



Australian Government

**Australian Centre for
International Agricultural Research**

project

Securing the profitability of the Toraja coffee industry

SADI-ACIAR research report

date published

October, 2007

prepared by

Tony Marsh
Coffee Consultant

Jeff Neilson
University of Sydney

approved by

David Shearer



Australia Indonesia Partnership

Kemitraan Australia Indonesia



ACIAR's participation in the Australia–Indonesian Partnership

The Australia Indonesia Partnership (AIP), comprising \$500 million in grants and \$500 million in highly concessional loans over five years, was announced in January 2005. The partnership supports Indonesia's reconstruction and development efforts, both in and beyond tsunami-affected areas. Assistance involves long-term sustained cooperation focused on economic and social development projects and Indonesia's programs of reform and democratisation.

ACIAR is committed to the partnership through the management of a component of the Smallholder Agribusiness Development Initiative (SADI), which aims to improve rural sector productivity and growth in four Eastern provinces—East Nusa Tenggara, West Nusa Tenggara, South East Sulawesi and South Sulawesi.

This initiative will improve incomes and productivity for farmers and agribusiness in response to market opportunities, through a process that is underpinned by improved adaptive research and development capacity.

ACIAR's role in the initiative is to strengthen province-based agricultural research and development capacity that is market and client-driven, and effectively transfers knowledge to end users. A key part of this approach is delivered through market-driven adaptive projects which are priorities for smallholders, farmer groups, agribusiness, government and other supporting agencies.

project number SMAR/2007/200

ISBN 978 1 921434 10 5

published by ACIAR
 GPO Box 1571
 Canberra ACT 2601
 Australia

This publication is published by ACIAR ABN 34 864 955 427. Care is taken to ensure the accuracy of the information contained in this publication. However ACIAR cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the publication. You should make your own enquiries before making decisions concerning your interests. Reproduction in whole or in part of this publication is prohibited without prior written consent of ACIAR.

Contents

1	Acknowledgments	4
2	Executive summary	5
3	Introduction.....	6
4	The Sulawesi Coffee Industry.....	6
4.1	Background.....	6
4.2	Major Coffee Producing Districts of Sulawesi.....	9
4.3	International Trade in Sulawesi Coffee.....	20
5	Issues of Relevance to the Sulawesi Coffee Industry	24
5.1	Low Farm Yields	24
5.2	Demand for Certified Coffee	25
5.3	Processing and Cup Quality	25
5.4	Geographical Authenticity	26
5.5	Risks of a Single-buyer	27
5.6	Post-harvest Processing and Value-adding.....	27
5.7	Coffee Varieties	28
5.8	Pest and Disease.....	29
5.9	Empowerment of Farmers Groups / Industry Associations	30
5.10	Prices and Value Chain Analysis.....	31
6	Recommendations for future development.....	32
6.1	Industry Partnership.....	32
6.2	Socio-economic Research on Farmer Decision-making Processes.....	33
6.3	Promoting Good Agricultural Practices and Environmental Sustainability	35
6.4	Construction of Physical Quality in Sulawesi.....	36
6.5	Regional Branding and Geographical Protection.....	37
6.6	Data Collection and Computer Mapping.....	38

1 Acknowledgments

The authors acknowledge the role of a number of organisations and individuals who provided essential input for this study. We are particularly appreciative of the time and support offered by the industry actors who shared their knowledge of the Sulawesi coffee industry with us.

In this regard we would like to mention Sam Filiaci, Kornel Gartner, Frans Honga Halim, Andi Yusril Iskandar, Amien Jabir, Frenky Jamal, Johannes Pasang, Keiji Sato, Hendra Suwiptandy, Acis Tomaso, and Sarjana.

The Provincial and District offices of the Directorate General of Estate Crops also provided valuable input and assistance with field activities, and we would like to thank Aris, Harli, Jakobus Lele, Karya Yunus, and Agus Sofyan in this regard.

Similarly, the Department of Trade in Makassar was particularly forthcoming with the provision of export data on which our analysis relied.

A number of individual coffee farmers across Toraja and Enrekang were also willing to spare their time to discuss with us their views on industry development, for which we are appreciative.

Finally, we would like to acknowledge the assistance of Medi, who accompanied us during the March visit, as well as on numerous field visits prior to that.

2 Executive summary

Sulawesi coffee accounts for only a fraction of Indonesia's total coffee exports (about 2%), and yet this regional production centre is an important supplier of the rapidly growing international specialty coffee sector. Coffee roasters, in the key markets of Japan and the United States, coordinate global supply chains to ensure access to high-quality Arabica coffee grown by smallholders in upland Sulawesi. Competition amongst buyers can be intense, particularly in the preferred growing District of Tana Toraja (widely known simply as 'Toraja'). Despite substantial foreign investment in both plantations and milling operations in the District, annual production in Toraja is limited to some 2,000 tonnes and yields are very low by global standards (perhaps only 150kg of processed green beans per hectare). Given the strong international demand for this coffee, there exists significant potential to raise rural incomes through: i) enhanced farm productivity, and ii) improved farmer organisation leading to improved prices. There are, however, major constraints to increasing farm productivity in Toraja, and current farm-gate prices are already some of the highest in the world.

The estimated size of the southern Sulawesi Arabica coffee industry is 7,000 tonnes, with production spread across the Districts of Toraja, Enrekang, Gowa and Sinjai in South Sulawesi, and in the Mamasa District of West Sulawesi. Exports are channelled through the Makassar port (official data suggests annual exports averaging between 3,000 and 4,000 tonnes over the last five years), with some interregional trade to Surabaya, Jakarta and Medan. A smaller volume of Robusta coffee (roughly estimated at 3,000 tonnes) is also produced in South and West Sulawesi, which for the most part is consumed locally (less than 500 tonnes is currently exported).

Shifting consumer demands in major world coffee markets have resulted in the emergence of various certification schemes related to sustainable coffee production. This wider development is now starting to exert a major influence on the way coffee is produced and traded in Sulawesi. The increasingly small numbers of active coffee exporters in Makassar are moving to initiate tightened upstream linkages with growers to ensure an adequate supply of high quality coffee, and to facilitate impending certification requirements. Farmer organisations in the coffee districts of Sulawesi are poorly developed at present and coffee farmers are not linked to a functioning extension service. The increasing willingness of several major buyers, therefore, to engage directly with coffee farmers in Sulawesi suggests the potential for developing an 'Industry Partnership' focused around farmer access to improved technologies. A potential threat to the competitive buying environment in Sulawesi coffee markets, however, is the potential for certification processes to lead to the capture of producer groups by downstream interests.

Whilst most industry actors agree that the market could easily absorb increased production from Toraja, the challenges to improving yields are substantial. Farm-gate prices in the markets of northern Toraja have increased from an average of Rp3,300 / litre in 2003 to Rp8,000 / litre in 2006, due to a combination of rising world markets and increasing buyer interest. And yet, these prices have not stimulated a corresponding heightened interest in improved coffee cultivation. Whilst new coffee plantings are evident adjacent to, and often within, the remote forest areas of Toraja, this reflects a continued extensification of agriculture rather than a shift to more efficient production. A key issue is the need to better understand farmer decision-making processes and incentive structures within Toraja to encourage improved farm practices, mitigate against deforestation, and ultimately increase productivity and household income.

The legal protection of the *Toraja* or *Kalosi* trade names, through the establishment of a Geographical Indication (GI), offers the potential to increase value retained within the growing community. However, the establishment and monitoring costs of such an activity would be substantial, and current institutional settings within Sulawesi are probably not yet

conducive for such a development. Effective regional brand management within specialty coffee markets is certainly vital in the long term, and the development of industry support structures should be considered to assist the industry move in this direction.

3 Introduction

The primary objectives of this report are to:

1. Identify and prioritise constraints affecting the profitability of the coffee industry in Toraja
2. Understand the capacity of the industry and supporting agencies to contribute to regional development in Toraja for the benefit of coffee smallholders
3. Provide recommendations on how these constraints can be addressed
4. Identify potential collaborators in Indonesia and Australia for future SADI project(s) in Eastern Indonesia.

The initial geographical focus was to be the Toraja District of South Sulawesi. However, Toraja is only one producing centre (albeit a strategically important one) within a regional coffee industry converging on Makassar (as the key export node) and including a number of growing Districts across South and West Sulawesi. Therefore, whilst a focus on Toraja has been maintained, an attempt has also been made to situate Toraja within this wider regional industry by including an overview of these production systems.

It should also be acknowledged that current exports from Makassar are overwhelmingly dominated by Arabica coffee, and that the international reputation of Sulawesi coffee in specialty markets is based on the Arabica variety. Apart from a brief discussion of Robusta production and trade, much of this report is therefore focused on the Arabica coffee sub-sector.

4 The Sulawesi Coffee Industry

4.1 Background

Coffee was already a major export commodity from Makassar in the mid 19th century, when production was concentrated in government lands near Makassar, around the present-day District of Gowa (Figure 1). A secondary area was located further north near Pare-Pare, including the present-day Districts of Enrekang, Toraja and Mamasa. The product from these northern districts was commonly traded as *Boengie*¹ coffee, a 'fancy' grade which demanded a premium price in international markets. Whilst production in the southern area was severely affected by leaf rust in the 1880s, production of high quality Arabica continued in Toraja and Enrekang. By 1973 however, following the disruptions of war and regional unrest, only 120 tonnes of Arabica (along with 560 tonnes of Robusta coffee) was exported from Makassar. In this post-colonial period, the designation *Kalosi* (a trading town supporting a coffee-growing hinterland in Enrekang District) became a popular trade name for this coffee instead of *Boengie*.

An important player in the post-war recovery of the regional coffee industry was the Japanese coffee company, Kimura Coffee Co. Ltd (later Key Coffee). In 1977, through a

¹*Boengie* was the name of a small trading port south of Polewali, from which prahu sailing vessels transported the coffee to Makassar for export until at least 1890. Even after trade ceased to flow through this port, the Boengie name continued to be used for at least another 50 years because of the strong market recognition of this name.

Sulawesi-based joint venture, PT Toarco Jaya established an estate and a smallholder buying station in Toraja (Figure 3). The 'Toarco' name is an acronym of 'Toraja Arabica Coffee', and *Toarco Toraja* became a trademarked flagship product for Key Coffee. The company was pivotal in promoting the *Toraja* designation in international coffee markets, particularly in Japan, where they hold an exclusive trademark over the use of the *Toraja* name. The company was also influential in changing local processing techniques, in particular through encouraging farmers to wet-process their coffee.

More recently, Sulawesi coffee has become a favoured origin in the rapidly expanding international specialty coffee market in the United States. Annual Arabica exports from Makassar increased from an average of less than 400 tonnes in the 1980s to around 2,000 tonnes throughout the 1990s (Figure 2), with the US emerging as the dominant market. This demand has fuelled the increased upstream influence of various international coffee companies. In 1998, a major mill was established in Toraja, through a joint venture between the US-based Cooperative Business International (CBI) and two local partners. This operation is known locally as the 'KUD' after one of these partners. In 2003, another internationally-funded investor, CV. Lion Lestari (for a period aligned with the US-based Holland Coffee Group) also established a strong buying presence in the Toraja district (with a mill in Makassar). A key driver in these upstream developments has been the substantial purchasing power of the Starbucks Coffee Company, which is thought to now buy as much as 50% of the total Sulawesi crop.

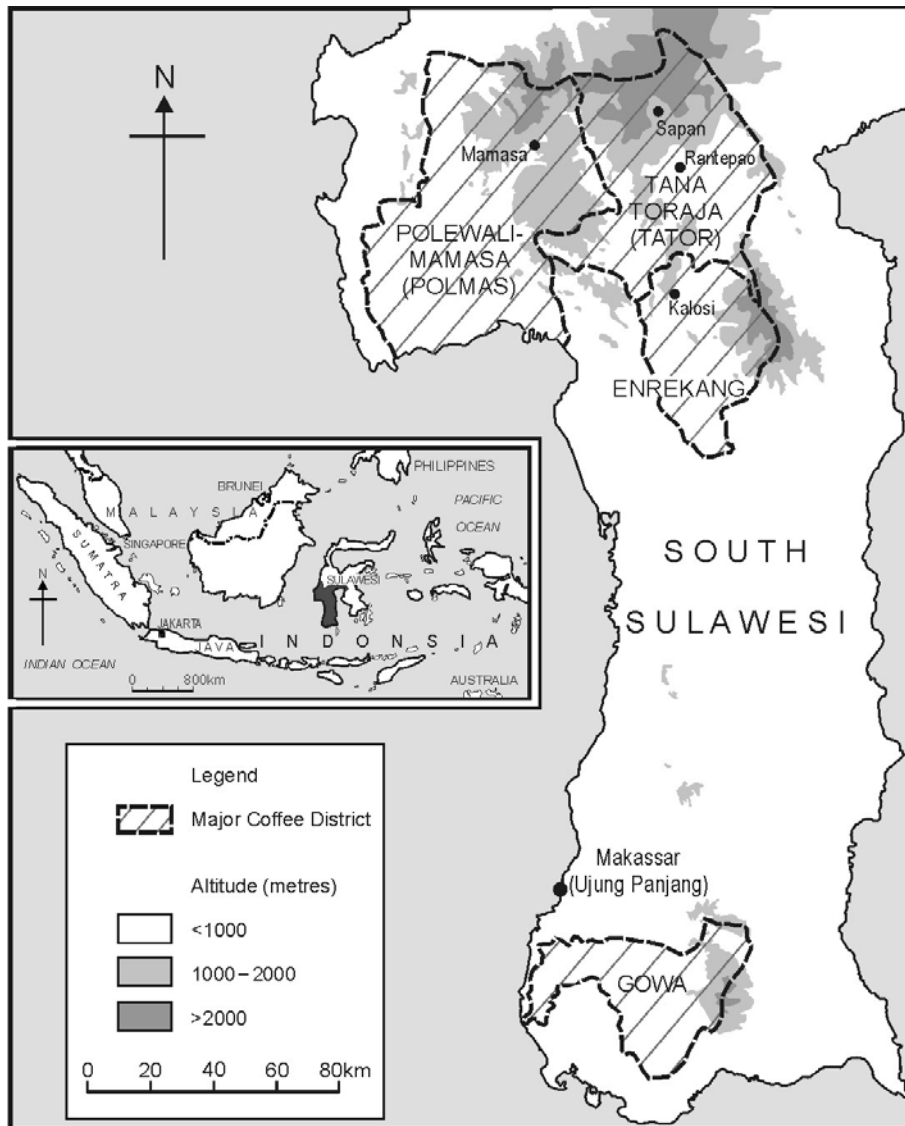
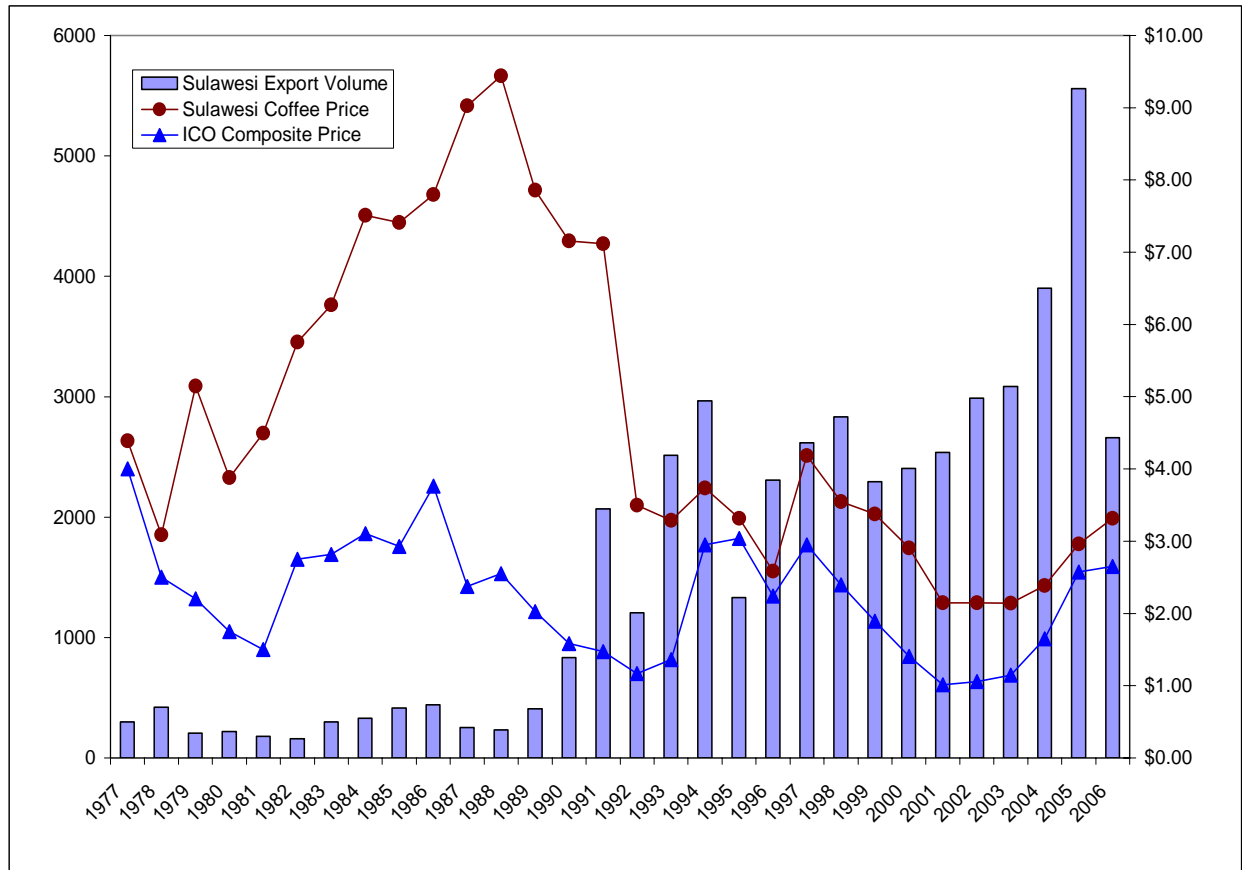


Figure 1. Coffee Map of Sulawesi



(Sources: Office of the Department of Trade, Makassar, BPS, and www.ico.org)

Figure 2. Growth in Arabica Exports from Makassar (Values in tonnes and USD/kg)

4.2 Major Coffee Producing Districts of Sulawesi

Whilst the total volume of annual Arabica exports from Makassar (around 4,000 tonnes) is still modest by global standards, coffee production dominates the local economies where it is grown. Within South Sulawesi, the major Arabica-producing Districts are Toraja and Enrekang in the northern complex (with smaller volumes in North Luwu / Seko), and Gowa and Sinjai in the southern complex. A significant volume of coffee is also produced in the Mamasa District of the newly formed West Sulawesi Province. Official production statistics are not based on detailed field surveys and tend to overestimate production by up to 300%. Based on field observations, traded volumes at local markets, demographics and average yields, and estimates made by various industry participants, Table 1 is considered to be a fairly accurate account of Sulawesi coffee production.

Table 1. Annual Production Estimates for major Sulawesi Coffee Districts (Tonnes)

District	Arabica	Robusta
Tana Toraja	(Smallholders) 1,500 (Estates) 500	500
Enrekang	2,000	200
Mamasa	2,000	1,000
North Luwu	300	500
Polewali	0	300
Gowa	500	200
Bantaeng	200	300
Sinjai	200	500
Total	7,200	3,500

4.2.1 Coffee Production, Processing and Trade in the Toraja District

Coffee production systems in Toraja are distinct within the various sites of Sulawesi coffee production, and are generally believed to produce a higher quality final product. The heart of smallholder production in Toraja is in the north (Plate 1), which is estimated to account for 70% of the District's production, with a further 25% grown in the southern area around Getengan and Buntu, and about 5% grown in the western sub-district of Bittuang (Figure 3).

The landscape of northern Toraja is dominated by three parallel highland valleys, each with an associated market that serves as a collection point for the coffee at Minanga, Sapan and Barrupu villages. A fourth central market is also located at Ke'pe (Figure 3). The coffee growing villages are mostly located above 1,500 metres altitude and generally have very poor road accessibility (using 4WD vehicles, it can take more than two hours to reach these villages from the central town of Rantepao). Coffee plots in northern Toraja are generally found in fairly close proximity to the village hamlet, and may consist of only a few hundred trees. Crop maintenance is minimal, and frequently the only labour input is during the harvesting and processing of cherries. Coffee trees are rarely capped or pruned. Farmers rarely apply synthetic fertilisers, although manure from adjacent pigpens and buffalo stables may sometimes be applied. Almost all plots are planted under a thin shade cover of *dadap* trees (*Erythrina lithosperma*), and sometimes intermixed under jackfruit, avocado, *uru* timber species, rambutan, tamarind, and sugar palm. Yields are low, and estimated to average between 100 to 200 kg (GBE²)/ha.

² GBE (Green Bean Equivalent) is used when volumes are actually based on another stage of processing such as red cherries or parchment coffee, and a conversion has been made to green beans.

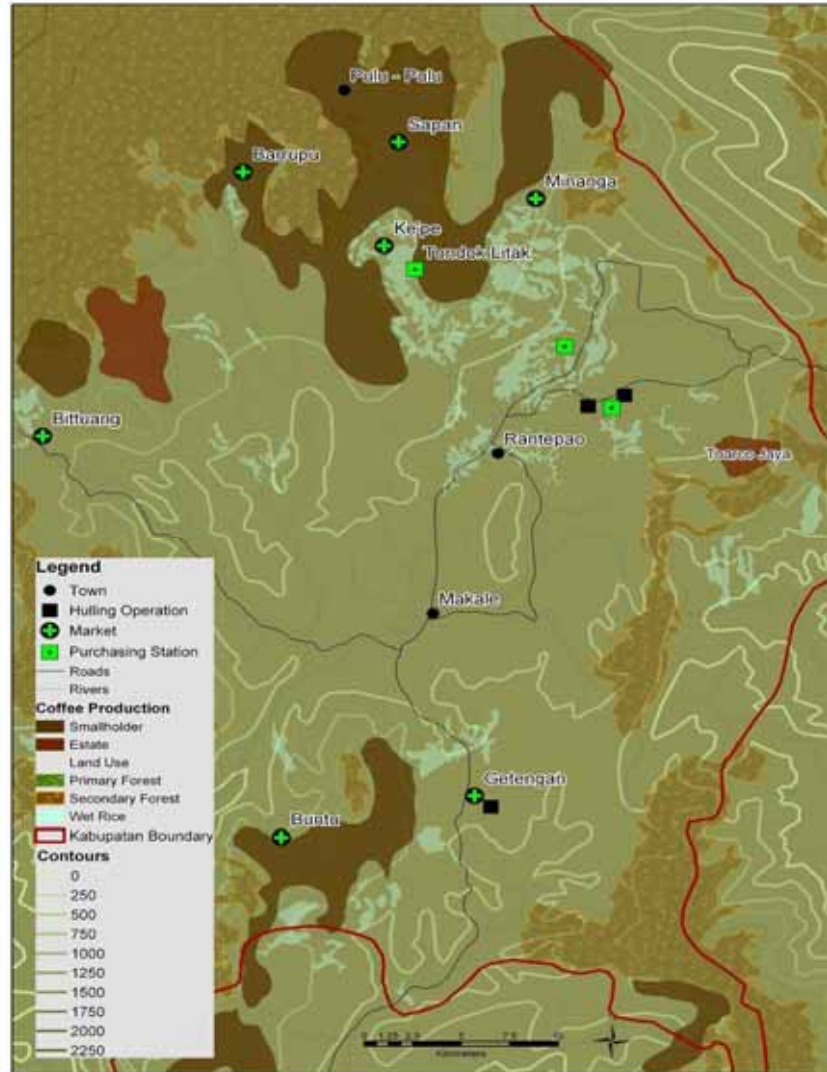


Figure 3. Coffee Map of Toraja District



Plate 1. Coffee Growing Landscape in northern Toraja



Plate 2. Hand Pulping in Toraja



Plate 3. Sun Drying in northern Toraja

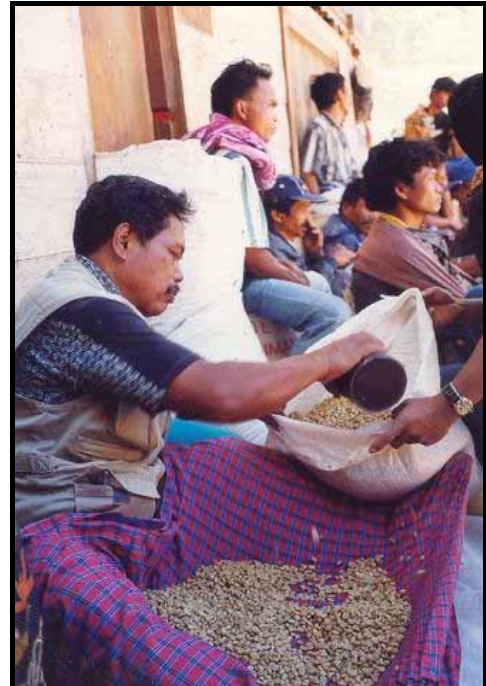


Plate 4. Measuring Coffee in the Sapan Market

Production in southern and western Toraja is similar to northern Toraja, although it is often part of a more diverse farm system, and coffee is not grown at the same consistently high altitudes as in northern Toraja. Production areas in western Toraja merge with those in Mamasa, and those in the south merge with Enrekang (Figure 3), with significant trade across these administrative boundaries. Coffee grown in northern Toraja is generally believed by buyers to be superior in quality compared to western and southern Toraja.

The peak coffee harvest in Toraja occurs between May and August. Generally, only ripe cherries are picked, and trees can be picked over four or five rounds throughout the harvest. Most households in northern Toraja possess a wooden hand-powered pulping machine (Plate 2), and cherry pulping is rarely delayed more than a night. The wet parchment coffee is then usually 'fermented' overnight in buckets, plastic bags or sacks, although this is a fairly haphazard affair and varies considerably between individual farmers. Some farmers ferment for a second night, although this is done frequently because weather conditions do not permit immediate drying. Growers will then wash the coffee the following day to remove the mucilage. The parchment coffee is sun-dried by the grower for four to five hours (Plate 3). This semi-dried parchment coffee is then traded at local markets. An estimated 5,000 families depend primarily on coffee for cash income in northern Toraja, and no other cash crops are widely grown in these villages.

Traditional markets in Toraja are held on six-day cycles, with different villages hosting markets on different days within a particular cycle. Names of the days in the six-day Toraja week are commonly borrowed from the local market on which they fall. The seven main Arabica coffee markets in Toraja are shown in Figure 3. During the peak coffee harvest, around 30,000 litres of parchment coffee (10,000 kilograms GBE) is commonly traded daily at each of the major markets. Farmers generally transport their own produce to the market, in hand-carried sacks, strapped to horseback or sometimes pooled together in old 4WDs.

Village traders (known locally as *pa'sambu* or *tengkulak*) wait on the outskirts of the market to intercept coffee carried by farmers. The coffee is measured on an open sarong (*sambu*) using a one litre measuring tin (Plate 4). This process allows the *tengkulak* to

make a brief inspection and quality estimation of the coffee prior to purchase. The *tengkulak* frequently pays a premium for low-defect parchment. In the markets, coffee is measured based on a heaped litre (*bocco*), whereas it is sold to key buyers in Rantepao as a levelled litre (*sasa*). Approximately every *bocco* litre in the markets is equivalent to 1.21 *sasa* litres sold in Rantepao; the difference is profit for the *tengkulak*. Many growers are already tied to a particular *tengkulak* through interlocked credit markets, particularly in the remoter villages of Northern Toraja. In addition to market collection, *tengkulak* collectors will also visit individual houses to monitor and /or collect the harvest. Most *tengkulak* immediately supply the semi-dried parchment coffee to one of the major buying stations near Rantepao (Toarco Jaya, the 'KUD' or Lion Lestari). For many years, Toarco Jaya operated a permanent purchasing station near the Ke'pe market at Tondok Litak (shown in Figure 3), strategically located to be accessible to coffee grown in all three of the northern valleys. In 2007, most purchases were being made at their Bolu office. Due to enhanced competition in recent years, however, Toarco has also established, at considerable cost, buying stations in remote coffee-growing villages above the Minanga, Sapan and Barrupu markets.

There is one final point to be made with regards different methods of coffee processing in Toraja. Toarco buys semi-dried parchment coffee, dries the parchment using mechanical driers and then hulls the coffee upon receiving an export order (this is the traditional system of processing known as 'dry hulling'). In contrast, most other operations in Sulawesi also buy semi-dried parchment coffee, but then immediately hull and then dry the green beans in the sun (a system apparently unique to Sulawesi and northern Sumatra, which is referred to as 'wet hulling' in this report). The influence of these different processing systems appears to be an important determinant of final cup quality, with 'wet hulling' believed to increase the level of body, and decrease acidity, in the cup.

4.2.2 'Kalosi' Coffee in Enrekang District

Kalosi (also known as Sudu) is a small market town in Enrekang on the main road between Toraja and Makassar. The international specialty coffee industry frequently uses the *Kalosi* (sometimes spelt *Kalossie*) identity as a common trade name for all Arabica coffee exported from Sulawesi. Kalosi has never signified a growing area *per se*, but refers to a trading centre whose hinterland is now ordinarily restricted to Enrekang District. The District of Enrekang (also known as *Duri*) is located directly south of Toraja, and is estimated to produce an equivalent volume of Arabica coffee to Toraja. *Duri* farmers grow various products for market, including cabbage, shallots, potatoes, papaya, *salak* (snake-skin fruit), cocoa, pepper, and cloves. A well-maintained road network links rural producers to central markets and buyers in Makassar.

There are two distinct coffee-growing areas in Enrekang: Baraka in the east and Alla in the west. The latter gradually merges with adjacent growing districts in southern Toraja. Coffee is generally grown at altitudes ranging from 1,000-1,500m in Enrekang. Individual holdings are slightly larger in Enrekang than in Toraja, and average around 2,000 trees per household. Coffee production in Enrekang is generally more intensive than in Toraja, and includes the widespread use of agrochemical inputs, less shade, and the cultivation of steep slopes. Coffee trees are commonly capped at about 1.5 metres, and pruning to improve light exposure and fruit production is common. As a result, average yields are considerably higher in Enrekang than in Toraja (estimated at 400-500kg GBE/ha).

Small market traders in Kalosi claimed to be selling up to 30 mechanised, coffee pulping machines per month, and a village cooperative at Benteng Alla indicated that at least 50% of its farmers now own such a machine. This indicates a high degree of mechanisation (shown in Plate 5), which is probably leading to improved quality in Enrekang. In the past, farmers would frequently delay pulping for up to a week due a lack of mechanised pulping machines. This would lead to poor 'fruity' tasting coffee. Semi-dried parchment coffee,

however, is not always immediately sold to local traders, and is commonly stored homes and warehouses, inevitably resulting in mouldy coffee.

There are two main coffee markets held twice weekly in Enrekang: the Kalosi (Sudu) market in the west; and Baraka market in the east. Much larger volumes are traded at these markets compared to Toraja. Traders from Enrekang may also purchase parchment coffee from the two coffee markets in southern Toraja (Getengan and Buntu) to supply their mills. However, it is more common for Enrekang-grown coffee to enter the southern Toraja markets, or be sold to one of the Toraja-based mills, where prices are notably higher. There is a high concentration of hulling operations in Enrekang (at least 15 in 2007), where the parchment is removed prior to drying and then transported (as green beans) to Makassar-based exporters. Plate 6 shows a typical Kalosi hulling operation. Parchment coffee from Mamasa and Gowa is also frequently processed at these mills. Each hulling operation finances village collectors to scout the coffee-growing villages to collect coffee, often providing financial support to farmers, interlinking credit with product marketing. Strict quality control measures are not usually enforced in Enrekang and it is rare for financial incentives to be offered for desired bean qualities or for beans to be rejected due to quality concerns.

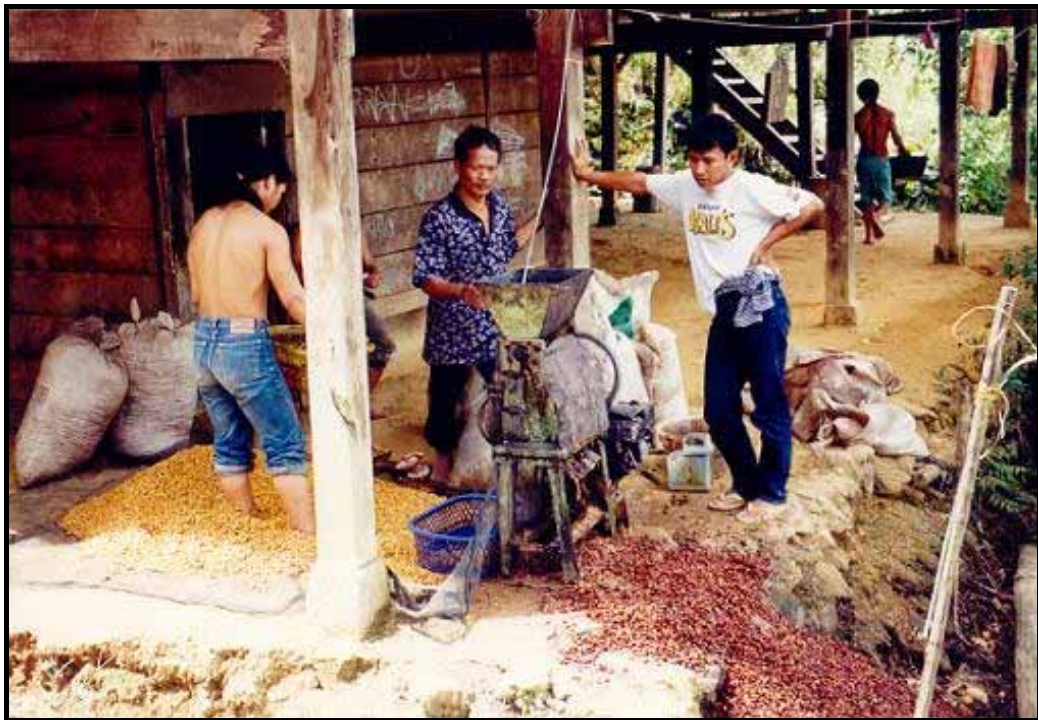


Plate 5. Mechanical Pulping in Enrekang



Plate 6. Kalosi Hulling operations and drying yard

4.2.3 Poor Environmental Practices in The Mamasa Valley³

The economy of the recently formed Mamasa District is heavily dependent on coffee production. In 2003, however, there was not one hulling machine in the valley, and all coffee was trucked to the coastal city of Polewali for further processing. Coffee production in Mamasa is characterised by poorly capitalised trade networks, ecologically unsustainable cultivation, and spatial dislocation from established village settlements. The District is hampered by poor road accessibility and communications, an undeveloped banking sector, and limited power supply. The Mamasa valley is enclosed by high mountain ridges and a single road links it to Polewali by a four-hour drive along unsealed roads. The main valley is also linked by a 2-day walk to Toraja, although there are ongoing plans to allow vehicle access across this very difficult terrain. Closely related languages, social practices, architecture and religion all indicate a shared cultural history between Toraja and Mamasa. Mamasa is sometimes referred to as 'West Toraja'.

Poor land management and forest clearing are serious problems in Mamasa. Much of the main valley is now covered with bracken fern and pine, as farmers retreat further and further up the slopes to clear forest for growing coffee. A combination of thin soils, steep slopes and little erosion control result in a limited productive life (sometimes only five or six years) for coffee trees before weeds invade the site and plots are abandoned. Plates 7, 8 and 9 show the various stages of forest clearing and planting, production and abandonment commonly found across Mamasa. Newly established communities, often reliant on coffee, are continually cut out of primary forest in remote locations within, and increasingly outside of, the main catchment. Due to the remote locations of many new plantings, farmers often stay there in rudimentary shacks during the harvest or planting periods.

Coffee is processed on farm as in Toraja, although fermentation is even more haphazard, and drying is commonly performed directly on the ground without using plastic sheets. In remote locations, the parchment may be dried longer than one day to reduce transport weight, leading to inconsistent quality. Most farmers carry their own coffee to one of the three main markets held weekly at Mamasa, Tamalantik, and Malabo, where 60,000 litres

³ Mamasa was not visited during the 2007 visit. This discussion is based on fieldwork performed in 2003.

of coffee (20 tonnes GBE) can be traded at each market during the harvest. With limited wet-rice production in the valley, farmers frequently barter coffee directly for rice.

Farmers in Mamasa do not generally have access to even informal credit, and as a result are generally not tied to any particular buyer in the market. Hundreds of collectors line the entrance to the Mamasan markets, buying coffee from local farmers, and then offload their stock to one of the larger local traders (only three traders were controlling the entire Mamasa market trade in 2003). These traders transport the parchment coffee to Polewali (where there were three active mills in 2003), although it is also commonly transported to Toraja and Enrekang (some ten hours away) if prices there are favourable. The Polewali mills can process ten tonnes of green beans daily and each claim to each hull about 500 tonnes in a season. The parchment coffee is hulled wet and after two to three days of sun-drying in the coastal heat, the green beans are sold to Makassar-based exporters, generally without prior sorting or selection. The lengthy supply chain from remote forest plots in Mamasa to coastal hulling operations means that coffee is often stored as semi-dried parchment for extended periods and can be extremely mouldy as a result.



Plate 7. Forest clearing for coffee planting in Mamasa

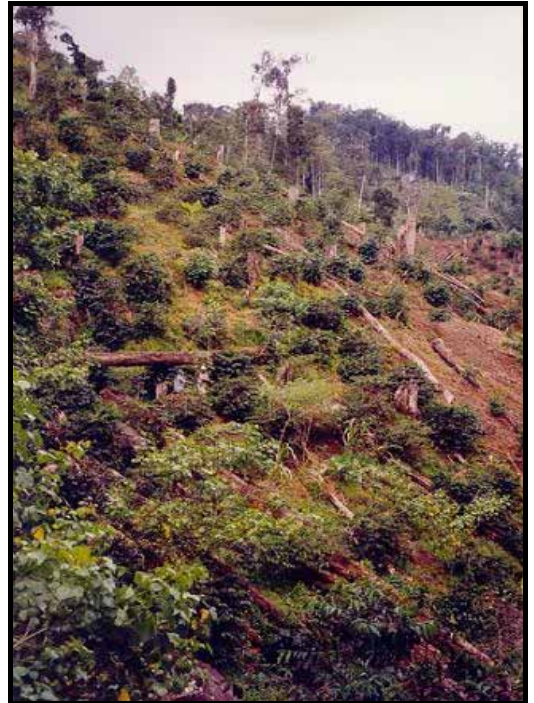


Plate 8. Coffee production in Mamasa



Plate 9. Coffee taken over by bracken fern and abandoned

4.2.4 Problems of Quality in Gowa District⁴

Coffee is grown in all five southern Districts surrounding Mt Lompobattang near Makassar (Gowa, Bantaeng, Sinjai, Bulukumba and Jeneponoto). Arabica Production in this area has increased significantly over the last 20 years, and is now concentrated mostly in Gowa District. The township of Malakaji, with at least one processing mill, has emerged as an important trading centre, and the name *Malakaji* is often used to identify coffee from all five Districts. Production here contrasts again to the production systems found in the three northern Districts already discussed and is generally considered to produce an inferior quality coffee. The contemporary history of coffee growing in this region can be traced to provincial government initiatives in the 1980s when, prompted apparently by solid international demand for Sulawesi Arabica, cultivation was encouraged in all upland areas. Government extension activities were an important factor contributing to the implementation of intensive agricultural practices in the region. Government support for the coffee industry has been particularly strong in Gowa, where processing equipment has been purchased for farmer groups and land made available for large-scale investment.

Farmer knowledge concerning crop maintenance, pruning methods and fertiliser application is generally advanced and productivity high as a result (estimated at 500kg GBE/ha). The quality of coffee, however, is significantly affected by the poor state of harvest and post-harvest processing. During field visits in 2003, coffee was universally harvested in a grossly unripe state (Plate 10). This practice was justified by the labour savings made by non-selective strip harvesting, by the avoidance of theft (which is apparently widespread), and by a belief that premature harvesting would reduce the demand on soil nutrients. The skins of immature coffee, however, adhere closely to the parchment and are difficult to remove. As a result, farmers often prepare the green cherries by mixing them with a chemical ripening agent, and storing in *goni* bags for one to two weeks prior to pulping. Generalised hullers, used also for rice and corn, are adjusted to pulp the coffee. These 'pulpers' do not actually separate the parchment coffee from the skins, and further separation is required. It is common for coffee then to be separated or 'washed' in local street drains using foul water (Plate 11). These processing methods, understandably, result in a very bad tasting coffee.

⁴ Neither Gowa nor the other producing districts in the south were visited during 2007. This discussion is based on fieldwork performed in 2003 and a meeting with Dinas Perkebunan in Makassar in March 2007.

Over the last five years, *Malakaji* coffee has been increasingly mixed in with better quality coffee from Toraja, Enrekang and Mamasa prior to export. Although a number of rejected containers from Makassar in recent years appear to have been caused by the inclusion of *Malakaji* coffee in export batches, such mixing undoubtedly continues. Quality complaints from international buyers have, however, started filtering up the supply chain and coffee prices in Gowa can sometimes be as low as 50% of prices in the northern complex. This in turn has led to a substantial inter-regional trade from Gowa to trading centres in Enrekang and Toraja. This marked difference in coffee quality across Sulawesi has been a key driver of the increased willingness of buyers to trace back the geographic origins of coffee in Sulawesi or, at the very least, to introduce new forms of coordination to monitor quality along the supply chain. The international image of Sulawesi coffee as a quality origin has been severely affected in recent years, due in part to the penetration of poor quality *Malakaji* coffee into export markets.



Plate 10. Freshly harvested Green cherries in Gowa District



Plate 11. 'Washing' the coffee in street drains in Gowa District

4.2.5 Large-scale Commercial Estates in Toraja

A commercial plantation sector also exists in Toraja. The first to be established in the modern era was the 500 ha Toarco estate at Pedamaran, which now produces around 120 tonnes of green beans annually. The lower altitudes (900-1,250 metres) of this estate are not ideal for coffee growing, and production costs are high to prevent pests and disease, and to maintain soil fertility. Coffee is processed using traditional dry hulling and smallholder-purchased coffee is also processed at the estate. Mechanical dryers are used. Despite renewing their lease for a further 30 years in 2003, the company claims to maintain the Pedamaran plantation at a significant financial loss. Key Coffee emphasises estate ownership through their marketing material in Japan, and yet the Pedamaran estate only contributes about 20% to Toarco's total exports from Sulawesi.

Another 5,000 hectares of land is included within six nationally-owned estate leases, mostly located between Bittuang and Barrupu in North-West Toraja (shown in Figure 3). Many of these estates were established in late 1980s or early 1990s, and an estimated 40% of the leased area has now been planted with coffee. Primary access to these estates is from Makale in southern Toraja, unlike the northern coffee belt, which is linked to Rantepao. Land clearing, initial planting and infrastructure required a substantial investment that most estates now consider irrecoverable, and most of the estates are now in various stages of abandonment. We were told that, prior to 1998, the estates combined to form a 'Torajan Planters Association', but this is no longer operational.

The first estate to be established, largest and most professionally operated of the national estates is Solutco, owned by the Kapal Api Group. Solutco covers 1,199 hectares of land, and includes the lands of a Dutch-era coffee (and tea) estate, which was abandoned during the Second World War. The plantation includes areas up to an altitude of 1,800 metres. Coffee is pulped, fermented and then dried on canopied tables for two to three weeks before being dry-hulled on the estate upon request (ie. a similar process to Toarco). Solutco has been able to consistently sell into international markets in the US, Japan, Singapore and Australia at good prices. Green bean production on the state is around 160 tonnes.

Of the remaining national estates, none is managed in the professional manner of the Toarco and Sulutco estates, and none have consistently penetrated international markets. Despite their size, these estates are mostly managed in a semi-traditional style. Yields on the Torajan estates (approximately 300 kg GBE/ha) are well below those on intensively managed estates in Java (1,000kg GBE/ha). All estates identified labour difficulties as a primary constraint to developing a commercially viable operation in Toraja. It also appears that many of these estates were established on poor quality (acidic) soils.

4.3 International Trade in Sulawesi Coffee

Almost all coffee exported from Sulawesi is traded through the container port in Makassar, with an undocumented smaller volume shipped first to either Surabaya or Medan. With the exception of the two Toraja-based operations (Kud Sane/CBI and Toarco Jaya), exporters generally perform cleaning, sorting, grading, and polishing at Makassar-based warehouses. The number of active exporters has gradually decreased over time, with only three companies responsible for approximately 70% of total exports in 2006. Some of the major exporters (and approximate annual export volumes) are:

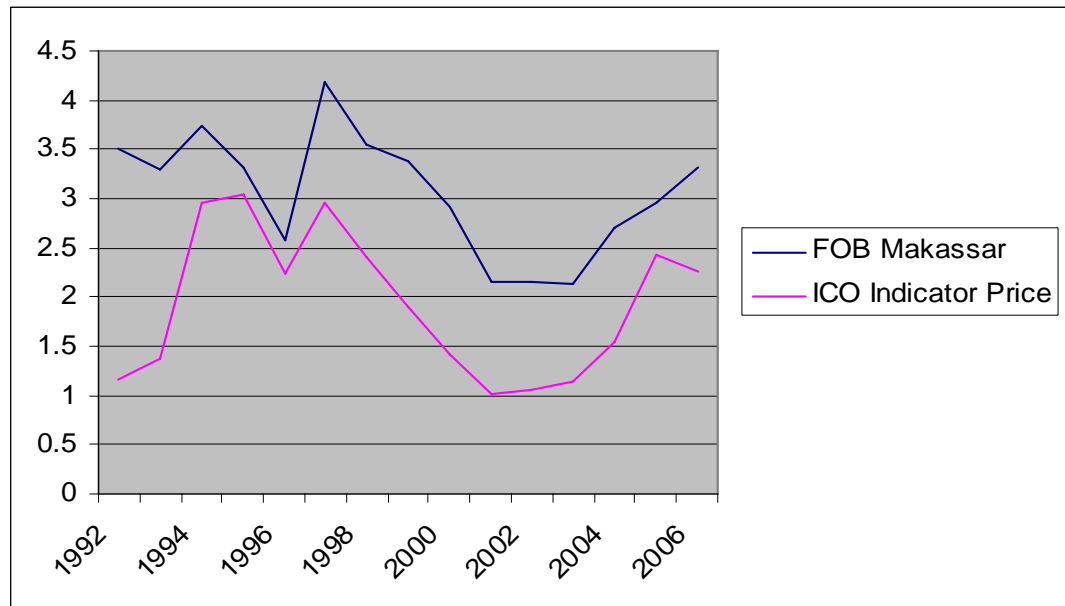
- KUD Sane (CBI): 1,200 tonnes
- Toarco Jaya: 500 tonnes
- Megahputra Sejahtera: 400 tonnes
- Sari Hasil Utama: 200 tonnes
- Lion Lestari: 150 tonnes

Two countries (the United States and Japan) dominate export destinations for Sulawesi coffee from Makassar (Table 2). Together, these countries account for more than 80% of total exports. Prior to 2000, Japan was the most important destination, although the growing specialty coffee sector in the US has since made it the dominant market. A major end-user of Sulawesi coffee is the Starbucks Coffee Company which, in the past, had purchased Sulawesi coffee via intermediaries, such as Royal Coffee and Holland Coffee. Starbucks now buys virtually all its requirements directly from KUD Sane/CBI, and smaller volumes from other exporters (usually through brokers). Whilst it is understandably difficult to obtain precise data, estimates are that Starbucks alone requires 70 containers of Sulawesi coffee (1,260 tonnes) annually. This now clearly dwarfs the requirements of Key Coffee in Japan (approximately 500 tonnes annually). Other international buyers active in Sulawesi over recent years include Holland Coffee, Royal Coffee, Daarnhouwer, UCC Ueshima and Brooks of Japan.

Table 2. Major Export Destinations for Arabica Coffee shipped from Makassar Port

Importing Country	2003	2005	2006	Share of total exports (average)
United States	1,608	2,937	1,172	57%
Japan	673	1,471	827	27%
Belgium	358	311	162	8%
Singapore	118	325	136	5%
Netherlands	58	159	66	<3%
Germany	63	159	36	<3%
Australia	54	54	72	<3%
Other	18	142	187	<3%
Total	2,950	5,558	2,658	100%

(Source: Office of the Department of Trade, Makassar)



(Sources: Office of the Department of Trade, Makassar, and www.ico.org)

Figure 4. Prices for Sulawesi Coffee Relative to Global Markets (USD/kg)

Over the last decade, average export prices for Sulawesi Arabica coffee in Makassar have stayed consistently above the indicator prices in world markets (Figure 4). Whilst prices paid for specialty coffees, such as Sulawesi, remain linked to fluctuations on the New York exchange, access to specialty markets provides a mild buffer against severe price falls. When world prices are relatively high (such as in 2005 and 2006) the ratio between the 'Free on board' (FOB) Makassar price and the ICO indicator price is about 1.3. When world prices are low (such as they were in 2002 and 2003), the FOB Makassar price was more than double the ICO indicator price. Price fluctuations in Sulawesi are also influenced by local supply and demand dynamics.

4.3.1 Geographical Identities for Sulawesi Coffee in International Markets

There is a range of Arabica coffees available in the global coffee trade, beginning at low quality industrial and commercial grades through to specialty Arabica coffees. Within the specialty Arabica market itself, there are good coffees (perhaps used for blending) and then there are coffees considered to possess superior cup characteristics leading to their use as single-origin coffees. Sulawesi coffee is widely used as such a single-origin coffee.

It is customary for coffee to be traded globally using the recognised names of origins as a signifier of certain quality attributes. The use of such geographic identities for individual shipments from Sulawesi varies considerably depending on consuming country preferences. The *Kalosi* trade identity is recognised by European buyers, whilst both the *Kalosi* and *Toraja* trade names are popular in the US market, whereas the Japanese market is more familiar with the *Toraja* name. In practice, the international buyer requests a particular identity to be printed on bags of green beans (this identity is also specified in ICO and other export documentation). The relationship between actual local origins and the use of geographic identities is a tenuous one. A coffee marked *Kalosi* does not necessarily come from Enrekang, and the volume of coffee traded within Indonesia and abroad under the *Toraja* label would seem to far exceed actual production in that District. At best, such designations are a proxy marker for the presence of particular quality attributes in the coffee. At worst, they are subject to blatant geographical fraud, such as in 2002, when several containers of coffee marked *Mandheling* were exported from the Makassar port.

Growth in the international specialty coffee sector, including roaster-retailer chains such as Starbucks, has seen an accompanying interest in geographically distinct (single-origin) coffees. Starbucks offers more than a dozen such single-origin coffees, including *Sulawesi*, usually marketed along with romantic place-related imagery. Strictly speaking, Starbucks accurately uses *Sulawesi* as a geographic designator, as the coffee it buys comes from the various growing regions of Sulawesi. Most roasters, however, tend to use the identifiers *Toraja* or *Kalosi* (virtually interchangeably), and this coffee has earned a reputation as a rare and unique origin. Sulawesi coffee is generally appreciated as a low acidity, high body coffee. The use of cultural imagery in the marketing of Sulawesi coffee is a common tool used by specialty roasters, and a survey of roaster websites included the following:

- Coffee means a lot to Toraja people, and they tend it with loving care. (2F Coffee)
- The Toraja people have an interesting cultural history that carries over to their methods of producing coffee in very traditional ways. (Peets Coffee and Tea)
- The Toraja people, from the island of Sulawesi, grow this most classic Indonesian coffee. (Allegro Coffee)
- The coffee formerly known as Celebes Kalossi ...but let's not call it that anymore. Kalossi was the colonial Dutch name for the Toraja region, incredible mystical densely forested region with weird giant bats hanging from trees, and ancestral homes shaped like ships. (Sweet Maria's)
- The coffee corresponds with the individuality of their culture in every aspect. (Interamerican Coffee)
- The region and the coffee, Toraja, are named after the colorful indigenous people of the region. (The Coffee Review)



Plate 12. Culturally-specific marketing for Toraja coffee used by Starbucks (left) and InterAmerican Coffee (right)

Despite contributing to less than a third of total Arabica production in Sulawesi, Toraja is the only growing district whose culture is evoked in a descriptive marketing sense by specialty roasters. The Toarco logo for example, now a patented trademark, consists of a stylised representation of a traditional *tongkonan* clan house. Whilst the Toraja District

does have distinct geographic features, such as higher altitude production, and greater care is generally given to processing, the ability of an origin to ‘tell a story’ is also an important attraction within the specialty coffee market (refer to Plate 12). In this sense, the cultural traditions of the Toraja people are an important asset in the construction of place-informed quality.

Sulawesi coffee has been further transformed by several international roasters to an ultra-gourmet product, demanding especially high premiums. *Aged Sulawesi Peaberry* has been sold at Peets Coffee and Tea in Berkeley for US\$132/kg (Peets also offered *Lost Toraja* at a premium price). Starbucks’ *Kopi Kampung* sold as a Black Label Special in 2006 for US\$57/kg. But, perhaps the most audacious attempt to value-add Sulawesi coffee is that of the Interamerican Coffee Group, through their Hamburg branch, with their *Kopi Tongkonan Toraja*, which sells as green beans for US\$50/kg. This coffee has then been sold as roasted coffee (by such purveyors as Imperial Teas of Lincoln in the UK) for the equivalent of US\$480/kg. This coffee is sold in hand-carved barrels, imitating sales in the local Rantepao market, complete with an interpretation of the designs and motifs used on the barrel. Admittedly, only very small volumes (perhaps only one tonne annually) of this coffee are sold in the market. However, it indicates that Toraja coffee is capable of serving an elite coffee segment at prices well above the standard specialty market.

4.3.2 Certified Coffees

In the global coffee market, the specific social or environmental conditions of production are often used to signify quality attributes to final consumers. Increasingly, such coffees require independent audits, certification and traceable supply chains to verify their claims. A recent Offering Sheet (March 2007) posted by the California-based specialty coffee trader, Royal Coffee (www.royalcoffee.com), specifies whether each shipment meets the following criteria:

- *Organic*: This coffee is certified organic,
- *Bird Friendly*: The Smithsonian Institution has certified this coffee as Bird Friendly-Shade Grown (Roasters must register with the Smithsonian Institution and pay a royalty in order to sell the coffee as Bird Friendly-TM or to use the Smithsonian Institution name),
- *Co-Operatively grown*: This coffee is procured from cooperatively-organised farmers,
- *Estate*: This coffee is grown and processed on one farm,
- *Fair Trade*: This is a registered Fair Trade coffee. Roasters must be registered with Fair Trade / TransFair and pay a royalty in order to sell this as a Fair Trade Coffee,
- *Rainforest Alliance*: This producer has been inspected and certified by Rainforest Alliance,
- *Shade Grown*: A representative from Royal Coffee has visited farms and verified that the coffee is grown under a canopy of shade trees.

In a very general sense, the presentation of such process-related attributes has traditionally allowed particular origins to create additional value and so demand a market premium. Increasingly, however, certification of coffee production systems is being required as a pre-requisite for market access, and is not necessarily associated with a market premium. An increasingly popular form of coffee certification in the European market is ‘Utz Kapeh’, which is benchmarked against the EUREPGAP codes for European retailers, and is used to designate socially and environmentally responsible production. Many end-users are now requiring that coffee is Utz Kapeh certified as a purchasing requirement. Most major roasters are now signatories of the Common Code for the Coffee Community (4C), a similar buyer-driven certification scheme. Furthermore, individual

buyers are establishing their own set of social and environmental procurement standards, such as the Starbucks CAFÉ Practices⁵ program.

The certification of coffee production systems is still, at this stage, undeveloped across Sulawesi. However, the requirements of Starbucks CAFÉ Practices, in particular, are rapidly driving a regional push towards supply chain traceability and certified rural spaces. This trend is now a key factor driving restructuring along existing coffee supply chains. Various exporters are currently discussing proposals to obtain organic and fair-trade certification in Sulawesi.

5 Issues of Relevance to the Sulawesi Coffee Industry

The following section addresses a range of issues of significance to the future successful development of the Sulawesi and Toraja coffee industries.

5.1 Low Farm Yields

Estimated Arabica yields in Toraja are between 150 and 200 kg GBE /ha. These are much lower than yields in both Enrekang and Gowa (estimated to be closer to 500kg GBE/ha). Further research is required to determine the reasons behind these figures; however the use of improved technologies (such as fertiliser use, pruning, plant rehabilitation and pest management) in Toraja is certainly less intense than elsewhere. There have been no major coffee development projects in Toraja in the past (in contrast to both Gowa and Enrekang), and coffee has had little attention from Government agencies in the District. Perhaps, the greatest attempt at improving farm practices in Toraja to date has been performed by Toarco Jaya, but without much success. The company claims that farmer motivations are low and Torajan farmers are not interested in committing additional resources to improving yields. Whilst there might be some truth in this observation, it is also evident that a comprehensive crop management program has not yet been offered to Torajan coffee farmers. Farm-gate prices in the markets of northern Toraja have more than doubled from 2003 to 2006. Yet, these prices have not stimulated a corresponding heightened interest in improved coffee cultivation, suggesting that more than market forces alone are required to stimulate improved production in Toraja.

Understanding farmer incentive structures and motivations are necessary to improve yields. There may be limitations on the availability of investment capital or high opportunity costs involved in crop improvement. When a Torajan coffee farmer wishes to increase production, there have been few constraints, to date, for simply expanding their area under production by clearing forest and planting more coffee. There is ultimately, however, a limit to such expansion, and presumably Torajan coffee farmers are reaching this limit and will have a greater incentive for more intensive cultivation techniques in the future.

Even on the larger commercial estates, where presumably there is greater access to improved technologies, yields still appear to be relatively low (perhaps only approximately 300-400 kg GBE/ha). There may also be some important geographical factors inherently limiting production in Toraja, such as rainfall patterns, altitude and soil conditions.

Conclusions: Torajan coffee farmers are probably capable of increasing coffee yields through the introduction of basic crop maintenance techniques, including soil management, pest control, pruning and rehabilitation. To date,

⁵ *Coffee and Farmer Equity (CAFÉ) is an externally-verified compliance system mandatory for all suppliers to the company, encompassing various social and environmental criteria.*

however, they have not had access to a reliable extension service. There are also a number of issues regarding farmer willingness to intensify production related to available capital, opportunity costs, labour availability, and risk aversion which need further examination.

5.2 Demand for Certified Coffee

The potential for value-adding Toraja coffee through certification, such as organic or fair-trade exists, but is limited by the fact that Toraja coffee already enjoys a significant premium in international markets due to quality attributes alone. Toraja coffee is already a niche product. Furthermore, the costs of introducing and managing a certification program can be considerable and experience elsewhere has shown that these costs are not always repaid through price premiums in the long term. Poor farmer organisation in Sulawesi compounds the cost of introducing certification programs.

However, certification and traceability are now realities within global coffee supply chains. Increasingly, certification is not so much a tool for value-adding, but a requirement of market access. Starbucks is a key driver of certification in Sulawesi, and the development of stronger upstream linkages. Since 2005, Starbucks has insisted on enhanced price transparency along their supply chain, and is now attempting to make its CAFÉ Practices compulsory. The implied traceability requirements of the system are exerting considerable pressure on suppliers to drastically restructure the way they manage their supply chain. In response, some international traders are establishing a more permanent presence in Sulawesi, or establishing joint-ventures with exporters in an attempt to create more solid trade relationships.

It is probably inevitable that Sulawesi coffee farmers will be involved in certification schemes in the near future. The question, then, becomes how this certification can be managed in a way which actually benefits coffee farmers. In the growing regions of Aceh, where certified coffee has had a longer history than elsewhere in Indonesia, exporters have paid the costs of farmer certification in an attempt to capture farmers within exclusive supply chains. There has been a history in Indonesia of agribusiness processing units, with exclusive access to a supply base (known as *Rayonisasi*), using their market power by depressing farm-gate prices.

Conclusions: Certification is an emerging reality within Sulawesi coffee systems, although it is unclear whether this will increase farmer income and who will ultimately bear the costs. International coffee trading companies, rather than traditional Indonesian exporters, have greater experience in implementing such schemes and will probably gain a further market advantage as a result. Certification requires farmer organisation, which is poorly developed across Sulawesi. Attention needs to be given to ensure that certification does not lead to farmer capture by single buyers, impinging on the competitive farm-level buying environment in Sulawesi. A key test for certification programs is whether they benefit farmers and not merely trading companies.

5.3 Processing and Cup Quality

The dominating presence of Toarco over the last 30 years, with strict purchasing requirements, has significantly improved traditional on-farm processing methods employed by Torajan farmers. Due to financial incentives offered by the company, most growers have adhered closely to the company's preferred processing methods, to produce semi-dry parchment of a quality that was superior to other regions in Sulawesi. Toarco has then used a dry-hulled process to produce a high quality, clean acidic coffee for its Japanese market.

With the rise of the specialty coffee market over the last 10 years there has been an increasing demand for wet-hulled coffees from Sulawesi. Coffee is sold in local markets as semi-dried parchment, which can be subsequently processed either as dry-hulled coffee (as performed by Toarco) or as wet-hulled coffee (as performed by most other processors in Sulawesi). These two methods create coffees with distinctly different flavour profiles. The dry-hulled coffee possesses a ‘cleaner’ cup taste, with higher acidity and less body. The ‘wet-hulled’ coffee has a heavier body, little acidity and a more complex flavour. In the US market, Sulawesi coffee is valued as a full-bodied coffee. Few other origins, with the exception of *Mandheling*, from northern Sumatra (which appears to be the only other origin in the world to use this wet –hulled process) can contribute the heavy body desired in many of today’s specialty Arabica blends. At present, approximately 75% of Sulawesi coffee is now produced as a wet-hulled coffee.

There is, however, little understanding of the influence of geographical conditions on cup quality, and even less on the role of processing technology. The extent to which the flavour characteristics of Toraja coffee can be replicated by altering processing methods in other parts of Sulawesi, or from other islands such as Flores, in order to blend with Torajan Coffee, is poorly understood. Key questions remain surrounding the construction of quality and the degree to which this is determined by variety, physical growing conditions, initial processing and by practices such as ‘wet hulling’.

If the ‘body’ is the element of Sulawesi coffee which contributes to its value in the specialty markets of the world, then it would be of significant commercial interest to explore what actually creates body in a Sulawesi coffee.

Conclusions: Further examination of the ‘wet–hulling’ processing technology would help to develop an understanding of what contributes to Sulawesi coffees’ unique specialty flavour. This may lead to opportunities to improve consistency and quality of Sulawesi coffee.

5.4 Geographical Authenticity

There are concerns that the unique brand credibility of Toraja coffee is being eroded by highly variable quality across Sulawesi and lack of appropriate traceability systems. There is certainly no way of guaranteeing the regional origin of all coffee sold in Makassar prior to export. Growing conditions, processing methods and trade networks vary considerably across major producing Districts, such that these heterogeneous conditions create coffees with markedly different cup characteristics. A high-value coffee means that there are high risks associated with adulteration. The mixing of various local origins prior to export is almost certainly diluting the reputation of *Toraja* or *Kalosi* in international markets. The nature of institutional arrangements (in an economic sense) along the supply chain is important in determining the most efficient mode of quality determination. There are various costs for buyers associated with ascertaining coffee quality, usually borne either by rigorous sampling or by investing in supply chain traceability and trust-based relationships.

Conclusions: Initiatives to secure geographical authenticity in Sulawesi should be considered. There may be also value in developing a range of local origins in southern Sulawesi by assisting other regional origins to develop their own market identities and flavour profiles to help protect existing origins like Toraja from being adulterated.

5.5 Risks of a Single-buyer

Starbucks currently absorbs an estimated 50% of Sulawesi Arabica exports. There are risks associated with an industry depending on any single buyer. As the dominant buyer, the quality demanded by Starbucks is fast becoming the quality standard in Sulawesi. Some high end exporters refer to this quality as 'commercial specialty', as the company requires both consistency of quality and volume, which may be leading to a simplified process at farm level and a loss of local quality diversity. The quality incentives for farmers in Toraja are rapidly changing due to the Starbucks influence, and there are concerns that this is affecting the primary product from farmers (semi-dried parchment), such that other producers (such as Toarco) will not be able to produce the product they need because of the lowered farmer quality requirements set by KUD / CBI (which ironically is purchased at a higher price).

With the exception of their 'Kopi Kampung' coffee, Starbucks has few geographical constraints for their Sulawesi coffee, and purchase coffee from all of over southern Sulawesi. Moreover, the volumes required by Starbucks make it impossible for the company to source exclusively from Toraja. A key question is then, what happens if Starbucks decides to stop buying the Sulawesi origin? Is there a need to mitigate risk by actively diversifying end-markets and encouraging a variety of local products? Indications are that various small roasters in the USA would like more access to high end Toraja coffee, but can't get access as sources are too controlled and volumes too limited.

Conclusions: The Sulawesi industry has clearly benefited from Starbucks' demand for its coffee. Starbucks activities and access to coffee should not be restricted. However, the industry should be mindful of the risks of a single major buyer and efforts should be made to diversify market chains to ensure existing smaller market chains are not squeezed out. There is a risk that other market sectors may lose interest in Sulawesi coffee if they can not get access to quality and quantities they need, due the fierce competition in Sulawesi coffee markets. The development of unique qualities and specialised niche markets using combinations of variety, location and processing technology would allow smaller traders and exporters to maintain market links other than Starbucks. This would help maintain the image and linkage of Sulawesi coffee to other markets (Europe, Japan, US), even if quantities are small. If Starbucks were to 'fall out of love' with Sulawesi, then these markets could grow quickly again.

5.6 Post-harvest Processing and Value-adding

What is the potential for greater value-adding of Sulawesi coffee by both farmers and the domestic industry prior to export? Coffee is currently sold by Sulawesi farmers as semi-dried parchment after performing relatively basic initial on-farm processing. Farm-level hulling is performed elsewhere in Indonesia and, to some extent, in neighbouring Enrekang. However, this involves significant quality risk. Centralised mills allow greater control over quality with less possibility of bean deterioration, and improve consistency. Furthermore, it is relatively simple for buyers to identify gross processing defects such as immature harvesting, delayed pulping, or mouldy coffee by a quick visual inspection of parchment coffee. This is considerably more difficult with green beans. Trade in semi-dried parchment also discourages inter-regional trading due to buyer demands for freshness, and so helps to ensure a degree of geographical authenticity. Farm-level hulling probably carries unnecessary risks in Toraja.

Coffee is almost exclusively exported as green beans. There have been very few successful cases of domestic roasting prior to export worldwide, and it is not realistic to contemplate a large-scale local roasting industry for the export market. Major end-users of

Sulawesi coffee are specialty coffee roasters who rely on a keen knowledge of consumer tastes to achieve market advantage. Roasting for the growing Indonesian domestic market offers some potential, and could potentially be developed in either the growing regions themselves or in Makassar. Successful coffee roasting in any context, however, depends on maintaining in-depth consumer knowledge and aggressive marketing, both of which are more likely to be achieved when roasters are in close proximity to their final market (ie. urban centres). There are a number of small coffee roasting operations in Toraja, which generally utilise primitive machinery to produce a poor quality product. Much of this is either sold locally in markets or packaged for sale as tourist souvenirs. The value of food tourism for regional branding has been demonstrated in various contexts, and could potentially be important in Toraja. However, at this stage it is not significant.

Conclusions: There is not likely to be much benefit to farmers in processing past semi-dried parchment coffee at this stage, and may in fact adversely affect farm-incomes through the risk of declining quality. Local roasting activities are only of interest in relation to the local tourism industry. Value-adding Sulawesi coffee (sometimes known as ‘supplier upgrading’) is more likely to be achievable through improved quality and the development of industry institutions which allow greater producer-control over quality construction along the value chain.

5.7 Coffee Varieties

Of the two main coffee species, Arabica coffee currently is clearly dominant within the international specialty sector, with Robusta commonly relegated to lower quality markets. In fact, the two types should be considered two separate commodities. Robusta is generally a more productive tree, such that farm profits can sometimes be higher despite lower prices. The decision to plant Arabica or Robusta, however, is usually determined by the prevailing altitude, with Robusta planted in areas lower than 1,000m. Within Toraja, Robusta production is concentrated in western Toraja, and is usually pulped, fermented and washed like Arabica coffee. After that, however, the process varies. Robusta is then dried and hulled by farmers, who complain about the labour-intensive process of pounding off the husks in stone mortars prior to sale at the market. Mechanical hulling appears to be rare. Robusta is generally traded in local markets as green beans. Whilst there may be some potential for developing gourmet Robusta markets, these are currently undeveloped. Robusta prices are already quite high in Sulawesi by world standards (Rp15,000/kg in March 2007); well above prices in Lampung (and higher than Flores). This is apparently due to strong demand from the local market, as very little Robusta is actually exported from Makassar (only 72 tonnes in 2006).

Almost all of the Arabica coffee trees grown by smallholders in Toraja are of the so-called ‘S lineage’ varieties (known locally as *kopi Jember*). Probably the most popular of these is S795. These varieties are resistant to most types of leaf rust, and are widely believed to demonstrate good cup characteristics. The varieties were introduced to the Jember Research Institute, from India, in 1955 and released into Sulawesi in the late 1970s. A second wave of improved coffee varieties arrived in Toraja in about 1990, characterised by various ‘dwarf’ varieties known locally as CIFIC, Catimor, and Kartika. None of these have become widely accepted due to community perceptions that their disease resistance breaks down and bean size reduces with age, that they have poor longevity, that they require excessive fertiliser to maintain health, and that they produce inferior tasting coffee. Still, very little is understood regarding the influence of coffee varieties on cup characteristics.

Prior to the introduction of the S lineage varieties, almost all Arabica coffee was of the *typica* variety (now known locally as *arabica asli* or ‘original Arabica’). Despite apparently having a superior cup taste, these trees are extremely prone to leaf rust, bear biennially,

take a longer time to reach maturity, and have poor productivity. The cultivation of *typica* coffee in Toraja is currently restricted to a few isolated plots in the north of Toraja and to aging single trees elsewhere (it is however, said to be more common in the Seko valley of North Luwu). There is an almost nostalgic perception of *typica* held by some industry actors and government officials, leading to some observers advocating a return to *typica* production in Toraja as a development strategy to improve the quality, reputation and price of local coffee. In the past, attempts to market exclusive containers of *typica* coffee, however, have been frustrated by supply constraints and the market's unwillingness to pay a significant premium, leading to inadequate compensation for growers.

The South Sulawesi Disbun Office explained that two mother seed gardens for Arabica coffee (S-795 and a new ICCRI variety *Andung Sari* - each seven hectares) had been recently established in Enrekang (at Banteng Alla) and in Toraja (at Bittuang), however these were unable to be located during our field visit. To date, the Jember research station develops varieties and then distributes them to regional production centres with very little attention to local adaptations.

Conclusions: Arabica coffee is likely to remain the most important coffee type in Sulawesi for international specialty markets. Robusta might be a viable crop in the lower-altitude Districts of South Sulawesi, although it is unlikely to be marketed as a specialty product. S795 is probably the most appropriate Arabica variety in Sulawesi, whilst attempts to encourage widespread planting with *typica* are risky and unlikely to be welcomed by farmers. Developing a small *typica* seed garden in a high altitude area of northern Toraja may be of benefit to maintain this old variety for future uses.

5.8 Pest and Disease

Coffee berry borer (CBB) was identified in earlier industry consultations as a significant issue in the Sulawesi coffee industry. CBB is an insect pest which completes part of its life cycle inside the developing coffee fruit. CBB-affected beans are characterised by a shot-hole which often encourages mould development and therefore a poor tasting coffee. High CBB levels can also lead to reduced productivity due to premature fruit drop. A comprehensive assessment of CBB prevalence across Sulawesi has not been performed, although discussions with many industry actors suggest that it is not a commercially significant problem at this stage. CBB-damaged bean prevalence is high at the beginning and end of the season, but not a major concern in the peak harvest. Various estimates of the percentage of beans affected by CBB seem to range from 5-20%. Altitude is a major factor determining the severity of CBB infestation, with coffee planted below 1000 meters being most at risk.

Spraying of insecticides is sometimes used to control CBB, although this is rare in Sulawesi. Spraying spores of *Beauveria bassiana*, a fungal pathogen of insects, can also be used as a microbial insecticide for CBB. After landing on the insect, *Beauveria* spores germinate, enter and kill the insect. Pheromone traps can also be used to attract and kill insects. Traps are widely used for monitoring of pest populations to determine the correct timing of other management methods such as insecticide application. Because of their expense (estimated at over US\$50/ha), such traps are probably not a viable option for at this stage beyond possible setting near pulping stations, or for monitoring. In general terms, CBB can usually be controlled through the implementation of good agricultural practices, focusing on adequate soil nutrition, complete harvesting and general plantation maintenance and plot sanitation. As such, CBB control is likely to be an important outcome of broader initiatives to improve crop management by Sulawesi coffee farmers.

Leaf Rust is found across Sulawesi, and is addressed principally through the planting of partially rust resistant varieties such as S795. Rust is also less of a concern in higher

altitudes, where Sulawesi coffee is mostly grown. Some lower altitude areas and commercial estates may resort to the spraying of copper fungicides to help control rust.

Nematodes are probably present in Sulawesi and having an adverse effect on tree health and farm productivity, however knowledge concerning their prevalence is poor. The presence of nematodes often goes undetected and their effects (noticeably yield losses) unnoticed or attributed to other causes. Nematodes may be a contributing factor to the observed low yields of Torajan coffee farms.

Conclusions: No detailed coffee pest and disease surveys have been performed in Sulawesi. Coffee Berry Borer is found across Sulawesi, although it is not considered to be a commercially significant problem. Whilst there do not appear to be any serious pest and disease concerns that demand immediate intervention, or otherwise threaten the long-term viability of the industry, a more complete survey would yield useful insights which would contribute to improved farm profitability. Integrated pest management should be part of any broader initiative to improve farmer access to technical knowledge.

5.9 Empowerment of Farmers Groups / Industry Associations

The promotion of farmer groups / cooperatives is widely advocated as a means for improving the bargaining position of farmers along the value chain (supplier upgrading). Across Sulawesi, coffee farmers are not widely organised into producer groups or cooperatives. Instead, the organisation of production currently occurs at the family, and sometimes clan, level. Coffee is commonly sold individually into traditional, privately-coordinated trade networks. Indonesia, however, does have a long history of government support for producer cooperatives (*Koperasi Unit Desa*-KUD, or *Koperasi Pertanian*-KOPTAN) in various commodity contexts, and there have been several attempts to organise farmers into producer groups across Sulawesi. Two KOPTANs in Sulawesi (one in Enrekang and the other in Toraja) have had preliminary discussions with a Makassar-based exporter (Megahputra) regarding possible collective marketing to facilitate traceability. The capacity of such groups to engage in collective marketing is poorly understood, and is generally limited by their ability to manage the financial requirements of members. In many areas (notably excluding Mamasa), these requirements are often met by informal collectors / moneylenders and, despite the infrequent capital assistance from various government programs, the producer groups are frequently commercially uncompetitive.

A primary driving force for the formation of farmer groups and cooperatives is actually from the buyers themselves due to traceability demands. As such, there is renewed interest in investigating effective modes of farmer organisation, and how groups can contribute to enhanced traceability, effective technology transfer, development of social capital, and improved market access.

Conclusions: Coffee farmers are not effectively organised across Sulawesi, either for advocacy or as producer organisations for collective marketing. Demands for supply chain traceability are now driving the formation of farmer groups in some instances. Improved farmer organisation offers several potential benefits for Sulawesi coffee farmers, and an investigation into how this could be best achieved in the Sulawesi context would be useful.

5.10 Prices and Value Chain Analysis

Considering the valorisation of *Toraja* coffee as a high-quality gourmet product, in both domestic and international markets, it is interesting then to explore whether coffee farmers in the District are benefiting significantly from these quality associations. Certainly, by global standards, farm-gate prices in Toraja are high. To determine the approximate price received by farmers in Toraja in USD/lb, the following formula can be used:

$$\text{Price in USD/lb} = (m \times 1.43) / r$$

Where *m* is the highland market price and *r* is the Rupiah exchange rate. The coefficient 1.43 is based on a conversion of 3.16 litres (*bocco*) of semi-dried parchment coffee being needed for 1 kg of export quality green beans (1kg = 2.2046 pounds).

On August 10, 2006, for example, market prices at Sapan market were about Rp8,000/litre *bocco*, which meant that (with a prevailing exchange rate of Rp9,066), farmers were receiving a price of about US\$1.26/lb, when the price in New York for 'Other Arabica Milds' was US\$1.12/lb (a ratio of 1.125). This ratio generally ranges between 0.9-1.5, with significant variations occurring due to the effects of local competition. Of course, such variation could also be a result of farmers' poor access to global price information and trader profiteering. It is important also to remember that market prices are paid for a relatively unprocessed product at a remote location. The high prices are quite remarkable when we consider that: i) the coffee must still be transported from the highland markets to Rantepao on poor roads; ii) the wet parchment has yet to be processed (milled, dried, sorted, polished, etc); iii) that the beans must still be transported 8 hours to Makassar; and iv) there are still considerable handling and shipping costs at the port.

Table 3. Average Prices paid along the Sulawesi Value chain (2006)

Supply Chain Node	GBE Average Price (US\$/kg)	Comments
Farm-gate (north Torajan markets)	2.78	Based on a price of Rp8,000/litre <i>bocco</i> in highland markets
Local Processors (KUD, Toarco)	3.09	Based on an average price of Rp7,200/litre <i>sasa</i> . Elsewhere in Sulawesi, this price would be significantly lower
Export (FOB)	3.68	Based on the Starbucks market. Average FOB price was 3.32, whilst some sales to Japan were in excess of 5.10 USD/kg (CNF)
Consumer level in the US market	26.78	Starbucks sells Sulawesi coffee @ 12.15 USD/ lb)

Toraja coffee, however, is a specialty product, and so prices are expected to be above those for commercial grades. Another method of assessing whether farmers are receiving adequate compensation is by looking at farm-gate prices as a percentage of prices along the value chain (refer to Table 3). In 2006, at an export price of 3.68 USD/kg, Torajan farmers were receiving 76% of the FOB price in Makassar. This picture, however, is complicated by the fact that high-quality Toraja coffee is widely mixed with inferior coffee prior to export. The logic of this mixing is that Toraja coffee is more valuable than other regional origins, such that the value of the Toraja bean component of the FOB is actually higher than the average FOB price suggests, and as a result, Torajan farmers are subsidising this poorer quality coffee. Interestingly, using the same data sources in 2003, farm-gate prices in Toraja were calculated to be much lower at 60% of FOB. This could

alternatively be a result of tighter margins as global prices have risen, or could be a result of increasing end-user (Starbucks) demands for increased price transparency along the supply chain.

Growers of specialty coffees generally receive a smaller proportion of the final retail price of coffee than do growers of commercial grades due to the importance of symbolic values in the construction of quality by branded roasting firms. This is evident in Table 3, where farmers receive only 10% of the final retail value. Whilst such comparisons cannot possibly take into account the full costs of processing, distribution, weight loss due to roasting, and most importantly, marketing, of such specialty coffees, it serves to demonstrate the current inability of coffee growers to meaningfully share the premium prices available in the market.

Village traders obtain a considerable profit of 31 cents /kg (Table 3), whilst these traders do not actually perform any processing, and transport costs are estimated at only 1-2 cents/kg. The costs incurred by these traders are more generally associated with financial services provided to farmers and the burden of quality risk. A greater understanding of these services is required to determine whether this is an unreasonably high profit margin. Due to the availability of attractive price premiums for higher quality coffee paid by some of the mills in Toraja, the village traders have an important role in transferring price differentials to farmers. No other growing region in South Sulawesi offers such quality-sensitive price differentials at the farmer level.

Conclusions: Farm-gate prices in Sulawesi are already some of the highest in the world, and the farmers' share of FOB price is around 70%, although the share of final retail price is low. The potential to improve the farm-gate share of FOB is closely linked to capacity-building within farmer organisations. Whilst the potential to improve the farm-gate share of final retail price is severely restricted at present, in the future this may be linked to the capacity of Sulawesi-based organisations to be involved in quality constructions along the value chain.

6 Recommendations for future development

Sulawesi coffee already possesses a good reputation in the international specialty coffee sector. Overseas buyers actively source coffee from the region through direct purchasing schemes, such that farm-gate prices (in Toraja especially) are high by world standards. The opportunities for further industry development, therefore, lie in such activities as enhancing the professionalism of industry associations, promoting environmental sustainability and certification, and improving technology adoption by farmers to increase productivity and farm profitability. The Sulawesi coffee industry should be working towards a future scenario where growers are well-organised, quality-conscious and obtaining a greater share of the retail value of coffee within specialty markets. The following five activities are considered important starting points for achieving such an outcome.

6.1 Industry Partnership

A clear strategic vision for the industry would assist with the promotion and maintenance of a strong regional identity in the world market. There is currently no unified voice for developing the Sulawesi coffee industry, and existing industry associations are weak and ineffectual. A clear vision would help identify development activities where the pooling of industry resources would achieve greater benefits than the sum of individual activities alone. It is preferable that some form of industry-wide partnership be established, which could present a coherent vision for future industry development. This partnership would provide an umbrella for the coordination of various industry activities and act as a clearing

house for the exchange of relevant knowledge and information. Sulawesi is now an important origin within increasingly sophisticated global coffee chains, and yet, domestic industry representative bodies and government agencies are ill-prepared to engage with a constantly changing set of global trade dynamics. Despite the prominent role of international coffee companies in purchasing Sulawesi coffee, these companies are essentially excluded from existing associations and industry planning. An Industry Partnership, involving these global participants, could facilitate organisational learning along the supply chain in such a way to ensure long-term competitiveness of the regional sector.

A key challenge is to ensure that major industry partners perceive there to be clear benefits from greater collaboration. At present, there are a number of activities which have the potential to garner widespread industry support, including:

- The establishment of, and capacity building for, effective farmer organisations (especially those that facilitate traceability and certification),
- Increasing production in the Toraja District (through intensification rather than extensification),
- Improving the quality of farm-level processing (particularly in areas outside Toraja),
- Understanding the unique quality characteristics of Sulawesi coffee and the role the variety, growing location and processing play in its construction,
- Improved data collection and mapping of production areas,
- Establishing a strong market identity which demands a consistently high price in international specialty markets.

Most major coffee exporters in Sulawesi are already working towards a range of certification programs for farmer groups which are compliant with various social or environmental principles. This increased willingness to engage directly with farmers and to invest in farmer group development and farmer extension activities suggests the potential for coordinating existing industry resources through an industry-wide Partnership. Many of the constraints identified in the previous section are interrelated and the following suggested activities (Sections 4.2 to 4.6) all possess significant areas of commonality, such that, ultimately, a coordinated approach would yield better outcomes.

Recommendation: Assess industry interest in, and then potentially support, the establishment of a ‘Sulawesi Coffee Partnership’ which would have sub-components of:

- **Socio-economic Research on Farmer Decision-making Processes,**
- **Promoting Good Agricultural Practices and Environmental Sustainability**
- **Understanding Coffee Quality Determinants in Sulawesi,**
- **Regional Branding and Geographical Protection,**
- **Data Collection and Computer Mapping**

6.2 Socio-economic Research on Farmer Decision-making Processes

The Sulawesi coffee industry is now at a stage where further development requires the active engagement of smallholder farmers. Buyers would like to see Sulawesi coffee farmers producing more coffee, increasing yields, adopting Good Agricultural Practices, improving quality, protecting the environment, and organising into transparent farmer groupings. There is currently a frustration (amongst buyers) that Sulawesi coffee farmers do not appear motivated to respond to these demands. This suggests a lacuna of knowledge regarding farmer incentive structures across Sulawesi, and especially within

Toraja. The socio-institutional environment within which farmers produce and sell coffee determines incentive structures, which in turn drive farmer decision-making processes. Market failures and imperfections with respect to labour, credit, access to land, information and future discounting are important determinants of household decision-making. Understanding these constraints, as well as the geographical and cultural context within which coffee is produced is fundamental to engaging farmers in future industry development, and high-quality socio-economic research would complement any other industry development initiative.

It is worthwhile pointing out that farmer decision-making processes are poorly understood right across Eastern Indonesia, and this suggested research activity could be as applicable to cocoa or cashews (for example), as it is to coffee. There are a number of commodity contexts across Eastern Indonesia where farmers have not adopted improved technologies, or are reluctant to work cooperatively with other farmers, when it would seem that to do so would improve farm profitability.

Suggested focus areas for this research include:

Farmer Groups. At present, farmer groups are being actively promoted across Indonesia for various agricultural commodities, primarily as a means for facilitating supply chain traceability and direct purchasing schemes by large agribusiness companies. Farmer groups are also being promoted, mostly through government-sponsored programs, to allow farmers to engage in value-added processing. The capacity of these farmer groups to perform such functions, however, has not been adequately assessed. Learning from past experiences would help inform appropriate modes of farmer organization in contemporary global value chains. Importantly, farmer groups are often perceived, by farmers especially, as a potential tool for 'escaping' from debt entrapment by local collectors.

Tengkulak and Tied Credit. Rural credit markets do not function perfectly in Sulawesi. The capacity for farmer organisations to function effectively is often dependent on their ability to provide better financial services to members than the existing informal credit arrangements of *tengkulak* collectors. In Sulawesi, and elsewhere, the services offered by the *tengkulak*, and implications for a competitive farm-level buying environment, are poorly understood. The failure of various 'direct-buying' initiatives and government interventions in the past was frequently due to a mistaken belief that 'shortening' the supply chain, and removing the middleman, would improve supply chain efficiency. Understanding informal credit arrangements in the coffee-growing districts should be a focus of socio-economic research.

Access to Technical Knowledge. How do farmers obtain information regarding on-farm technical improvements? In the Sulawesi coffee districts, government extension agencies do not currently play an important role in information dissemination. Rather, informal social networks, first-stage collectors and input distributors are principal sources of both technical and price information for coffee farmers. What is the quality of this advice? How can access to technical information for these collectors be supported and improved? Would better access to agricultural knowledge improve farm profitability and reduce pressures on forest pioneer fronts?

Risk Management. Formal risk management tools, such as insurance and hedging, are mostly absent in Sulawesi. Instead, farmers and traders rely on informal mechanisms to cope with risk. In an environment where farm profitability is as sensitive to price variability as to the absolute level of prices, the development of effective institutions to cope with risk is essential to increase farm efficiency. Risk minimisation is often a hidden factor influencing rational farmer decisions not to adopt improved agricultural practices. The extent of sharecropping and land pawning arrangements across Sulawesi is poorly

understood, and the nature of these institutions will significantly influence farm management decisions and the effectiveness of extension services. It is important to first understand what informal and formal risk management mechanisms currently exist in Sulawesi. Finally, are local prices in Sulawesi linked to the New York exchange and would access to global price movements help improve the bargaining position of Sulawesi coffee farmers?

Farm Systems, Livelihoods and Remittances. Perhaps the most important form of risk minimisation at the farmer level is crop and income diversification. In many instances, coffee is grown as one component of a mixed farm system, which might include rice and tuber crops for subsistence, livestock for ceremonial consumption and other commercial crops for an alternative cash income. Off-farm income generation and the role of remittances, in particular, are vital determinant of farmer willingness to allocate resources to coffee production. In Toraja, participation in a complex ceremonial system is a key factor determining resource allocation at the household level and will be a central component of any socio-economic study of the Sulawesi coffee industry. The relative importance of these various productive activities is still poorly understood in the coffee regions of Sulawesi, suggesting that a farm systems approach to household income generation should be adopted.

Quality Incentives, Grades and Standards. To maintain the international reputation of Sulawesi coffee as a premium product, adequate price incentives for quality production must be ensured along the entire supply chain. Importantly, quality improvement does not always result in improved farm incomes due to increased costs. Existing export grades and standards are probably less important in Sulawesi than elsewhere, although informal quality requirements set by private buying stations and enforced by village collectors and market traders are of paramount importance. It is possible that the opaque nature of quality standards and associated high transaction costs in the Sulawesi coffee industry is contributing to lower farm-gate prices. Furthermore, the role of cup-testing is a central concern within specialty markets and is still a poorly understood quality convention for many exporters. An analysis of quality conventions and standards employed at each node along the supply chain would help identify such sources of economic inefficiency.

Recommendation: Initiate a comprehensive socio-economic research activity to understand farmer decision-making processes and incentive structures in Eastern Indonesia.

6.3 Promoting Good Agricultural Practices and Environmental Sustainability

Forest clearing for coffee production is an ongoing concern in the Sulawesi highlands, reflecting an extensive, rather than an intensive, approach to agriculture. Whilst these concerns have not yet been specifically targeted by either environmental organisations or government agencies in Sulawesi, it is reasonable to expect that this will change in the coming years. For example, a recent WWF report, *Gone in an Instant*, highlights the role of coffee farming and encroachment in ongoing deforestation across Lampung Province in Sumatra. Global coffee companies are increasingly apprehensive about having their valuable brand assets associated with environmental degradation in source countries, resulting in the plethora of corporate-driven certification schemes now found in the global coffee industry.

The reasons for coffee expansion into forest areas are varied and complex. A key component, however, is effective farmer extension promoting improved agricultural practices and a shift away from land-extensive production. Linked to global certification demands and environmental concerns, then, assisting the development of effective farmer

extension services in Sulawesi should be an industry priority. A corresponding benefit for farmers would be an improvement to the extremely low yields (in Toraja especially) and potentially improving farm income as a result.

The mechanism through which farmer extension would be most effectively implemented in Sulawesi is unclear at this stage. There are some indications that government extension offices across Indonesia will be significantly revitalised through the World Bank FEATI loan, which might improve service provision within the Sulawesi coffee sector in the future. In the short-term, however, various private-sector buyers are already working towards models of private extension delivery in Sulawesi. The impetus for these initiatives is generally to facilitate traceability. These efforts signify noteworthy attempts towards farmer engagement which could be further supported through more effective knowledge provision. First stage collectors also routinely provide technical advice to farmers. Private sector efforts at farmer extension activities within Toraja are also driven by an interest in stimulating increased production within this sought-after producing district. Importantly with regards the industry Partnership (suggested above), improving the productivity of existing coffee plots in Toraja potentially offers an activity of common interest to all major buyers.

Recommendation: Determine the extent, and understand the driving factors, of coffee-related forest encroachment in Sulawesi. Then, support existing initiatives towards the implementation and certification of Good Agricultural Practices across Sulawesi through an improved agricultural extension service.

6.4 Construction of Physical Quality in Sulawesi

The unique flavour and character of Sulawesi coffee (physical quality) is a key component of the success of Sulawesi coffee industry (particularly Toraja). Along with the full-washed clean, high acidity coffee produced for over 30 years by Toraco, a unique process of wet hulling has evolved in Sulawesi and northern Sumatra, and is a key to producing the body which identifies this coffee in some markets. This wet-hulled process also gives the raw green bean a distinctive colour, which is one of the first indicators of quality sought by buyers of this specialty coffee. A number of larger processors / exporters have been developing, through empirical means, standardised processes to gain a more consistent quality for this wet hulled coffee which is now used for approximately 75% of exported coffee. However, there are reports that this standardisation of processes (to achieve more consistency for key large buyers) is reducing the uniqueness and complexity of the Sulawesi coffee. There is currently little understanding of the role of processing technology in determining quality, and how this interacts with geographical conditions and coffee variety. The degree to which the flavour characteristics of *Toraja* coffee can be replicated by using similar processing methods in other parts of Sulawesi, or in places such as Flores, is also poorly understood. There are questions on how 'special' the coffee of Toraja will be if processing methodologies are standardised and simplified to match with flavour profiles of coffee from other regions or islands in Indonesia. Achieving 'replicability' of coffee by having a range of sources of a similar coffee is a key strategy for large buyers. However, over time, this strategy and the influence of large buyers may make coffees like Toraja less unique and replaceable with a downward pressure on price.

There are benefits for the whole Sulawesi coffee industry to understand more clearly the inter-related roles of processing, growing location and coffee variety on coffee quality and consistency. This would be particularly useful for smaller processors / exporters trying to develop new and competitive unique market niches in the industry by understanding and managing quality. This process would necessarily require engagement with a range of buyers in cup tasting and evaluating coffees and help to create credibility and new market linkages.

Recommendation: Develop an improved understanding of factors that influence the physical quality of Sulawesi coffee to aid the industry to improve quality and consistency, and develop options to create value adding for smaller niche markets. Specifically, more needs to be known about the unique ‘wet-hulling’ process which helps to give Sulawesi coffee its unique specialty flavour. Also, assist other regional coffees to develop identities and reduce the reliance of trading on the *Toraja* reputation.

6.5 Regional Branding and Geographical Protection

Starbucks promotes coffee with the slogan ‘Geography is a Flavor’. Certainly, quality in the specialty coffee sub-sector is increasingly associated with the capacity of roasters to sell geographic origins. As it is already part of this international sub-sector, the Sulawesi coffee industry would benefit immensely from an effective regional brand management strategy. Globally, the trend is for coffee production regions to protect their marketing identities through the establishment of Geographical Indications (GIs or systems of appellation). The wine industry has demonstrated that GIs allow producers living in a bounded area to construct economic rents associated with a recognised regional identity, and so retain a greater share of the final retail price of their product. Interestingly, major coffee end-users, such as Starbucks, are also increasingly supportive of GIs as a less painful alternative than geographical trademarks now being proposed by producing country representatives⁶.

Both *Toraja* and *Kalosi* are recognised as specialty coffee identities, and could potentially benefit from legal geographical protection. Northern Toraja, in particular, is associated with a bounded production area, possesses a distinct cultural identity (which lends itself to the social construction of quality), has a unique growing environment due mainly to altitude and topography, and growers have developed an entrenched culture of quality processing. Assuming that demand for this origin remains high, and that production is effectively limited by geographical constraints, coffee growers living within the protected area would benefit from increased farm-gate prices. There are also considerable potential synergies with the Toraja tourism industry (once a rapidly growing sector, but now struggling), which could benefit from a stronger regional image, improved local roasting activities and agro-tourism development.

The establishment and monitoring of a GI, however, is a costly and time-consuming exercise, with no certainty of success. The legal framework within Indonesia for such protection is still poorly developed, and the potential for creating new rent-seeking opportunities, as a result of a GI, is considerable. Current CIRAD-sponsored efforts to establish a GI for *Kintamani Coffee* in Bali serve as a test-case for how a GI might be functional within the Indonesian context, and should be closely monitored and evaluated for possible applicability to Sulawesi.

The establishment of a GI (or similar legal protection) in Toraja/Sulawesi should be considered a long-term goal of the industry. Current institutional settings within Sulawesi, however, are probably not conducive to its immediate development. In particular, such an endeavour would require strong farmer organisations, a cohesive industry association, an operational legal framework, a motivated and supportive local government, and sustained buyer interest. Other activities mentioned above, such as an Industry Partnership, Socio-economic Research, and Farmer Development through Good Agricultural Practices, would however assist the industry move in this direction.

⁶ Refer, for example to the ongoing Starbucks-Ethiopia Trademark dispute over identities such as *Sidamo*, *Yirgacheffe*, and *Harrar*, <http://poorfarmer.blogspot.com> provides a good overview of this case.

Recommendation: Support initial activities with the long-term goal of establishing legal protection for regional coffee identities in Sulawesi.

6.6 Data Collection and Computer Mapping

A final activity, both necessary for possible geographical protection in the long run and with immediate industry-wide benefits, is developing a reliable geographic database regarding Sulawesi coffee production. Improving the capacity of government agencies to collect and interpret data accurately would be of benefit to the industry. This database would also be an important baseline from which any subsequent development activity could be assessed. The use of remote sensing imagery could quite easily be incorporated into a computer mapping (GIS) system to identify major production areas. Such imagery could also be used to determine the extent of forest encroachment due to coffee farming in recent years.

Recommendation: Provide support for relevant government agencies to conduct a comprehensive baseline assessment and mapping of the industry.



Australian Government

**Australian Centre for
International Agricultural Research**

project

Securing the profitability of the Flores coffee industry

SADI-ACIAR research report

date published

October, 2007

prepared by

Tony Marsh
Coffee Consultant

Jeff Neilson
University of Sydney

contributor

Dr Surip Mawardi
Indonesian Coffee and Cocoa Research Institute

approved by

David Shearer



Australia Indonesia Partnership

Kemitraan Australia Indonesia



ACIAR's participation in the Australia–Indonesian Partnership

The Australia Indonesia Partnership (AIP), comprising \$500 million in grants and \$500 million in highly concessional loans over five years, was announced in January 2005. The partnership supports Indonesia's reconstruction and development efforts, both in and beyond tsunami-affected areas. Assistance involves long-term sustained cooperation focused on economic and social development projects and Indonesia's programs of reform and democratisation.

ACIAR is committed to the partnership through the management of a component of the Smallholder Agribusiness Development Initiative (SADI), which aims to improve rural sector productivity and growth in four Eastern provinces—East Nusa Tenggara, West Nusa Tenggara, South East Sulawesi and South Sulawesi.

This initiative will improve incomes and productivity for farmers and agribusiness in response to market opportunities, through a process that is underpinned by improved adaptive research and development capacity.

ACIAR's role in the initiative is to strengthen province-based agricultural research and development capacity that is market and client-driven, and effectively transfers knowledge to end users. A key part of this approach is delivered through market-driven adaptive projects which are priorities for smallholders, farmer groups, agribusiness, government and other supporting agencies.

project number	SMAR/2007/200
----------------	---------------

ISBN	978 1 921434 09 9
------	-------------------

published by	ACIAR GPO Box 1571 Canberra ACT 2601 Australia
--------------	---

This publication is published by ACIAR ABN 34 864 955 427. Care is taken to ensure the accuracy of the information contained in this publication. However ACIAR cannot accept responsibility for the accuracy or completeness of the information or opinions contained in the publication. You should make your own enquiries before making decisions concerning your interests. Reproduction in whole or in part of this publication is prohibited without prior written consent of ACIAR.

Contents

1	Acknowledgments	4
2	Executive summary	5
3	Introduction.....	7
4	The Flores Coffee Industry	8
5	Production Areas.....	8
5.1	Manggarai	8
5.2	Ngada.....	10
5.3	Pricing and Market Potential of Flores coffee	18
5.4	Role of Coffee Processing in Creating Quality	19
6	Industry Strengths.....	20
6.1	The Physical Environment	20
6.2	Existing Coffee-growing Culture	20
6.3	Potential for 'Symbolic' Quality Construction	21
6.4	Supportive Government Institutions.....	21
6.5	Existing Industry Efforts at Quality Improvement.....	21
6.6	Demand for Speciality Coffee	21
7	Industry Constraints.....	21
7.1	Limited Quality Orientation within Existing Coffee Trade Networks	22
7.2	Lack of Strategic Industry Planning	22
7.3	Risk Adverse Farmers and Diverse Farm Systems.....	22
7.4	Poor Farmer Access to Knowledge and Extension	22
7.5	Poor Supporting Infrastructure.....	22

1 Acknowledgments

The authors acknowledge the role of a number of organisations and individuals who provided essential input for this study. We are particularly appreciative of the time and support offered by the industry actors who shared their knowledge of the Flores coffee industry with us.

In this regard we would like to mention Kornel Gartner, Bambang Gunjurong, Olivier Tichit, Hindrawan Wibisono, and Edisius Yongki Wibisono. Tonsis Jemada in particular was responsible for coordinating our visit and accompanied us for the duration of our stay in Flores.

The District offices of the Directorate General of Estate Crops in both Manggarai and Ngada were both particularly generous, providing valuable input and assistance with field activities, and we would like to thank Verra Killa, Tanur Salesius and Marcel Ndaou for their input.

Kornellis Manjur of the Economics Division at the Manggarai District Regional Secretary provided important information regarding regional trade dynamics.

A number of individual coffee farmers and representatives of farmer groups across Flores were also willing to spare their time to discuss with us their views on industry development, for which we are appreciative.

During our visit to Flores, we also met on a number of occasions with representatives of the USAID AMARTA program, and we are grateful to Henry Harmon, Robert Capstick and Heru Walujo for their cooperation,

2 Executive summary

The island of Flores has produced significant volumes of coffee for well over a century. Coffee is a smallholder crop in Flores, grown within a subsistence-based agricultural system, and is the principal source of farm income in the Districts of Manggarai and Ngada. The natural environment in these Districts, with high altitudes, seasonal rainfall and extremely fertile soils, is well-suited to coffee production.

An estimated 2,500 tons of Arabica, and 4,000 tons of Robusta, is produced annually on Flores, almost all of which is traded through the East Javanese port of Surabaya. Green coffee beans are either transported overland in trucks and ferries, or shipped via the Reo Harbour on Flores' north coast direct to Surabaya. Whilst demand for Flores Robusta coffee appears to be good, Flores Arabica coffee is relatively undeveloped and does not currently possess an established market identity. (The primary end-use for Flores Arabica appears to be as a cheap substitute for blending by the exporters in Surabaya.) The local price differential between the two commodities is small. This is in contrast to many other growing regions where Arabica prices are often 30% to 50% higher than Robusta. A number of Arabica quality improvement initiatives have already commenced in Flores, funded by government agencies, international development agencies and the private sector. Whilst these initiatives are still embryonic, international specialty coffee buyers are already showing an increased interest in the origin. Considerable potential exists for developing heightened quality consciousness along the value chain and establishing Flores as a specialty coffee origin, which would raise rural incomes in coffee-growing villages.

The coffee trade in Flores is based around the town of Ruteng in Manggarai District, where a dozen or so traders buy and sell Arabica and Robusta green coffee from all over Flores. For the most part, these traders are not engaged directly with international buyers, and are isolated from the changing demands of the global coffee sector. Coffee is normally collected by traders and, without further processing, transported to Surabaya. There appear to be no quality-related price incentives for the various types of coffee processing performed at farm level. Very few traders have established direct relationships with farmers beyond the traditional *ijon* system of tied credit, and most to date, have little motivation to improve quality at the farm level. Whilst one local trader has made some inroads into seeking heightened Arabica quality, these efforts do not appear directly linked to the requirements of the international market and farmer engagement has been limited to motivating farmers through price incentives.

There are a number of clear strengths and opportunities which suggest that Flores could develop into a specialty Arabica coffee origin, whilst further building the reputation of its Robusta. In addition to the ideal coffee-growing environment of Flores, the established coffee-growing tradition within the communities provides a good basis on which to develop a high value industry. The name 'Flores' also lends itself to the construction of symbolic coffee value, and the relevant government institutions appear supportive of coffee-related initiatives. The present combination of poor primary processing and lack of market understanding provide potential to quickly add value to this coffee. However, to capitalise on these strengths and opportunities, a range of constraints must be addressed and overcome.

Geographical isolation is the major constraint for the industry. Those involved in the industry lack knowledge about market opportunities and the technical requirements for quality improvement and value adding. The industry has no strategic plan and it will be difficult for any single small intervention to transform the industry without major investment. The farm system is highly risk averse, such that changes to farm-level production and processing methods must be clearly demonstrable as being beneficial to farmers. Farmers currently lack information and the means for effective knowledge

transfer is limited. To facilitate a shift towards a high value coffee industry in Flores, infrastructure improvements are also required. An efficient port and/or improved export documentation procedures in Flores would allow export-ready coffee to be traded more efficiently. At the farm level, improved water supply to villages is required to allow production of high quality washed coffee.

In Flores, the potential exists to help create a world class speciality coffee origin, resulting in increased farm incomes for the estimated 75,000 families currently involved in coffee production. Intervention can contribute to a quality-oriented shift in the Flores coffee industry. If technical issues can be resolved, an industry strategy formulated, and interaction between the various stakeholders supported, the scene is set for larger scale inputs to continue the development of the industry.



Flores Farm Family with traditionally processed Arabica Coffee

3 Introduction

The objectives of the report are to:

- Identify constraints affecting the profitability of the coffee industry in Flores,
- Understand the capacity of the industry and supporting agencies to contribute to regional development in Flores for the benefit of coffee smallholders, and
- Provide recommendations on how these constraints can be addressed

The focus is on the two main coffee production Districts of Manggarai and Ngada with information generated through interviews with stakeholders and general field observations, although there is a limitation due to the coffee harvest had not begun and there was little coffee being traded at the time of data gathering.

This report is focused primarily on Arabica coffee. However, it should also be acknowledged that current Robusta production is twice that of Arabica for Flores and there appears to be further opportunities for the development and value adding of Robusta in Flores as well as Arabica.

4 The Flores Coffee Industry

Flores is a long narrow island in East Nusa Tenggara (NTT) Province, in Eastern Indonesia. The two districts of Manggarai and Ngada (Figure 1), both in the western half of the island, contain the two major coffee production areas on the island, constituting an estimated 90% of production for both Arabica and Robusta coffee. These production areas are focused around the District towns of Ruteng and Bajawa. Ruteng is the centre for coffee trading operations on Flores.

There is a broad range of agricultural production in the coffee areas of both Districts. Soils in the Manggarai coffee area are fertile but are often spread across steep slopes, whilst soils in Ngada appear to be even more fertile and are located on a gently sloping upland plateau. Coffee is clearly the most important cash crop for farmers in both regions, although farmers cultivate a number of other food and cash crops in addition to coffee. These diverse production systems suggest a particularly risk adverse farmer, such that a shift towards more intensive commodity production remains a challenge in this relatively isolated part of Indonesia.

Arabica and Robusta coffee are grown passively in Flores with virtually no chemical fertilisers or pesticides. Both crops are mostly unpruned and widely intercropped, sometimes with Arabica and Robusta grown together. Coffee is mostly grown under the shade of *Erythrina* or *Albizia* trees, which are very tall and unpruned. Growing conditions are ideal for both Arabica and Robusta with deep fertile soils, adequate rainfall and a good dry season to ensure flowering and fruit set (overbearing could be a problem in these conditions). Coffee is healthy with no obvious diseases of major economic significance.

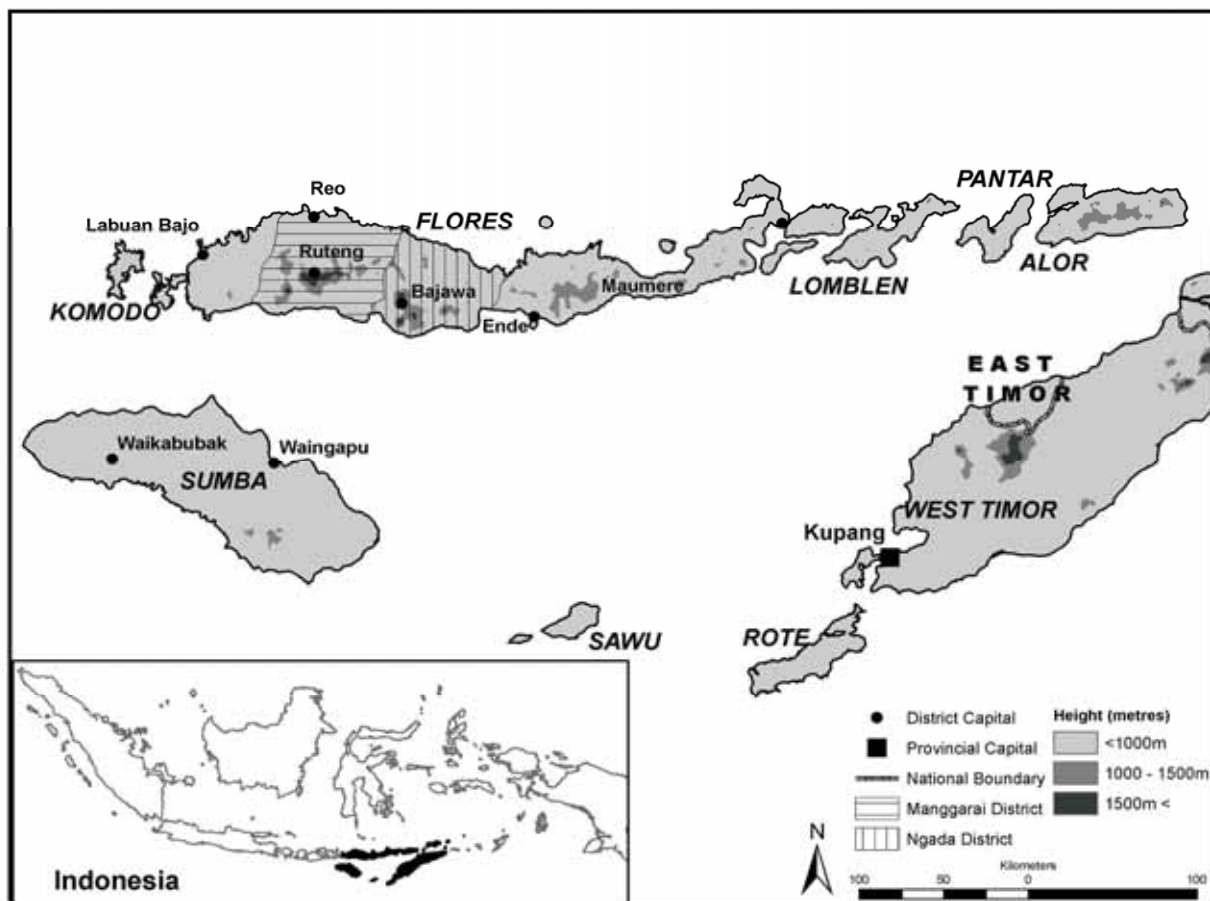
5 Production Areas

5.1 Manggarai

The coffee-growing area of Manggarai is concentrated around the steep slopes of Mount Ranaka (2358m), and a short chain of associated peaks stretching some 50 km in an east-west direction. Ruteng (altitude 1150m) is located just to the north of Mount Ranaka. Coffee production begins with Robusta grown on the lower slopes from 500m in altitude, then merges with Arabica in the middle altitudes of 800 to 1200m, and is then dominated by Arabica up to 1800m. The coffee areas in Manggarai are spread across a number of sub-districts, including Poco Ranaka, Borong, Elar, Kota Komba, Ruteng, and Lambeleda. These areas tend to be characterised by ageing coffee trees and declining production. Farmers appear to be more dependent on coffee in these areas than in the Ngada coffee areas. Manggarai is the main Robusta producing District in NTT.

We were provided with conflicting production estimates from different sources. The official National Estate Crops Statistics of Indonesia (published by the Department of Agriculture in Jakarta for the period 2003 to 2005) suggest that, in 2003, total annual production of Robusta coffee in Manggarai alone was 9,431 tonnes, and for NTT Province was 14,120 tonnes (Arabica data was not available). The local agriculture (Disbun) office in Ruteng, however, has recently revised its methods for estimating production and now reports that only 4,492 tonnes of Robusta is grown in Manggarai District. This Disbun office now reports that 1,241 tonnes of Arabica is grown in Manggarai. These latter estimates seem to correlate fairly closely with estimates made by a range of traders and industry stakeholders. Revised production estimates are based on tree counts, and then using standard planting distances (2.5m by 2.5m for Arabica and 3m by 3m for Robusta) to calculate total areas under cultivation.

Table 1 provides coffee production data for Manggarai District. Extrapolating from this data, average farm size is 0.12 hectares (132 trees) for Robusta and 0.08 hectares (128 trees) for Arabica. Field observations, however, suggest that (in some areas at least) farmers have coffee holdings far in excess of this (at least 0.5 hectares). Stakeholders suggest that up to 80% of farm families in the area grow some coffee, although it is probably little more than a backyard crop for many. Certainly, however, average holdings of coffee in Flores are small, indicating the general lack of focus on intensive coffee production within the farm system. Also extrapolating from Table 1, average yields from the productive areas are 376 kg GBE¹/ha (Robusta) and 301 kg GBE/ha (Arabica) which seems to accurately reflect the condition of farms observed.



Map showing the Two Major Coffee-growing Districts on Flores

Table 1. Coffee Production Data for Manggarai District

	Immature (Ha)	Productive (Ha)	Ageing (Ha)	Total (Ha)	Production (Tonnes GBE)	Families with Coffee
Robusta	4,294	11,931	1,194	17,419	4,492	36,980
Arabica	1,264	4,117	388	5,769	1,240	13,918

Source: Department of Estate Crops and Horticulture Manggarai District 2007

¹ GBE (Green Bean Equivalent) is used when volumes are actually based on another stage of processing such as red cherries or parchment coffee, and a conversion has been made to green beans.



Rice terraces and coffee areas near Ruteng, Manggarai District



Coffee Production area of Colol near Ruteng, Manggarai District

5.2 Ngada

The town of Bajawa is situated on an upland plateau (at 1200m altitude), which is surrounded by a complex of volcanic domes. The Ngada coffee areas are spread across this plateau, with large areas of relatively flat areas found between 1000 and 1400m altitude. The steeply-sloping volcanic cone of Mount Inerie, at 2200m, dominates the landscape to the south of Bajawa. Due to the relatively expansive land area found at these altitudes, coffee production in Ngada is dominated by Arabica cultivation (Table 2 shows this to be about 80% of total production). Production in Ngada is concentrated in the two key sub-districts of Ngada Bawa and Golewa (estimated to collectively account for

more than 90% of the Districts' total Arabica production). The Ngada area is characterised by very fertile soils, younger coffee trees and increasing production.

National Statistics data was not available for Ngada. The local Disbun provided the data shown in Table 2. The District production estimates of 368 tonnes (Robusta) and 1,727 tonnes (Arabica) correlate fairly accurately with estimates provided by a range of traders and industry stakeholders. Extrapolating from this data, yields are estimated to average 1030 kg GBE/ha for Robusta and 691 kg GBE/ha for Arabica (based on productive areas). At first glance, these appear to be very high yields, unlikely to be obtained on unimproved smallholder plots. Whilst it is possible that favourable conditions, such as fertile soils, relatively flat lands and young trees, are combining to encourage extremely high productivity, it is more likely that this is merely an underestimation of the productive area.

Table 2. Coffee Production Data for Ngada District

	Immature (Ha)	Productive (Ha)	Total (Ha)	Production (Tonnes)
Arabica	2,850	2,501	5,351	1,728
Robusta	438	357	796	368

Source: Department of Estate Crops Ngada District 2006



Volcanic Mount Inerie and gently sloping landscape of Ngada District



The town of Bajawa nestled in a heavily forested upland valley

5.2.1 The Social Setting of Coffee Production

In both producing Districts, there appear to be strong cultural traditions closely interwoven with farm practices. Livestock is commonly reared for ceremonial use and participation in these ceremonies is a major financial commitment for many families. Distinctive Flores architecture and traditional culture (*Bajawa*) appears to be especially pervasive in Ngada. The diverse resource and labour requirements of a traditional society appear to be a factor contributing to a lack of intensification within coffee production systems in Flores.

Overlaying traditional culture in Flores is the widespread influence of the Catholicism, reportedly adhered to by 97% of the population. It is clear that the Catholic Church plays a dominant role in the lives of people in these parts of Flores, with churches dominating both rural and urban landscapes. In addition to providing spiritual guidance, the Catholic Church is actively involved in economic and development activities in the area. In Ngada, the Church owns some large coffee estates and that an 'Economic Commission' is active within the Archdiocese of Ende (and under it the Diocese of Ruteng). It will be important to understand the Catholic Church's role in the daily life of farmers and to engage the Church as a stakeholder in any development activity in the area.

Farmers practice a broad based, mixed farming system with the benefit of extremely fertile soils, growing a range of food crops, with corn being the main staple along with dry and wet rice, soy and kidney beans. A wide range of vegetables, such as green beans, are also grown. Popular cash crops in western Flores include candlenut, cocoa, and cashews, whilst large stands of bamboo are also cultivated. Small livestock are an important part of the agricultural system. This diversified farm system is an apparent response to risks of food security. In recent years, extended drought and failed harvests have led to widespread food shortages in eastern Flores, particularly in Sikka, Ende and Flores Timur.

In 2006, floods in Ngada destroyed large areas of food crops, whilst the 2007 landside in Manggarai (following localised drought and failed corn harvest) destroyed wet rice and dry fields, again threatening food supplies. The inability of existing institutions and government agencies in Flores to cope with localised food shortages seems to reinforce farmer concerns over intensifying commodity production. Government programs to stimulate export crop production (such as coffee and cocoa) in Flores have also been targeted by several local NGOs as contributing to food shortages and starvation.



Traditional Bajawa Adat Village

A further social issue is land uncertainty and clashes with forestry officials. In 2002 and 2003, local government officials commenced a campaign to evict coffee farmers who, it was claimed, were illegally occupying forest lands in Manggarai (near Colol village). The ensuing conflict came to a head in 2004 and included the chain-sawing of smallholder coffee trees, arrests and protests. Uncertainty over land rights is clearly an important issue in Manggarai, and is possibly associated with a disinclination amongst farmers to make long-term investments in their farms.

5.2.2 Coffee Types and Varieties

Only two out of the more than eighty species of coffee are grown commercially around the world. These are Arabica (*Coffea arabica*) and Robusta (*Coffea canephora*). Each requires slightly different agro-climatic conditions (with some overlap). Arabica is grown at cooler, higher altitudes of 1000 to 2000 metres whilst Robusta grows from sea level to 1000m. Good rainfall of at least 1600mm per annum is required for both species. In general, Arabica is a more complex crop to grow and process. Both Arabica and Robusta can be grown either intensively (200 man-days and one tonne of fertiliser per hectare) or passively (where farmers simply harvest the cherries with little crop maintenance). The system adopted by farmers depends on a range of social and economic factors. If good production, processing and marketing requirements are met, Arabica generally achieves a higher farm-gate price than Robusta. While Robusta is generally lower priced, it can yield up to twice as much coffee per hectare than a comparable Arabica production system. Quality and marketing tend to be the key factors in improving Arabica profitability, whilst high productivity and farm efficiency are often the key factors in Robusta profitability.



Typical smallholder farm with rice and coffee under mixed shade, Manggarai



Coffee under Erythrina Shade, Ngada

Arabica and Robusta tend to have their own specific markets and uses. Robusta is generally considered a lower quality coffee compared to Arabica. The export price normally reflects this, with Robusta prices being approximately half to two thirds that of Arabica. Robusta flavours are harsher and do not have the fine and delicate flavours associated with Arabica. Robusta also has twice the caffeine of Arabica. For these

reasons, Robustas are normally used in the cheaper blends for less discerning markets and for instant coffees or mixed sparingly with Arabicas. Robusta, however, was traditionally a key component within Italian espresso blends, and whilst the speciality coffee market has tended to favour Arabicas, high grown and well processed Robusta can also sometimes be used in quality blends. In simple terms Robusta is used as a 'base' in such coffees providing the 'body' or 'mouth feel', whilst Arabica provides acidity, aroma, and a range of subtle flavours. For this reason, both Flores Robusta and Arabica have good value adding and marketing potential.

Little is known about the Arabica varieties found in Flores, as these have been of little interest to buyers in a commoditised, low quality Arabica market. However, Arabica varieties will become a topic of interest if the Flores coffee does move toward a specialty market as variety composition may be a key strategy in developing a Flores 'character'. ICCRI researchers believe that the dominant Arabica variety in Flores is S795, with localised concentrations of Typica, Catimor and Hybrid de Timor. A high concentration of an old local Arabica variety called 'Juria' was observed, which is a much larger form than normal Arabica. These trees are obviously Arabica, but the actual variety is not known and needs further investigation. The unique size of these trees may provide additional marketing potential.

Even less is known about the Robusta varieties found in Flores. Varieties are normally of little interest to buyers in the commoditised Robusta market. Varietal interest in Robustas is normally limited to issues such as disease resistance, productivity and bean size. However, Robusta varieties may be a topic of interest if the Flores coffee does move to build upon its existing Robusta quality reputation.

It is also possible that the fertile and mountainous environment of Flores contains unique microclimates, where interesting combinations of environment and varieties create possibilities for specialised market development. The Ngada area is believed to be much cooler than the Manggarai area, even though they are both at about 1200m altitude, with clear differences between Ngada and Manggarai Robusta described by some industry actors.



Large 'Juria' Arabica trees, Manggarai

5.2.3 Harvesting and Processing

The harvest seasons of Arabica and Robusta overlap, with Arabica harvested from May to August and Robusta harvested from July to September. As both Arabica and Robusta are large unpruned trees, the harvest is a slow process. It is reported that ripe Arabica cherry is selectively harvested, with farmers visiting each tree four to five times over the four month season. This needs to be confirmed, as it appears to be in contrast with the marketing process where there is no incentive for quality and strip-picking (harvesting all coffee when only about 60% of the cherry is actually ripe). Under such conditions, harvesting of green coffee would be more cost-effective. It is also reported that Robusta cherry is selectively harvested like Arabica, which would be rather unusual in Robusta production systems where strip-picking usually dominates, and may be a reason why Flores Robusta is a relatively sought after origin. It was reported that Flores farmers believe that strip picking can damage the coffee tree.

There is no standardised system for processing Arabica cherry to green bean. Coffee is bought by traders as *Asalan* (unsorted and ungraded green bean). There is no price differentiation in the local market for how this is produced. A number of primary processing methods were reported such as: i) drying whole cherry (natural method) and then hulling the dry cherry to produce *Asalan*; ii) pulping and then drying the coffee without fermentation (semi-washed) and then drying and hulling the parchment to produce *Asalan*; and iii) pulping, fermenting and washing (full-washed) prior to drying and hulling the parchment to produce *Asalan*. Some coffee is also wet-hulled and some is dry-hulled. It can be concluded that due to the range of processing methods used by farmers and accepted by traders the normal Arabica quality of Flores will be extremely low.

Robusta tends to more uniformly processed with farmers reportedly using the 'natural' process to produce dry cherry (as is common for Robusta). Coffee is hulled at farm level prior to sale.

The processing of fresh cherry to dry cherry or dry parchment is an extremely critical in step to maintain quality. A further critical area is the storage of the dry coffee and then the hulling of coffee to produce *Asalan* for sale. A large proportion of the crop is hulled by farmers pounding it in stone mortars which will produce a range of flavour defects to add to the already poor quality primary processing of the fresh cherry. All of these factors contribute to the poor quality of Flores coffee compared to the potential of the coffee on the tree.

5.2.4 Trading System

Coffee is traded from farmers through traditional middle traders (called *Ijon* or *kaki-tangan*) to the major traders, all based in Ruteng. *Asalan* is sold by weight with little to no regard for quality. In the past, two traders had facilities capable of producing export ready coffee. However, it appears that the majority of Arabica and Robusta is now bulked and shipped to Surabaya as *Asalan* with no processing performed in Flores.

Flores Arabica is virtually unknown outside the local Indonesian market as these coffees are reportedly mixed and blended in Surabaya with other Indonesian coffees. Flores Robusta is apparently sought after for specific markets in Japan where it is sometimes sold under the Flores name ('Flores' or 'Reo' coffee). It was also reported by one trader that visits had been made to Ruteng by Japanese and Dutch buyers to monitor the Flores Robusta supply chain (possibly looking for direct sources of Flores Robusta in an attempt to stop adulteration in Surabaya).

5.2.5 Local Coffee Traders

The Manggarai District collects a 'tax' of Rp50 per kilogram of coffee traded out of the District (prior to September 2006, this was Rp100 per kilogram). An official database therefore exists for the interregional trade in coffee from Flores, although such data is expected to underestimate actual trade (Table 3). The dominance of coffee in agricultural income in the District is also evident in the table. Again according to this District data, there were ten local traders, all based in Ruteng, actively trading coffee in 2005.

Table 3. Interregional Commodity Trade from Manggarai District

Trade from Manggarai (tonnes)			
	Coffee	Cocoa	Cashew s
2004	3876	672	670
2005	3110	550	693
2006	4027	513	484

Source: Economics Division, Manggarai District Regional Secretariat

According to local sources, all of these traders are ethnic Chinese and most deal in a range of commodities. The largest Ruteng-based trader is CV. Matahari, which also roasts and markets its own coffee locally. The traders operate in a very competitive local market, where coffee is bought and sold on margins with very little interest in quality or value-adding (ie. a commodity market). Green coffee is pooled in Ruteng and sold on to Surabaya, based on contract request and price indications from Surabaya. Some of the traders are sub-offices for Surabaya exporters, whilst others appear to be more independent. The Ruteng traders are isolated from international markets and do not have access to information and knowledge about new, emerging markets particularly in the specialty sector.

5.2.6 Transport, Shipping and Export

Virtually all of the coffee produced in Manggarai and Ngada Districts is shipped through the Port of Reo. This is a small port. It is capable of taking ships up to 1000 tonnes, although most ships are in the range of 200-300 tonnes. Reo appears to be the main gateway for inbound rice and other essential commodities (such as fertilisers) to Western Flores and these ships are given priority at the port. Long delays are reported by traders shipping coffee out from Reo.

It is also possible to transport coffee overland from Flores to Surabaya using trucking companies and four inter-island ferry crossings. This appears to be more costly, slower and is considered riskier in terms of theft.

Preparation of export shipments from Flores has been conducted in the past by some traders. However, the difficulty of arranging export documentation via the provincial capital of Kupang (and also the port authorities in Surabaya), and the risk of transport and handling export-ready coffee break-bulk in small inter-island ship routes, has proved difficult.

The size and capability of the Reo Port limits the export capacity and opportunities for Flores coffee. A port is reportedly being upgraded on the south coast of Flores near Aimere, which would appear to be in the wrong location to serve the export industries as shipping lines need more direct links to Surabaya via the north coast of Flores. Currently, the largest port on Flores, and the only port officially registered as a 'commercial' port (operated by Pelindo III) is Maumere.

5.3 Pricing and Market Potential of Flores coffee

5.3.1 Arabica coffee

Key questions remain on the final use of Flores Arabica. International buyers have had little exposure or offerings of traditional Flores Arabica coffee, which indicates that is mainly blended and mixed into other Indonesian coffees in Surabaya.

The majority of the 2500 tonnes of Flores Arabica is either processed as a 'natural' or a 'semi-washed' coffee, with few quality incentives and of relatively low quality. Confirmation of the low quality of Arabica being produced on Flores is indicated by the 2006 season maximum local factory door price (for *Asalan*) of only Rp16,000/kg. This is only slightly higher than the Robusta price at Rp14,000/kg.

Price discussions with local traders and quality comparisons with other recently developed specialty coffee origins, such as East Timor, suggest that existing Flores Arabica coffee, if offered on the world market, would be priced at minus 20 to minus 25 cents below the NY 'C'. To check this price assumption, NY 'C' price averaged roughly 120cents/lb over the last six months of 2006. Discounting 20cents/lb gives a potential export price of Flores coffee of 100 cents/lb or around Rp20,020/kg FOB Surabaya (at Rp9,100/USD). A Ruteng purchase price in 2006 of Rp16,000/kg leaves just over Rp4,000/kg to cover inter-island shipping, sorting, grading and export preparation in Surabaya, as well as a reasonable profit margin for the Surabaya trader.

From experiences in origins such as East Timor, it is likely that improved Flores Arabica could, however, be sold at prices of plus 10 to plus 15 cents/lb to the NY 'C'. (Toraja and Mandheling coffees are at prices of plus 40c/lb over the NY 'C', which in a 120c/lb market equates to an FOB price of \$3.52/kg). There are indications that for a small increase in processing costs and a focus on quality management in the processing and marketing

chain, FOB prices could increase by Rp5,500/kg or 25%. In turn, much of this could be translated to significantly improved farm-gate prices.

The East Timorese coffee industry is a case where a poor quality filler coffee was transformed in the 1990s into a recognised quality origin by the deliberate efforts of donor agencies and value chain leaders. Indonesian Arabicas are sought after origins in the global market speciality coffee market, providing an important platform for acceptance of Flores coffee.

5.3.2 Robusta coffee

Discussion with traders indicate that Flores Robusta is a sought after coffee and is exported under the 'Flores' name or under the name of the Port, 'Reo', although little is known about the coffee or end-uses. It appears to be traded at about a \$100 to \$200 premium per tonne over the London market for Robusta, which is much higher than Lampung Robusta (which commonly sells at a discount to the London price). Japan is reported to be the key market.

It is not clear what characteristic set Flores Robusta apart from other Robusta origins. Most of the other processes in the chain are rudimentary, such as hulling by traditional pounding. Robusta is sold by farmers as *Asalan*. Flores Robusta is reported as being a small, hard, dense bean. It is also reported that Flores Robusta is selectively picked when ripe and not strip-picked, which would have a clear impact on quality. Higher altitude growing areas will also play a part in creating a distinct flavour character. Even though Flores Robusta appears to be a known coffee, it is by no means a Speciality Robusta. There is scope to help improve value of Flores Robusta by technical, quality and marketing interventions.

5.4 Role of Coffee Processing in Creating Quality

The role that coffee variety and growing environment play in influencing coffee quality and character is widely acknowledged. There has been much less acknowledgment of the role of coffee processing in influencing taste profiles. Coffee quality is often assessed at a significant distance from production areas, with coffee trading companies using cup tasting to assess, then accept or reject, coffees presented to them in shipment samples. Despite their skill in assessing quality, there is little technical understanding of the processes that develop particular coffee flavours. Often processing is seen as an inert activity which merely maintains the natural character and flavour of coffee, if done correctly, and is the cause of deterioration when quality is a problem.

There is now growing interest in understanding the role processing plays in the development of coffee character, as the speciality coffee industry has begun to seek out unique and specialised flavours, and to demand more reliability and consistency in quality. It is now realised that a range of characters and flavours are possible for a single origin if different primary processing methods are used.

Most coffee origins are linked to a defined processing method which has evolved over time and through the influence of factors such as colonial industry, local culture, climate, labour, water availability, and market signals. Flores, however, currently does not have a clearly-defined, characteristic processing method. At present, a range of processes are used which combine to create inconsistent, low quality coffee. Apart from the range of traditional processing systems in Flores, two small initiatives focused on developing coffee for the speciality market are under way. One is using a 'wet-hulled' technique to produce a coffee with high body and low acidity, while another is using a full-washed technique to produce a clean, acidic coffee with lower body coffee. An objective evaluation of the most

appropriate processing technology for the long term benefit of the Flores Coffee industry, suited to local culture, infrastructure and environmental conditions is needed.

6 Industry Strengths

Farm-gate prices for Arabica coffee in Flores are currently low by Indonesian standards. The industry, however, possesses a number of favourable conditions which would support the establishment of 'Flores' as a recognised origin within the international specialty coffee sector. If managed appropriately, quality improvement and integration into speciality marketing chains would significantly increase the rural incomes of an estimated 75,000 farm families in Flores.

As a simple measure of possible impact, Flores farmers could benefit from price increases of 25% (and possibly up to 40%) for speciality coffee over farm-gate prices for traditionally processed and marketed coffee. This potential price increase may be a trigger to increase the generally low farm productivity. In addition to better prices, linking farmers into the speciality coffee marketing chains opens farming communities to a range of opportunities, such as access to information, community groupings and more reliable business partnerships. These information linkages, partnerships and groupings then have the potential to become the conduits and catalysts for further farmer livelihood improvement initiatives and community development activities.

Several factors are conducive to the future development of specialty coffee production in Flores.

6.1 The Physical Environment

Coffee produced in the districts of Manggarai and Ngada has an important competitive advantage over many other coffee-growing regions in Indonesia and around the world. Both districts are fortunate to possess fertile, well drained volcanic soils, which are well suited to quality Arabica production. Higher altitude coffee production generates superior tasting coffee, and Arabica production in Flores appears to range from around 1200 meters up to 1700 metres altitude. Much of the Robusta production is also relatively high-grown, found between 500 and 1200 metres altitude. Physiologically, the coffee plant requires a period of water stress to stimulate flowering balanced with annual high rainfall. The seasonal weather patterns on Flores seem well-suited to reasonably high coffee production.

6.2 Existing Coffee-growing Culture

Coffee has been grown on Flores for at least 150 years, and the local communities are highly familiar (through intergenerational learning) with the crop. Coffee production is integrated within existing farm systems. Whilst farm systems are diverse, coffee is undoubtedly a vital source of cash income in villages. At these altitudes, few other agricultural commodities possess the same environmental requirements and flexibilities in production and trade as coffee. The estimated 2,500 tons of Arabica now grown in Flores easily satisfies the critical mass (of at least 500 tonnes) which is generally required to establish a reliable new origin within the specialty coffee sector.

6.3 Potential for ‘Symbolic’ Quality Construction

The name ‘Flores’ has certain marketable associations which, combined with a unique culture (particularly in Ngada District), lends itself to construction of symbolic coffee quality. In his book, *The Perfect Cup*, Tim Castle writes:

“If a cup of coffee tastes good, it’s not as good as one that reminds you it came from a place and that people grew it.”

Indeed, the ability for an origin to tell a story is an increasingly important ‘quality’ within the speciality coffee sector. A successful case of consciously utilising cultural imagery to increase the symbolic quality of coffee is that of Key Coffee in the Toraja coffee industry in the 1970s and 1980s. The rugged, volcanic Flores landscape (adjacent to Komodo Island) is home to several, distinct traditional ethnic groups, which would seem to offer several potential points of departure for telling a unique ‘Flores’ story.

6.4 Supportive Government Institutions

As the primary commercial agricultural commodity in the districts of Manggarai and Ngada, coffee is afforded a high priority by local governments. The Department of Estate Crops offices in both Manggarai and Ngada Districts are actively involved in on-going coffee development projects. In addition to central government funding, significant district budget allocations are also made towards coffee improvement.

6.5 Existing Industry Efforts at Quality Improvement

Robusta farmers in Flores are already paid a slight premium for their coffee, which still has the potential to be developed further. Initial attempts to develop inroads into the speciality Arabica market, by several small projects, have shown promising results. Activities in Flores coordinated by the Indonesian Coffee and Cocoa Research Institute (ICCRI) led to at least three containers of full-washed Arabica (dry hulled by local cooperatives) being sold into international speciality markets in 2006.

6.6 Demand for Speciality Coffee

Overall world consumption of coffee has increased only slightly in recent years. However, the speciality coffee market sector has seen dramatic growth over the last five to ten years, driven by demand from companies like Starbucks and a range of medium-size companies, eager to source speciality coffees from all over the world. There are consistent market signals suggesting that there would be a demand for an improved Flores origin in this growing market. Whilst the demand exists, a successful reputation as a speciality coffee must be built through consistent delivery of a unique speciality coffee with the key attributes of quality, consistency, low risk and reliability over at least a five year period. International specialty roasters have been supportive of initial attempts to develop a specialty origin in Flores.

7 Industry Constraints

The previous section set out the opportunities for future development of the Flores coffee industry. These opportunities rely on building quality (both actual and symbolic) leading to acceptance of Flores coffee in international specialty markets. However, to perform the successful transition towards quality oriented markets, the following existing constraints will need to be addressed. Five broad categories of constraints have been identified

containing a range of sub-categories, many of which are cross-cutting. The constraints are not prioritised and are designed only to give a general sense of the key issues.

7.1 Limited Quality Orientation within Existing Coffee Trade Networks

Developing over several generations, the Flores coffee industry has not generally been oriented towards quality markets. The traditional ‘trader mentality’ has focused on Arabica coffee as a commodity, which is bought and sold on margins with very little interest in value-adding. Green coffee beans originating from various Arabica varieties, produced through a number of distinctly different processing methods, are pooled together in Ruteng and sold on to Surabaya, where it is presumably used as a cheap filler coffee. The Ruteng traders are isolated from international markets and do not have access to information and knowledge about new, emerging markets (particularly in the specialty sector). In this environment, there is very little incentive for traders to develop an understanding of coffee quality attributes, to improve technology or to work closely with farmers. Farmers, in turn, are not generally exposed to price incentives for higher quality coffee.

7.2 Lack of Strategic Industry Planning

The ad hoc development of the coffee industry in Flores has meant that a coordinated approach to industry development or strategic planning does not exist. This is exemplified by the variety of processing technologies currently used, and the number of distinct Arabica coffee varieties grown in Flores, with uncertain implications for cup quality. This has resulted in a range of coffee qualities and flavours emanating from the island, such that Flores coffee does not currently have a regional reputation or distinct image in the international market. Regional marketing of Flores coffee does not really exist. The industry is currently being pulled in different directions by industry actors, government departments and development agencies.

7.3 Risk Adverse Farmers and Diverse Farm Systems

Whilst coffee is the primary source of cash income in many villages, farmers are particularly risk adverse and manage a highly diverse farming system. They may be reluctant to devote additional resources to increasing coffee production and quality improvement. If farmers are not adequately motivated to invest in coffee improvement, any intervention is unlikely to succeed.

7.4 Poor Farmer Access to Knowledge and Extension

The changes wrought by regional autonomy across Indonesia have exacerbated existing problems of inadequate extension for Indonesian tree crop farmers. As a result, District-level Disbun offices no longer have their own extension staff. Instead, Disbun programs are implemented through Sub-District Farmer Extension Offices (Balai Penyuluhan Petani-BPP), and field Officers (Penyuluhan Petani Lapangan-PPL) below them. Institutionally, these offices are coordinated administratively through the Agency for Food Crop Development (Dinas Pertahanan Pangan) or equivalent agencies reporting directly to the District head (Bupati). Field officers are often trained in core food crop production such as rice and corn, and frequently do not have the specific technical knowledge required for improving tree crop production.

7.5 Poor Supporting Infrastructure

At the village level, the introduction of wet-processing systems requires reliable access to water supply during the harvest period (which frequently coincides with the dry season). In

many villages, access to such a water supply is not currently available, particularly in Ngada district.

The current inability to containerise coffee at a port in Flores severely limits the construction of a distinct market identity for Flores coffee, and contributes to the isolation of Ruteng traders from international markets. The administrative requirements for Flores-based export activities are considerable, involving coordination with both Kupang and Surabaya.

Insufficient formal credit appears to be available in the coffee districts for agricultural investment and upgrading.

Road construction to remote coffee-growing villages is likely to be an issue, limiting accessibility and the ability of coffee value chains to transfer price incentives to farmers.