains originating from Okapa and Kainantu are representative of the players such as the smallholders, processors, exporters. Likewise, the respondents in the FT chains originating from Okapa and Kainantu are the representative of players such as the smallholders, cooperatives and exporters. There were 61 representatives of the different players who participated in the interview, as shown in Table 3.0.

Table 3.0 The interviewees representing each player in the four chains

Representative of Players	Four supply chains of the four case studies			
	FTC ₁	CNC ₁	FTC ₂	CNC ₂
FT smallholders	12		8	
Co-operative board members	3		3	
FT exporter	1		1	
Conventional smallholders		13		15
Processors		1		1
Conventional exporter		1	1	Same as CNC ₁
Total interviewees (61)				

The development of the questionnaire

To interview these respondents in Table 3.0, a questionnaire was constructed for each participant or player along the span of the FT and conventional coffee chains. The questions were constructed to cover an overview of the players' business, operational functions, coffee selling, coffee prices and alternative chains. The key features in the FT and conventional chains' questionnaire was value creating activities, logistics, quality control, information flows, relationship and coordination, source of return and other benefits; and constraints to detaining better returns. The questions were envisaged to adequately elicit information to cover all the research questions posed earlier. Appendix I and II provides examples of a questionnaire used for the FT smallholder, the co-operative and the exporter, and the conventional smallholders, the processor and the exporter.

The secondary data

Secondary data were collected to support the questionnaires. This included quantitative data from stakeholders, partnering firms and key informants, which provide richness to this case study approach.

The primary data collection approach

The primary data was collected through personal contacts in the field in Okapa and Kainantu district of EHP. The field research started on 18th July 2008 and ended on 30th August 2008. About six weeks were spent in making appointments, arranging logistics, traveling to remote

rural villages, and conducting interviews with different chain players in each chain. Interviews started with smallholders participating in each chain from remote areas of Okapa or Kainantu districts and ended with exporters in the town.

The appointments were made in the first week with participants in Goroka by personally visiting the processors, exporters, roaster, and board members of a cooperative from Okapa and transport providers. It was coincidence that an FT FLO inspector arrived in Goroka on July 23th 2008 for the annual audit of the FT chain in Okapa and Kainantu districts to renew their FLO licenses. During the first week-end, the researcher accompanied the FLO inspector to Okapa villages where smallholders resided and made appointments with farmers to interview them in the following week. In the second week, appointments were made with FT smallholders in Kainantu while accompanying the FLO inspector there. During the first two weeks, interviews were done with FT cooperative board members in the two chains. In the third week, a second visit was made to Okapa to walk several kilometers to remote villages. The smallholders involved with the FT coffee chain and conventional coffee chain were interviewed both at day and night time. Also, coffee gardens were visited to observe organic farming practices, topography terrain, coffee farm size, cherry processing techniques and road infrastructure and general conditions of the road.

In the fourth week, a FT coffee exporter in Goroka was interviewed and also the conventional coffee processor who buys coffee from smallholders in Okapa. Also observations were made to their properties to observe value creating processes of green bean coffee before exporting. Informal information was given by supervisors of the processing mills and transport providers who transport containers to Lae wharf.

In the fifth week, trips were made Kainantu district and interviews were conducted with FT smallholders, co-operative board members and an FT buyer/exporter. Observations were made on coffee gardens, land fragmentation, road conditions, exporter's properties (warehouse, cherry processing mill and plantation) and other cash cropping activities. A visit was made to a village where smallholder coffee producers supply their coffee to the conventional chain. Interviews were done and observations were made of their coffee gardens, parchment processing and logistics. While the processor involved in the conventional chain was interviewed, a visit was conducted to his property, which allowed observation of the value creating activities of green bean coffee.

In the final week, interviews were conducted with the conventional coffee exporter, a multinational company based in Goroka. Visits were made to the CIC office to collect some secondary information and also the Goroka Arabica Coffee Roaster to get an overview of their business activities. In Goroka, an interview was made with a conventional coffee exporter who normally assists the FT coffee buyer/exporter in Kanantu to export coffee overseas FT coffee buyers.

The interview questions were translated into Pidgin English, a PNG's national language for the interviewee. The interviewees' responses were written in full on the blank space under each question. The interview time took two to three hours. Taking into account the time constraint and smallholders' daily household activities, the interviewer conducted interviews with three to eight interviewees together in some instances as well as one on one contacts. Likewise, one or two cooperative board members of the FT chain were interviewed during appointed times and sometimes follow-up calls were made to fill in information gaps. The interviews with processors and exporters in the conventional chain were done on one on one.

4.3.3 The Limitations and Constraints

The research encountered some difficulties and constraints which are noted below. Transport cost in PNG had doubled from the time when the research was approved to the time when it was carried out, making air and road travel more expensive and difficult.

Travel along the Okuk highway between Kainantu and Goroka, and the provincial road between Okapa and Goroka, was hampered by lawlessness. However, the researcher used local knowledge to navigate the travel to these places from Goroka and no problems were encountered.

Further difficulties were encountered during the interview. The smallholders were anxious when the interview time exceeded more than one hour. This is because they had daily household activities to attend to. The researcher used a digital recorder in the first few interviews but encountered malfunctioning problems with the equipment. It can only function for one hour and 30 minutes before the battery goes flat and there was no electricity in the rural area to recharge it so the interviewer reverted back to copying responses. Some appointments made had to be cancelled because the farmers went to their gardens or to attend

to social obligations. Some interviewees did not answer the questions asked, but instead, they talked about a range of issues concerning them, instead. Despite these difficulties, the interviewer is confident that the robust information was collected.

Another difficulty encountered was that some processors and exporters said that some questions relating to cost of production, coffee price, volume and total revenue were sensitive and that they were unable to disclose real information. However, they provided general information based on Y grade coffee price available through the mass media in PNG. Some information received from overseas customers by exporters on price and product differentials was not shared.

4.4 Data Analysis and Report Writing

In total there are four coffee chains analysed in this study, two from each of the districts in the study (Okapa and Kainantu). The unit of analysis is the chain with PNG. The comparative analysis focussed on within districts comparisons. This means that the FT chain in the Okapa district will be compared with the conventional chain in that district, while the FT chain in Kainantu will be compared to the compared to the conventional chain in that district. Then the paired chains were examined to identify similarities and differences between them.

In each chain, the sub-unit of analysis (i.e., chain players) are linked with the next player in the chain. In the FT chains, the smallholders are directly linked with the exporter whilst their cooperative does not trade but only facilitates the FLO certification processes. The smallholders in the conventional chain linked with the processor but not the exporter. The identity of the chain players was kept confidential, and alphabetical codes used to refer to them in chapter 5 are as follows. **FTC₁** indicates the first Fair Trade chain and **FTC₂** indicates the second Fair Trade chain in this study. **CNC₁** indicates the first conventional chain and **CNC₂** indicates the second conventional chain in this study. The codes used for the chain participants in the results are as follows: **SG** indicates smallholder groups, **CG** indicates co-operative board member group, **CP** indicates coffee processor, and **CE** indicates coffee exporter.

4.6 Conclusion

Based on the research proposition, this research method employed comparative case study approach. The case description of the FT and the conventional chains originating from each districts were compared and analysed for similarities and differences. Comparisons based on the conceptual model were done in terms of chain returns and value creation. These core outputs of each chain are derived from the interacting components such as the activities, constraints, chain participants and relationships and coordination. On this basis, the research questions were answered.

Chapter 5 Results

5.1 Introduction

This chapter describes the Fair Trade (FT) and the conventional coffee supply chains that were studied. This description views the span of each chain from the smallholder coffee producers to the exporter, but not beyond this point.

There are six sections in the chapter. Section 1.2 describes case 1, the FT chain originating from Okapa. This section covers several subsections, which includes the span of chain, processes, information flows, relationships and coordination, and returns to different players. Section 1.3 describes case 2, the conventional chain originating from Okapa in the same way. Sections 1.4 and 1.5 then describes case 3, (the other FT chain that originates in Kainantu and the other conventional chain originating from the same area. The conclusion to the chapter is in Section 1.6.

5.2 Case 1: Fair Trade Coffee Supply Chain Originating from Okapa

This FT coffee supply chain (FTC₁) originates in Okapa, EHP, and the interviewees comprised smallholder coffee producers, the FT cooperative and the exporter. Those interviewed were twelve smallholders, three members of the FT co-operative and one staff member of the export firm.

The smallholders are members of a certified FT cooperative and are certified organic coffee producers. They produce organic coffee and sell it directly to the exporter. The FT cooperative in this chain has no capacity or finance to buy members coffee, process and sell it. The exporter buys parchment coffee from smallholders, processes and exports to overseas customers through the FT, organic, specialty and conventional coffee markets channels.

5.2.1 Span of Chain

This FTC₁ is a short chain that comprises input suppliers, smallholder coffee producers, the FT cooperative and the exporter within EHP, PNG. The span of the chain is illustrated in Figure 4.0 and is described in detail below.

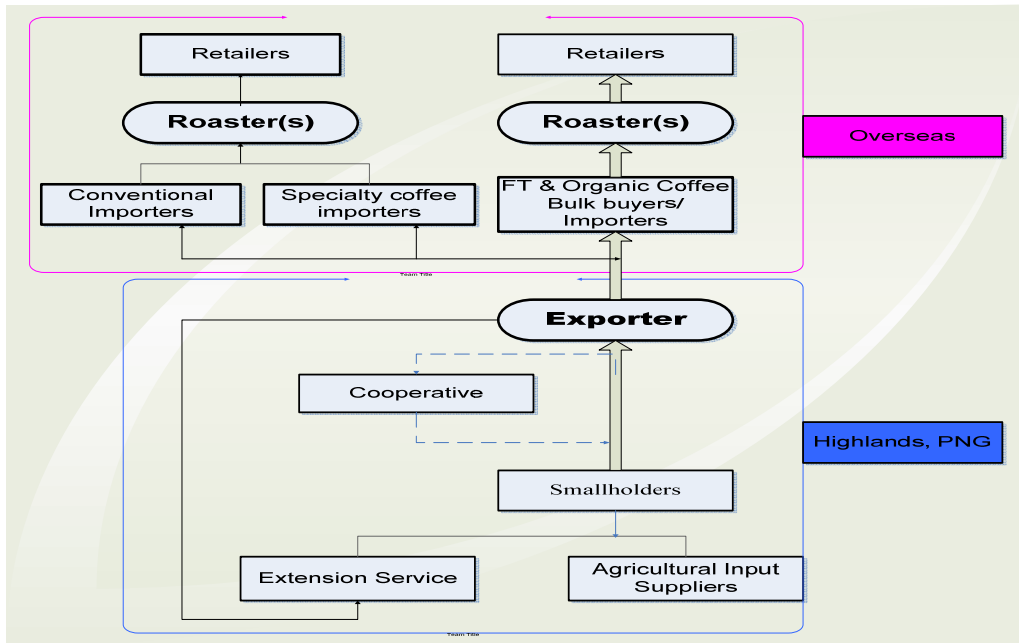


Figure 4.0 *The FT & organic coffee supply chain originating from Okapa district, EHP*

Smallholders

The smallholders are members of a certified FT FLO cooperative. They are also certified organic coffee producers recognised by the National Association for Sustainable Agriculture Australia (NASAA). They live in remote villages in Okapa district, about 85 km from Goroka. They buy farm inputs from agricultural stores in Goroka. They use limited resources to produce organic coffee and supply to buyers since it is their major source of rural income.

Co-operative

The co-operative has 3600 smallholders as registered members. It has a small amount of property in Okapa station and the Board members are volunteers. This co-operative does not act as a coffee buyer for the members, but facilitates the use of the FT premium for social community development, and also is responsible for renewal of the FT FLO certification processes. Hence, it has no trading functions, and instead, its functions are to use the FT premium for social community development and also to be involved in the renewal of Fair Trade Labelling Organization International (FLO) certification processes. The FT premium is paid by FT coffee buyers to the co-operative as a fixed premium to be used exclusively for social community developments. The use of the FT premium is audited annually by to renew the FLO certificate for the players in this chain. Another premium is derived from the fixed

certified organic coffee premium price. This premium is paid on top of the established FT floor price established by the overseas FT coffee buyers.

Exporter

The exporter has FT FLO certification and organic coffee certification for export and operates from its head office in Goroka. It provides extension service, has an established buying depot in Okapa and transfers the FT premium to the co-operative. The exporter has capital assets and capacity to buy coffee, add value to green bean coffee and export to overseas consumers or FT coffee buyers.

5.2.2 Processes

Smallholder coffee producer's processes

In this FTC₁, smallholders' processes comprise coffee growing, harvesting, processing, logistics and quality control.

Smallholders grow young coffee trees and maintain mature trees. They prepare the land, transplant seedlings, intercrop food crops and manually control weeds until the young coffee trees are three years old and bear berries. In mature coffee trees, the smallholders employ organic coffee maintenance practices. They slash tall weeds and also use spades to control weeds. Smallholders noted that weed control puts constraints on their labour, time and resources. They carry out heavy pruning on mature trees every five or six years and light pruning of vegetative growth on branches or stems annually. Smallholders plant shade trees like casuarinas, nitrogen fixing, edible fruit trees and other ornamental trees. They said that their soil is naturally fertile with a suitable climate for growing coffee.

“We practice organic farming so chemical fertilizers; glyphosate and insecticides are not applied. These chemicals are expensive and less profitable to us but our soils are naturally fertile for organic coffee growing”.

Smallholder Group (SG)

In terms of harvesting, labour is arranged during the peak coffee season and family labour is used during the non-peak season to pick all the ripe cherries. The coffee pickers pull down the tree carefully with one hand and use one or both hands to pick the ripe red cherries.

Family labour is used to provide supervision and security because some people steal the cherries. It was revealed that labour constraints existed during the coffee season and smallholders said that their family labour is spread over daily household activities.

“Between April – July, labour is a constraint so we arrange communal labour and provide meals. We may hire sports group or church youth group to pick the cherries at three week interval. During non peak season, the family labour is distributed over coffee picking, gardening, livestock rearing, etc”. SG

In terms of parchment processing, smallholders use family labour to pulp the cherry while others hire a pulping machine from their neighbour. The cherry skin goes out as rubbish and parchment beans are collected in the bag. Smallholders cover the coffee bag with leaves to ferment for two days (36 hours) for the mucilage to degrade from the parchment.

The fermented beans are poured into a string bag or bag with small holes and immersed into a pool of running water. Smallholders remove the floaters and other rubbish. They use two hands to rub the parchment to remove the remaining mucilage. Fully washed parchment coffee is poured onto a canvas on the ground. A family member turns them regularly and provides security from straying animals and stealing. Smallholders reported that sun drying to reach No.1 parchment (or a 12% moisture level) may take one week during sunny days and two weeks or more during cloudy or rainy days. Dried coffee is stored in the hut (the family’s house) on a bed.

In terms of logistics issues, smallholders grow coffee in different parcels of land with an average distance of two kilometres between them. Harvested cherry coffee from these gardens is carried up the rugged and hilly terrain to the village for parchment processing. The processed parchment coffee is stored in the hut until sold. When to sell coffee is determined by factors such as the coffee price, urgent social –cultural obligations, school fees and availability of trucks.

“We have several coffee gardens, depending on the parcels of land inherited from individual father. We make decision or together with our spouse to sell coffee based on household needs, school fees and social obligations such as funeral cost, bride price, compensation, etc”. SG

Smallholders usually carry the coffee bags to the nearest road access and transport them to a buying depot in Okapa or Goroka. Some smallholders said that selling coffee at the FT exporter's buying depot in Okapa minimises risks associated with poor (muddy) road condition, road hold up, sleeping on the road for few days, and incurring extra cost. It also reduces the risk of coffee quality being affected by rain. Other smallholders take these risks by transporting it to Goroka.

“We carry parchment coffee to the nearest road access. When we transport coffee from Okapa to Goroka, it may take two to three days because of poor road condition from gluey mud, pot holes, land slips, appalling bridges and rain erosion”. SG

In terms of quality control, smallholders do not apply farm chemicals, which is consistent with organic farming practice. They grow coffee and maintain its quality during this period with weeding, pruning, fencing, and manual drainage cleaning. At harvesting, they hand pick ripe red cherries as mixed Arabica coffee varieties, but smallholders admitted that poor quality coffee cherries are sometimes harvested when (some hired youth/church groups or communal labours) pick half ripe, black, green, rat or bird eaten berries and collect fallen berries. Their harvesting time starts sometime from morning to afternoon and they commence cherry pulping late evening or next morning, which may cause cherry fermenting before pulping. Some smallholders said that they lack skills in adjusting hand pulping machines and there are some unpulped berries, skins, defects and pulped parchment going together in the fermenting bags. When they put the fermenting bags on the ground and cover them with leaves, they may cause uneven fermenting due the bag being left on the ground without water.

Smallholders have good water sources for fully washing the coffee. Their cleaning practice is of removing floaters, sticks, etc and using both hands to repeatedly rub the parchment and so removes the mucilage should enhance quality. However, sun-drying the parchment coffee on used canvas or plastics on the ground may cause uneven drying in this foggy mountain area. Smallholders said that further parchment cleaning is done by removing black beans, green berries, sticks and cherry skins, and making every effort to ensure dryness reaches No.1 parchment (12% moisture) level during sun drying to enhance quality.

“We supply mix variety of Arabica coffee to the buyer. No buyer is buying single Arabica coffee variety. We dry coffee to No.1 parchment or 12% moisture level because it determines better price at the road side”. SG

Co-operative’s processes

The cooperative lacks the necessary finance, capital assets and skilful staff necessary to perform trading functions for smallholder members. Its only role is facilitating the use of the FT premium funds for social community development and the renewal of FT FLO certification processes. It adheres to FT FLO standard conditions and states that the members are involved in democratic, participatory and transparent processes for the organisation.

FT FLO inspector wants the co-operative to mobilise coffee from members but we know this will not work in Okapa. We know our problems in mobilising coffee such as fragmented topography, lack 4WD trucks, poor road conditions and lack of finance to pay them on delivery. We know that coffee is part of members’ culture and we must pay them and not to delay payment through mobilisation processes. Few times, the FT exporter advanced us K5000 to buy, process and sell coffee to them but the hidden costs (transport, labour, etc) is high for small volume so we quit”. Co-operative Group Board Members (CG)

In terms of logistics and quality control, the co-operative sometimes provides information on coffee price and facilitates transporting of members’ coffee to buying depots in Okapa. Although the FLO inspection fee is paid by the exporter, the co-operative facilitates the FLO inspector’s visits to producers’ coffee gardens, provides information on FT standards and financial records of FT premium accounts to ensure that the FLO certificate is renewed.

Exporter’s processes

The final player is the exporter of certified FT and organic coffee, who undertakes processes such as buying, further processing, logistics and quality control relating to smallholder’s parchment coffee before exporting.

The exporter has the capacity to provide extension services and buying depots to smallholders in Okapa. This assists smallholders to produce and sell organic coffee that meets

FT and organic coffee certification standards. The exporter said that Okapa smallholders registered for FT (as well as not registered) sell their organic coffee to buying depots in Okapa or in Goroka. Depot managers in Okapa provide sales receipts to smallholders who later present it at Goroka and get paid whilst those who sell in Goroka are paid on the spot. Coffee supplied to Okapa is stored and later transported to Goroka.

“We want coffee volume so we buy coffee from both certified and non certified smallholders in Okapa derived from organic farming practices. Depot managers consolidate coffees supplied by these smallholders together, not separated, they do not use cash because of lawlessness”. Coffee Exporter (CE)

In terms of logistics, coffee stored at buying depots is transported by the exporter using its own fleet of four wheel drive (4WD) trucks to transport coffee from Okapa to Goroka. The exporter said that this approach is to alleviate the smallholders' problems of high transport cost, poor road conditions, lawlessness and weather affecting coffee quality during transportation. The exporter stores the parchment coffee in the warehouse in Goroka and then further processes it into green bean upon customer's request.

In terms of green bean processing, the exporter hires a processing mill and carry out further value creating activities. The parchment with 14% moisture level or more undergoes touch up drying in the drier machine. Parchment coffee with 12% moisture level is poured into the feeding hopper. First, the de-stoner machine separates heavy materials. Next, the huller machine removes the parchment skins or husk and the polisher removes the silver skin that remains on the green bean. Then, green bean coffee is cleaned by winnowing. The catador machine removes the remaining husks, the coffee is bagged and transported back to the exporter's facility. The final cleaning of green bean is done by casual workers at the exporter's facility. Later, the grading machine sorts and grades the green beans according to customer's specifications. Finally, it is bagged and labelled for overseas customers.

In terms of quality control, the exporter provides extension service and training on activities such as growing, harvesting, processing and logistics so that smallholders' coffee meets FT and organic certification standards. However, some quality problems with smallholders are communicated to the buyers by the village inspectors who work as extension workers for the exporter. The exporter has strict rules for depot managers to assess parchment coffee before

buying; for example, assessing parchment coffee for 12% moisture level, low defects and weighing less than 45 kg for a 60kg volume bag. Those bags with 12% moisture level that weigh more are thoroughly checked and rejected. If depot managers fail, they are reprimanded with salary penalties. This is because there will be a weight loss during green bean processing. The exporter stores the coffee in semi-permanent sheds and transports it to Goroka using 4WD trucks with covers to ensure coffee quality is maintained.

The parchment coffee is stored at the exporter's warehouse to maintain the required 12% moisture level. The exporter said that the important value creation activity at exporting stage is the green bean cleaning by casual labour who hand pick black, discoloured and defective beans under close supervision. The grading machine sorts and grades the green bean as A, X, PSC, Y and T where the first three have higher product differential prices.

“We supply consistent quality of A, X and PSC coffee since we deal with FT, organic and specialty markets. Most smallholders' coffee has poor quality and increases processing cost so depot managers are instructed not to buy wet coffee. Because there is weight loss, increases cost and the return is low”. CE

The exporter carries out sample assessment with external attributes (size, shape, colour and smell) and internal attributes (flavour and aroma) according to customer's quality specification. The exporter said that some FT and organic certified importers and roasters require single origin like “Purosa” or “Okapa” organic coffee and the grades are A, X and PSC. Similar buyers in Germany also buy Y grade. The exporter also sell A, X and PSC grades to specialty coffee markets and some PSC, Y and T grades to instant coffee buyers in the conventional market. The exporter has had no experience of coffee being rejected.

5.2.3 Information flows

Smallholders

The smallholders share information on organic coffee growing, harvesting, processing and quality control with the village inspectors and amongst themselves. In addition, smallholders provide information on the number of coffee trees to the exporter through the village inspectors (exporter's village extension workers).

“We receive information from the exporter through the village on organic coffee growing, harvesting and processing. The exporter tell us that we would get better price on organic coffee but we are discourage when the current FT coffee price is similar to the conventional price”. SG

Smallholders share information on logistics and quality control such as transport, road condition, coffee buying, lawlessness and weather conditions with the exporter’s village inspectors and other smallholders to produce and sell coffee. They said that they have lesser information sharing with the co-operative on those issues. The smallholders interviewed said that there is no information shared with the exporter or inspectors on quality attributes, quantity, product origin and different overseas customers.

“The exporter does not share information on quality, quantity, product origin, continuity and timing of supplying coffee to what which overseas customers. We assume that FLO is buying our coffee but FLO inspector told us in this year 2008 visit that the exporter sells our coffee to different buyers” SG

They receive information on the coffee price from radio broadcast via FM radio EHP, village inspectors, depot manager, coffee producers and factory door price upon delivery.

“We sell coffee to buyers when information of high coffee price is received. The exporter tells us to get better price on organic coffee and discount on transport cost but the price is unclear”. SG

Co-operative

The co-operative does not share much information with smallholders and the exporter because it does not trade. It shares information only on FT certification standards and the FT premium used for social community developments.

Sometimes, the co-operative assists smallholders with information on general logistics, FT or organic coffee standards and how more FT premium can be derived by selling more coffee to the exporter. However, the cooperative lacks information on FT price strategy, product origin, premium paid, volume of coffee customers’ requirements and FT market information.

We are unable to track smallholders coffee volume supplied; its quality and customer's information from the exporter. Our members are complaining to us about information on the exporter's FT price. Even then, we too don't know how FT price is calculated". CG

Exporter

The exporter shares information with smallholders on FT and organic coffee processes through its village inspectors. The exporter also shares information with them on the coffee price, transport cost reduction and buying location. A reverse information flow occurs with certified organic smallholders supplying details of their total trees to the exporter through the village inspectors for crop forecasting information. The exporter appears not to share information with the co-operative on the FT price strategy, types of FT market, customer preferences and product specifications (origin, FT, organic and specialty coffee).

The exporter shares information with village inspectors and depot managers on logistics such as inventory of coffee in store, truck, road conditions, and lawlessness and weather conditions with transporting coffee from Okapa to Goroka. Information is shared also on organic coffee quality attributes, quantity, continuity and timely supply between these parties.

"We understand the problems associated with transport, road conditions, cultural context, and road hold up to bring coffee from Okapa. We do not pressure our depot managers on quality, quantity, continuity and timely supply of coffee. To harness these problems, we operate six days a week and buy coffee at Y grade price and provide discount on transport cost". CE

Furthermore, the exporter shares information with certified FT and organic overseas buyers on green bean coffee quality attributes (shape, colour, size, taste and aroma), origin (Purosa or Okapa), quantity (number of containers), FT premium, logistics (shipping details) and quality control (sample cupping and CIC quality inspection).

5.2.4 Relationships

Smallholders

In this chain, smallholders buy farm inputs from agricultural stores in Goroka using a spot market relationship.

The smallholders collaborate and cooperate with each other in sharing family labour, arranging communal labour and hiring youth groups or church groups to work on coffee growing, maintenance, harvesting and processing. The family labour sharing and communal labour usage is necessary because they have social–cultural obligations which have strong ties with coffee income. They also cooperate in sharing the cost of arranging transport.

“We share family labour and also arrange labour to produce more coffee and get a better income. This labour sharing is vital because we contribute to the cost of funeral cost, bride price, compensation, school fees, etc”. SG

The smallholders said that there are no business relationships with the co-operative because they are not trading. However, smallholders attend the annual general meeting organised by the cooperative to decide on the usage of FT premium and they are also involved in the FLO inspector’s visit that is coordinated by the co-operative.

With respect to the FT exporter, the smallholders are independent and flexible and will supply coffee to the exporter or to other buyers on a spot market basis.

Co-operative

The co-operative has no business relationships with smallholders or exporter because it does not trade. However, the co-operative interacts with the exporter on the renewal of the FLO certification processes to ensure smallholders sustain their livelihoods through complying with FT standards. This cooperative receives the FT premium which is transferred to the cooperative’s account from the exporter for social community development activities in Okapa.

“We don’t have staff, finance and (a) processing mill. We would like to provide extension service, micro-credit facilities and other services to members to fulfil our objectives but we don’t conduct business to generate income to do so. However, the co-operative is align with the exporter purely for the FT premium to build elementary school classrooms, primary school classrooms, purchase of curriculum materials, beds for health clinics and maintenance of road”. CG

The co-operative said that it facilitates the FT FLO inspector’s visit to smallholders’ villages to renew the FLO certificate each year. This cooperative also coordinates and manages the activities of social community development as noted above.

Exporter

The exporter’s relationships with smallholders are designed to facilitate processes associated with coffee buying and value creating activities whilst information is to facilitate this. The exporter through the FT and organic coffee certification processes tries to build trust and commitment with smallholders.

“We know that the co-operative is not trading so we coordinate and manage organic coffee product flow from smallholders to meet FT and organic coffee certification standards”. CE

The exporter coordinates and manages the extension service, crop forecast, coffee buying, prices, quality, quantity, logistics, continuity and timely supply of coffee from Okapa with the village inspectors and depot managers.

“Our customers know PNG’s coffee season so they place forward contracts. We normally have forward contract of two containers per month. Export is adjusted according to coffee bought from smallholders and processed”. CE

In terms of exporter–cooperative relationship, the exporter works with the co-operative for the purpose of FT FLO and organic coffee certificate renewal processes. The exporter said that it pays for the FLO and organic inspectors visit annually.

“We pay high fee for the FLO inspector’s visit to renew our certificates. The co-operative usual involved in taking the FLO inspector to audit their book on FT premium expenditure, visit smallholders coffee gardens”. CE

In terms of exporter – overseas buyer relationships, the exporter buys coffee from smallholders six days a week to meet high demand of overseas buyers. However, the volume for export is inadequate to meet the demands of overseas FT coffee buyers. The exporter and overseas buyers have a common understanding of FT FLO and organic certification and the overseas buyers coordinate and manage the FT and organic coffee requirements such as quality, quantity, continuity, consistency and timely supply of coffee. The exporter supplies the following export volume to overseas FT coffee buyers: 80% to organic coffee importers and roasters, 18% to FT coffee importers and roasters, and 2% to specialty and conventional importers and instant coffee roasters.

There appears to be a larger market for FT, organic and specialty coffee but the exporter highlighted a number of constraints in not meeting this demand. These are insufficient capacity of the exporter, smallholder’s small-scale coffee product volume, poor quality, poor road condition, lawlessness, and high FLO inspection fee, lack of trust and commitment and behavioural uncertainty of smallholders. The later constraints refer to a situation where some registered smallholders exchange coffee bags for pig or a small amount of cash to meet urgent cash needs such as funeral costs. They can feel that preserving their status in the community is more important than their commitment to the exporter.

5.2.5 Returns

Exporter’s returns

The exporter’s returns in this chain are from FT FLO and organic coffee. This allows them to get a premium from their involvement in the sale of certified FT coffee, certified organic premium coffee, and coffee to specialty markets. The premium paid by the overseas buyers for FT coffee is paid directly by the exporter to the cooperative for social development activities, rather than being paid directly to the individual smallholders who produced the coffee. The exporter said that the importers and roasters of organic, FT and specialty coffee also pay a price differential based on the grades, origin and other product quality attributes.

The coffee product specifications that the exporter adds value to are A, X, PSC, Y and T grades. The exporter said that a differential price or grade premium is paid by overseas buyers based on these coffee grades. For instance, the grade premium for A, X and PSC grades is K 0.25/kg above the New York (NY) C grade price¹ while there is 12% discount from NY C grade for Y grade. The T grade recovered from waste, is sold at a discount price.

Almost all exports by the exporter are for FT and organic coffee, with 18% FT coffee and 80% organic coffee. Of this 98%, the majority (70%) is exported as Y grade, with the rest being sold as A, X and PSC grades. The exporter buys 1,300 tonnes of coffee and exports 975 tonnes. The remaining 325 tonnes (25%) is reported to be wastage, from which the exporter recoups 10% and sold it as T grade.

The average standard FT price paid by overseas buyers is K9.71/kg. From this, a price of K4.70/kg for Y grade FT parchment coffee is paid to smallholders. A proportion of the remaining K5.01/kg is retained by the exporter as its return which represents value adding and profit to the exporter. Excluded from this calculation is the FT premium paid to the co-operative. However, the exporter said the FT trade premium is paid to the co-operative. Further, it revealed that the FT minimum floor price for green bean coffee was US\$ 0.51/lb (K 3.23/kg) but because of the current high conventional price, the overseas FT coffee buyers were paying US\$3.50/kg (K9.71/kg). The exporter said that the fixed premium price for FT coffee was US\$0.05/lb (K 0.32/kg) while the certified organic coffee premium price was US\$0.15/lb (K0.95/kg). They said that these two premiums make up the FT premium fund for social projects.

A transport fee of K 0.50/kg is taken out of the K 4.70/kg payable to smallholders. This leaves smallholders supplying FT coffee with K 4.20/kg. The exporter commented that this could be compared to K4.00/kg paid by conventional buyers of non-FT coffee to smallholders. The exporter said that they had to ensure that there was some small benefit given directly to the producers of the FT coffee to encourage them to continue producing and selling the coffee through this chain.

¹ C grade price is the New York commodity price for green bean coffee, which is discounted at 12% to Y grade green bean price for smallholder coffee producers.

When asked to comment on any issues that could affect the level of their returns, the exporter reported that there are high costs associated with the FLO inspector's visit, and high costs associated with storage, transport and village inspection. They also comment on the impact of poor road conditions and lawlessness on their costs. They further commented that problems with poor quality coffee and low supply, along with unpredictable behaviour and lack of commitment by smallholders were having an impact on their returns.

Smallholders' returns

In this chain, the smallholders receive income from their coffee sales for both FT FLO and certified organic coffee as one payment. They supply varying quantities of FT parchment coffee to the exporter on an ad hoc basis. On average, they supply eight bags of 60 kg parchment coffee per year to the buyer at the current price of K4.20/kg, which gives them a gross return of K2016. Interestingly, if they sold this coffee through conventional channels at K4.00/kg, their return would be only marginally lower at K 1920. Smallholders commented that the FT and organic coffee price currently provided by the exporter did not provide a strong incentive for them to produce this coffee. The smallholders claim that more effort is required for this type of coffee production.

When asked, smallholders mentioned that factors that affect their returns are social-cultural obligations, debts, educational costs, high transport cost, coffee stealing, labour scarcity and productivity, poor road conditions, hold-ups, difficult topography, and coffee getting wet when being transported. Such factors raised their costs and reduced the quality and productivity of their coffee. Such factors apply to both FT and conventional coffee.

Co-operative's returns

The cooperative has no trading function. The role of its board members as locals is to ensure that the FT premium for social community development activities benefits the smallholders in the villages of the area. This FT premium fund is audited by the FLO inspectors annually. Although, it appears that the co-operative receives K1.27/kg (green bean equivalent) in total, it is not clear what volume of FT coffee was traded through the chain.

From the interview with cooperative board members it was found that the social development benefits from the FT premium benefitted both the members and non members of the cooperative. The 3600 members indirectly benefit from the FT premium through its activities.

However, as noted above, the producers of the FT coffee did not appear to benefit directly from the FT coffee that they produced and sold through this channel.

5.3 Case 2: Conventional Coffee Supply Chain Originating from Okapa

Case 2 is the conventional coffee supply chain (CNC₁) originating from Okapa. The PNG segment comprises farm input suppliers, smallholder coffee producers, processor and exporter. In this chain, the people interviewed were thirteen smallholders as a group, and one respondent each for processor and conventional exporter.

The smallholders in this chain buy farm inputs from agricultural stores, produce organic coffee, process it into parchment and then sell this coffee to many buying agents, including the processor in this chain. The processor interviewed has agents on the roadside in Goroka and others in Okapa buying parchment coffee from smallholders. The processor also buys coffee from smallholders in Okapa who deliver it direct to his property in Goroka. Then the processor processes the parchment into green bean coffee and supplies to the exporter. The exporter in this chain buys coffee from processors, processes and supplies the value added green bean coffee to the overseas conventional coffee importers.

5.3.1 Span of Chain

This (CNC₁) originating in from Okapa is a longer chain than the FT chain originating in this area, since it comprises input suppliers, smallholder coffee producers, processor and exporter. The span of the conventional chain representing each player is illustrated in Figure 5.0 below and a more detailed description is given in this section.

Smallholders

The conventional smallholder coffee producers live in Okapa district, 85 km from Goroka. They reported having little or no input from extension agents. These smallholders use low cost farm inputs such as a hand pulper, tools, materials and labour to produce organic parchment coffee. The smallholders supplied the coffee to the processor's buying agents either in Okapa or Goroka. There is more than one processors operating in Goroka and Okapa, including the processor interviewed for this research and they are all competing for smallholders' coffee.

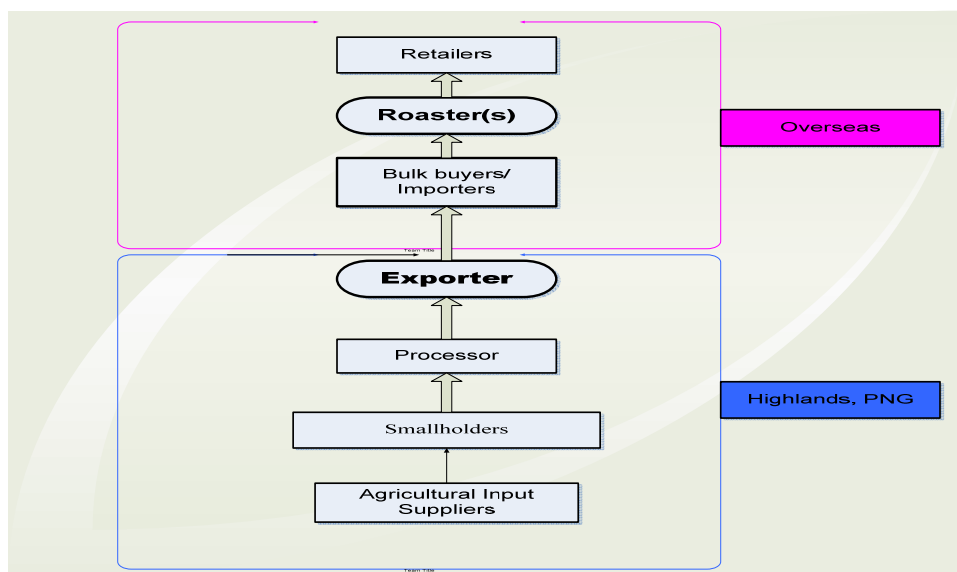


Figure 5.0 *Span of conventional coffee chain originating from Okapa district in EHP*

Processor

There are many processors of the conventionally produced coffee and they have a trading license from the CIC. One of them is the conventional coffee processor in this chain. The processor buys parchment coffee from the smallholders, hires the processing mill to process the coffee and then sells the green bean coffee to the exporter. This processor is based 8 kilometres from Goroka town. The processor’s agents buy parchment coffee on the roadside in Goroka and also in the villages of Okapa. He has a “wantok system” with the smallholders and the buying agents in Okapa which is further described in section 5.3.4. The “wantok system” is a social system inherent in PNG culture and provides the basis for social cooperation between the smallholders and processor.

Exporter

The conventional exporter has a conventional coffee exporting licence from the CIC and is based in Goroka. This exporter is part of an international corporation that has interest in several companies operating as exporters in producer countries as well as importers in consumer countries and so links coffee producers and roasters respectively. The exporter buys green bean coffee from processors, adds value (by manual cleaning, sorting, grading, bagging, labelling and cupping) and supplies to overseas importers in the coffee consuming countries.

5.3.2 Processes

Smallholder coffee producer's processes

In this CNC₁, the conventional smallholder's processes involved coffee growing, harvesting, processing, logistics and quality control.

The smallholder's coffee production practices relating to growing young trees and maintaining matured trees to produce organic coffee are similar to those described for FTC₁, since the smallholders in cases 1 and 2 originate from Okapa and so have similar culture, soil properties and climate.

“We don't apply fertiliser, round-up (glyphosate) and insecticide in our coffee gardens. These chemicals are too expensive and tedious to carry through the fragmented topography”. SG

With harvesting, the smallholders have arrangements for communal labour, sharing family labour and hiring sports or youth groups, and their harvesting techniques during the coffee season is similar to FTC₁. However, they have a labour constraint due to other smallholders being involved in the same coffee value creating activities during the coffee season and their family labour is spread thinly over household activities.

Pickers hand picks ripe red cherries. With parchment processing, the smallholder's pulp the cherries in the late evening after the harvest or the next morning. They employ fermenting and fully washed techniques with good water sources similar to the FT smallholders in FTC₁. The smallholders' usually sun-dry the coffee for a number of days until it reaches 12% moisture level or No. 1 parchment.

“We pour fermented parchment coffee into a string bag or a sheet of shade cloth and immerse the coffee into a pool of running water or wash them at a waterfall. Sometimes, we use bags by making small holes so water can flow out with mucilage but not effective”. SG

In terms of logistics, the smallholders grow and harvest coffee in small parcels of land a few kilometres away from their village or house. The small land size is due the complex land

tenure system and so the land inherited from the father gets smaller every generation. The smallholders have problems in carrying cherry coffee from these scattered small coffee gardens to the village. In addition, it is difficult due to steep hilly terrain that makes travel tedious and slow.

“We inherit parcels of land from our father which is divided among the sons. The land size gets smaller so we have several coffee gardens in different places. From these, we harvest coffee cherries and carry them to the village”. SG

The smallholders said that pulping coffee is done in the village to avoid stealing of the hand pulping machine and fermenting beans. After washing and sun drying of parchment coffee to reach No.1 standard, the coffee is stored in the hut on the bed. This dried parchment coffee remains stored in the hut while the owner monitors the coffee price. Most smallholders interviewed weigh their coffee bags before transporting to avoid buyers cheating them. Some smallholders interviewed from a remote villages said that they hire people to carry the parchment coffee bag to the nearest road access while those nearby arranged 4WD truck to transport coffee to the buyer in Okapa or Goroka. The factors influencing the smallholders' decision to sell the coffee are similar to those noted in the FTC₁, namely, high price of coffee, availability of truck, social-cultural obligations (household needs, school fees, funeral cost, compensation, bride price, etc), good weather and better road conditions and lawlessness.

Transport cost is high at K0.50/kg of parchment coffee, which is 11% of the current coffee price, and is paid to truck owners. Smallholders also pay a separate transport fare in addition to this charge. The other major problems are the muddy road condition, road hold ups and stealing of coffee.

“We used to travel to Goroka for two to three days on this gluey muddy road. When the vehicle cannot move, we dig out the mud for almost a day”. SG

In terms of quality control, the smallholder's quality control of organic coffee production is similar to FTC₁. The pickers hand picked ripe red cherries as mixed Arabica coffee varieties. However, sometimes the hired youth groups or communal labours also pick half ripe, black, fallen and bird eaten berries which may have value, which may affect the quality of coffee. As noted above, daily harvesting time finishes late afternoon and pulping may be done next

day, which may cause some cherry fermenting. Smallholders appear to lack technical skill in adjusting the pulping machine which may cause defects. In addition, the fermenting of coffee in the bag and without water on the ground may affect the coffee quality.

“We pick coffee any time in the morning when the morning dewdrops off from the leaves and stop any time in the afternoon when tired. The cherry is pulped late evening or next morning may cause cherry to ferment. Sometime, the machine damages the beans and the cherry skins are not separated well”. SG

Furthermore, smallholders carry out the first cleaning during the washing of fermented coffee and second cleaning during sun drying to remove defects. Sometimes, the coffee quality is affected by moulds when covered to protect it from sudden rain during sun drying. They keep the dried parchment coffee in the hut on the bed which keeps the moisture level down.

Processor’s processes

In this (CNC₁), the conventional coffee processor’s processes involved coffee buying, processing, logistics and quality control.

In terms of coffee buying, this processor buys coffee through its buying agents from Okapa and Goroka as noted above. The processor also has a “wantok system” with some smallholders who deliver coffee to the storehouse in Goroka. The agent assesses the weight of the bag and moisture of coffee before paying a standard Y grade price.

“Sometime my wantok smallholders supply coffee direct to me. As part of ‘wantok system’, I provide price incentive on the spot or help them during non-coffee season with money or kindness but it’s fragile”. CP

In terms of processing, this processor sun dries parchment coffee with 14% moisture level or does a touch up drying using a drying machine at the hired processing mill. The processor processes the green bean coffee using the same procedures as described in FTC₁ for the exporter. The only exception is the processor does not clean the green bean coffee manually. The grading machine is used to sort and grade the green beans as PSC, Y and T as required by the exporter. The processor said the exporters offer the base price on the grades and level of defects and give them no choice to negotiate for price.

“Before I used to have contract with exporter and try to maintain volume and supply of coffee on time as required. I find this difficult with my agents and smallholders from Okapa not supplying the quantity required on time. Now, I buy coffee, process and supply at my own pace”. CP

In terms of logistics, the processor has two trucks and a utility vehicle with a storehouse. Parchment coffee bought from the roadside or supplied by smallholders is stored in the warehouse. Then the parchment coffee is transported to the processing mill for processing. The value added green bean coffee is supplied to the exporter.

In terms of quality control, the processor said the business is risky because smallholder’s coffee can be poor quality and the exporter’s price depends on quality and not quantity. The processor trains the buying agents on how to assess the parchment coffee quality for moisture content using the hand and to rub the husk, observe the bean colour and smell. In addition, training is provided to identify bags with more moisture or heavy materials from the weight and to physically assess it. Before green bean processing, the processor also assesses the value creating processes at the processing mill in terms of removing husks, silver skins and defects level. The processor test runs some samples in the mill or checks with recently processed green bean on general quality output and then processes the green bean coffee. The processor said that no coffee supplied has been rejected by the exporters.

“I train my buying agents to assess parchment moisture carefully and the weight of coffee bag. When a bag weighs more than expected weight, we thoroughly check the parchment. If a buyer buys a wet parchment, there will be a loss of weight and low return”. CP

The exporter’s Processes

The final player in this chain is the exporter. This conventional exporter’s processes involved buying, processing and supplying value added green bean coffee to importers.

In terms of processes, the exporter buys green bean coffee from processors and plantations. The processors who bring coffee to the exporter include new processors who are becoming regular suppliers and those with contracts who are long-term contract processors. The

processor in this study who is supplying the coffee to the exporter is a non-contract regular supplier. This exporter buys coffee six days per week at the door, stores the coffee in the warehouse and keeps the inventory records awaiting overseas importer's request. The exporter then hires women as casuals to manually clean the green bean by hand picking discoloured, sticks and stones from the green bean. The grading machine sorts and grades the green bean according to the sizes by the mechanically operated vibrating sieves. The coffee specific grades are X, PSC, Y1, Y2, and T.

In terms of logistics, the exporter has the capacity, capital and resources to buy coffee from the processors, store in the warehouse and create value to green bean stages as noted above. Upon request by the overseas importers, the exporter make an inventory of the stored coffee, assesses the green bean coffee quality and quantity and create values through cleaning and grading as noted above. The graded coffee is bagged, labelled and loaded onto several containers. Each container holds 300 green bean coffee bags or 60.5kg. These containers are transported down to Lae by a hired truck from a transport company based in Goroka.

In Lae, the coffee is unloaded and loaded onto shipping containers destined for overseas and a wharf fee is paid by the exporter. However, the exporter said there are some issues relating to a lack of skilled labour supply and unpredictable behaviour of staff that can affect the chain efficiency.

"I know that PNG has adequate labours but work ethics is absent. My company trains young people but they disappear after three or four years which is an unpredictable behaviour. There is a lack of continuity in experience and knowledge with our workforce. These issues affect our profit margin". CE

In terms of quality control, the exporter controls green bean quality at buying, storing, product enhancement, transporting and shipping stages. This exporter checks the processor's coffee upon delivery. The exporter's staff collect samples from processor's green bean coffee to assess the external quality attributes (such as colour, size, defects and 12% moisture level) and internal quality attributes (such as taste and aroma) before paying the processors.

“When new clients deliver coffee, our staffs check their processing licences to avoid CIC fines for buying stolen coffee. This is also necessary for us to avoid cheating from them and owning poor quality coffee supplied”. CE

On taking ownership of coffee, the exporter stores the green bean coffee in a ventilated warehouse. The exporter said the manual cleaning of green bean coffee is done by hand-picking discoloured, black, rubbish and defective beans to improve the quality. The cleaned coffee is sorted and graded by the grading machine. The exporter’s liquor who is a trained coffee quality person conducts cupping to assess for taste and aroma as specified by the importers. The exporter noted there are smallholders whose coffee is of low quality and that some processor’s behaviour is also unpredictable; that is they are attending to social obligation instead of supplying coffee as promised.

The exporter sends a sample by fast courier mail to the importer overseas to confirm quality specifications. Upon confirmation, the green bean coffee is then exported. The exporter said that importers have not rejected the coffee exported to them.

5.3.3 Information Flows

Smallholder

Smallholder coffee producers share information on coffee growing, harvesting, processing and quality control with each other but not with the buyers or extension agents.

“We lose confidence in the coffee extension agents because they don’t visit us to share information on coffee as expected. But we share information on coffee production techniques, coffee buyers and price with other smallholders”. SG

The smallholders also share information with other smallholders on logistics such as transport arrangements, transport cost, road condition, coffee buyers and lawlessness. Likewise, they share information on quality control techniques such as the harvesting ripe red coffee, washing, sun drying, storing and transporting. Information on these value creating activities are not shared with the buying agents but on casual basis with the processor. The

smallholders reported that they do not receive information on quality attributes, quantity and timely supply from the processors.

“We don’t share information on coffee processes with buyer’s agents because they are street people employed to buy coffee and lack experience and knowledge about coffee”. We talked with processor on casual basis. SG

With respect to coffee price information, the smallholders receive it from the radio broadcast via FM radio EHP and smallholders returning from selling coffee. Some smallholders also read ‘take or leave’ coffee price notices at the roadside or on the factory door upon delivery. The smallholders noted that after incurring transport costs, plus their urgent need for cash and related difficulties, they have little choice but to accept the price. They admitted lacking information on coffee quality attributes, respective prices associated with high quality and ways of improving their coffee to get better prices.

Processor

The processor does not share information on coffee processes with most smallholders, except those on the ‘wantok system’. Moreover, the processor does not share information on coffee processes with other processors because there is strong competition between them. The processor shares some coffee price information with smallholders through its buying agents and smallholders who personally deliver coffee to him. However, the processor does not share information on quality attributes and the different prices he receives from the exporter.

“I know processing parchment so I share information with smallholder to dry their coffee to No.1 or 12% moisture level because it determines better Y grade price. I share information on price incentive for smallholders to supply more quantity before price drops”. CP

The processor also shares information with the buying agent based in Okapa on factors related to parchment coffee, logistics, quality control, weather and lawlessness. He reported that processing cost is reduced when the buying agents or smallholders adhere to his information on quality control from buying to storing and through to transporting. This processor has been in the business for 30 years, and in his opinion, CIC should provide better information on quality processing and stimulate the growth of more coffee production for

everyone's benefit. The processor said that CIC and the government should work on these issues so farmers and processor have reliable information to work together.

“CIC has banned coffee cherry trading due to stealing but they are not providing extension and disseminating information on coffee quality for smallholder in Okapa and also to increase production. We know the CIC is financed by 70% of export levy coming from these smallholders”. CP

The processor receives information on coffee processing, quality control and different coffee prices based on grades specified by the exporter, but not on other product attributes, overseas market requirements and customer's preferences. There is a lack of information and the processor is unable to negotiate for a better price with the exporter.

“We are unable to negotiate with the exporter on coffee price because the manager convinced us with words we don't know and offer us take or leave price. We want business so we supply the coffee on the price offered”. CP

Exporter

The exporter shares information with long-term contract processors on processing parchment into green bean, grades, quality attributes and coffee price. This exporter also conducts training with these processors on financial management to ensure they remain in business and to build trust and commitment. In contrast, the exporter shares information on coffee price, but not other information, with new processors and non-contract processors. This exporter also shares information with CIC on coffee pricing which is broadcast through the radio EHP.

“We only provide take or leave coffee price information to new and non-contract processors who make up one-third of suppliers. We provide information on processes, market trend and coffee price which determined using the exchange rate to long-term contract suppliers. We also train them on financial management to keep them in the supply chain”. CE

Furthermore, this exporter shares information with overseas importers on coffee price, process and grading of coffee, quality attributes and quantity. The exporter and importers have a free flow of information between themselves because they are one part of one firm.

“The exporter is part of multinational corporation firm, which has 48 companies working in 28 countries as exporters and importer but our information on customer and our relationship is confidential”. CE

5.3.4 Relationships

Smallholder

In this CNC₂, the smallholders have spot market relationships with input suppliers and parchment coffee buyers when buying farm inputs and selling coffee respectively. However, some smallholders also have a ‘wantok system’ (which is a type of social security system) between the processor and those smallholders. The processor helps these smallholders during the non-coffee season with money or in kind contributions and they feel obliged to supply coffee to him, and so the cycle continues. However, this system appears to be fragile since some smallholders may sell to other buyers when urgent cash requirements arise.

The conventional smallholders collaborate and cooperate with one another in arranging communal labour, family labour sharing and hiring social groups for managing their processes. The communal and family labour collaboration may have cultural significance as the income from coffee is used for social cultural obligations.

“We share family labour and communal labour. If one of us has social problems such as funeral cost, bride price, compensation, etc, we contribute to share the cost”. SG

Moreover, the smallholders also cooperate in sharing the cost of arranging and hiring trucks to transport their coffee to buyers in Goroka

Processor

The processor in this chain has spot market relationships and a ‘wantok system’ with the smallholders as noted above. The processor does not collaborate or cooperate with other processors because they are competing against one another for small volumes of smallholders’ coffee. The processor organises his own buying agents to buy parchment coffee in Goroka or Okapa and organises transporting, storage, hiring of processing mill and processing of green bean coffee.

This processor supplies value added coffee to the export on a relationship basis that is beyond spot price transaction (since it is regular but is not a contract).

Exporter

The exporter buys green bean coffee from new and non-contracted processors using relationships that lie somewhere between the spot market and contracts. In addition, this exporter has long-term contractual relationships with long-term contract processors with payment done on delivery as with non-contractor.

In the interview, the exporter explained that they help the contract processors with trucks to transport their coffee to the warehouse, conduct financial management training and provide information on coffee market changes and exchange rate to build trust and commitment. These actions are aimed at establishing long-term business relationships with contract processors unlike the non-contract processor. However, both the contract and non-contract processors have little information on the type of markets, importers requirements, product specification and product quality attributes and differential prices.

In this chain, the exporter has a strong relationship with overseas importer since they are subsidiary companies of the international corporation. The exporter supplies 50% of its coffee to Germany and other 50% to Japan, USA and Australia where the importers are located. These importers coordinate and manage the coffee to meet their requirements on quality, quantity, continuity, consistency and timely supply of coffee. The exporter said there is a strong relationship with overseas importers, who would buy more coffee from them but the processors cannot sufficiently meet the market's demand.

“We have arms length relationship with 13 coffee importers who are either instant coffee importers (soluble coffee) and or roaster coffee importers. But the volume produced in PNG can not to meet importers demands”. CE

5.3.5 Returns

Exporter's Returns

The exporter has the capacity to buy more but usually buys 13 200 tones. It exports green bean in various grades to overseas importers of instant (soluble) and roaster coffee. The

average price offered by the overseas importers is K9.70/kg. The exporter retains K3.00/kg to cover its own value-adding activities and profit and K6.70/kg is passed on to the processor.

The exporter's source of return is the coffee price offered by the overseas importers based on New York world coffee price and the value of the PNG currency. As noted above, this exporter supplies value added coffee to 13 different overseas importers, and its return is based on the proportion of each of the coffee grades supplied, such as X, PSC, Y and T. The exporter's association with the international company is likely to increase its returns over what it might get if it was not a part of this international company. The exporter's returns are also likely to be helped by their strong relationship with their contract processors, since this will allow them to access better quality coffee and get better continuity of supply.

When asked what factors might impact negatively on their returns, the exporter commented on poor road infrastructure in rural areas, lack of road maintenance on the highway, and lawlessness on the road. They also mentioned lack of skilled labour and unpredictable behaviour (e.g., a sudden resignation or departure from job due to social obligations or land disputes affecting their family). The exporter also said that PNG needed to increase coffee production to meet the overseas customer's demand and that CIC should focus on this as well as improving coffee quality.

Processor' Returns

The processor received K6.70/kg from the exporter for the green bean coffee. In turn, they paid smallholders K4.50/kg for parchment coffee.

When asked, the processor said that they try to maximize their return by reducing cost of processes and maintaining quality control through close supervision and the 'wantok system'. The processor also said that their returns from coffee sales are affected by the level of competition between processors and limited information flows. They also noted low quality of smallholder's coffee, lawlessness and opportunistic selling behaviour of smallholders as contributing to low return.

Smallholder's Returns

On average, smallholders supply 8 bags of 60 kg parchment coffee per year to the buyer and earn K1920.00 at the current price of K4.50/kg (less K0.50/kg for transport cost).

Smallholders noted there is no guarantee that this coffee price will remain at these levels.

To improve their returns, the smallholders use low cost farm inputs but the high cost of transport lowers their profit margin. The respondents noted that there appear to be two major constraints that impede their returns. The external constraints are world coffee prices, poor road condition, fragmented topography and lawlessness. The internal constraints are lack of labour, social-cultural obligations, repaying debts, high prices of basic goods and educational costs, all of which impede the smallholder's ability to reinvest in coffee production.

5.4 Case 3: Fair Trade Coffee Supply Chain Originating from Kainantu

Case 3 is the second FT coffee supply chain (FTC₂) originating from Kainantu district and comprises smallholder coffee producers, cooperative and buyer/exporter. The participants interviewed were eight smallholders, three members of the co-operative and one member each from the buyer/exporter and a licensed exporter who assists the buyer/exporter to export.

The smallholders in this chain are members of certified FT cooperative and produce non-certified organic coffee. This coffee is supplied to the buyer and not the cooperative. The FT co-operative has smallholders as its members but it has no capacity and finance to trade. It uses the FT premium funds for social community developments and facilitates the FLO certificate renewal process. The buyer/exporter buys the smallholders' coffee cherry, process it into green bean and exports direct to overseas FT coffee buyers.

5.4.1 The span of chain

Figure 6.0 illustrates the span of chain players and a more detailed description is given below.

Smallholders

The smallholders are members of a certified FT FLO cooperative. They live in rural villages, about 11-15 km away from Kainantu, 87 km from Goroka and live within the vicinity of the

buyer/exporter's coffee plantation. The smallholders use low cost farm inputs to produce organic cherry coffee and supply to the buyer.

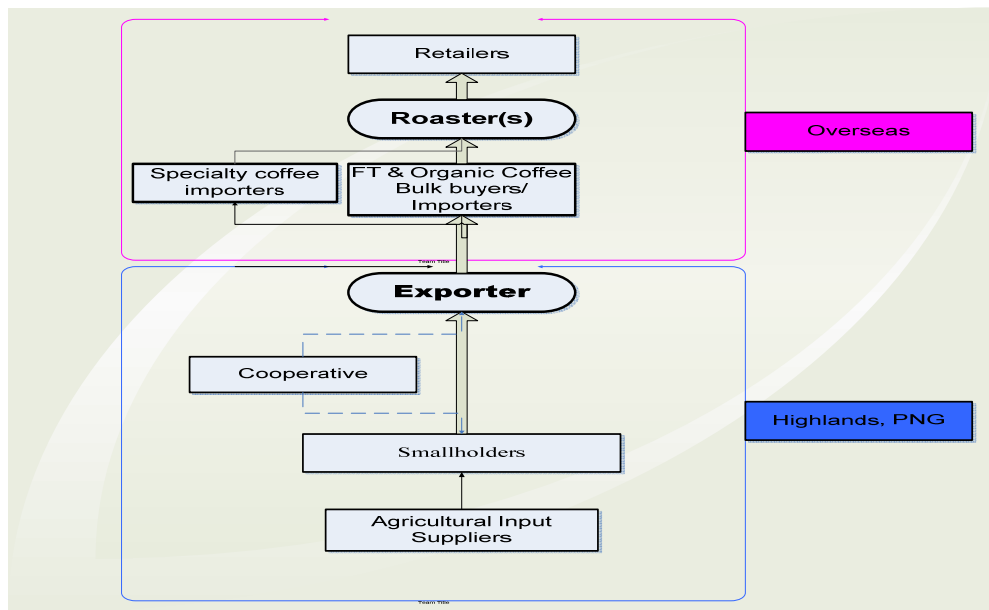


Figure 6.0 The FT coffee supply chain originating from Kainatu district of EHP

Co-operative

The co-operative has 810 smallholders as registered members but it is without trading functions. It had an interim board and it aligned the members of the co-operative with the buyer, based on the “wantok system” as explained previously. The co-operative held its first general assembly meeting as this research was being conducted and official board members voted in on 6th of August 2008. The co-operative’s office is based in Kainantu and its role is to facilitate the use of the FT premium for social community development and to assist with the renewal of the FT FLO certification process as noted previously.

Exporter

The exporter in this chain owns a coffee plantation and has the FT FLO certificate to export coffee, but not an organic coffee certificate. It operates from its head office in Kainantu, 11 km away from the plantation. The exporter provides trucks to transport smallholder’s cherry coffee to the central wet factory. It also transfers the FT premium to the co-operative. The exporter has capital assets and capacity to buy cherry coffee, processes this to green bean coffee and supply to overseas FT coffee buyers.

5.4.2 Processes

Smallholder's processes

In this FTC₂, the smallholder's processes comprise coffee growing, harvesting, logistics and quality control but no parchment processing.

The smallholders organically grow young coffee trees and maintain the mature trees in a similar way to that described in case 1 and 2, except for the weed control techniques. The smallholders noted that weed control puts a constraint on their labour, time and resources so round-up or glyphosate is also applied. The use of this chemical but not others is allowed by the FT FLO inspector, and this practice is said to be in accordance with the FT organic standards.

“We do not apply fertilizer in our coffee garden but only round-up when weeds are beyond our labour. The FT FLO inspector and the cooperative have told us that it is allowed under the FT regulation. Besides, the chemical fertilizer or herbicides are very expensive for us to buy compared to what we earn”. SG

With harvesting, the labour arrangement used, (which is sharing family labour and hiring labour) and the harvesting techniques during the peak coffee season are similar to those described in case 1 and 2. However, the cherry picking in this chain is done early in the morning, transport is arranged with the buyer and the coffee is delivered to the wet factory (mill) the same afternoon. The respondents said that use of family labour and labour shortage to completely harvest the garden at three weekly intervals is a critical issue.

The smallholders in this chain do not carry out parchment processing and they argue that this arrangement has reduced their cost, since they don't have to process, and as well as reducing cherry stealing and the labour constraint is removed allowing time for other cropping activities.

“We provide security to coffee, harvest, sell cherry coffee direct to the buyer and get payment and this minimises the stealing of cherry. No stolen coffee is bought by the buyer and no other cherry buyers in the area”. SG

In terms of logistics, the smallholders use their limited resources to grow coffee in different parcels of land up to one kilometre away. The cherry coffee harvesting is done by arranged communal labour, family labour and hired sports or church groups during the coffee seasons. The ripe red cherries are hand picked and put in bags. The smallholders face land topography difficulties in carrying the harvested coffee to the nearest access road for the exporter's truck to pick them up. When the cherries are transported to the wet factory at the plantation, the smallholders get the sales receipt and present it at the exporter's office in Kainantu to receive cash payment.

In terms of quality control, the smallholders do not apply farm chemicals, which is consistent with organic farming practice except for Round-up as noted above. They hand pick ripe red cherries as mixed Arabica coffee varieties with close supervision since the buyer may reduce the price of cherry at the buying point if the cherries are of low quality. However, the problem is that some harvesters pick half ripe, black, green and rat or bird eaten berries. The smallholders said that trying to minimize poor cherry quality is very difficult with labour constraint and the time limitation because they must deliver the cherry coffee to the buyer in the afternoon of the same day of harvest. They argue that there is no price incentive to pick coffee cherry by variety or ripe red cherry and also the coffee garden may not be harvested completely.

Co-operative's processes

The cooperative lacks capacity and finance to perform any trading functions. The co-operative is only active in facilitating the use of the FT premium funds for social community development and renewal of the FT FLO certification processes. Initially, the co-operative was administered by the interim board members because it was said that smallholders were very slow in understanding the FT coffee concept since this FT co-operative inception in 1997. However, it was further said that the smallholders gradually comprehended the benefit of FT and ownership of the co-operative as their organisation.

“This FT concept was introduced to us in 1996 by the initiator and promoter who is also the owner of the buyer, a local from the area. The buyer and us received the FT FLO certificate in 1997 we educate the smallholders on the FT concept, formation of cooperative, FT price and FT premium for social developments. But we found that their understanding is slow”. SG

In addition, the co-operative was having difficulties with smallholders understanding the FT FLO standard conditions of being involved in democratic, participatory and transparent processes. It took almost a decade before the first general assembly meeting was held as noted above.

“We know the smallholders lack understanding of this new FT concept and business skills. The smallholders think the co-operative and the buyer are same entity and they ask the buyer for advance to meet the cost of school fees or social obligations. Because of this, we want the smallholders to become financial members of the co-operative to manage members’ affairs but were advised against this idea by the FLO inspectors”. CG

In terms of logistics and quality control, the co-operative is not involved with transporting and storing of coffee and maintaining coffee quality since it does not trade. However, the co-operative facilitates FLO inspector’s visits to smallholders, and provides financial records of FT premium accounts to ensure the FLO certificate is renewed.

Exporter’s processes

The buyer/exporter, as the final player in this chain, exports certified FT FLO coffee after undertaking processes such as buying cherry coffee, processing, logistics and quality control.

This exporter has the capacity to buy smallholder’s cherry coffee and depulp them in less than 12 hours from the time of harvesting. These coffee cherries are bought from the smallholder members living within the vicinity of the buyer’s 129 hectare plantation and the central wet factory. Buyer/exporter staff assess the cherry coffee quality at the weighing deck near the wet factory and provide sales receipts to smallholders. The smallholders then present the receipt to the buyer’s office and receive payment on the spot.

“The smallholders normally report to me when they are harvesting. I instruct them to harvest from early morning upto 1:00 pm and my 4WD truck transport the cherries to the wet factory for weighing and pulping same day”. CE

With the wet processing method, buyer/exporter staffs weigh the coffee, assess the quality and pour it into the receiving trough. The water runs through the trough where floaters are

removed by hand and the cherry coffee flows with water into the electric powered depulping machine. The depulping machine comprises a frame supporting a shaft where two discs have projecting ribs mounted on one side and two depulping plates with projecting ribs on the other side. When water and cherry coffee fall through the middle of these discs and pulping plates, they move in the opposite direction, thus forcing the bean out from the cherry. The parchment beans fall into the collection box through the sieve (with holes for pulped beans to easily pass through) while the cherry skin goes out as waste. The unpulped cherry coffee flows with water into the final single depulping machine for further depulping, which is separated as T grade at this stage.

The pulped parchment beans in the collection box are piped into the fermenting box. Then, it is filled with clean water and allowed to ferment in anaerobic condition for 36 hours. This enhances the microbial activity necessary to degrade the mucilage from the parchment. The fermented parchment coffee is piped to the aquapulper machine which cleans the remaining mucilage and other dirt on the parchment. This parchment is piped into the washing box for washing. Then, the fully washed parchment is piped to the big screen box where parchment coffee is collected while the water runs off. The staffs use the wheelbarrow to collect the parchment coffee, carry the beans to the canvas and spread them for sun drying.

It was noted that sun drying to reach 12% moisture level takes less than 7 days during the dry season and 14 days or more during wet season. This centralised wet factory processing has the highest standard output, and the co-operative came first in the Asia Pacific and seventh in the World Gourmet Coffee Competition organised by the Specialty Coffee Association of America (SCAA) in 2007.

“An expert from SCAA organised my wet processing mill and set up wet milling machines. I produce the best speciality quality in the Asia Pacific but I need to improve my catchment tank to compete with the world”. CE

In terms of green bean processing, the buyer/exporter hires a processing mill in Kainantu to add value to the green bean. The parchment coffee with 12% moisture level is poured into the feeding hopper. First, the de-stoner machine separates heavy materials. Next, the huller machine removes the parchment skins or husk and the polisher removes the silver skin that

remains on the green bean. Then, the green bean coffee is cleaned by winnowing while the catador machine removes the remaining husks.

The manual cleaning of green bean is done by casual workers hand picking discoloured, black and cracked beans. Finally, the grading machine sorts and grades the green beans according to buyer's specifications such as A, AA, X and PSC. These are bagged and labelled for exporting. The low quality Y and T grades that were separated out during cherry depulping, green bean sorting and grading are sold to local exporters.

In terms of logistics, the buyer/exporter provides a 4WD truck to transport the smallholder's cherry coffee to the wet factory's weighing deck. The exporter said that this is done to reduce smallholders' problems of high transport cost and poor road conditions. The buyer processes cherry into parchment coffee and stores them in the warehouse awaiting overseas buyer's request. Stock inventory is done in the warehouse upon customer's request and the parchment coffee is transported to the green bean processing mill using their own truck. After adding value to green bean coffee, 300 bags of 60 kgs each is loaded onto a container. It is transported to Lae wharf using a hired truck owned by the licensed exporter who normally assists the buyer/exporter to export the FT coffee overseas.

In terms of quality control, the exporter provides educational awareness on FT standards, organic coffee production, quality control and environment sustainability. The exporter's cherry buyer buys from the co-operative members' ripe red cherry coffee harvested from morning up to 1:00 pm to avoid cherry fermenting and this practice improves low quality cherries during the processing. The cherry wet processing has a quality control technique that meets the FT certification standards and buyers requirements.

With cherry processing, the exporter said the cleaning of floaters such as green beans, overripe cherries, sticks and leaves are not done as effectively as possible before it goes into the depulping machine. The exporter intends to establish a tank to separate floaters from the sinkers or good berries and heavy materials. After depulping, the parchment beans fall on to a screen with holes only large enough for the bean to pass through to the collection box. The unpulped beans flow to a single final depulping machine that removes the cherry skin. These parchment beans are separated as T grade from this stage. This processing approach has improved the parchment quality from T grades, defects, and unpulped berries.

The parchment coffee is fermented in anaerobic condition and the addition of an aquapulper to remove the mucilage mechanically before fully washed has improved the quality. Further, the drying is done on a canvas, and if there are sudden showers the coffee is covered for many hours, which may cause a mould problem. However, the buyer said there is no quality problem experienced because value created from this wet processing method produces more specialty coffee grades and less Y and T grades as described below.

Further quality control is achieved by maintaining the room temperature of the warehouse, storing coffee for less than two months from harvesting time and manually cleaning the green bean before grading. The grading of green bean coffee according to FLO certified overseas buyers are A, AA, X and PSC which are specialty coffee but are organically grown.

“I supply consistent quality of A, AA, X and PSC coffee since I deal with FT FLO certified organic and specialty markets in Germany and USA. Most of my coffee is sold to Elan Organic Coffee roaster based in Germany. I do not have organic coffee certification from NASAA but the buyers know me”. CE

The buyer assesses the external quality and internal quality attributes in a similar way to what was described in case 1 and 2. In addition, the CIC quality control inspector assesses the general quality before exporting. The quality attributes assessed by the buyer are air mailed to the overseas customers by fast courier mail. Upon the buyer’s confirmation, the required quantity is despatched in bags of 60.5kg each and is exported to FLO certified organic coffee roasters. This buyer/exporter said that its first bad experience was when three coffee containers were rejected by Starbucks in 2002. There was a substantial loss due to an error at unloading and reloading at the wharf when the designated consignment was shipped elsewhere. This was corrected and no further coffee has been rejected so far.

5.4.3 Information flows

Smallholder

The smallholders share information on coffee growing, harvesting, processing and quality control among themselves. They receive coffee price information from the radio broadcast by FM radio EHP, but the cherry price information is received from the buyer. In addition, the

smallholders share information on logistics, quality control at harvesting and the cherry coffee price with the buyer but not with the co-operative.

“The exporter verbally tells us to harvest ripe red cherry coffee in the morning and deliver to the coffee wet factory the same afternoon. The buyer shares information on cherry price, advantages of FT price, FT premium, and minimising parchment processing cost and labour constraints. But we do not share such information with the co-operative as they are not trading”. SG

The smallholders interviewed said there is no information shared with the exporter on parchment quality, green bean quality attributes, the prices of different green bean grades, continuity and timely supply; overseas markets and other related information. In the interview, the smallholders said that they know from the FT FLO inspector that their coffee is bought by FT coffee roaster companies in overseas consuming countries.

Co-operative

The co-operative does not share information with smallholders and the buyer on coffee prices and quality because it does not trade. However, it shares information on FT certification standards and the FT premium on social community developments.

The co-operative also shares information with smallholders on FT organic coffee standards and the more FT premium will benefit them by being part of FT co-operative. This information helps to link smallholders with the buyer/exporter by utilising the “wantok system” as noted above. In the interview, the interim board of the co-operative said that they are part of the management of the buyer and so they have some sort of a conflict of interest in sharing information. Even though, the co-operative has official board members as of 6th August 2008 the co-operative may lack capacity to facilitate information flow independently at this stage. The co-operative board said the farmers’ low-level of education, lack of business skills and attitude of expecting fast or more cash from doing little, and without taking a long-term view has influenced the long delay in building the co-operative’s capacity.

Exporter

The exporter initiated this FTC₂ and shares information with smallholders as noted above. In addition, this exporter shares information with the co-operative on the FT premium and FT price but not other confidential information as noted above.

“I know the smallholder’s problems with transport, road conditions, cultural context, low parchment coffee quality, parchment processing cost, illiteracy, increasing living cost, high educational cost and high farm input cost. These issues prompted me to initiate this FT coffee concept and carried out educational awareness since 1996 but smallholders slow to understand it. But, I have patience and want the co-operative to be independently in future”. CE

The exporter shares information with FLO certified organic coffee roasters in coffee consuming countries. The information relates to the green bean coffee quality attributes (shape, colour, size, taste and aroma), single origin, quantity (number of containers), FT premium, logistics (shipping details) and quality control (sample cupping and CIC quality inspection).

5.4.4 Relationships

Smallholder

In this chain, the smallholders buy farm inputs from agricultural stores in Kainantu or Goroka on a spot market relationship basis, which normally occurs in an ad hoc way.

The smallholders said that they have strong social cultural obligations. Therefore, they collaborate and cooperate with one another in arranging communal labour and sharing family labour to work on coffee growing, maintenance and harvesting. Sometimes, they hire youth social groups since most smallholders are doing the same activities during the coffee season. However, there is no need for cooperation on transport or logistics since they sell cherries to the buyer who collects them.

The smallholders said that there is no business relationship with the co-operative because they are not trading. However, the smallholders attended the annual general meeting

organised by the cooperative to decide on the use of the FT premium democratically and participated in voting for official board members, and involved in the FLO inspector's visit.

The smallholders relationship with the exporter is a little beyond a spot market relationship. The smallholders are independent and would be prepared to supply coffee to the other buyers but this is not possible because the CIC has banned cherry trading in PNG, except for those licensed traders or plantations with a wet factory.

Co-operative

The co-operative is not trading and has no business relationship with the smallholders and the buyer/exporter. This co-operative has no finance to pay for the FLO inspectors visit to renew the FLO certification annually and thus rely heavily on the buyer/exporter to financially support it. The cooperative's self-interest is ensuring that this FT chain links the players from PNG in order to sustain the smallholders' livelihoods through the FT price and the FT premium. The co-operative is also interested in the FT premium for social community developments.

“We want the smallholders to sustain their livelihoods through FT price as their income and FT premium for social community developments. These developments are purchasing of curriculum materials, building materials for new classrooms and medical supplies for health workers in the area”. CG

The co-operative, besides facilitating the FT FLO inspector's visit, coordinates the activities of social community development and ensures that coffee production is environmentally sustainable. However, the co-operative wanted to become a relevant organisation with a trading relationship between the smallholders and the exporter but faces difficulties in securing funds.

“To secure finance, we want smallholders to become financial members since 2002 but no one has paid to date. The FLO inspector advised that it is against the FT standards and we have little option to seek financial sources”. CG

Exporter

In this chain, the exporter has a relationship that is beyond a spot market relationships with smallholders (as noted above). This buyer/exporter has vertically integrated some coffee processes from cherry buying, parchment processing and green bean processing. The exporter through the FT FLO certification tries to build trust and commitment with smallholders, but says that they lack understanding and also have unpredictable behaviour.

In terms of the exporter – cooperative relationship, the exporter has a relationship with the co-operative for the purpose of FT FLO certificate renewal processes. In addition, the exporter has strong relationship with the PNG coffee exporter licence holder and uses its logistics (trucks, yard, etc) and licence to export. This arrangement is important for buyer/exporter since it has direct communication with overseas buyers. The PNG coffee licensed exporter also helps in the transaction of the buyer/exporter's revenue and receives a 5% commission from the export revenue for the service provided.

In terms of exporter – overseas buyer relationship, the buyer/exporter buys coffee from smallholders six days a week to meet the demand of the overseas. The volume available for export is said to be inadequate but it is regularly adjusted. The exporter said there is a common understanding with FT FLO certified overseas buyers who provide product specification. The overseas buyers seem to work closely with the exporter to meet their requirements on quality, quantity, continuity, consistency and timely supply.

I used to spend more than half a million kina (K0.5 million) on the whole operations annually to ensure the smallholders and overseas buyers are connected through me". CE

5.4.5 Returns

The exporter's returns

The exporter's returns in this chain are derived from the FT FLO certificate (which enhances the FT floor price), a specialty coffee differential price and returns from low grade coffee sold to the local exporter. The entire FT premium derived from the non-certified FT organic coffee sold to overseas buyers is transferred to the co-operative's account for social community developments. This exporter sells to an FT FLO certified overseas coffee roaster.

The buyer/exporter said that roasters of FT organic and specialty coffee also provide price differentials on the grades and other quality attributes.

“We export 80% FT organic and specialty gourmet quality coffee to (a) FT Organic Coffee roaster and 20% of the same to other similar buyers in USA. New customers are enquiring about co-operative’s FT coffee due to the SCAA specialty coffee competition performance but don’t have the volume”. CE

The exporter processes just over 1,069 962 kg mixed cherry coffee annually, which is produced from the plantation and the smallholders. From this, there is a weight loss of 75% from the cherry to parchment and further 20% from parchment to green bean resulting in annual green bean production of 213 tonnes. Each year, the exporter exports nine containers (each with 300 bags of 60 kg or 18 tonnes) giving a total of 162 tonnes. This makes up 67% of the volume exported with high quality coffee grades as noted above, while the 23% or 51 tonnes remaining is low quality Y and T grades. The latter two grades are sold to the local exporter at Y grade price as noted in case 2 and case 4.

The average standard FT price paid by overseas buyers is K8.46/kg, excluding the FT premium. From this, K1.00/kg is paid to the smallholders and K7.46/kg remains with the exporter to cover cost of value creation from wet processing to green bean processing, risk involved with product ownership and low grade coffee sold at local markets.

The buyer/exporter said that there are problems that affect their return. These are the high cost of FLO inspector’s visit, poor road conditions, lawlessness and illiteracy affecting smallholders understanding of the FT concept. In addition, the smallholders can behave unpredictably and this leads to lack of trust and commitment.

Co-operative’s returns

The co-operative has no trading function as noted above, but the board members as locals ensure the FT premium for social community development activities benefits the smallholders. In the interview, the FT premium for social development benefits was implemented by the interim board until 2008, when the official board members were democratically voted in. It is unclear what improvements have occurred from these FT

premium funds for economic development to the co-operative as it lacks finance and resources to provide services to the members.

Smallholder's returns

In this FTC₂, the smallholders receive returns from the sale of coffee that has the FT FLO certificate of the co-operative. With coffee supplied through the FLO certification process, it gives them a return through the FT floor price as their income and the FT premium funds used for social developments that benefits the whole community. Their returns are enhanced through low cost farm inputs, no parchment processing and thus avoiding the risk involved with low quality parchment. The cherry coffee FT price paid to smallholders is K1.00/kg, less transport cost of K0.05/kg, and so the smallholders receive K0.95/kg net of transport as their income.

“We supply several bags of 50 kg bags at three weeks interval to the ACP at K1.00/kg. From this, K0.05/kg is deducted for transport and we get K0.95/kg. Cherry sells save us parchment processing cost, theft of coffee, reduce labour constraint and we have time for other cash cropping activities”. SG

The smallholders supply small and variable quantities of cherry coffee to the exporter at three weekly intervals right after harvesting each day and receive a sales receipt that is presented to the buyer's office for payment. Their sale of coffee is not influenced by factors other than the physical cherry ripeness. The average cherry coffee weight supplied annually was 40 bags of 50kg each or 2000 kg. Therefore, the average income from cherry sales is K1 900.00, excluding transport cost.

The smallholders noted that there are some internal (controllable) constraints that affect their return. These are social-cultural obligations, weed control and labour constraint, which makes it difficult to increase coffee production. Some external (uncontrolled) constraints that impede better return are poor road conditions, fragmented topography and social-cultural activities during harvesting times.

5.5 Case 4: Conventional Coffee Supply Chain Originating from Kainantu

Case 4 is a second conventional coffee supply chain (CNC₂) originating from Kainantu. It comprises farm input suppliers, smallholders, a processor and an exporter. In this CNC₂, the people interviewed were fifteen smallholders, one processor and one conventional exporter.

The smallholders in this chain buy farm inputs from agricultural stores, produce organic coffee and supply to many buying agents. The processor interviewed buys smallholder's parchment coffee by having agents on the roadside and at the factory door in Kainantu.

The exporter in this chain is the same exporter of the CNC₂. This exporter also buys coffee from a processor in Kainantu, processes it and adds further value to resulting green bean coffee and then sells this to the conventional coffee importers in overseas.

5.5.1 The Span of chain

The players in the conventional chain are illustrated in Figure 7.0 below and its detailed description is in this section.

Smallholders

The conventional smallholder coffee producers live in the Kainantu district, 87 km from Goroka. They have access to CIC's Coffee Research Institute and Growers Services which is in Kainantu. The smallholders use low cost farm inputs such as hand pulper, tools, materials and labour with some minor use of round up as per FT standards to produce coffee that they called organic. The smallholders process parchment coffee and supply this to buyers in Kainantu.

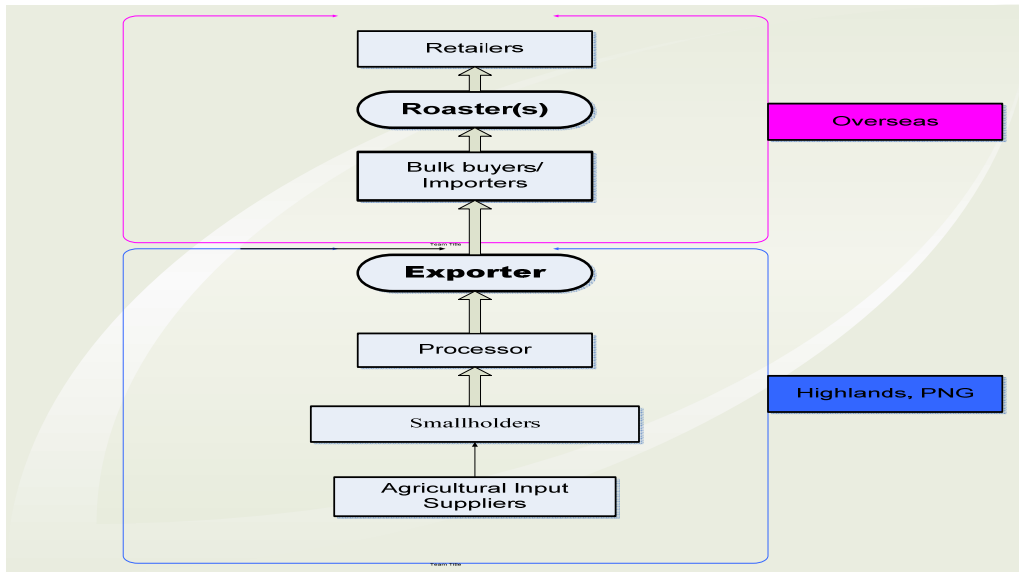


Figure 7.0 *Span of conventional coffee chain originating from Kainantu district, EHP.*

Processor

The conventional coffee processor in this chain has a trading license from the CIC to buy parchment coffee, process it further and sell the green bean coffee. This processor is based 87 kilometres from Goroka town. The processor’s agents buy parchment coffee near the Kainantu town market and at the factory door. He has a “wantok system” with the smallholders at the outback of Kainantu and some in Obura Wonenara District who supply coffee to him. (Note that the ‘wantok system’ was described in section 5.3.1). This processor has a processing mill, and he processes and supply green bean coffee to the exporter.

Exporter

The conventional exporter as a final player in this CNC₂ is also the same exporter of CNC₁. It has a conventional coffee exporting licence from the CIC and is based in Goroka. This exporter is part of an overseas owned company or multinational corporation and buys coffee from processors and supplies to overseas buyers as described in section 5.3.1.

5.5.2 Processes

The smallholder coffee producer's processes

In this CNC₂, the conventional smallholder's processes included coffee growing, harvesting, processing, logistics and quality control.

The smallholder's coffee production practices of growing young trees and maintaining matured trees to produce organic coffee is similar to FTC₂. The smallholders in this chain live near the Okuk Highway and Kainantu and also 20 to 30 kilometres from Kainantu. Those smallholders who live near the highway or Kainantu have adjusted their coffee farming system by intercropping food crops and vegetables in both young and mature coffee trees for extra cash income. Some smallholders in the remote villages also intercrop food crops with young coffee trees but plant shade trees and edible shrubs with matured coffee trees.

“The coffee fertilizer is very expensive to buy but we plant vegetables with chicken manure and shade trees under the coffee trees to improve soil fertility. We apply round up to control weeds but no insecticides or fungicides because the damage from insects or diseases is not severe and also their costs are high”. SG

Almost all the smallholders in remote areas use low cost farm inputs and labour to grow, harvest, process and supply parchment coffee to suppliers. With harvesting, the smallholder's arrange communal labour, shared family labour and hired sports or youth groups while others hire casual harvesters during the coffee season. Some smallholders said that the culture of communal labour and sharing family labour is dying out with cash economy activities. The hire of casual labourers arises because of labour constraints.

“We normally hire casuals to pick coffee at K0.15/kg to K0.20/kg of cherry coffee harvested during peak coffee season because there is labour shortages in the village”. SG

With parchment processing, the smallholder's pulp the cherries late evening after the harvest or the next morning. One person turns the hand pulper to pulp the cherry while a helper puts cherry coffee and water into the hand pulper. The pulper removes the skin on the other side

whilst the pulped bean falls into a collecting bag. Some smallholders said that sometimes the unpulped bean, green bean and cherry skins mix with the pulped coffee.

The pulped cherry coffee is left under the house or covered with leaves or bags for 24 to 36 hours for the mucilage to degrade. The fermented coffee is transported to the nearest water source and fully washed. The technique is to immerse the bag in the pool of running water, removing the floors and skins, and use the hand to rub the beans to remove the remaining mucilage. Other smallholders pour fermented coffee into a sheet of shade cloth and repeat the same procedure until the parchment is cleaned from mucilage and dirt. The smallholders sun dry the parchment coffee for seven days during the dry season and 14 days or more during the wet season to reach 12% moisture level or No. 1 parchment.

In terms of logistics, the smallholders grow coffee and other cash crops in small parcels of land a few kilometres away from their village or house. Land tenure problems explained in section 5.3.2 are also experienced here. Cherry coffee is hand picked using communal or hired labour and also family labour. The smallholders said that carrying cherry coffee from these different small coffee gardens to the village for pulping was a problem. They further said that pulping coffee in the village is to avoid stealing of the hand pulping machine and fermenting parchment coffee beans.

With full washing, they use family labour or trucks to transport the fermented coffee to the nearest water source which at times is difficult. They sun dry the parchment coffee to 12% moisture level and it is then stored in the hut on the bed for some weeks and the smallholders monitor the coffee price. Most smallholders interviewed weigh their coffee bags before transporting to avoid buyers' cheating them.

“We walk several kilometres to the nearest road access with our parchment coffee. Then travel by public motor vehicles to the roadside in Kainantu or factor door and sell to the buyer”. SG

Factors influencing the smallholders' decision to sell the coffee are similar to those noted in the section 1.3.2. Some smallholders faced poor road conditions while others have easier road access with transport cost is K0.20/kg of parchment and the owners pay a separate bus fare

for themselves as well. The smallholders also face the possibility of road hold up when transporting their coffee in this area.

In terms of quality control in this chain, the smallholders' production of coffee that is called organic is similar to FTC₂. The harvesters hand picked ripe red cherries as mixed Arabica coffee varieties but sometimes pickers hand pick half ripe, black, fallen and bird eaten berries because they want to get more money per kg of cherry harvested. This may affect the quality. Sometimes the cherry is pulped next day after harvesting and this may cause cherry fermenting. The smallholders admitted that the hand pulping machine can also cause defects. Furthermore, the parchment coffee fermented in the bag without water and on the ground may also affect the quality of coffee. Some smallholders admitted using muddy water from a nearby water source to wash the fermented coffee due to a labour constraint and so not being able to get clean water from further away. Storing the dried parchment coffee in the hut on the bed maintains quality, and avoids absorbing soil moisture when the dried parchment was left on the ground.

The processor's processes

In this chain, the conventional coffee processor's processes involved coffee buying, processing, logistics and quality control.

In terms of coffee buying, this processor buys smallholder's coffee at the factory door or the agents buy it at the road side in Kainantu. The processor also has a wantok system with some smallholders who deliver coffee to the factory. The buying staffs assess the weight of the bag and moisture of parchment coffee before paying a standard Y grade price.

"I train the buying staff to assess parchment coffee for quality and quantity. My weighing clerk uses the scoop to collect parchment sample the bag, rub the parchment off and assess the qualities such as colour, smell, and moisture by pressing the bean. They weigh the coffee even with good qualities to avoid cheating by new suppliers mixing heavy materials or wet parchment". CP

In terms of green bean processing, the parchment coffee with 14% moisture undergoes touch up drying using the drying machine. The processor processes the green bean coffee using the same procedures as described in FTC₁ (section 5.2.2). This processor supplies the green bean

as required by the exporter without manually cleaning the defects. To meet the exporter's requirement, the grading machine is used to sort and grade the green beans as PSC, Y and T as required by the exporter. The processor said the exporters offer the base price for these grades and level of defects.

"I am a middleman for the smallholders and exporter. I try to negotiate for other grades price but the exporter convinces me that only the plantation will have such bargaining power because they supply consistent coffee qualities".

CP

In terms of logistics, the processor has a processing mill with storage room, three trucks, two utility vehicles and communication facilities. The parchment coffee bought from the roadside or supplied direct to the factory by the smallholders is stored according to the moisture level.

Those parchment bags with 12% moisture level are processed into green bean. Others with 14% moisture or more are sun dried or machine dried and then processed into green bean. The value is added to the green bean when the husk and silver skin is removed. The green bean coffee is graded according to the exporter's requirement and transported in a weather proof truck or container to maintain quality and delivered to the exporter in Goroka.

"When rain drops on the way when smallholders are transporting their parchment coffee, the coffee is normally wet. We pay them second Y grade price and meet the cost of drying the coffee again". CP

The processor controls the quality at the stages of buying, green bean processing, storage and transporting. The exporter says that quality is the important factor that determines coffee price so he trains the staffs who buys coffee to assess quality and quantity. The parchment coffee supplied by smallholders is thoroughly assessed at the road side and at the factory door for coffee with 12% moisture level. The processor does touch up drying to ensure the parchment coffee's moisture level is uniform. The processor said that no coffee supplied has been rejected by the exporters.

“I train my buying staffs on assess parchment coffee’s quality and quantity because the smallholders coffee is generally of low quality. Coffee business is a very risky business because the quality of coffee is not obvious factor but the price depends on it and not the quantity”. CP

The exporter’s Processes

The final player in this chain is the exporter. This conventional exporter’s processes involving buying, processing and supplying green bean coffee to importers is explained in section 5.3.2.

5.5.3 Information Flows

Smallholders

The smallholders in this chain share information on coffee growing, harvesting and processing techniques with other smallholders, but not with the buyers or extension agents. In contrast, the CIC use the news agency to tell farmers to increase production and improve their quality, but CIC’s extension service to smallholders has now ceased. The smallholders said there is no coffee extension and information on the latest coffee production techniques necessary to meet the different emerging coffee markets. Some get coffee production and processing information from the CIC’s Coffee Research Institute base in Kainantu but others do not have such information.

“We want the CIC’s extension service and information on new ideas of production and coffee markets emerging in PNG to get better returns. We were members of the PNG Coffee Federation and supplied coffee but the payment was delayed. Also the price received was no different to the conventional price and we lose interest. We now deal with the conventional market”. SG

The smallholders also share information with other smallholders on logistics such as transport arrangements, transport cost, road condition, coffee buyers and lawlessness. Likewise, they share information on quality control techniques such as the harvesting of ripe red coffee, techniques on fully washing, sun drying, storing and transporting. The information of logistics and quality control is sometimes shared with the processor, particularly in regard to

harvesting, fermenting, washing, sun drying and storing techniques and transporting to the buyer. In contrast, they do not receive information on quality attributes, quantity and timely supply from the processors.

The smallholders receive coffee price information from the radio broadcast by the CIC via FM radio EHP and also from the road side or factory door upon coffee delivery. They said that because they incur high transport costs, and sometimes have urgent social obligations to meet, they accept the price offered. The smallholders says the lacked information on coffee quality attributes and ways of improving their coffee to get a better price.

The processor's information flows

The processor does not share information about green bean coffee processes with most smallholders, except with those on the “wantok system”. Moreover, the processor does not share information on coffee processes with other processors because there is strong competition between them. This processor gives information on coffee price, quality attributes and quantity assessment information to its parchment coffee buying staff and smallholder ‘wantoks’, but the processor does not share such information to all the smallholders. They argue that this is because most of the smallholders have low level of education and cannot comprehend the low quality coffee they supply and the hidden cost involved in adding value.

The processor gives information to its buying agent and smallholders on aspects of buying parchment, transporting it during wet weather, quality control and lawlessness. The processor said that when information on quality and transportation of parchment coffee is adhered by the buyers and smallholders, this results in processing cost reduction. The processor admitted there is less profit margin when small volume and low quality coffee is flowing through the processing mill. He further says that this is due to little extension and information being received by smallholders.

“Most of the smallholders who supply coffee to me have started to lose confidence in the CIC extension service. I think the CIC should advise the government to support the coffee industry and provide information to smallholders to increase production and improve quality”. CP

The processor receives relevant information on coffee processing, quality control and different coffee price based on grades specified by the exporter. But the information on other product attributes such as consistency, timely supply and overseas market's requirements is not shared by the exporter with the processor. This lack of information makes it difficult for the processor to negotiate a better price from the exporter.

The exporter's information flows

The exporter shares information with long-term contract processors, non-contract processors but are regular suppliers and new processors shopping for price is described in section 5.3.3.

5.5.4 Relationships

Smallholders

In this CNC₂, some smallholders have spot market relationships with input suppliers and parchment coffee buyers; when buying farm inputs and selling coffee respectively. However, other smallholders operate on a "wantok system", which brings together buyer and seller more cooperatively but the processor admits the agreement can be easily broken. Other smallholders sell their parchment coffee to buyers nearby due to meet cost of urgent social obligations and other sell to other buyers that they think is offering best price.

The smallholders in this chain, like others in both FT and conventional chains, they collaborate and cooperate with one another in arranging communal labour, family labour sharing and hiring social groups. Such cooperation is encouraged by the inherent social cultural significance of the coffee income which may be used for social obligations in the community.

"When people help us in growing, maintenance, harvesting and processing is a kind of investment. We use some of the coffee income to help those who help us in their social and cultural cost and as our social obligations". SG

Most smallholders in this chain usually share information between them on coffee price. Coffee price information dissemination is coordinated by the CIC but the actual price paid is controlled by the processors.

Processor

In this CNC₂, the processor has spot market relationships and a “wantok system” with the smallholders as noted above. But the processor does not collaborate or cooperate with other processors as noted above. The parchment coffee buying, green bean value creation and supply to the exporter is done by the processor.

This processor supplies value added coffee to the exporter on a spot market relationship. The processor said that, although there is a long term contract available with the exporter, the flexibility associated with searching for a higher price and supplying is better option. It became evident in the interview that the processor does not have much ability to negotiate for price since the exporter offers a price based on specified quality attributes and not quantity.

Exporter

The exporter buys green bean coffee from new and non-contracted processors as well as the long-term contracted processors. The new and non-contracted suppliers have a spot market relationship with the exporter while the contracted suppliers have a long-term contractual relationship with the exporter. The processor described in this chain is a non-contract processor. The description of the exporter’s relationship and coordination was described in section 5.3.4.

5.5.5 Returns

The exporter’s returns

In this CNC₂, the conventional exporter is the same exporter in CNC₁. This exporter’s returns and constraints to receiving higher returns were described in section 5.3.5.

The processor’s returns

In this CNC₂, the processor’s receives the coffee price given by the exporter. This return is improved by reducing cost of processes, logistics and maintaining quality control through close supervision, training and information sharing with coffee buying agents or employees, and encouraging loyalty from smallholders through the “wantok system”, although this is elusive. In this chain, the processor retains K2.20/kg to cover their processes and give them a profit margin leaving K4.50/kg to be paid to smallholders.

Although this processor is a regular green bean coffee supplier to the exporter, they operate on a spot market basis with the exporter, which means that their returns can rise or fall. In addition, there is a high degree of competition between processors for low supply volume and poor quality coffee supplied by the smallholders. Unpredictable behaviour from smallholders, as well as lawlessness, can affect the processor's returns.

The smallholder's returns

In this CNC₂, the conventional smallholder's major source of annual income is the coffee. Other secondary source of income is from vegetables intercropped and sold at the local market. In order to improve returns from coffee, the smallholders use low cost farm inputs, communal labour and the "wantok system".

In the interview, an average of nine 60 kg parchment coffee bags are supplied annually to the processors and their buying agents. The parchment price was K4.50/kg when this research was conducted. From this, K0.20/kg was deducted as transport cost and paid to the truck owner whilst the smallholder receives K4.30/kg after the transport cost has been deducted. On average the smallholders earn K2 322.00 per year. From the interview, there were some issues that emerged that impede returns to smallholders. These are the high cost of transport, coffee stealing, and poor road condition in combination with wet weather. The commitment to social obligations also diverts attention from coffee value creating activities and limits cash investment to coffee production and processing. Even though there is a coffee research institution located in their district, the smallholders interviewed said that they had little access to information and technology that could improve their returns.

Chapter 6 Analysis and Discussion

6.1 Introduction

This chapter presents the analysis of the results for four case studies presented in the previous chapter, which comprised two paired coffee supply chains from Okapa and two paired chains from Kainantu districts. From each district, the FT and conventional chains will be compared and analysed according to their value creating processes, information, and relationships and coordination in accordance with the research questions. The analysis is then compared with results from previous studies and other findings from the literature.

There are six sections with an introduction in section 6.1 and a conclusion in section 6.6. Section 6.2 provides the analysis of prices and returns to smallholders (and other players) (Research Question 1). Then, section 6.3 provides an analysis on the sources of returns that creates community benefits (Research Questions 2). Section 6.4 gives an analysis of the constraints to getting higher returns (Research Question 3). Section 6.5 is the discussion.

6.2 Analysis of Prices and Returns

6.2.1 Smallholders' Prices and Returns

The returns from coffee appear to be the major source of rural cash income for smallholder coffee producers in all case study chains. The returns from coffee and the sharing of returns between the players in both FT and conventional chains in the case studies are shown in Tables 4.0 and 4.1.

Table 4.0 Average prices and returns received by chain players

Chain Players Prices and Returns	Case 1 (FTC₁)	Case 2 (CNC₁)	Case 3 (FTC₂)	Case 4 (CNC₂)
Exporter's Price (K/kg green bean)	9.71	9.70	8.46	9.70
Processor's Price (K/kg green bean)		6.70		6.70
Smallholders' Price (K/kg parchment)	4.70	4.50		4.50
Smallholder's Price (K/kg cherry)			1.00	
Smallholders' returns (K/year)	2016 ¹	1920	1900	2322

There is a floor price for FT coffee, but when the world price for conventional coffee increases, the FT price rises above this floor price. The FT fixed premium (for social and certified organic coffee) is excluded in the above coffee prices. The returns for smallholders is derived by multiplying the price they received by the average amount of coffee sold. It excludes production and transport costs. These prices and returns have been converted to parchment coffee equivalent prices in Table 4.1 in order to compare the results from the four case studies.

Table 4.1 Average prices and returns received by chain players (parchment coffee equivalent)

Chain Players Prices and Returns	Case 1 (FTC₁)	Case 2 (CNC₁)	Case 3 (FTC₂)	Case 4 (CNC₂)
Exporter's Price (K/kg parchment equivalent)	7.77 ²	7.76	6.77	7.76
Processor's Price (K/kg parchment)		5.36		5.36
Smallholders' Price (K/kg parchment)	4.70	4.50	4.00 ³	4.50
Smallholders' returns (K/year)	2016	1920	1900	2322

¹ The average net return for smallholders in the four case studies based on their average coffee produced each year.

² 1 kg of parchment coffee converts to 0.8 kg of green bean coffee. K/kg parchment coffee equivalent = (K/kg green bean coffee x 0.8)

³ 1 kg of cherry coffee converts to 0.25 kg of parchment coffee. K/kg parchment equivalent = (K/kg cherry x 4)

The Returns to Paired Chains: FTC₁ and CNC₁

Each player's return in the FTC₁ and the CNC₁ chains originating from Okapa are shown in columns 2 and 3 of Tables 4.0 and 4.1 and are analysed here. In Table 4.0, the coffee price paid by the overseas FT coffee buyers to the exporter is K9.71/kg green bean. From this, the smallholder parchment coffee price is K4.70/kg, which includes K0.20/kg incentive provided by the FT exporter. The FT exporter said in the interview that this incentive was to improve smallholders' returns. The FT cooperative has no return because it does not trade. In the conventional chain (CNC₁), the green bean coffee price of PGK9.70/kg was paid to the exporter by the overseas importers. From this, the exporter pays green bean price of K6.70/kg to the processor and has retained K3.00/kg green bean. Therefore, it appears that there is very little difference in the green bean coffee price paid by overseas customer in both the FT and conventional chains.

These prices in Table 4.0 were converted to parchment coffee equivalent prices in Table 4.1. This was calculated to get a meaningful comparison of prices along the chains. The parchment price equivalent for the exporter was K7.77/kg in the FT (FTC₁) and K7.76/kg for the exporter in the conventional chain (CNC₁). These prices reflect the value creation activities of each chain, and must cover their variable and fixed costs, any profit and also returns paid back to the community as part of FT commitment discussed below.

The conventional processor (CNC₁) received a parchment equivalent price of K5.36/kg. The parchment coffee price received by FT smallholders was K4.70/kg, a minor difference of K0.20/kg when compared with the conventional smallholders' parchment price of K4.50/kg.

From Table 4.1, the distribution of returns (prices) along the chains can be calculated. In the FT chain (FTC₁), the individual smallholder coffee producers received 60% of the price (parchment equivalent) received by the exporter, while the exporter received 40% after deducting the price paid to the smallholders. In the conventional chain, the smallholders received 58% of the price (parchment equivalent), the processor received 11% and the exporter 31%. While at first glance it appears as if the exporter in the FT chain captures a greater margin than the exporter in the conventional chain, the FT exporter must take the FT premium that is returned to the community out of their share. When this is entered into the calculation (see Section 5.3.2 for actual values) the FT exporter's share falls to 33% and the community receives a share of 7%.

In addition to price, the average smallholders' returns from the average volume of coffee produced per year in both chains are shown in Tables 4.0 and 4.1. These tables show that the FT smallholders' annual average returns was K2016 per year for FTC₁ and K1920 for CNC₁. There is only a small difference with the FT smallholders who have an average return of K96 per annum more than the conventional smallholders. This difference arises because of the extra K0.20/kg paid to them by the exporter. It was noted in the interview that this price difference has nothing to do with FLO certification. The exporter explained that they need to provide an incentive for smallholders to encourage them to market through the FT chain. This situation arises because the conventional coffee price was high at the time of this research and the FT price was above FT floor price. Both exporters reported that the demand from overseas buyers was very strong at this time.

The Returns to Paired Chains: FTC₂ and CNC₂

The returns to each player in the FTC₂ and the CNC₂ chains from Kainantu are shown in columns 4 and 5 of Tables 4.0 and 4.1 and are analysed here.

In Table 7.0, the green bean coffee price paid by the overseas FT coffee buyers to the exporter is K8.46/kg. In this chain, the smallholders sell cherry coffee, not parchment and the cherry coffee price received from the exporter was K1.00/kg. The FT cooperative has no return because it does not trade. The green bean coffee price paid to the exporter by overseas conventional coffee importers was PGK9.70/kg. From this, the exporter pays a green bean price of K6.70/kg to the processor and retains K3.00/kg green bean.

The parchment price equivalent for the exporter was K6.77/kg in the FT chain (FTC₂) and the corresponding price of K7.76/kg in the CNC₂ for the conventional exporter. The processor in the conventional chain received parchment equivalent price of K5.36/kg, and the smallholders in this chain (CNC₂) received K4.50/kg for their parchment coffee. This compares to K4.00/kg parchment price equivalent received by the smallholders in the FT chain (FTC₂).

For the second pair of chains, the distribution of returns was also calculated. In the FT chain, FTC₂, the individual smallholder received 59% of the price (parchment equivalent), while exporter received 41% after deducting the price paid to the smallholder. In the conventional chain, CNC₂, the individual smallholder coffee producers received 58% (parchment price

equivalent), the processor received 11% and the exporter received 31%. The price quoted by the FT exporter seems puzzling, since this exporter is processing the coffee cherry and is supplying higher quality coffee than the standard Y grade coffee that the conventional chain quoted for the coffee price. This answer was checked with the exporter but they said again that this was correct price. It is possible that they have subtracted the FT coffee premium paid back to the community from this price, and/or the 5% commission paid to the exporter with the licence who exports on their behalf, and even the cost of the FT FLO certification. Regardless, it appears that this figure is not directly comparable to the conventional price.

Therefore, when comparing the chains, the FT exporter's price seems to be lower than the conventional exporter, but the difference should be treated with caution. FT smallholders' parchment price equivalent is K0.50/kg less than the conventional smallholders, but the smallholders in this chain do not have to bear any cost and risks associated with processing the cherry coffee into parchment. As a result, the prices received by the smallholders in both chains seem comparable.

The smallholders' returns from the volume of coffee produced per year in FTC₂ and CNC₂ indicate that the FT smallholders' annual average return was K1900 per year for FTC₂ and K2322 for CNC₂. These figures indicate that the FT smallholders' average annual return was K422 less than the conventional smallholders. However, the conventional smallholders must bear the costs of parchment processing, while this has been eliminated in the FT smallholders' average annual return. This means that the K422 difference is likely to be quite marginal when these costs are taken into account. There was no evidence of FT certification improving FT smallholders' returns in FTC₂ at this time when the conventional coffee price was high.

6.2.2 Returns in the FT Chains to the Community and Comparison between the Paired Chains

There are other returns; both economic and non-economic benefits received by the communities in FTC₁ and FTC₂, and these benefits are discussed here. In terms of direct economic benefits noted above, the smallholders in both FTC₁ and FTC₂ gained remarkably similar economic benefits in terms of parchment equivalent price and total average annual returns (Table 4.1), even though the FTC₂ configured its value creation a little differently,

with vertical integration of coffee cherry and parchment processing done by the exporter in FTC₂ whereas the smallholders process parchment in FTC₁. Likewise, when the parchment equivalent price and average annual return of smallholders in both conventional chains, CNC₁ and CNC₂ are compared with the above FT chains; there are remarkably similar economic benefits. Therefore, in the period of high conventional coffee prices, there is very little difference in coffee prices and annual average return to smallholders in the FT chains.

Besides the payment received by FT smallholder coffee producers, the FT smallholders communities in FTC₁ and FTC₂ also received a benefits from the FT fixed premium funds for social community developments and environmental sustainability through the FT and organic coffee farming standard practices. It was interesting to note that the premium for organic coffee was three times greater than the FT premium. It was noted in the interview that the exporter in FTC₁ pays fixed FT premium funds direct to the FT co-operative's account, not to the smallholders. These amounts were K0.32/kg green bean (US\$0.05/lb) as FT social premium and K0.95/kg green bean (US\$ 0.15/lb) as certified coffee premium price, which in total is K1.27/kg. This converts to a FT premium of K0.26/kg and K0.76/kg for FT and organic premium respectively for parchment price equivalent, which is K0.52/kg. However, it was not possible to get information on the total FT premium funds paid to the co-operative and also the amount of coffee volume supplied by the smallholders that is exported. The co-operative was asked about this, but they did not seem to keep records of coffee sold by their members to the exporter or were unwilling to divulge these.

While the exporter in FTC₂ also pays the FT premium fund for social community benefit direct to the co-operative, it did not disclose the FT fixed premium price like the exporter in the FTC₁. Also the volume of smallholder coffee exported and total premium funds paid were not evident in this chain either. It was evident in the interview that there is a potential conflict of interest since the exporter's staff are also administering the co-operative affairs in the interim period at the time of this research and before the FT co-operative became fully functional.

Even though, the smallholder communities in both FTC₁ and FTC₂ might gain benefits from adhering to FT and organic standards unlike the conventional chains, the economic benefits are minimal to the actual FT smallholder producers at this time. Further, the social community benefit from FT premium appears to benefit the whole community but creates

free rider issues since all smallholders live in a social community and some may sell through the conventional chain but others sell through the conventional chain. This creates moral hazards and these non-economic benefits can be ignored when producing smallholders face urgent social obligations or other catalysts for unpredictable behaviour.

6.3 Sources of Returns that Create Community Benefits

It was concluded in Section 5.2 that individual smallholders in FT chains did not get higher prices than individual smallholders in conventional chain. It was also noted that there was very little observable difference between the prices received by exporters for FT and conventional coffee. However, the field work was done during a period of high coffee prices and the same result might not occur when international coffee prices were low. However, the smallholder communities did benefit through the social community benefits that come with the FT coffee chains.

The above result means that it is not necessary to answer Research Question (ii); namely, if smallholders in FT coffee chains receive higher returns than smallholder in conventional coffee chains, then what are the sources of these returns? However, this question can be recast slightly, since the smallholders in the FT chains receive community benefits.

Therefore, the question will be asked ‘what are the sources of these community benefits?’

In FTC_1 , the span of chain is shorter than the CNC_1 with value creation of coffee being done by smallholders and exporter. The FT smallholders produce organic parchment coffee and supply them to the FT exporter, which cuts out the coffee processor in the conventional chain (CNC_1). The smallholders create value to the organic coffee by growing, harvesting and processing according to FT and organic coffee standards or conditions. The exporter creates value by integrating its operations through the extension service to smallholders, establishes buying depots in Okapa to buy parchment coffee direct from smallholders, provide logistics to maintain quality coffee while transporting it from Okapa to Goroka. It also processes the parchment into green bean in the processing mill before grading the coffee into differentiated coffee grades (A, X, PSC, Y1, Y2 and T). In the study, it was found that the exporter had: 80% supplied to organic importers and roasters, 18% supplied to FT coffee importers and roasters, and 2% supplied to specialty and conventional importers and roasters.

Therefore, cutting out the processor has meant that the share of price received by these players in the conventional chain can be shared between the FT exporter and the FT community. After taking the payment of the premium into account, the FT exporter receives 33% (compared to 31% in the conventional chain), the smallholder receives 60% (compared to 58% in the conventional chain) and the community receives 7%. Thus, the 11% gained by the processor is split into three ways: to the exporter, the smallholder coffee producer, and the community. Therefore, the FT FLO certification indirectly leads to the higher returns to the community, and these returns occur, not through higher coffee prices, but through cutting out one link in the chain and redistributing the price margin that went to this link.

As with the first set of paired chains, in FTC₂, the chain is shorter than the CNC₂ with value creation of coffee taking place between the smallholders and the exporter. The FT smallholders produce cherry coffee and supply this to the FT exporter, which also cuts out the coffee processor in the conventional chain (CNC₂). The smallholders create value to the organic coffee by growing and harvesting but not parchment processing. They adhere to FT and organic coffee standards in their production practices. The exporter creates value by integrating operations between itself and the smallholders through the harvesting of coffee cherry (timing of picking and delivery to wet processing mill), logistics (trucks, transportation, wet mill, drying area and store house). It also buys the cherries on daily basis. The exporter then processes cherry to parchment and then to green bean with high quality control mechanisms as evident in the interview and field visits. It appears that this value creating processes is aimed at differentiated coffee products (A, AA, X and PSC) based on overseas customer preferences. The exporter's returns are derived from the sale of FT coffee exported to different types of markets: 80% supplied to organic and specialty gourmet coffee roasters in Germany and 20% supplied to organic and specialty gourmet coffee roasters in USA.

Because it was not possible to get information on the amount of the FT premium paid to the community, it was difficult to analyse the proportion of returns to the different actors in this chain. It is also difficult to comment because the coffee cherry is not processed into parchment by the smallholders and it is difficult to know to what extent the costs and risks associated with this offset compared with K4.50/kg. In addition, as mentioned above, it is not clear what the price quoted by the exporter actually includes or excludes. However, the

margin made by the processor in the conventional chain will be distributed among other parties, even though it is not possible to calculate these figures.

In summary, it can be concluded that the sources of returns that create community benefits lies in the shortening of the chains and more effective value creation that occurs through the remaining players or partners.

6.4 Constraints to Getting Higher Returns

It was noted in there search that there are some common constraints affecting the value creation (and ultimately the returns to the chain players) in all the four chains. The constraints that may have affected smallholders in the four chains associated with value creating activities as evident in the interviews with smallholders are divided into general and specific constraints. The smallholders' general constraints are (i) lack of resource to invest in coffee production and improving coffee quality, (ii) labour scarcity to maintain the coffee and harvest coffee cherry, (iii) decreasing land size (paternal land tenure system), (iv) persistent debt and social cultural obligations, (v) lack of government extension service and micro-finance in rural areas, (vi) lack of transport and communication infrastructure, and poor road conditions, and (vii) lawlessness on the road (road hold-ups).

More specific production and marketing issues that affect smallholders' value creation and their subsequent returns are (i) social cultural obligation at critical times affect coffee production and quality control, (ii) fragmented topography (isolation) demands high labour input, (iii) lack of improved technologies and techniques (to process better quality coffee), (iv) low quality parchment coffee (picking poor quality cherry, cherry fermenting before pulping, more defects from hand pulper, uneven fermenting in the bag, use old processing materials, and drying on the ground), (v) smallholders unpredictable marketing behaviour, (vi) spot market relationship with self interest, (vii) exporters having power and information, (viii) lack information on market types, differentiated product quality and customer preferences, (ix) lack of trust and commitment to the buyers.

As for the co-operatives in FTC_1 and FTC_2 , they are not trading because their constraints are difficult to identify. However, they did identify lack of capacity and resources to trade. The constraints to processors in the two conventional chains (CNC_1 and CNC_2) appear to have

similar constraints. These are poor road conditions and delay in the supply of coffee, taking ownership of poor quality parchment coffee, spot market relationship characterised by self interest, and related to this is lack of vertical and horizontal coordination, exporters having power and information asymmetry (distorted information on markets, product differentials in price and customer preferences). These factors constraint value creating activities and higher returns to the processor from the exporter and they appear to be squeezed between the smallholders and exporter.

The exporters in all the four chains appear to have these common constraints to their value creation, and they cited poor road infrastructures and conditions, lawlessness, poor quality coffee supplied, under supply of coffee, unpredictable behaviour of their suppliers, low level of education, and lack of trust and commitment.

It appears that there are common constraints that affect the value creation and returns of the players in all four chains. However, there are some differences in constraints between the chains. In particular, there are some differences in smallholders' constraints between FTC₁ and FTC₂. The smallholders in FTC₁ have more constraints such as labour input, materials, time and associated cost to produce parchment coffee, logistics (storing and transporting), quality control associated with price changes at buying points. A number of constraints are minimised with cherry trading in FTC₂. Moreover, the smallholders in FT chains (FTC₁ and FTC₂) appear to have different constraints to those in the two conventional chains (CNC₁ and CNC₂). These are that (i) smallholders have to adhere to rigorous FT and organic coffee standards, (ii) they don't seem to fully understand the FT concept, and seem to expect that the FT coffee price always give higher returns than the conventional chain, and (iii) FT cooperative s lack capacity (finance, resource and staff) to assist producers.

In general, it can be cautiously concluded that constraints appear to add more disadvantage to the FT smallholders than the conventional smallholders at this time when the coffee price were high and very similar to all the chains. In addition, the FT co-operatives in both FT chains lack the capacity and finance to undertake trading functions unlike the processors in the two conventional chains. Furthermore, there are some added burdens for the FT exporters unlike the conventional exporters since the FT exporter has to pay the FT FLO inspection fees for annual renewal of the certificate on behalf of FT cooperative and smallholders.

In summary, it can be concluded that, in general, the constraints associated with value creation are similar for the chain players in all the four chains. However, there are some added hurdles for the FT chains. These are adhering to the FT and organic standard practices for FT smallholders, the FT co-operatives lack capacity to trade, and the FT exporter pays the FT FLO inspection fee.

6.5 Discussion

This section presents the discussion by relating the findings of this research to the literature in Chapter 3. The insight of the conceptual model developed from the literature provided a basis for answering the research questions and relating them to the literature.

A key point worthy of discussion relates to the proportion of returns distributed along the two paired chains, which were calculated above and can be related to the literature. In the conventional chains (CNC₁ and CNC₂) in this study, the proportion of price (parchment price equivalent) paid by overseas customers to chain players in PNG showed that the individual smallholder coffee producer receives 58%, the processor 11% and exporter 31%. In the FT chains (FTC₁ and FTC₂), the proportion of returns (based on parchment price equivalent) distributed between chain players shows that the individual smallholder receives 58-60% and the exporter receives 40-42%. These findings can be compared with some literature on the distribution of returns along the chain.

An Oxfam (2002) study said that the returns distributed to players within the coffee producing countries were: the exporter receives 7%, the processor 5% and the smallholder 2%. If these figures are converted to the proportion of price of price received within the country itself (i.e., 14%), then in the Oxfam study the exporter receives 47% of in-country returns, the processor 33% and the smallholder 20%. This distribution of returns is broadly supported by Kaplinsky & Fitter (2004). However, Batt & Murray-Prior (2006a) (citing Dambui et al., 2006) noted that in PNG the smallholders can receive higher proportion (32% fob Lae) of the price for organic coffee. Hence, the finding on distribution of returns from coffee price within the PNG part of the chain does not support Oxfam (2002) claim, but instead is more in line with findings of Batt & Murray-Prior (2006a). This higher proportion of exporter's price being returned for organic coffee to smallholders may result from the high degree of competition at processor and exporter level in trying to access the small volume of

coffee produced by PNG smallholders. Related to this is the high and unsatisfied demand from overseas customers for PNG coffee produced in both the FT and conventional coffee chains.

The literature also refers to issues associated with FT co-operatives having trading functions (Milford, 2004). Several authors suggested that smallholder's co-operative are a mechanism for improving returns to the members (smallholders) through functions such as providing savings and credit schemes to invest in coffee production (Grundy, 2005), mobilising and consolidating smallholder's coffee (USAID, 2005), empowerment for smallholders so they have bargaining power (Kaplinsky & Fitter, 2002; Renard, 2003), freer information sharing (Niederhauser et al., 2008; van Roekel et al., 2008), improving relationships to instil trust and commitment (Fitter & Kaplinsky, 2001; Bacon, 2005), and vertical and horizontal coordination allowing the chain to be more efficient and effective in meeting to customer demands (Milford 2004: Muradian & Pelupessy, 2005; Imhof & Lee, 2007), as well as establishing direct links with overseas FT coffee buyers through FLO certification (Taylor, 2005; van Roekel et al., 2008). There are also other benefits noted in the literature such as bringing (upgrading) smallholder further along the value chain to benefit them (Kaplinsky & Morris, 2006:19), capacity building (regular trainings) to improve production and coffee quality (differentiated coffee products) and moving toward traceability for higher returns (Milford, 2004:53-4; Dempsey, 2006:7-10; Imhof & Lee, 2007:86). Through such functions, the literature argues that the FT co-operatives have improved returns to their members in terms of economic benefits, social justice and environmental sustainability (DFID, 2000; Milford, 2004; Imhof & Lee, 2007). However, many of these benefits are not there in PNG where the two FT co-operatives appear to have no trading functions.

The FT co-operatives also have their share of problems according to the literature. The FT co-operatives supported by external sources can lack the capacity, production and processing technology and techniques, education, management, marketing skills, etc making it difficult to upgrade the chains (Milford, 2004:35-7; USAID, 2005:11-2). Some literature cited refers to FT co-operative's having trading functions but encountering value creation constraints and challenges (DFID, 2000; Ponte, 2002; Milford, 2004; USAID, 2005; Muradian & Pelupessy, 2005; Schlmezer, 2006; Dempsey, 2006; Imhof & Lee, 2007). The FT co-operatives in this study contrasted with the literature. The two co-operatives in FTC₁ and FTC₂ do not trade because they lack the capacity to do so. In this study, the FT co-operative was only a means

to get FT FLO certification and so a direct link to overseas FT coffee customers, and for smallholders and exporters to gain economic benefits through the FT floor price and fixed premium price. Therefore, it is not possible to compare the benefits and problems of the PNG FT co-operatives studied with the finding of the literature noted above.

There is one finding from this study that deserve greater discussion, which is the free rider's sharing of community benefits in both FT chains (FTC₁ and FTC₂). The suppliers of FT coffee do not get rewarded individually for producing FT coffee, but the whole community benefits from the FT premium. This fits PNG's culture of a social-communal system noted in the research. This means that the free rider can benefit as a member of the community while selling through conventional chains and not FT chains. In relating this finding to the literature, it was noted that free riding in the literature tends to refer to members of the FT co-operative who gains from community benefits but are non- active participants in monitoring the co-operative's management (Milford, 2004:35-7). In PNG, the FT smallholders adhere to rigorous FT and organic coffee production standards to produce coffee but are only getting the same coffee price as the conventional smallholders. This challenges the argument that smallholders benefit from higher returns from FT coffee (USAID, 2005; Imhof & Lee, 2007) as well as through benefits from community projects (Grundy, 2006; Schmeizer, 2006:17).

In PNG, it is not clear whether this free-rider problem is worse in periods of high coffee prices. Also, note that free riding alluded to by Milford (2004:37) is different to the finding in this study. The free rider in this research is a non-member of the FT co-operative but has right to and access to community benefits. This finding on the community benefits challenges the notion of two sets of benefits in the literature.

In this study, the FT chains were shorter but it was the exporter, not the co-operatives who took over the role of the intermediary. FT co-operatives did not play any role as the intermediary in buying coffee from their members (smallholder coffee producers), processing it and supplying it to the exporter, unlike the conventional processors. Shortening of the chain does not remove the functions of value creation performed by the processor but in this study, the exporter takes over these functions. This finding can be compared with literature in this study, argues that FT chains are shorter with intermediaries being replaced by a co-operative and this has improved chain efficiency (Dietz et al., 2002; Milford, 2004; Grundy, 2005;

Schmelzer, 2006; Imhof & Lee, 2007). The part of the finding about shortening of the chain to achieve chain efficiency supports the literature.

Furthermore, it is also argued in the literature that the shorter FT chains foster social-cultural values (solidarity, cooperation and equality) of smallholders and so are more ethical, whereas the conventional chain is labelled as being unfair (Schmelzer, 2006:26-32). Schmelzer (2006) further argued that, although FT returns to smallholders is more for social benefits, there is limited understanding of FT having social-cultural significance because smallholders thought of FT as just another coffee market with high quality and higher price and not an agent of social change. These issues were also echoed by Tallontire (2001:8-9) who argued that FT criteria does not take full account of social justice (gender inequality) and labour relations (poor working conditions or non-family wage labour) at smallholders household levels.

The findings in this research are that smallholders in both FT and conventional chains have a 'wantok system' (PNG's cultural system of social security and cooperative sustenance) and use this for communal or family labour sharing and in some cases, selling coffee. These social systems are underpinned by strong social-cultural obligations that care for social well-being of all smallholder households and communities. In PNG, coffee returns support social-cultural values, which is a Fair Trade attribute mentioned by Schmelzer (2006) and Tallontire (2001), but in PNG, it applies beyond FT chains and can include returns from conventional chains as well.

The constraints identified in the literature for both FT and conventional chains can be related to the research findings. In this research, the common constraints were identified for both FT and conventional chains, which affected chain players' value creation and returns. These constraints are lack of capacity, poor transport and communication infrastructures, poor road conditions, lawlessness, lack of extension service, lack of micro-credit schemes, low quality coffee products (coffee product differentiation with except of exporters), unpredictable behaviours, spot market relationship with opportunistic behaviour (self interest), exporters with power and information asymmetry (market, quality and customer preferences), lack transparency and traceability, lack of trust and commitment, and lack of horizontal coordination. Such constraints have also been noted in the literature, where lack of capacity (DFID, 2000; USAID, 2005; Batt & Murray-Prior, 2006 ab), lawlessness, lack of transport and communication infrastructure and poor road conditions (Batt & Murray-Prior, 2006 ab;

Imhof & Lee, 2007; ACIAR, 2007), lack of extension, micro-credit facilities and poor coffee quality processing (Batt & Murray-Prior, 2006ab; ACIAR, 2007, Nielson, 2008), exporter's power and information asymmetry, lack trust and commitment (Taylor, 2005; Imhof & Lee, 2007; Niederhauser et al., 2008), lack of transparency and traceability (Raynolds, 2008), and lack horizontal coordination (USAID, 2005; Dempsey, 2006) have all been noted.

In addition, other common constraints specific to smallholder coffee producers in both FT and conventional chains identified in this research are: labour scarcity, small land size, fragmented topography and isolation, lack of extension service, strong social cultural obligations, lack of technologies and techniques, lack of empowerment, and lack of vertical coordination. These constraints were also noted in the literature from studies done elsewhere (Oxfam, 2002; Ponte, 2002; Milford, 2004; Muradian & Pelupessy, 2005; USAID, 2005; Imhof & Lee, 2007; Nielson, 2008; Raynolds, 2008) as well as in PNG contexts (Murray-Prior & Batt, 2006, Batt & Murray-Prior, 2006ab; ACIAR, 2007). The findings of constraints specific to smallholders at smallholders' value creation level in both FT and conventional chains support the literature.

However, there are some constraints identified in this study that are different between the smallholders in FT chains and the conventional chains. The FT smallholders have resource constraints in adhering to rigorous FT and organic standards and this puts greater pressure on their daily livelihoods activities than in the case for the smallholders in the conventional chains. The finding of rigorous FT and organic standards as a constraint supports an Oxfam (2002) claim.

The research also found that smallholders did not fully understand the FT concept. The literature shows that smallholders participating in FT chains in Ethiopia (Dempsey, 2006; Dempsey & Cambell, 2006), Mexico (USAID, 2005), Bolivia (Imhof & Lee, 2007) and in PNG (Batt & Murray-Prior, 2006ab) also did not understand the FT concept.

A further constraint arises that is relevant to FT exporters, but not the conventional exporters. This constraint is the costly FLO certification fee paid for annual inspection and renewal of certificates. Oxfam (2002) claimed that this cost can be borne by smallholders' organisation if they are organised, but this proved not to be the case in PNG. In overseas cases, it was found that in some cases, the export as the private firm, paid for the FLO certification

renewal annually and it must recover the cost through its coffee sales (DFID, 2000; Muradian & Pelupessy, 2005; Niederhauser et al., 2008; Nielson, 2008). In this research, the exporter also paid the fee and recovered the cost out of the coffee price.

A key finding of this research relates to how does one create incentives for smallholders coffee producers to remain in the FT chain in times of high conventional coffee prices that are above raises the FT floor price? There was a claim in the literature that the FLO certification guarantees the established floor price for green bean coffee at US\$1.31/pound (K8.66/kg), a fixed FT social premium at US\$0.05-10/pound (K0.32/kg) and also a fixed certified organic coffee premium at US\$0.15-20/pound (K0.95/kg) when coffee is directly supplied to overseas FLO certified buyers (Oxfam, 2002:18; Milford, 2004:9 Raynold, 2002:416; Taylor, 2007:137; Raynolds, 2008:3). When relating this literature to the findings in this research, the FT floor price of K8.66/kg is below the conventional coffee price of K9.70/kg. During the low prices, the FT floor price makes the FT chain attractive, but during periods of high prices, returns from both chains are likely to be very similar. While the community benefits by way of free rider noted above, the individual smallholders gain very little by being in the chain, though on the other hand, it is not worse off than the conventional chain.

Therefore, from this discussion, it can be concluded that the study supports some of the literature but not other parts. In summary, it was found in PNG that the proportion of price received by smallholders in the FT and the conventional chains is highest at smallholders end and reduces at the exporters end (within the PNG segment of the chain): the FT co-operative does not trade, but is a formal means for FT FLO certification and direct linking to overseas customers and distributing the FT premium; and the free rider problem in PNG is based around a non-member of FT co-operative that has access to and right to community benefits.

6.6 Conclusion

The findings in this research for the paired FT and conventional chains from Okapa and other similar paired chains from Kainantu found no evidence of FT FLO certification improving smallholder's returns when the conventional coffee price is high. However, the FT smallholder communities benefit from the FT premiums through social community development and environment sustainability. The sources of these community benefits are

derived from the shortening of the FT chain compared to the conventional chains. However, there are a number of constraints to value creation and returns to smallholders, and some further differences between the FT chains and conventional chains. The discussion of this analysis reveals that some findings in this research support the literature while others are new contributions.

Chapter 7 Conclusion

7.1 Introduction

This chapter outlines the conclusions from the research. Section 7.2 gives a summary of the findings. Section 7.3 outlines limitations of the research, and provides recommendations for the future research. Finally, Section 7.4 outlines the contribution of this research.

7.2 Summary of Findings

In PNG, coffee is an important export commodity that is produced by 280 000 smallholders and it is a major source of smallholder's livelihoods in the highlands region. There are new coffee markets emerging for coffee produced in PNG and the coffee market types focused on in this study is the market for FT coffee. The general perception in PNG and elsewhere is that smallholders' returns are higher in FT chains than in conventional chains. These higher returns are thought to arise from sources of value creation arising from FT FLO certification, shorter chains, relationships, information, horizontal coordination, and greater empowerment, all of which is aimed at giving greater returns to the smallholders.

Three key research questions were as follow. First, do smallholders in the FT chains receive higher returns than the smallholders in the conventional chains? Secondly, if smallholders in the FT coffee chains receive higher returns from their coffee than the smallholders in the conventional chains, what are the sources of these higher returns? Finally, if smallholders in the FT chains don't receive higher returns than in the conventional chains, what are the constraints to smallholders receiving higher returns from the FT coffee chains than the conventional chains?

In order to answer these research questions, literature was reviewed to identify relevant concepts and findings. On the basis of this, a conceptual model of agribusiness supply chain functions was developed. This was based on the core elements of return and value creation. These core elements were influenced by four interacting components: chain players, value creating activities, constraints, and relationships and coordination. This conceptual framework was then operationalised to provide a basis for the empirical work.

Case study methodology was selected as an appropriate method for eliciting the required information. Four case study chains were selected. Paired FT and conventional chains originating from Okapa and Kainantu districts were compared and analysed. Comparisons were made between these FT chains and conventional chains for similarities and differences based on the conceptual model on returns and key functions that enhances value creation such as the span of chain, coffee processes, information flows, relationships (and coordination).

The research found that smallholders in the FT chains and conventional chains receive very similar prices for their coffee (parchment price equivalent). Hence, there was no evidence that smallholders in the FT chains received higher prices or returns from their coffee production. The study was conducted during a period of high conventional coffee prices, which is likely to explain for such a finding.

As a result, this study found that there was no evidence of FLO certification improving returns to smallholders in the FT chains over returns received in the conventional chains, but the community that FT smallholder producers come from did benefit. The sources of these community benefits lies in the shorter FT chains and the distributions of the margin that would have been made by the processors to smallholder coffee producers, exporters and the community.

Finally, this study found that constraints associated with value creation are similar in all the four chains studied. However, there are some added hurdles for the FT chains in adhering to FT and organic coffee standards. In addition, FT co-operatives lacked capacity to trade and their only functions were to help with FLO certification and distribute the FT premium to the community.

The findings of this research support some aspects of the literature, but not others. The findings that supported the literature are: shorter FT chains support social-cultural values of the smallholders, the role of the intermediary is taken over by the exporter if this is not done by the co-operative, constraints to smallholders receiving higher returns in FT chains are the same as those identified in the literature, adhering to rigorous FT and organic standards can be difficult for smallholders, and the exporter pays FLO certification fee rather than the FT co-operative. Those findings that appear not to support some aspects of the literature are: the proportion of price received by smallholders in the FT and the conventional chains is highest

at smallholders end and reduces at exporters end (within the PNG segment of the chain); the FT co-operative does not trade at all, and the free rider problem in PNG is based around a non-member of FT co-operative that has access to and right to community benefits.

7.3 Limitations of the Research and Recommendation for the Future Research

These research findings were based on information collected only at one time period when the coffee price was high. It would have been useful to do the study also at a period of low coffee price to see whether the same result held, but there were no resource to do this in this study. Another limitation is that this study would have been more complete if the research looked at what was going on further down the chain beyond the exporter. As it was, this research only looked at the PNG segment of the chain. A further limitation is that the research was only able to look at two sets of paired chains because of resource and time constraints and logistical issues, and the results would be more robust if other chains operating in the highlands were included in the study.

The limitations of the research provide the basis for recommendations for future research. A similar study when the coffee prices are low could determine how results differ in such periods and provide a more complete picture. A similar study that extends to the overseas portion of the chain might also provide greater insight. Finally, a similar study with more paired chains could be done to give a more robust picture.

7.4 Contributions of This Research

In this period of high conventional coffee prices, returns to smallholders from FT chains were no better than the returns gained in conventional chains. As a result, this leads to opportunism, moral hazards and lack of loyalty to the buyers by smallholders in the FT chains, who have to adhere to rigorous FT and organic coffee standards, which are higher than those in the conventional chains. In addition, the proportion of price received by smallholders in both FT and conventional chains is higher than the exporter and the intermediaries in PNG context, which contrasts with the conventional wisdom in the literatures. This may be due to high competition at processor and exporter level for the small volume of coffee produced by smallholders, and the high demand for coffee by overseas customers. The other contribution of this research appears to be in identifying the free rider

problem with respect to community benefits. This particular free rider issue, where a smallholder is a non member of the FT co-operative but has right to community benefit does not appear to have been discussed in the literature.

8.0 Reference

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Appendices

Appendix I Fair Trade Coffee Supply chains Interview Questionnaire for Smallholders, Co-operative and Exporter

Case 1 and 3: Interview Questionnaire for Smallholders

Smallholder's name: _____

A. Introduction

Good morning...I am doing a research on FT coffee supply chain and sales in order to find better ways of creating value and improve better returns to smallholder coffee producers. Can I speak to household head or person who decides coffee sales in your family?

B. Overview of Business

1. Would you kindly tell me about your self, family and daily activities you do?
 - a) Name of household head: :.....
 - b) Relations with household:
 - c) Number of family members:
 - d) Qualification?
 - e) Experience in coffee production? Describe
 - f) Years of farming coffee?
 - g) Do you make the decision in coffee sales?
 - h) Who else makes decision? If not, why?
 - i) Besides coffee, what other crops and livestock you produce for cash income?
 - j) What are other off-farm income activities or employment?
 - k) Do these other activities affect your coffee production? If so, how would you overcome it?
 - l) What activities generate most cash income to meet living cost of living?

C. Coffee Production

1. Describe your coffee garden
 - a) Describe your marketing resource
 - i) Physical
 - ii) Capital
 - iii) Land size
 - b) Coffee garden 1:
 - i) Age (years)?
 - ii) Area (ha)?
 - iii) Expected output (kg)
 - c) If not, please tell me in general about your coffee gardens:
 - i) Age (years)?
 - ii) Area (ha)?
 - iii) Expected output (kg)
2. Describe your coffee production
 - a) How do you carry out your production operations in:
 - i) Husbandry practices of growing coffee?
 - Planting?
 - Shade?
 - Weeding? (type and intervals/year)
 - Fertilizer application? (type and intervals/year)
 - Pruning? (type and intervals/year)
 - Insect control? (type and intervals/year)
 - Other coffee farming systems practices?
 - iii) Harvesting of coffee cherry according to standard procedures?
 - Cherry type?
 - Timing of harvesting?
 - Harvesting technique?
 - Materials used?
 - Methods used in cherry from field to the road side?
 - Interval of harvest/season?
3. Describe your coffee processing:

- a) Cherry pulping (Use of hand pulper or rudimentary technique) standard procedures?
 - b) Fermenting using standard procedures?
 - c) Fully washed using standard procedures?
 - d) Sun drying of parchment using standard procedures?
 - e) Bagging (handling)?
 - f) Storage (standard conditions and procedures)?
 - g) Delivery to parchment buyer's point?
 - h) What 'proportion' of your coffee production is growing coffee and increasing planting?
 - i) What 'proportion' is coffee processing (transforming cherry to parchment)?
4. Describe your cost of coffee production and processing.
- a. Coffee farm input cost: tools, fertilisers, herbicides, etc
 - b. Coffee processing (manual) machine: cost, age, life span, repair and maintenance cost (If the cooperative does not have these asset, proceed to c)
 - c. Fermenting and drying materials: cost, age, life span, and replacement cost
 - d. Hut storage. Describe whether there is a cost, or not.
 - e. Transport cost from farm to consolidating point. Who arrange and pay the cost?
 - f. Bagging materials: Cost of Jute bags, canvas, etc?
 - g. Hire of communal labour from village (Cost at weeding, pruning, fertilization, harvesting, pulping, washing & drying)?
 - h. Family labour (time spend at weeding, pruning, fertilization, harvesting, pulping, washing & drying in a coffee season or month)?
 - i. Other overhead cost: Postal services, Telephone, Electricity, etc
5. Describe what you do to deliver your coffee to the selling point
- a) What different coffee products (based on variety, location and parchment quality) do you supply to the immediate customer?
 - b) How do you ensure that your coffee meet high quality standard?
 - c) How much of your coffee is supplied to the immediate customer per week or month in a coffee season?
 - d) How much of each coffee product is not supplied (wastage) each week?
 - e) How does your coffee supply and wastage vary over the coffee season? Why?
 - f) How does your parchment buyer assess the quality of your coffee?
 - g) How does your parchment buyer assess the quantity (weighing?)

6. What are your constraints at:
 - a) Production?
 - b) Harvesting?
 - c) Processing?
 - d) Is there anything you think you could do to improve the production, harvesting and processing of your coffee?
 - e) If so, who do you think could provide you with information on how to do this?
7. Do you discuss techniques for production, harvesting, processing or transporting coffee with other growers?
 - a) If so, describe what you discuss and which growers (family, neighbours, etc) you discuss it with.
8. Do you cooperate with other growers in production, harvesting, processing or transporting coffee?
 - a) If so, describe what you do with other growers and which growers are these?

D. Coffee Selling

1. Where and who do you sell your coffee parchment to (FT Co-operative)?
 - a) How far is it from your coffee garden/home?
 - b) What means of transport do you use to get there?
 - c) How much time does it take you to get there?
2. How do you know when and where they are buying?
3. How do you know what their buying price is?
4. What does your FT co-operative buyer want?
 - a) Quality (e.g., grade, colour, size, etc)
 - b) Quantity
 - c) Continuity and timing of supply
 - d) Long standing relationship with supplier
 - e) Other FT attributes (list)
5. Do you know what the FT certification standards are?
 - a) If so, what are they?
6. Who checks the FT certification conditions?
7. What information does the FT co-operative provide you with on FT certification conditions?

8. What information does the FT co-operative provide you on what you need to do to meet the conditions of FT certification?
9. How did you find out what the FT co-operative buyer wanted?
10. Do you think that your FT co-operative buyer is satisfied with the coffee that you supply?
 - a) If not, what do you think you could do to better satisfy the FT co-operative buyer?
11. Do you sell all your coffee parchment all at the same time to the FT co-operative buyer?
 - a) If so, do you intend to keep selling to them?
12. Do you ever sell to other parchment buyers?
 - a) If so, why do you sell to these parchment buyers sometimes and not to the FT co-operative?
 - b) If you sell to other parchment buyers, how do you choose which buyers to sell to?
 - c) If you sell to other parchment buyers, how much (kgs or bags) do you sell to the FT co-operative buyer and how much (kgs or bags) do you sell to other parchment buyers?
13. Do you ever sell to other parchment buyers other than FT?
 - a) If so, how do you choose which parchment buyer to sell to?
 - b) If so, how much (kg or bags) do you sell to your regular parchment buyer and how much (kg or bags) do you sell to other parchment buyers?
 - c) Why do you sell to others?

E. Coffee Prices

1. When did you last sell coffee to the FT co-operative buyer (date)?
2. What price (per kg?/bag?) did you receive for this coffee?
 - c) Do you know if other smallholder coffee producers receive the same price, lower or higher prices for their parchment?
 - d) What would be the reasons for different prices received by different smallholders?
3. What would be the average price (per kg? bag?) for coffee sold to the FT co-operative buyer

- a) For this season?
 - b) For last season?
4. When you sell your coffee to the FT co-operative buyer, how are you paid?
 - a) When are you paid?
 - b) Are you satisfied with the timing of payment to you?
 - a) If so, say why?
 - b) If not, say why not?
 5. What other non-monetary benefits you get from FT?
 - a) If so, what are they?
 - b) How do you compare this with conventional chain?
 6. On average, how many times do you sell coffee in a season?
 7. On average, how much coffee (kg or bags) do you sell each time you sell coffee?
 8. On average, how much coffee (kg or bags) would you sell in total in a season?

F. FT Chain Participation

1. What were your reasons for becoming a member of the FT co-operative?
2. How did you find out about this chain?

G. Conclusion

1. How do you think you could improve your returns from your coffee production?

Case 1 and 3: Interview Questionnaire for FT Co-operative

FT Co-operative Members Name: _____

A. Introduction

Good morning....I am doing a research on FT coffee supply chain and sales in order to find better ways of creating value and improve better returns to smallholder coffee producers. Can I speak to Manager who makes decision on conventional coffee buying, price, transportation, warehousing, processing and export to overseas?

B. Overview of Business

1. How can smallholders become members of the Co-operative? Procedures
2. What conditions do they have to meet to become members of the Cooperative?
3. What are the FT conditions that smallholder members of the Co-operative have to meet?
4. Describe how cooperative got started?
5. What is the future plan and vision of the cooperative?

C. Your Coffee Co-operative's Operations

1. How do buy coffee? (i.e., do smallholders in the co-operative come to a central buying point?)
2. How do the smallholder cooperative members know when you are buying coffee?
 - a) If not, how do members agree on buying price?
3. How do smallholder members find out what your buying price is?
4. What happens when you buy?
 - a) How do you assess the quality of the coffee from smallholders?
 - b) How do you assess the quantity of the coffee from smallholders?
5. What are the steps after you buy coffee parchment from smallholder cooperative members?
 - a) Describe steps in processing, grading, etc). If any.
 - Machine drying of parchment coffee
 - Winnowing
 - Hauling
 - Grading
 - Bagging
 - b) Are there FT conditions that have to be met with your processing etc operations?
 - b) How do you grade and bag them (according to different variety, location (origin) grades or mix)?
 - c) How do you transport the coffee you buy to the exporter?
6. Describe what happens when you sell the coffee to the exporter.
 - a) How does the exporter assess the quality of the coffee that you are selling them?
 - b) How does the exporter assess the quantity (weighing)?

- b) How does the exporter assess the (internal -taste) quality of the coffee that you are selling them?
7. Is there anything you think you could do to improve the grading, processing or transporting of the coffee that you sell to the exporter?
 - a) If so, who do you think could provide you with information on how to do this?
 - b) If so, does the exporter provide you with information on how to do this?
 - c) Do you discuss techniques for grading or processing coffee with other partners in the FT chain?
 8. Do you cooperate with other coffee processors in transporting coffee?
 - a) If so, describe what you do with other processors?

D. Coffee Buying

1. How many smallholders are in your FT co-operative?
2. Do you buy coffee from all of them?
3. Do you ever buy coffee from smallholders who are not members of your FT cooperative?
4. What do you want when you are buying coffee parchment?
 - a) Quality (eg grade, colour, size, etc)
 - b) Quantity
 - c) Continuity and timing of supply
 - d) Other FT attributes
5. How do you check that FT certification conditions have been met?
6. What information do you give your smallholder members on what you want when buying coffee?
7. What information do you give your smallholder members on FT certification conditions?
8. Are you satisfied with the coffee that you get from your cooperative smallholder members?
 - a) If not, what do you think they could do to better satisfy you?
9. Is there anything you think your smallholder members could do to improve the coffee that they sell to you?
 - a) If so, who do you think could provide them with information on how to do this?
 - b) If so, do you provide them with any information on how to do this?

- c) If you provide them with information, what information do you give them?
- 10. If not, who do you think could provide them with information on how to do this?
- 11. Do you know if your smallholder cooperative members sell all their coffee to you?
 - a) If so, do you expect them to continue to sell all their coffee to you?
- 12. Do you think your smallholder cooperative members sell to other processors?
 - a) If so, how do you think they choose which processors to sell to?

E. Coffee Buying Prices

1. When did you last buy coffee from your smallholder cooperative members (date)?
2. What price (per kg?/bag?) did you pay for this coffee?
3. What would be the average price (per kg? bag?) that you paid for coffee
 - ii. This season?
 - iii. Last season?
4. When you buy your coffee, how do you pay your smallholder cooperative members?
5. When do you pay them? (From date of delivery)
6. Are they satisfied with the timing of your payment to them?
 - i. If so, why do you think this is?
 - ii. If not, why do you think this is?
7. Do other processors use different payment method? How frequent do they do that?
8. On average, how much coffee do you buy (kg or bags) each day in a season?
9. On average, how much coffee (kg or bags) would you buy in total in a season?
10. What sort of arrangement between you and smallholder cooperative member keep you together in business

F. Coffee Selling

1. Who do you sell your coffee to?
2. What does your buyer want when you are selling coffee to them?
 - i. Quality (e.g., grade, colour, size, etc)
 - ii. Quantity
 - iii. Continuity and timing of supply
 - iv. FT attributes
 - v. Other attributes

3. What information does your buyer give you on what they want?
4. Is your buyer satisfied with the coffee that you get from you?
 - a) If not, what do you think you could do to better satisfy them?
5. Does your buyer provide you with information on how you could better satisfy them?
 - a) If so, what information do they provide?
6. Do you sell to the same exporter each time and expect that you will keep selling to them?
7. Do you ever sell to other exporters?
 - a. If so, how do you choose which exporter to sell to?
 - b. If so, how much (kg or bags) do you sell to your regular buyer and how much (kg or bags) do you sell to other buyers?
8. Do you have waste before selling it to processors?
 - a) How much (portion) is the wastage before selling it to exporter?
 - b) How do you reduce waste?
 - c) Who else will reduce waste and how?

G. Coffee Selling Prices

1. When did you last sell coffee (date)?
2. What price (per kg?/bag?) did you receive for this coffee?
3. What would be the average price (per kg? bag?) that you received for coffee
 - a) This season?
 - b) Last season?
4. When you sell your coffee, how are you paid by the exporter?
5. When are you paid by them them?
6. Are you satisfied with the timing of their payments to you?
 - a) If so, why is this?
 - b) If not, why is this?
7. On average, how often do you sell coffee in a season?
8. On average, how much coffee do you sell (kg or bags) each time that you sell?
9. On average, how much coffee (kg or bags) would you sell in total in a season?

H. Alternative FT Chains

1. What are your reasons for setting up this FT chain?
2. How did you find out about FT coffee?

I. Conclusion

1. How do you think you could improve your returns from your coffee processing?

Case 1 and 3: Interview Questionnaire for FT Coffee Exporter

FT Exporter Actor's Name: _____

A. Introduction

Good morning...I am doing a research on FT coffee supply chain and sales in order to find better ways of creating value and improve better returns to smallholder coffee producers. Can I speak to Manager who makes decision on smallholder coffee price, processing and export to overseas?

B. Overview of Business

1. Would you kindly tell me about your self?
 - a. Qualification?
 - b. Experience?
 - c. Years of service?
2. Describe how the business got started?
3. What is the future plan and vision of business?

C. Coffee Exporting Operations

1. How do you buy coffee?
 - a) Do processors come to you?
 - b) Do you send agents to roadside or rural areas?
2. What resources do you have for this? (physical, capital, staff, materials, etc)
 - a) Describe physical, capital, labour, materials, etc
 - b) Describe qualification and skill level of firm
 - c) How do you find with the skilled worker or the lack thereof affects your parchment business performance?
 - d) Describe general overall operational cost per coffee season or year.
3. How do these people know that you are buying coffee?
4. How do people know when you are buying coffee?
5. How do people know what your buying price is?
6. What happens at the coffee buying coffee?
 - c) How do you assess the (physical) quality of the coffee that traders bring you?
 - d) How do you assess the quantity (wt) of the coffee that traders bring you?
 - c) How do you assess the internal (taste) quality of the coffee that processors bring you?
7. What are the steps in enhancing green bean after you buy coffee from processors?
 - a) Describe steps in grading, shipping etc)
 - Machine drying of parchment coffee
 - Winnowing
 - Hauling
 - Grading
 - Bagging
 - b) How do you transport the coffee you buy to the exporter?
 - c. How do you grade and bag them (according to different variety, location (origin) grades or mix)?
8. Describe what happens when you sell the coffee to the bulk buyers overseas
 - a) How does the importer assess the (physical) quality of the coffee that you are selling them?
 - e) How does the importer assess the (internal -taste) quality of the coffee that you are selling them?

- f) How does the importer assess the quantity (weighing)?
- 9. Is there anything you think you could do to improve the coffee that you sell overseas?
 - a) If so, who do you think could provide you with information on how to do this?
 - b) If so, does the exporter provide you with information on how to do this?
 - c) Do you discuss techniques for grading or processing coffee with other processors?
- 10. If so, who do you think could provide you with information on how to do this?
 - a) If so, describe what you do with other overseas buyers?

D. Coffee Buying

- 1. Who do you buy your coffee from?
 - a. Do you have particular processors that you buy from or will you buy from any processor?
- 2. What do you want when you are buying coffee?
 - a) Quality (eg grade, colour, size, etc)
 - b) Quantity
 - c) Continuity and timing of supply
 - d) Other attributes
- 3. What information do you give processors on what you want?
- 4. Are you satisfied with the coffee that you get from processors?
- 5. If not, what do you think they could do to better satisfy you?
- 6. Is there anything you think processors could do to improve the coffee that they sell to you?
 - a) If so, who do you think could provide them with information on how to do this?
 - b) If so, do you provide them with any information on how to do this?
 - c) If you provide them with information, what information do you give them?

7. Do you buy from the same processors each time and expect that they will keep selling to you?
8. Do you think processors sell to other exporters?
9. If so, how do you think they choose which exporters to sell to?

B. Coffee Buying Prices

1. When did you last buy coffee from your smallholder cooperative members? (date)
2. What price (per kg or bag) did you pay for this coffee?
3. What would be the average price (per kg? bag?) that you paid for coffee?
 - a) This season?
 - b) Last season?
4. It may be that the exporter pays different prices to different cooperatives: why are there price differences, what is this or seller attributes are these price differences based on?
5. Do you have contracts with cooperative to supply you with certain quantities and quality?
6. If so, do you have a fixed price for these contracts?
7. When you buy your coffee, how do you pay your smallholder cooperatives?
8. When do you pay them from date of delivery?
9. Are they satisfied with the timing of your payment to them?
 - a) If so, why do you think this is?
 - b) If not, why do you think this is?
10. On average, how much coffee do you buy (kg or bags) each day in a season?
11. On average, how much coffee (kg or bags) would you buy in total in a season?

12. What sort of arrangement between you and cooperative members keep you together in business?

C. Coffee Selling

1. In general, where does the coffee that you sell go to?
2. What does your buyer want when you are selling coffee to them?
 - a) Quality (e.g., grade, colour, size, etc)
 - b) Quantity
 - c) Continuity and timing of supply
 - d) Other attributes
3. What information does your buyer give you on what they want?
4. Is your buyer satisfied with the coffee that you get from you?
 - a) If not, what do you think you could do to better satisfy them?
5. Does your buyer provide you with information on how you could better satisfy them?
 - a) If so, what information do they provide?
6. Do you sell to the same buyers each time and expect that you will keep selling to them?
7. Do you ever sell to other importer or roasters overseas?
 - a) If so, how do you choose which importer to sell to?
 - b) If so, how much (kg or bags) do you sell to your regular buyer and how much do you sell to other buyers?
8. Do you have waste before selling to overseas buyers?
 - a) How much (portion) is the wastage before selling it to importer?
 - b) How do you reduce waste?
 - c) Who else will reduce waste and how?

D. Coffee Selling Prices

1. When did you last sell coffee (date)?
2. What would be the average price (per kg? bag?) that you received for coffee?
 - a) This season?
 - b) Last season?
3. When you sell your coffee, when are you paid by your buyers?
4. Are you satisfied with the timing of payments to you?
 - a) If so, why is this?
 - b) If not, why is this?
5. On average, how often do you sell coffee in a season?
6. On average, how much coffee do you sell (kg or bags) each time that you sell?
7. On average, how much coffee (kg or bags) would you sell in total in a season?

E. Conclusion

1. How do you think you could improve your returns from your coffee exporting?

Appendix II Conventional Coffee Supply chains Interview Questionnaire for Smallholders, Processor and Exporter

Case 2 and 4: Interview Questionnaire for Smallholders

Smallholder's name: _____

A) Introduction

Good morning....I am doing a research on FT coffee supply chain and sales in order to find better ways of creating value and improve better returns to smallholder coffee producers. Can I speak to household head or person who decides coffee sales in your family?

B) Overview of Business

1. Would you kindly tell me about yourself, family and daily activities you do?
 - a) Name of household head:
 - b) Relations with household:
 - c) Number of family members:
 - d) Qualification?
 - e) Experience in coffee production? Describe.
 - f) Years of farming coffee?
 - g) Do you make the decision in coffee sales?
 - h) Who else makes decision? If not, why?
 - i) Besides coffee, what other crops and livestock you produce for cash income?
 - j) What are other off-farm income activities or employment?
 - k) Do these other activities affect your coffee production? If so, how would you overcome it?
 - l) What activities generate most cash income to meet living cost of living?

C) Coffee Production

1. Describe your coffee garden
 - a) Describe your marketing resources and assets

- i) Physical
 - ii) Capital
 - iii) Land size
 - b) Coffee garden 1:
 - a. Age (years)?
 - b. Area (ha)?
 - c. Expected output (kg)
 - c) If not, please tell me in general about your coffee gardens:
 - iv) Age (years)?
 - v) Area (ha)?
 - vi) Expected output (kg)
2. Describe your coffee production
- a) How do you carry out your production operations in:
 - i) Husbandry practices of growing coffee?
 - Planting?
 - Shade?
 - Weeding? (type and intervals/year)
 - Fertilizer application? (type and intervals/year)
 - Pruning? (type and intervals/year)
 - Insect control? (type and intervals/year)
 - Other coffee farming systems practices?
 - iii) Harvesting of coffee cherry according to standard procedures?
 - Cherry type?
 - Timing of harvesting?
 - Harvesting technique?
 - Materials used?
 - Methods used in cherry from field to the road side?
 - Interval of harvest/season?
3. Describe your coffee processing
- h) Cherry pulping (Use of hand pulper or rudimentary technique) standard procedures?
 - i) Fermenting using standard procedures?
 - j) Fully washed using standard procedures?
 - k) Sun drying of parchment using standard procedures?

- l) Bagging (handling)?
 - m) Storage (standard conditions and procedures)?
 - n) Delivery to parchment buyer's point?
 - h) What 'proportion' of your coffee production is growing coffee and increasing planting?
 - i) What 'proportion' is coffee processing (transforming cherry to parchment)?
4. Describe your cost of coffee production and processing
- j. Coffee farm input cost: tools, fertilisers, herbicides, etc
 - k. Coffee processing (manual) machine: cost, age, life span, repair and maintenance cost (If the cooperative does not have these asset, proceed to c)
 - l. Fermenting and drying materials: cost, age, life span, and replacement cost
 - m. Hut storage. Describe whether there is a cost, or not.
 - n. Transport cost from farm to consolidating point. Who arrange and pay the cost?
 - o. Bagging materials: Cost of Jute bags, canvas, etc?
 - p. Hire of communal labour from village (Cost at weeding, pruning, fertilization, harvesting, pulping, washing & drying)?
 - q. Family labour (time spend at weeding, pruning, fertilization, harvesting, pulping, washing & drying in a coffee season or month)?
 - r. Other overhead cost: Postal services, Telephone, Electricity, etc
5. Describe what you do to deliver your coffee to the selling point
- a) What different coffee products (based on variety, location and parchment quality) do you supply to the immediate customer?
 - b) How do you ensure that your coffee meet high quality standard?
 - c) How much of your coffee is supplied to the immediate customer per week or month in a coffee season?
 - d) How much of each coffee product is not supplied (wastage) each week?
 - e) How does your coffee supply and wastage vary over the coffee season? Why?
 - f) How does your parchment buyer assess the quality of your coffee?
 - g) How does your parchment buyer assess the quantity (weighing?)
6. What are your main constraints at;
- a) Production?
 - b) Harvesting?
 - c) Processing?

- d) Is there anything you think you could do to improve the production, harvesting, and processing of your coffee?
- e) If so, who do you think could provide you with information on how to do this?
- 7. Do you discuss techniques for production, harvesting, processing or transporting coffee with other growers?
 - a) If so, describe what you discuss and which growers (family, neighbours, etc) you discuss it with.
- 8. Do you cooperate with other growers in production, harvesting, processing or transporting coffee?
 - a) If so, describe what you do with other growers and which growers are these?

D. Coffee Selling

1. Where do you go to sell your coffee parchment to?
 - a) How far is it from your coffee garden/home?
 - b) What means of transport do you use to get there?
 - c) How much time does it take you to get there?
2. How many parchment buyers are there at the buying point?
3. How do you choose which buyer to sell your coffee?
4. How do you know what their buying price is?
5. Are there price differences?
6. What are the bases for these price differences between buyers?
 - a) Quality of product
 - ii. Quantity of delivered parchment
 - iii. Timing of delivery
 - iv. Long standing relationship with supplier
7. Do you normally sell to the same buyer?
8. Do you intend to sell to the same buyer? Why?
9. How often has this happened this season (or last season) that you sold coffee to?
10. Why did you sell to another parchment buyer?
11. Has the parchment buyer ever rejected part or all of your coffee that you offer? If so, why?
12. Has it ever happened that you don't want to sell to certain parchment buyers? If so, why?

13. What does your parchment buyer want?
 - a) quality (eg grade, colour, size, etc)
 - b) quantity
 - c) continuity and timing of supply
 - d) other attributes
14. How do you know what your parchment buyer wants?
15. What information does your parchment buyer give you on what they want?
16. Do you think that your parchment buyer is satisfied with the coffee that you supply?
 - a) If not, why?
 - b) What do you think you could do to your coffee to better satisfy your parchment buyer?
17. Does your parchment buyer make suggestions on husbandry, harvesting, processing or transporting practices to you?
 - a) If so, what suggestions have they made?
 - b) If not, why?
18. Do you sell to the same parchment buyer each time and intend to keep selling to them?
19. Do you ever sell to other parchment buyers?
 - d) If so, how do you choose which parchment buyer to sell to?
 - e) If so, how much (kg or bags) do you sell to your regular parchment buyer and how much (kg or bags) do you sell to other parchment buyers?

E. Coffee Prices

1. When did you last sell coffee (date)?
2. What price (per kg?/bag?) did you receive for your coffee?
 - a) Do you know if other smallholder coffee producers receive the same price, lower or higher prices for their parchment?
 - b) What would be the reasons for different prices received by different smallholders?
3. What would be the average price (per kg? bag?)
 - a) For this season?
 - b) For last season?
4. When you sell your coffee, how are you paid and when are you paid?
5. Are you satisfied with the timing of payment to you?

- a) If so, say why
 - b) If not, say why not?
6. On average, how many times do you sell coffee in a season?
 7. On average, how much coffee (kg or bags) do you sell each time you sell coffee?
 8. On average, how much coffee (kg or bags) would you sell in total in a season?

F. Alternative FT Chains

1. Do you know about the FT or specialty coffee chains? If so, what do you know about it?
2. If you know about this chain, would you consider selling your coffee through it?
3. Do you know what you would have to do as a producer to sell into this chain?

F. Conclusion

1. How do you think you could improve your returns from your coffee production?

Case 2 and 4: Interview Questionnaire for Conventional Processor

Processor's name: _____

J. Introduction

Good morning....I am doing a research on FT coffee supply chain and sales in order to find better ways of creating value and improve better returns to smallholder coffee producers. Can I speak to Manager who makes decision on conventional coffee buying, price, transportation, warehousing, processing and export to overseas?

K. Overview of Business

1. Would you kindly tell me about your self?
 - d. Qualification?
 - e. Experience?
 - f. Years of service?

2. Describe how the business got started?
3. What is the future plan and vision of business?

L. Coffee Processing Operation

2. How do you buy coffee?
 - a) Do traders come to you?
 - b) Do you send agents out to roadside or rural areas?
2. What resources do you have for this? (Physical, capital, staff, materials, etc)
 - a) Describe physical, capital, labour, materials, etc
 - b) Describe qualification and skill level of firm
 - c) How do you find with the skilled worker or the lack thereof affects your parchment business performance?
 - d) Describe general overall operational cost per coffee season or year.
3. How do these people know that you are buying coffee?
4. How do people know when you are buying coffee?
5. How do people know what your buying price is?
6. What happens when you buy?
 - a) How do you assess the quality of the coffee that traders bring you?
 - b) How do you assess the quantity of the coffee that traders bring you?
7. What are the steps after you buy coffee parchment from traders?
 - a) Describe steps in processing, grading, etc)
 - Machine drying of parchment coffee
 - Winnowing
 - Hauling
 - Grading
 - Bagging
 - b) How do you transport the coffee you buy to the exporter?
 - c) How do you grade and bag them (according to different variety, location (origin) grades or mix)?
8. Describe what happens when you sell the coffee to the exporter
 - a) How does the exporter assess the (physical) quality of the coffee that you are selling them?

- b) How does the exporter assess the (internal -taste) quality of the coffee that you are selling them?
 - c) How does the exporter assess the quantity (weighing)?
9. Is there anything you think you could do to improve the grading, processing or transporting of the coffee that you sell to the exporter?
- a) If so, who do you think could provide you with information on how to do this?
 - b) If so, does the exporter provide you with information on how to do this?
 - c) Do you discuss techniques for grading or processing coffee with other processors?
10. Do you cooperate with other processors in transporting coffee?
- a) If so, describe what you do with other processors?

M. Coffee Buying

1. Who do you buy your coffee from?
2. What do you want when you are buying coffee parchment?
 - a) Quality (e.g., grade, colour, size, etc)
 - b) Quantity
 - c) Continuity and timing of supply
 - d) Other attributes
3. What information do you give traders on what you want?
4. Are you satisfied with the coffee that you get from traders?
5. If not, what do you think they could do to better satisfy you?
6. Is there anything you think parchment traders could do to improve the coffee that they sell to you?
 - a) If so, what are the main constraints to improve?
 - b) Would they get rewarded for doing so?
 - c) If so, do you provide them with any information on how to do this?
 - d) If you provide them with information, what information do you give them?
7. If not, who do you think could provide them with information on how to do this?
8. Do you buy from the same traders each time and expect that they will keep selling to you?
9. Do you think traders sell to other processors?
 - a) If so, how do you think they choose which processors to sell to?

N. Coffee Buying Prices

1. When did you last buy coffee (date)?
2. What price (per kg?/bag?) did you pay for this coffee?
3. It may be that they pay different prices to different producers: why are there price differences, what is the range of prices; on what product or seller attributes are these price differences based on?
4. What would be the average price (per kg? bag?) that you paid for coffee
 - a) This season?
 - b) Last season?
5. When you buy your coffee, how do you pay parchment traders?
6. When do you pay them and time after delivery?
7. Do other processors use different payment method? How frequent do they do that?
8. Are they satisfied with the timing of your payment to them?
 - a) If so, why do you think this is?
 - b) If not, why do you think this is?
9. On average, how much coffee do you buy (kg or bags) each day in a season?
10. On average, how much coffee (kg or bags) would you buy in total in a season?
11. Do you have any contract or other arrangement with parchment traders?

O. Coffee Selling

1. Who do you sell your coffee to?
2. What does your buyer want when you are selling coffee to them?
 - a) Quality (e.g., grade, colour, size, etc)
 - b) Quantity
 - c) Continuity and timing of supply
 - d) Other attributes
 - e) Is there a price difference based on these attributes?
3. What information does your buyer give you on what they want?
4. Is your buyer satisfied with the coffee that you get from you?
 - a) If not, what do you think you could do to better satisfy them?
5. Does your buyer provide you with information on how you could better satisfy them?

- a) If so, what information do they provide?
- 6. Do you sell to the same exporter each time and expect that you will keep selling to them?
- 7. Get an idea of the options that the processor has.
 - a) How many exporters are there to sell to?
 - b) Will all exporters accept this product; do different exporters have different requirements?
 - c) Does it happen that processors don't accept the product? Why?
- 8. Do you ever sell to other exporters?
 - a) If so, how do you choose which exporter to sell to?
 - b) If so, how much (kg or bags) do you sell to your regular buyer and how much (kg or bags) do you sell to other buyers?
 - c) How much waste do you have each season? Why?
 - d) How do you reduce waste?
 - e) Who else will reduce waste and how?

P. Coffee Selling Prices

- 1. When did you last sell coffee (date)?
- 2. What price (per kg?/bag?) did you receive for this coffee?
 - a) Are there different prices for different attributes? What attributes can result in different prices?
- 3. What would be the average price (per kg? bag?) that you received for coffee
 - a) This season?
 - b) Last season?
- 4. When you sell your coffee, how are you paid by the exporter?
- 5. When are you paid by them?
- 6. Are you satisfied with the timing of their payments to you?
 - a) If so, why is this?
 - b) If not, why is this?
- 7. On average, how often do you sell coffee in a season?
- 8. On average, how much coffee do you sell (kg or bags) each time that you sell?
- 9. On average, how much coffee (kg or bags) would you sell in total in a season?

Q. Alternative FT Chain

1. Do you know about the FT and specialty chains? If so, what do you know about it?

R. Conclusion

1. How do you think you could improve your returns from your coffee processing?

Case 2 and 4: Conventional Coffee Exporter

Conventional Export actor's Name: _____

A. Introduction

Good morning....I am doing a research on FT coffee supply chain and sales in order to find better ways of creating value and improve better returns to smallholder coffee producers. Can I speak to Manager who makes decision on smallholder coffee price, processing and export to overseas?

B. Overview of Business

1. Would you kindly tell me about your self?
 - g. Qualification?
 - h. Experience?
 - i. Years of service?
2. Describe how the business got started?
3. What is the future plan and vision of business?

C. Coffee Exporting Operations

1. How you do buy coffee?
 - c) Do traders come to you?
 - d) Do you send agents out to roadside or rural areas?
2. What resources do you have for this? (physical, capital, staff, materials, etc)

- a) Describe physical, capital, labour, materials, etc
 - b) Describe qualification and skill level of firm
 - c) How do you find with the skilled worker or the lack thereof affects your parchment business performance?
 - d) Describe general overall operational cost per coffee season or year.
3. How do these people know that you are buying coffee?
 4. How do people know when you are buying coffee?
 5. How do people know what your buying price is?
 6. What happens when you buy?
 - a) How do you assess the (physical) quality of the coffee that traders bring you?
 - b) How do you assess the quantity (wt) of the coffee that traders bring you?
 - c) How do you assess the internal (taste) quality of the coffee that processors bring you?
 7. What are the steps after you buy coffee from processors?
 - a) (Describe steps in grading, shipping etc)
 - Machine drying of parchment coffee
 - Winnowing
 - Hauling
 - Grading
 - Bagging
 - b) How do you transport the coffee you buy to the exporter?
 - c) How do you grade and bag them (according to different variety, location (origin) grades or mix)?
 8. Describe what happens when you sell the coffee to the bulk buyers overseas
 - a) How does the importer assess the (physical) quality of the coffee that you are selling them?
 - b) How does the importer assess the (internal -taste) quality of the coffee that you are selling them?
 - c) How does the importer assess the quantity (weighing)?
 9. Is there anything you think you could do to improve the coffee that you sell overseas?
 - a) If so, who do you think could provide you with information on how to do this?
 - b) If so, does the exporter provide you with information on how to do this?
 - c) Do you discuss techniques for grading or processing coffee with other processors?

- 10 If so, who do you think could provide you with information on how to do this?
 - a) If so, describe what you do with other overseas buyers?

D. Coffee Buying

1. Who do you buy your coffee from?
2. Do you have particular processors that you buy from or will you buy from any processor?
 - a) Quality (e.g., grade, colour, size, etc)
 - b) Quantity
 - c) Continuity and timing of supply
 - d) Other attributes
3. What do want when you are buying coffee?
4. What information do you give processors on what you want?
5. Are you satisfied with the coffee that you get from processors?
6. If not, what do you think they could do to better satisfy you?
7. Is there anything you think processors could do to improve the coffee that they sell to you?
 - e) If so, what are the main constraints to improve?
 - f) Would they get rewarded for doing so?
 - g) If so, do you provide them with any information on how to do this?
 - h) If you provide them with information, what information do you give them?
8. If not, who do you think could provide them with information on how to do this?
9. Do you buy from the same traders each time and expect that they will keep selling to you?
10. Do you think traders sell to other processors?
11. Do you think processors sell to other exporters?
 - a) If so, how do you think they choose which exporters to sell to?

E. Coffee Buying Prices

1. What would be the average price (per kg? bag?) that you paid for coffee(Note: you may not be able to ask or to get this information)

2. It may be that they pay different prices to different producers: why are there price differences, what is the range of prices; on what product or seller attributes are these price differences based on?
3. What would be the average price (per kg? bag?) that you paid for coffee
 - a) This season?
 - b) Last season?
2. Do you have contracts with processors to supply you with certain quantities and quality?
3. If so, do you have a fixed price for these contracts?
4. When you buy your coffee, how do you pay processors?
5. When do you pay them?
6. Are they satisfied with the timing of your payment to them?
 - a) If so, why do you think this is?
 - b) If not, why do you think this is?
7. On average, how much coffee do you buy (kg or bags) each day in a season?
8. On average, how much coffee (kg or bags) would you buy in total in a season?

F. Coffee Selling

1. In general, where does the coffee that you sell go to?
2. What does your buyer want when you are selling coffee to them?
 - a. Quality (eg grade, colour, size, etc)
 - b. Quantity
 - c. Continuity and timing of supply
 - d. Other attributes
 - e. Is there a price difference based on these attributes?
3. What information does your buyer give you on what they want?
4. Is your buyer satisfied with the coffee that you get from you?
 - a) If not, what do you think you could do to better satisfy them?
5. Does your buyer provide you with information on how you could better satisfy them?
 - a) If so, what information do they provide?
6. Do you sell to the same buyers each time and expect that you will keep selling to them?

G. Coffee Selling Prices

1. What would be the average price (per kg? bag?) that you received for coffee (You may not be able to ask this question or get an answer to it)
 - a) This season?
 - b) Last season?
2. When you sell your coffee, when are you paid by your buyers?
3. Are you satisfied with the timing of payments to you?
 - a) If so, why is this?
 - b) If not, why is this?
4. On average, how often do you sell coffee in a season?
5. On average, how much coffee do you sell (kg or bags) each time that you sell?
6. On average, how much coffee (kg or bags) would you sell in total in a season?

H. Conclusion

1. How do you think you could improve your returns from your coffee exporting?