



**Pacific Horticultural &
Agricultural Market Access
Plus Program**

Supported by Australia and New Zealand

Papua New Guinea Coffee Market Study





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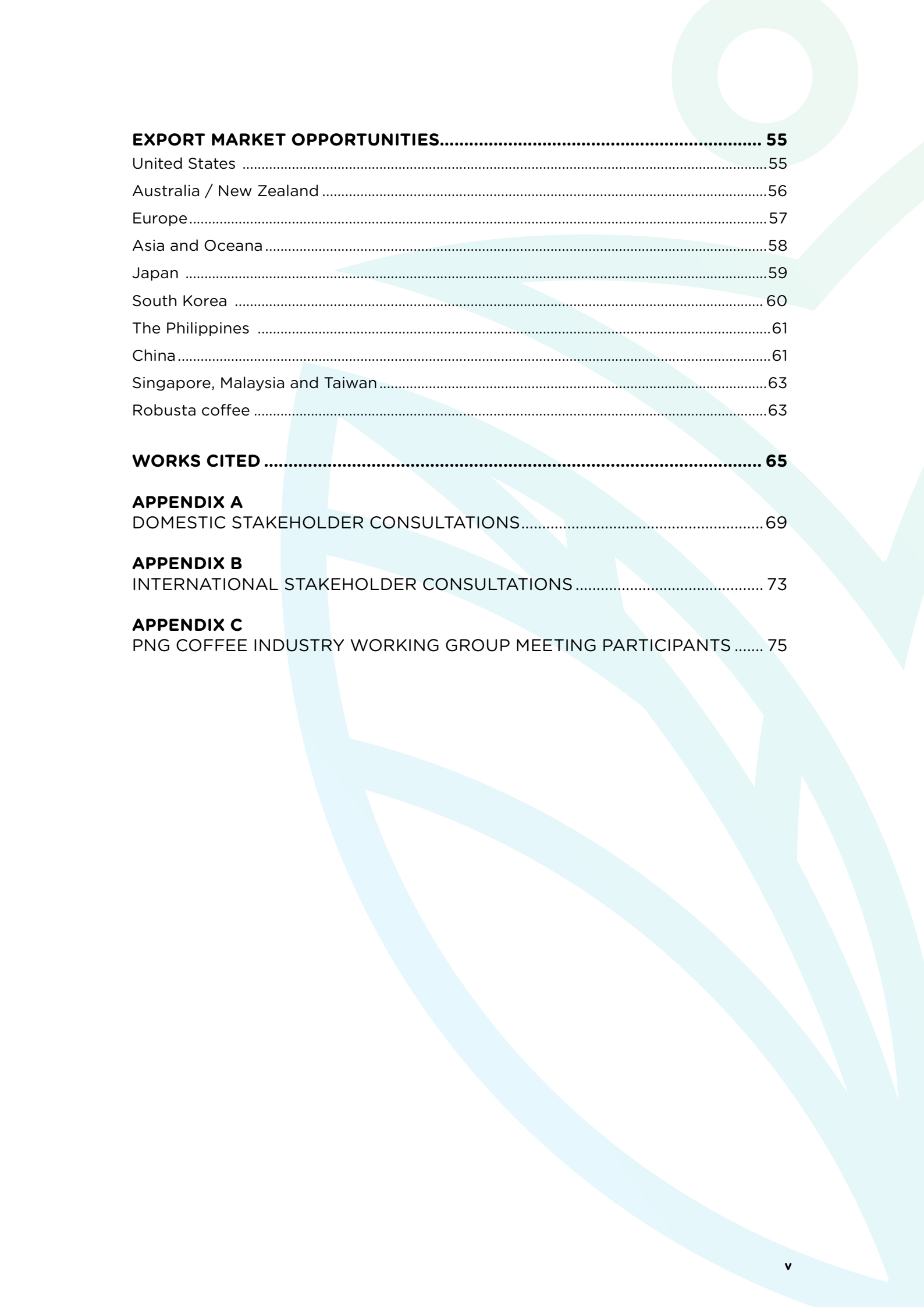
Papua New Guinea Coffee Market Study



CONTENTS

| | |
|-------------------------------------------------------------------------------|-----------|
| ACRONYMS | 1 |
| EXECUTIVE SUMMARY | 3 |
| Top Priorities..... | 6 |
| INDUSTRY CHALLENGES..... | 7 |
| Doing business in PNG | 7 |
| Land access and tenure | 8 |
| Crime | 8 |
| Complex and rigid regulatory structure..... | 9 |
| Logistics | 9 |
| Infrastructure..... | 10 |
| Finance..... | 10 |
| Foreign exchange restrictions | 11 |
| Youth participation | 11 |
| Pests, diseases and climate change..... | 11 |
| Gender roles | 13 |
| COFFEE VALUE CONSTRAINTS..... | 15 |
| Quality shortfall..... | 15 |
| Smallholder farming | 16 |
| Farmer incentives | 17 |
| Competition from other crops..... | 17 |
| Inadequate extension services | 18 |
| IDENTIFIED PRIORITIES | 19 |
| Support women..... | 19 |
| Support women’s groups | 20 |
| Include women in training programs..... | 20 |
| Increase organizational gender balance | 20 |
| Community-based gender initiatives..... | 20 |
| Facilitate business growth, domestic consumption and international trade..... | 21 |
| Reduce overregulation and licensing schemes | 21 |
| Support cooperatives and nucleus group development..... | 22 |
| Supply smallholder credit, finance training | 23 |
| Promote domestic consumption | 24 |
| Harvest new value from waste and environmental sustainability..... | 25 |
| Maintain international market presence | 27 |
| Organize a private industry association | 29 |

| | |
|--------------------------------------------------------------------------|-----------|
| Collaborative purchasing..... | 31 |
| Develop agritourism | 31 |
| Promote quality from tree to cup | 33 |
| Implement updated quality grading standards..... | 34 |
| Establish service bureau mills..... | 34 |
| Expand farmer extension services..... | 34 |
| Offer cup quality, roast and brew training | 35 |
| Strengthen and expand national cupping event..... | 35 |
| Host a national barista, coffee cocktail, and roasting competition | 36 |
| Establish regions and flavor profile map..... | 37 |
| WORLD COFFEE MARKET DISCUSSION..... | 39 |
| Established markets are maturing..... | 39 |
| New markets are emerging | 40 |
| Producers are becoming consumers..... | 41 |
| Commodity prices remain low | 41 |
| COFFEE IN PNG..... | 45 |
| Strategic relevance | 45 |
| Market position..... | 46 |
| COMMODITY, DIFFERENTIATED, AND SPECIALTY | 49 |
| Traceability..... | 50 |
| Origin branding | 51 |
| ROASTING FOR EXPORT | 53 |
| Perishability | 53 |
| Sourcing, branding, and specialization..... | 54 |



| | |
|--------------------------------------------------------------|-----------|
| EXPORT MARKET OPPORTUNITIES..... | 55 |
| United States | 55 |
| Australia / New Zealand | 56 |
| Europe..... | 57 |
| Asia and Oceania | 58 |
| Japan | 59 |
| South Korea | 60 |
| The Philippines | 61 |
| China..... | 61 |
| Singapore, Malaysia and Taiwan..... | 63 |
| Robusta coffee | 63 |
| WORKS CITED | 65 |
| APPENDIX A | |
| DOMESTIC STAKEHOLDER CONSULTATIONS..... | 69 |
| APPENDIX B | |
| INTERNATIONAL STAKEHOLDER CONSULTATIONS | 73 |
| APPENDIX C | |
| PNG COFFEE INDUSTRY WORKING GROUP MEETING PARTICIPANTS | 75 |

ACRONYMS

ABAC APEC Business Advisory Council
ADB Asian Development Bank
APEC Asia-Pacific Economic Cooperation
ASEAN Association of Southeast Asian Nations
AST Authorized Specialty Coffee Association Trainer
AUD Australian Dollars
BLS United States Bureau of Labor Statistics
BPO Business Process Outsourcing
BSCA Brazil Specialty Coffee Association
CBB Coffee Berry Borer beetle pest (*Hypothenemus hampei*)
CIC Papua New Guinea Coffee Industry Corporation
CIRAD French Agricultural Research Centre for International Development
CQI Coffee Quality Institute
DFAT Australia Department of Foreign Affairs and Trade
ECX Ethiopia Commodity Exchange
FAO Food and Agriculture Organization of the United Nations
FAS United States Department of Agriculture Foreign Agriculture Service
FNC Federación Nacional de Cafeteros de Colombia, Colombian Coffee Growers Federation
GCR Global Coffee Report magazine
GIS Geographic Information System mapping technology
GPS Global Positioning System
IBBM PNG Institute of Banking and Business Management
ICO International Coffee Organization
INA Papua New Guinea Institute of National Affairs
IPA Papua New Guinea Investment Promotion Authority
ITC International Trade Centre, a joint agency of the World Trade Organization and the United Nations
IWCA International Women's Coffee Alliance
NASA JPL United States National Aeronautics and Space Administration, Jet Propulsion Laboratory
NCA National Coffee Association of the United States
NGO Nongovernmental Organization
PDG The Perfect Daily Grind online trade magazine
PGK Papua New Guinea Kina
PHAMA Pacific Horticultural & Agricultural Market Access Program
PNG Papua New Guinea
PPAP World Bank PNG Productive Partnerships in Agriculture Project
PSC Premium Smallholder Coffee grade within Papua New Guinea
PT&I Pacific Trade Invest
RTD Ready-to-Drink product category
SCA Specialty Coffee Association
STA Short Term Adviser
TPA Papua New Guinea Tourism Promotions Authority
USD United States Dollars
WB World Bank
WBC World Barista Championship
WCE World Coffee Events
WCR World Coffee Research

EXECUTIVE SUMMARY

This report presents the results of a rapid coffee industry assessment of Papua New Guinea. To reach conclusions, the document incorporates data obtained from stakeholder interviews within PNG and consuming countries, in-person observations, and desktop research of industry-specific data. The priorities outlined are designed to improve the value and appeal of coffee production in Papua New Guinea.

Coffee is the single most important smallholder crop in Papua New Guinea. (Anis, 2012) The suggestions herein are intended to be beneficial across the value chain but particularly for the one third of the country's population who are smallholder coffee farmers. All coffee stakeholders in PNG from cultivation through export stand to profit from cooperative collaboration toward a common national goal of strengthening performance, profitability, and sustainability of the industry.

Value improvements to coffee production will come from increases in work productivity and quality. These require organization, process improvements and efficiency measures, traceability, gender equity and the support of women's groups.

Good agricultural practices make differentiation of coffee possible. Differentiation is needed to escape the low-value commodity market. Value addition resulting from later stages of coffee processing, like drying process experimentation, new uses for farming byproducts, coffee roasting, and retailing are additionally recommended.

There are critical nationwide issues that inhibit economic development across all industries not limited to coffee, including: crime (theft, public security), inadequate infrastructure, and land tenure disputes. Combined, these conditions inhibit incentives and available credit for long-term business investments that allow an economy to flourish. They are not problems that can be solved by the activities recommended in this report. Nonetheless, the challenges are addressed herein as significant barriers inhibiting improvement of the coffee sector for the purpose of providing supporting testimony in future policymaking.

PNG's coffee industry is in decline. (Giovannucci & Hunt, 2009) From 1990 to 1999, the nation exported an average of 1.077m 60 kg bags of green coffee per annum, which stagnated at 1.047m p.a. between 2000 and 2009. From 2010 through 2016, however, that figure has dropped to 934m bags p.a., or an 11% decline in output from the previous decade. (ICO, 2018) From 2012-2017, sales prices remained low, with the FOB price of green coffee exports sold at an average 12.7% discount below commodity exchange prices¹.

The industry is disadvantaged by high operating costs, low productivity, and quality inconsistencies resulting from a large decentralized labor force of independent smallholder farmers. Many of those farmers live in rural areas with limited access to wet milling, transportation, or storage facilities, which leads to quality defects.² Quality control at the points where coffee cherries and parchment are sold to mills or intermediary trading agents is also inconsistent, further reducing downstream value.

85% or more of the nation's coffee is presently produced by smallholders, with 15% or less coming from larger plantations. (CIC, 2017) The number of larger plantations has been shrinking since 2009³, in part due to high operating costs (e.g. security and ground transportation), but also under pressure to surrender titled land to claimants with varying disputes. Plantation coffees receive higher price premiums in international trade due to better quality and consistency resulting from standardized business practices.

Smallholder farmers are self-reliant and do not have access to the same materials, facilities, and information as larger plantations, nor are they necessarily as committed to coffee as a long-term business. Extension service supporting smallholders has been limited, provided by a small number of agents from CIC responsible for the entire country, and others regionally from NGO projects. Making reasonable but short-term economic decisions, smallholders routinely evaluate potential earnings from coffee farming compared to other activities. As commodity coffee prices drop, they switch to other crops that yield larger and more immediate returns, like cabbage, broccoli, and sweet potato. Some may leave farming altogether seeking other work. The incentive to farm coffee is low, still, coffee remains the most viable cash crop for the majority of PNG's smallholder farmers.⁴

Value addition is attempted at the export miller's location after coffee parchment has been sold by smallholder farmers. Dry mills are owned by the larger exporting companies who engage in international trade. This limits individual farmers' ability to participate in any price premiums earned from quality achievement. Coffees are sold and exported in national grades, with most smallholder coffees blended and homogenized with limited traceability to their source.

1 Coffee Industry Corporation Export Statistics: 2012-2017, Summary of Exports by Destination compared to ICO composite indicator price for the same time period. Estimated using straight-line depreciation of PGK relative to the USD from Jan 1, 2012 (2.13 PGK/USD) – December 31, 2017 (3.24 PGK/USD).

2 Wet milling (or pulping) should be performed within 12 hours of picking. Pulped and dried coffee may be stored at cool temperatures for weeks before shipment but should be isolated from contaminants in a dedicated facility to avoid absorption of off-tastes.

3 Information obtained from stakeholder interviews

4 Coffee is less perishable than other substitute crops, and also traded internationally in US dollars, insulating its price from devaluation of the Kina

Extensive government regulations and licensing requirements have been put in place for the purpose of upholding quality standards at all stages in coffee production. These restrictions have only complicated doing business in an already difficult environment, while doing little to improve quality. A free market operates more efficiently than one that is highly regulated and private industry better understands the demands of its market than the public sector.

The nation's coffee industry will be more productive with less government intervention and more support with:

- 1) expanded agricultural extension service and best practices training,
- 2) scientific research on agronomic and economic issues leading to new national programs and policies, and
- 3) support for private industry that facilitates doing business domestically and abroad.

Despite the many challenges faced by Papua New Guinea's coffee sector, it is positioned to benefit from new market opportunities. Worldwide coffee consumption continues to outpace production in all market segments, from low quality commodities through certified lots, to high-end micro- or nano-lots of specialty coffee. (ICO, 2018) Buying trends in maturing markets have opened new segments for coffee producers to receive price premiums for their work. PNG has the potential to concurrently increase production quantities of commodity coffee that can serve the demands of newly emerging coffee consuming nations while expanding price differentiated offerings for developed markets.

In a global market of increasing competition Papua New Guinea is in the challenging position of competing against larger, more efficient and productive origins for market share of an interchangeable low-value commodity. A

clear strategy for PNG's coffee industry is needed to reorient the nation to pursue its comparative advantages.

There is no lack of demand for high grade coffee from PNG. Supply is the primary constraint. PNG retains a favorable overall impression among older specialty buyers, who indicate they can purchase as much coffee meeting their standards as the country can produce.⁵ The potential exists to introduce PNG as a specialty origin to younger professionals and consumers, who are the future of the industry.

Generational shift is the single largest trend impacting the world coffee market. Millennials have changed the value proposition for coffee worldwide, using technology and purchasing power to demonstrate their value on health, ethics, authenticity, social and environmental issues. (GCR, 2016) The same generational shift is happening within PNG, accompanied by the economic emergence of well-educated middle-class consumers.

Conditions are right for the development of a domestic consumer café culture. There are presently only a few locally roasted coffee brands and cafes meeting international standards in the country's urban cities. Expansion of a domestic coffee industry with numerous outlets for consumers to enjoy high quality coffee will increase consumption.

Increased domestic consumption adds value to the local industry, increases demand and value for domestic coffee, advances PNG's image as a high-quality coffee producer, and adds new jobs in the coffee sector. It also attracts future leaders to the coffee industry as young patrons or baristas in trendy cafes.

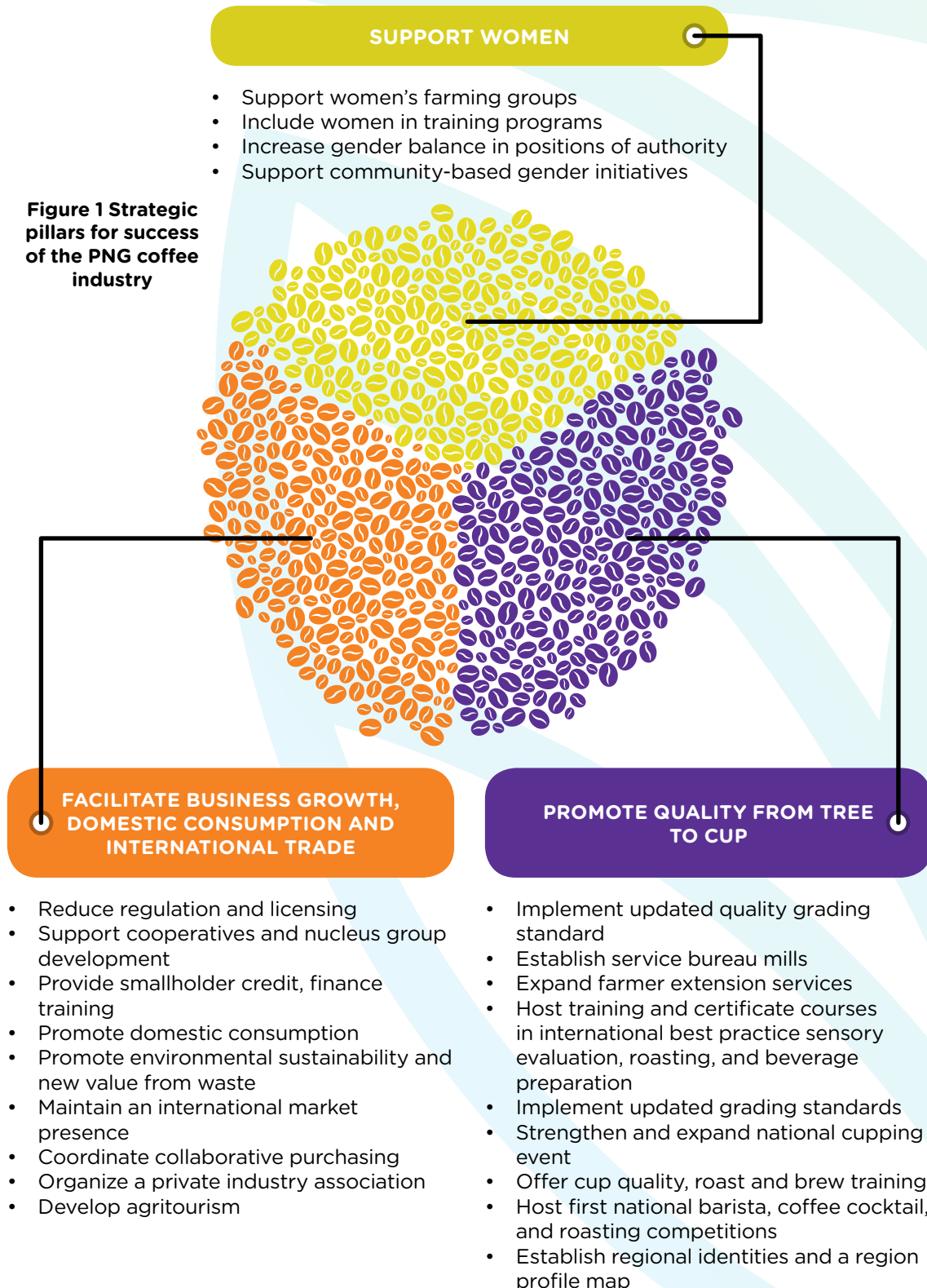
Together, policy and strategic investments aimed at improving productivity and price differentiation through quality enhancement, certification schemes, and further processing have the potential to dramatically impact the livelihoods of 400,000 farming families.

⁵ Stakeholder interviews with coffee importers and roasters from Australia, Europe, and the United States

Top Priorities

Three areas of focus are identified in this report as necessary to achieve immediate and long-term desirable results.

Figure 1 Strategic pillars for success of the PNG coffee industry



INDUSTRY CHALLENGES

Coffee is a major cash crop in Papua New Guinea, generating approximately K350 million in export revenue each year that provides income for more than 400,000 farming households. (CIC, 2017) Production volumes have been in decline in recent years and value for the average quality of coffees produced by PNG is low. Faced with increased competition from more efficient and productive producing nations the industry is seeking to redefine its market position through a series of initiatives that increase productivity and add value. Significant challenges remain to be overcome:

Doing business in PNG

There are many challenges to doing business in PNG, both institutional and systematic. A positive forecast made by ANZ Bank of PNG's future prospects emphasizes PNG's rich natural endowment and location will allow it to capitalize on growth in Asia. Much argues that the economic gains from the extractive sector should be put in to support the

infrastructure required to grow the agriculture sector of PNG.

For doing business, PNG ranks 109th out of 189 in the world, lower than typical Pacific island nations (WB, 2018). The ease of starting a business, obtaining construction permits and trading across borders are key impediments.

The legal system is slow, inefficient and expensive, and there are a number of regulatory and institutional impediments to businesses wishing to obtain finance.

Encouraging the formalization and growth of the SME sector in PNG will require attention to all these areas.

A business survey conducted by the World Bank Group in 2015 interviewed sixty-five manufacturing and processing companies located in Port Moresby and Lae to prioritise the key challenges facing business. (WB, 2015) Corruption was identified as the primary obstacle, followed by political instability, land access, crime, and other factors. The resulting cost of doing business in Papua New Guinea is high.

Key Obstacles % Respondants

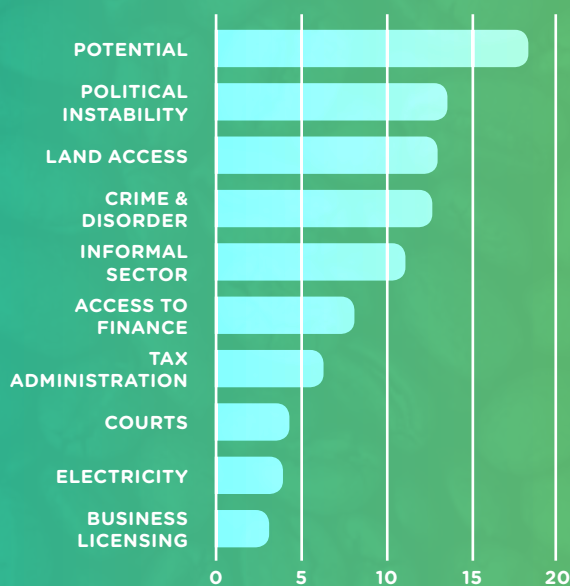


Figure 2 World Bank Enterprise Survey 2015 Perceived Key Business Obstacles

These added costs decrease the competitiveness of PNG's coffee industry in the world market. In order to achieve profit margins comparable to producers in other countries, it is necessary to sell at higher prices than its competition and/or use technology and human capital to expand output productivity.

Land access and tenure

Access to land remains a key challenge in Papua New Guinea, where land is closely held under customary ownership. In Papua New Guinea 93% of the land is customarily owned, while only 7% is state-owned land that is available to locals and foreigners.

Foreigners cannot acquire land in PNG to do business if it is held under customary title and ownership. Land for industrial or agricultural purposes is acquired through state under a 99-year lease or special agriculture lease.

Formal recording, recognition, and government enforcement of land ownership rights are necessary for agricultural development not limited to coffee. Economic theories universally agree that individuals and businesses invest in labor, capital, materials and intellectual property with the intent of receiving a return on investment. Uncertainty resulting from questionable enforcement of land titles creates unacceptable risks that inhibit private investment and access to lines of credit.

The inconsistent enforcement component of PNG's formal land tenure system is a significant threat to farming activity. (FAO, 2002) Whether formalized through a government system or negotiated and enforced through tribal leadership, some solution is necessary to bring stability to the business of coffee farming.

Crime

Crime in Papua New Guinea may be the single largest industry constraint and direct cost of doing business. Direct losses from theft are substantial, as are indirect costs like security and lost time from work. (Lakhani & Willman, 2014) PNG Coffee Industry Working Group stakeholders indicated in interviews that 35% or more of their operating budget is dedicated to security alone.

Agricultural theft is widespread, with some farmers indicating that they pick coffee prematurely to avoid leaving valuable ripe cherries within reach of criminals. Unripe coffee fruit is lower in quality and value than ripened fruit and may be considered defective.

Business operating hours are limited to avoid nighttime criminal activity. Mobility is limited, particularly for tourists who face heightened risks walking, taking public transportation or taxis. These practical restrictions inhibit potential growth of a domestic roasting and retail café market.

Businesses and industry representation are encouraged to continue discussions with government leadership to stress the difficulties faced by agriculture and importance of enforcing law and order.

Complex and rigid regulatory structure

Regulations and licensing schemes put in place to ensure the quality and value of coffee produced and roasted in Papua New Guinea add complexities and costs without providing measurable benefits.

For example, the cost and business requirements necessary to obtain and maintain an export license is beyond the reach of most small farming groups. These are the same groups most likely to produce and export the highest value coffee in the country's future.

Government attempts at regulating coffee quality often fail. This is demonstrated by the cautionary tale of the ECX, the Ethiopian government's commodity exchange. In 2008 the country implemented strict rules mandating all smallholder sales through a government run electronic trading floor at exchange grades. The system was a technological marvel but failed to take into consideration a key source of value in differentiated coffees.

Individual smallholder lots, which historically had been purchased by specialty buyers at high price premiums were required to be mixed with others of lower quality to raise the aggregate selling price for all. By doing so, government policymakers who were unfamiliar with the coffee market reduced the value of their entire industry by effectively eliminating traceability. Prices and government revenues took a nosedive despite increases in production, as the value of smallholder

trade plummeted, and numerous traders resorted to illegal black markets for trade. (Mezlekia, 2012) Acknowledging the disastrous consequences of bad policymaking, reforms were instituted in 2017 to reverse course and restore direct trade of smallholder lots. (Tadesse, 2017)

Similar threats from government intervention exist in PNG, but to less extremes. A free market operates more efficiently than one that is highly regulated and private industry better understands the demands of its market than the public sector.

Logistics

PNG lags in trade logistics relative to other exporting nations, with the lowest score in the Pacific on the Global Logistics Index and in the Doing Business Trading Across Borders indicator. In the latter, PNG's complex customs processes and high charges are significant contributing factors to its poor performance.

The Global Logistics Performance Index evaluates six key dimensions, including efficiency in customs procedures, quality of trade and transport related infrastructure.

While trade is encouraged with neighboring Australia and New Zealand, the costs and time to export to these countries remain a business challenge for the coffee exporters. It takes approximately 5-6 working days to complete customs compliance documentation for export and costs approximately USD\$660 to process the documentation. This does not include the fees paid for transporting coffee freight from the inland highlands region to Lae or freight forwarding fees. The cost to transport a freight container between Mt. Hagen and Lae is estimated to cost between PGK 4,000-K20,000 per 20ft container. This can be greater than the cost of ocean shipment to its destination.

In ports and coastal shipping PNG also suffers high costs and other business impediments from the lack of competition. Stevedoring is controlled predominantly by one business, leading to disproportionately high costs shipping from port of Lae at the

base of the Highlands Region to the main city to Port Moresby (or to other domestic ports). In Morobe Province where coffee is mainly transported in from coastal communities, farmers employ inefficient nineteen foot outboard motor craft or one of only two local shippers that move cargo along the coastline.

Infrastructure

Roads, electricity, water supply, and to a lesser extent telecommunications/internet infrastructure are poorly maintained, and sometimes nonexistent in rural communities. Conditions worsen during seasonal rains, which erode paths used to transport coffee in various stages to market. Some farmers are unable to bring their products to market because the roads are impassable, others must make significant time and monetary investments in transportation to reach the nearest location for processing.

The cost of overland transportation from the main centers of farming activity in Mt. Hagen and Goroka to the port at Lae is comparable to the cost of overseas shipping to a destination country. This condition is rarely seen in coffee producing nations, most notably Nepal, Yemen, and remote parts of Central Africa and Bolivia.

PNG is recognized as having among the world's poorest access to clean water. WaterAid Australia estimates 67% of the nation's rural population is without access to clean water. (Cunningham, 2017) Despite the lack of availability of water, national standards for treatment of wastewater from wet mills do not exist. Coffee effluent waste from processing is toxic and a form of industrial pollution. Its treatment and proper disposal is an important environmental consideration.

Electrical service in the country is inadequate, unreliable and expensive, which adds to operating costs and creates an unstable environment for business. Rural areas have little or no access to electricity networks. Processing facilities using electricity are required to operate generators, and sometimes backup generators to the generators in order to maintain consistent operations. Solar energy is a viable option but not widely used in practice due to the threat of solar panel theft.

Telecommunications has improved dramatically in recent years due to the deregulation of the country's industry in 2008. Mobile phones and internet service is widely available and used but remains expensive with frequent outages. (Lawrence, 2017) Internet access is no longer a luxury, it is a necessity of modern business - particularly so in one as international as the coffee trade. Tools like email, messaging services, and social media including Facebook and Twitter are legitimate and common platforms for international trade in 2018. Limited access to telephony and internet resources is a constraint to doing business in a global economy.

Finance

Access to credit is expensive for established businesses and limited or nonexistent for smallholder farmers. The lack of viable credit options limits business investment and growth. Inadequate financing hinders the construction of facilities and acquisition of capital equipment, as well as the seasonal application of inputs, labor necessary to maintain crops, and cherry or parchment buying during the peak season.

For smallholders, the choice of selling coffee as low-value coffee cherries over higher value parchment may depend on cash flow. The same constraint impacts whether a farmer may choose coffee or another crop that can be harvested and brought to market more quickly for cash payment.

Past credit schemes to offer microfinancing through CIC have failed due to low repayment rates. (Giovannucci & Hunt, 2009) Direct lending to community groups from exporters has achieved better success in recent years. This model shows promise for expansion through organized farming groups in combination with financial training.

Foreign exchange restrictions

Foreign exchange restrictions put in place in mid-2014 to maintain value of the Kina during times of falling commodity prices continue to hinder economic growth. The excess demand for foreign currency slows international transactions, thus making investment in an import-dependent economy extremely difficult. (Fox, Howes, Nema, & Schroder, 2017)

Payments to overseas suppliers for input material and capital equipment are limited by foreign exchange restrictions, meaning that substantial transactions may take several days, weeks, or longer to complete. The delays have resulted in billions of Kina in accumulated foreign 'dollarized' debt, which grows as the Kina depreciates. (Mou, 2017).

An overvalued Kina diminishes the domestic value of coffee exports and reduces the industry's competitiveness in international trade.

Youth participation

Papua New Guinea has one of the youngest populations in the world and a disproportionately high rate of young joblessness. (Halim, 2013) Despite 75% or more of the population having experience with subsistence farming, youth are not becoming professional farmers. Youth lack opportunities to learn about agriculture and participate in farming business, other than as day laborers.

There is also a lack of interest and general perception that, "farming is that it is for rural, uneducated, poor and aged people." (Halim, 2013) Domestic farming is not a

desirable profession, and viewed as a "last resort," for those with secondary or better education.

This challenge comes at a time when the PNG coffee industry is in need of future leadership. The potential exists to develop a new generation of coffee farming professionals within PNG by improving the image and attractiveness of coffee as an international agribusiness, developing new events and activities that incorporate youth engagement in the coffee sector, and sponsoring internship programs for students interested to pursue a career in farming. (FAO, 2014)

Pests, diseases and climate change

Arabica coffee is a fragile self-pollinating species with a shallow gene pool resulting from commercial cultivation of only a few major varieties. This means that arabica species are particularly susceptible to the effects of climate change, pests and diseases.

In recent years, climate change has reduced arable land for coffee cultivation and changed weather patterns that threaten to disrupt the livelihoods of farmers who have grown coffee for generations. "Seventeen of the 18 warmest years in the 136-years OF data recorded have occurred since 2001, with the exception of 1998." (NASA JPL, 2018) As temperatures increase decade over decade World Coffee Research predicts that all coffee producing nations will lose up to 80% of suitable coffee growing areas by 2050, creating a supply shortfall of 118m bags. (WCR, 2017)

Papua New Guinea is unprepared for the effects of climate change. The country is ranked 158th out of 181 nations tracked by the University of Notre Dame Global Adaptation Initiative for vulnerability. (University of Notre Dame, 2018)

Accelerated by climate change and as the result of new weather patterns, pests and diseases like the coffee berry borer (*Hypothenemus hampei*), leaf rust (*Hemileia vastatrix*) and worse will continue to plague coffee production

Papua New Guinea with increasing ferocity. Other less publicized pests, like nematodes that eat coffee plant roots persist and require extension assistance for detection and treatment. Nematodes alone are responsible for an estimated 15% crop loss if not controlled with pesticides or resistant varieties. (University of Leeds, 2018)

Pests and diseases are traveling the world with greater mobility due to the globalization of economies and accessibility of air travel. Biosecurity measures offer a front-line defense against pathogens and other invaders but only delay the inevitable. Research, planning, vigilance and organization is necessary to prepare for the next threat.



Figure 3 Coffee berry borer damage, photo credit: CIC



Figure 4 Coffee leaf rust disease, photo credit: Peter Guilliano, Specialty Coffee Association

CBB was discovered in PNG in 2017 in Jiwaka and presents a serious threat to the industry. Left untreated it can cause losses of 30-35% with 100% of all coffee cherries infected, more if harvest is delayed. (Bittenbender, Wright, & Greco, Coffee Berry Borer (*Hypothenemus hampei*), 2018)

The pest is a small black beetle approximately 1.4mm – 1.78mm in size. The female beetle bores into young ripe berries generally through the navel region. It lays eggs inside the coffee seed (or seeds). CBB larvae then feed on the coffee as they mature and tunnel back to the surface, destroying the green coffee.

Three types of damage are associated with CBB:

- 1) Premature fall of young coffee berries
- 2) Increased vulnerability of infested ripe berries to fungus or bacterial infection, and
- 3) Reduction in both yield and quality, which reduces the income of coffee farmers

A coordinated effort of aggressive management is necessary to reduce damage and spreading. Mitigation techniques include the production and distribution of beetle traps to the field and wet mills, use of synthetic cherry sacks tied shut to avoid contamination, and immediate milling after harvesting. After the season is complete, pruning, removal and destruction of remaining fruit is recommended. (Bittenbender, Wright, & Greco, Coffee Berry Borer (*Hypothenemus hampei*), 2018)

Gender roles

Women smallholder farmers in Papua New Guinea bear a double burden of work. They are responsible not only field labor but are also expected by cultural norms to perform domestic duties, such as housework, cooking, and child rearing in the household. The labor provided by women is often in harvesting and processing, which are viewed as low-value tasks, despite their importance when seeking to achieve high quality production.

Men of the household are typically responsible for the transportation, sale, and export of coffee. Men collect the income at the point of sale, meaning that women have little control over how proceeds are spent. Studies have shown that while women use almost all earnings to support household needs, including food, clothing, education, and healthcare, men typically spend 25% or more of their income for other purposes. (FAO, 2002) Women's economic empowerment in coffee growing regions therefore has positive outcomes for entire families, as well as communities.

Coffee industry studies have further shown that **farming communities engaged in women's empowerment initiatives can increase both productivity and quality.** (Ionescu, 2018) Communities cited by the SCA Gender Equality in Coffee white paper reported increased consistency and significant gains in coffee quality resulting from technical training programs that deliberately included women. When granted the same access to land, finance and technology as male counterparts, women could increase agricultural output by as much as 30%.



Figure 5 PNG women sorting coffee beans

COFFEE VALUE CONSTRAINTS

Smallholder “Y” grades, which represent the majority of coffees exported by Papua New Guinea, are currently sold at a discount to already low commodity prices. (CIC, 2018) This is because of cup defects, both visible defects that can be seen in green coffee and invisible defects that can be only identified by taste. Consequently, PNG’s smallholder coffee is sometimes used as inexpensive filler for blends or soluble coffee. (Business Advantage PNG, 2014) These are the industry’s lowest-value applications. Only a small portion of PNG’s exports qualify as certified or specialty coffees that attract price premiums.

Quality shortfall

Buyers of both commodity and specialty coffees recognize the country is falling short of full potential value.⁶ The terroir for growing high quality arabica coffee in PNG is ideal. (Davids, 2009) Temperature, soil fertility, and rainfall found in PNG’s coffee

farming areas rival the best found in any producing region. Combined, these allow coffee plants to mature slowly, producing fruit with high sugar concentration complex, vibrant acidity that attracts premium value. Other countries known for producing coffees of consistently higher value do not necessarily have this same natural advantage. Following best practices in cultivation, harvesting, processing, storage, and transportation,

⁶ Information obtained in stakeholder interviews

PNG has the potential to produce among the most desirable coffees in the world strictly on the basis of quality.

All of PNG's coffee quality and consistency problems are manmade and can be corrected to increase value. Defects are most effectively stopped at the source, before they are created.

Attempts at sorting out visible defects later in the value chain is inefficient. The method does not provide a mechanism for farmer incentives for improvement. It also cannot exclude invisible defects that impact taste, which is ultimately what customers value.

Organization of individual farmers into cooperative farming groups following standardized practices will reduce the incidence of defects that are lowering coffee value. This must be accompanied by education, incentives for performance, and facilitation to succeed.

85% or more of the nation's coffee is produced by PNG's smallholders. (CIC, 2017) Executing best industry practices among hundreds of thousands of widely dispersed farming families is difficult under the best of circumstances. The situation is made worse by poor roads that make transportation of crops to processing and market a slow and expensive process, limited access to processing facilities, and inadequate incentives to improve. (Giovannucci & Hunt, 2009)

Smallholder farming

SMALLHOLDER MODEL

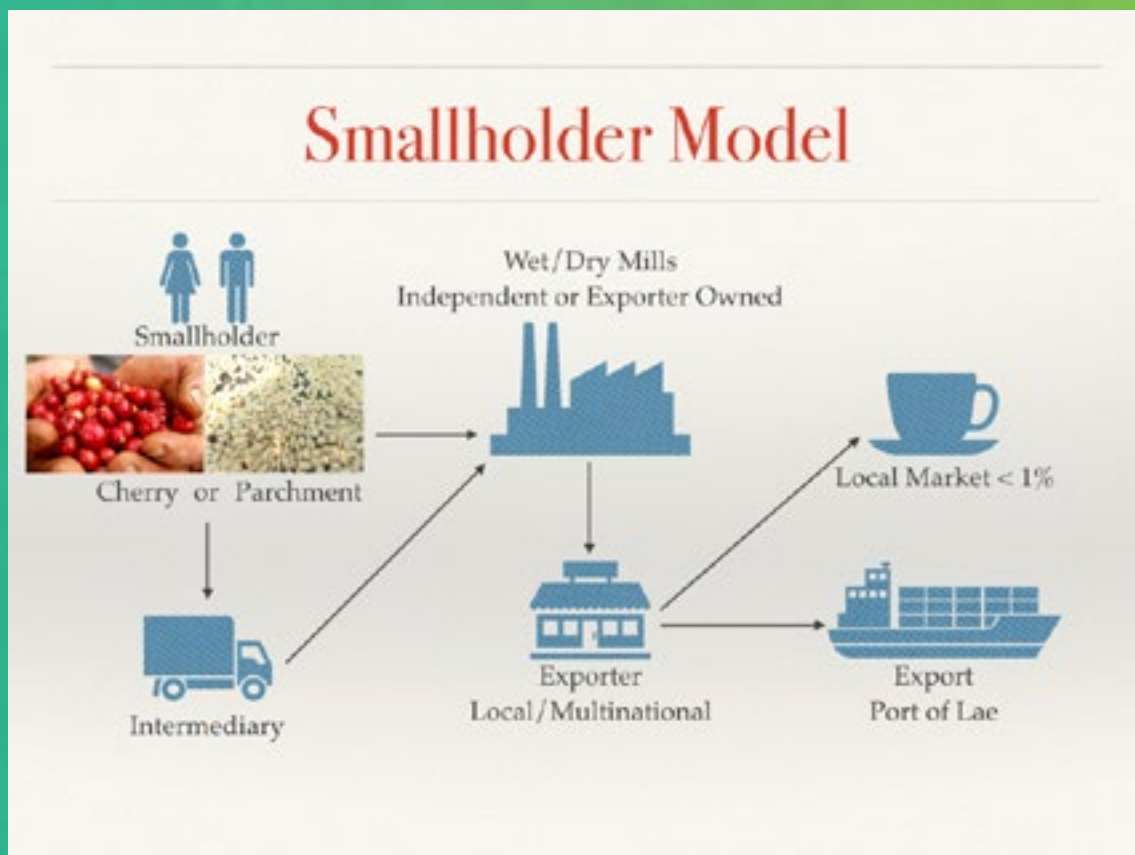


Figure 6 Smallholder coffee production model

Smallholder farmers are mostly self-reliant and do not have access to the same materials, facilities, and information as larger plantations, nor are they necessarily as committed to coffee as a long-term business. Lacking tools, support services, and in some cases the know-how of a larger business, they make the best economic decisions they can to maximize income and manage cash flow.

The lack of available credit encourages farmers to make decisions that favor a faster return on activity rather than better returns.

Smallholders' available options include:

1. selling coffee cherries to processors, or to traders for the fastest return and least effort, but lowest income; or
2. processing cherries to parchment, which requires pulping equipment, additional processing/drying time and know-how, but generally commands better market prices when executed correctly.

Few farmers or farming groups have the potential to control coffee inventory through to its final stage of dry mill processing. Fewer still have the capability of exporting coffees to high value markets.

Farmer incentives

Quality in PNG's smallholder industry model is largely within the control of the processor/exporter who buys cherries or parchment. Quality is selectively enforced depending on market conditions and business model. Cherry or parchment buyers consolidate lots, visually inspecting for quality defects, smelling for fermentation, or measuring moisture.

Processed coffee should optimally be dried to between 9-12% moisture content. (ITC, 2012) Moisture content outside of this range leads to cup defects, particularly high moisture, which allows for the growth of mildew, fungus, and molds that ruin flavor.

Cherry and parchment buyers are taking a risk by purchasing coffee which they've had no oversight in farming. Not all defects are visible, so the true quality of the coffees offered in this form is unknown until it is processed, roasted, and cupped⁷. As a result, buyers offer the lowest locally-competitive price.

Attempts have been made to regulate quality with national grading standards but doing so at the point of shipping before export has little or no impact on the earlier stages of coffee farming. Quality control by positive financial incentive is more effective. National grading standards set a minimum bar of quality that is expected from each class of product but discourages greater achievement.

Lacking price incentives, farmers are unlikely to implement better practices, such as picking only fully ripe cherries, pulping them within 12 hours, and drying them free from contamination. (Bittenbender & Easton Smith, *Growing Coffee in Hawaii*, Revised Edition, 2008) The additional effort will go unpaid under the present system of trade.

Collaboration between processor/exporter and farming group lead to more trust and verifiable quality information that reduces risks. For example, an exporter with representation in a farming community can observe cultivation and harvesting practices, increasing confidence in a quality result. That confidence will result in higher premiums returned to the community.

Competition from other crops

As commodity coffee prices drop, smallholder farmers may switch to other crops that yield larger and more immediate returns, like cabbage, broccoli, and sweet potato. Some may leave farming altogether seeking other work. The incentive to farm coffee is low, still, coffee remains the most viable cash crop for the majority of PNG's smallholder farmers.⁸

⁷ Cupping is a process of tasting coffees using precise industry standards and protocols to evaluate green coffee quality and desirability.

⁸ Coffee is less perishable than other substitute crops, and also traded internationally in US dollars, insulating its price from devaluation of the Kina

Coffee grows slowly and requires continual maintenance and reinvestment to achieve incremental gains in productivity and market value over time. Reactivating coffee activity to capitalize on higher prices can take two or more seasons to rehabilitate abandoned coffee trees and four years to harvest coffee from new plantings. (Equal Exchange, 2018)

The loss of farming skill and market presence during low commodity price years is equally or more damaging than unmaintained trees. Short-term opportunistic coffee farmers are low quality producers. Without steady quantities of supply to the marketplace, buyers who rely on Papua New Guinea as a critical component of their roasted products will turn elsewhere for more dependable substitutes. Smallholders must see value in coffee to farm consistently, but with the low and unstable present value of commodity crops, do not have sufficient incentive to do so.

Intercropping presents an opportunity to retain coffee farming skill while earning additional revenue from the same plot of land. Crops like avocado, banana, oranges, black pepper, macadamia, and many more can be grown productively alongside coffee. (PDG, 2016) Crop variety not only provides financial stability, but reduces pests, fixes soil nutrients and reduces erosion. In recent years honey has been popular within the Latin American coffee industry as a high value product that can be farmed in coffee areas. (Mares, Nadworny, & Paull, 2016) Attracting bees to farmlands improves fertilization of crops and increasing coffee flowering.

Inadequate extension services

Extension services supporting smallholders has been limited, provided by a small number of agents from CIC responsible for serving the entire country, and others regionally from numerous NGO projects including but not limited to PPAP.

Effective extension services are provided year-round with a continuous presence by officers in producing communities to advise on good agricultural practices.

This is not currently possible with the small number of government / CIC agents, which have been estimated to each be responsible for tens of thousands of individual farmers.⁹

Coverage becomes particularly important when faced with climate change or the outbreak of disease and pests, such as the Coffee Berry Borer. Mitigation techniques for these issues often require a quick response and elaborate overlapping activities that require farmer instruction.

Coffee trees are aging, which reduces productivity. Some are decades older than the recommended 30-year life cycle for arabica species. The establishment of field nurseries and instruction on routine crop management and replanting will dramatically improve productivity and plant health.



Figure 7 Coffee berry borer trap, photo credit: CIRAD

⁹ Stakeholder interview CIC Research and Grower Services Division, Aiyura

IDENTIFIED PRIORITIES

The following are identified priority areas of strategic focus with activities identified to improve the marketability and value of PNG's coffee industry. Each category is listed by priority in descending order by anticipated magnitude of impact, with activities listed under each category ordered in time to begin:

- **short (less than 12 months)**
- **medium (1-3 years)**
- **long-term (3-5 years).**

Support women

Women are the future of coffee farming. The empowerment of women has the potential to transform Papua New Guinea's coffee industry by directly improving quality performance and family welfare. Women are the front lines of coffee production who provide the labor that most directly affects coffee quality, specifically picking cherries and sorting defects. (Brones, 2018) When given equal access to household resources, they are also more likely than men to invest in family and the future. (Ionescu, 2018)

“Social norms often discriminate against women in rural areas leading to disproportionate land and asset ownership; household and income decision making; time and labour distribution; access to information and training; and participation and leadership in rural organisations or as registered suppliers to agribusinesses.”

Nick Watson, International Trade Centre

The theme of including women can be incorporated across the range of initiatives already in progress. New activities focused on income generating opportunities for women and cultural initiatives that create balanced households should receive top priority consideration.

Changing deeply held cultural beliefs is not easy but can be accomplished to the benefit of society. With commitment to the concept demonstrated through time, repetition, and consistent support favoring women's coffee farming activities and business enterprises.

Support women's groups

- Provide financial support (credit), training (agricultural, finance, management), and trade assistance for organized women's farming groups, including but not limited to those projects already underway by PPAP and CARE International.
- Support the organization, expansion, and promotion of PNG Women in Coffee Group for the identification and inclusion of new participants.
- Establish a formal IWCA (International Women's Coffee Alliance) chapter for access to international community resources.
- Facilitate traceable export of coffees originating from these groups to destination markets.
- Assist the group(s) to sell coffees in overseas markets.
- Assist the group(s) to design and build a women-owned and operated roasted coffee brand with dedicated retail café operation in PNG. The purpose of this enterprise is to provide training and model success for women entrepreneurs to start their own businesses.

Include women in training programs

- Include women in technical training, specifically farming, quality control/evaluation, and roasting.
- Coordinate training schedules with women within selected farming communities.
- Hire women as trainers and extension agents to promote female participation and encourage women to become agriculture professionals.

Increase organizational gender balance

- Recommend an analysis of gender diversity gap and workplace culture within CIC conducted by external specialized consultants. Implement suggested changes.
- Promote and hire women to senior management positions within government offices, NGO projects and private industry.
- Establish gender balance of CIC board directors and senior management to equally represent men and women.

Community-based gender initiatives

- Collaborate with aid and development organizations to coordinate agriculture training with preexisting community-based gender initiatives.
- Communicate with community leaders and industry stakeholders to stress the importance of women's participation as farm and household equals, as well as raise awareness to the issue during training programs helps to increase inclusion of women.

Facilitate business growth, domestic consumption and international trade

Excessive regulation has put private industry in an adversarial relationship with the government entities designed to support them. Healthy skepticism from business stakeholders characterizes PNG's regulatory institutions as ineffective at best - and at worst, a significant threat to the future of the country's coffee trade.¹⁰

Government regulations are not effective at encouraging achievement to the high standards of a dynamic global market. They are also counterproductive to industrial economic growth. Fair competition is the only route to ensuring production of high quality products that satisfy international demands.

No free market is perfect. Inequities exist that place smallholder farmers in particular at the perpetual disadvantage of large business; in this case, buying agents and exporters. This is why the role of government in PNG's coffee industry should be to encourage and facilitate the development of collaborative farming groups and lower restrictions so that they can compete on improved, if not equal footing. Current regulations and licensing schemes in place are doing the opposite.

Once paperwork has been reduced, government staff can assume a role doing those things that help to advance the coffee industry: providing agricultural extension services, doing scientific research, investing in the building of infrastructure, protecting the environment, providing or facilitating access to credit, organizing and offering trade training programs for those who cannot afford it, and facilitating overseas trade. The role of government is to help individuals and businesses succeed by doing those things they cannot do on their own.

Restrictions prohibiting the internal trade of unprocessed coffee by exporters adds an undue burden on community coffee aggregators, who may otherwise themselves be capable of exporting coffees directly. Current regulations require those small businesses to work through larger exporters to fulfill deliveries at an additional cost and with potential loss of value from branding and traceability. Modify or eliminate restrictions to permit trading agents to export.

Roasted coffee and roasting coffee businesses should be exempted from current regulations, except as required by international customers.

Small volume shipments of green coffee should be exempted from current regulations, except as required by international customers.

Relocate sampling / grade inspection approval facilities to mill locations from the port. This will allow for better productivity and eliminate the need to potentially return shipments.

Modernize documentation, including but not limited to fumigation certificates, to speed release of shipments.

Ensure gender and industry segment are equally represented on the CIC board.

Reduce overregulation and licensing schemes

The burden of obtaining licenses for exporting, roasting, shipping, and capital equipment purchases inhibits growth in these areas without improving the quality of goods or services.

The recommendations below highlight areas observed as being friction points between government agencies/CIC and industry. It is not within scope of this assignment or expertise of its author to draft regulations. Therefore, a thorough independent review of CIC's processes and

¹⁰ Information obtained in stakeholder interviews

industry regulations with benchmarking against international best practices employed by coffee exporting nations is recommended.

Reconsider licensing requirements for activities other than green coffee export. Lower export license fees and application requirements for green coffee exporters to be within reach of any interested parties.

The time of various agencies completing its checks in the process to export adds days to the process of exporting coffee and can amount to significant delays during the peak harvest season. Seasonally increase staffing levels to reduce backup.

The minimum annual export quantity of 6,000 bags restricts licensing all except for large commodity firms. Lower or eliminate the minimum.

There is presently no clear path to allow the exportation of high value micro-lots from the country. Any reasonably prepared small producer should have equal access to export her or his product to an international buyer.

Support cooperatives and nucleus group development

NUCLEUS MODEL

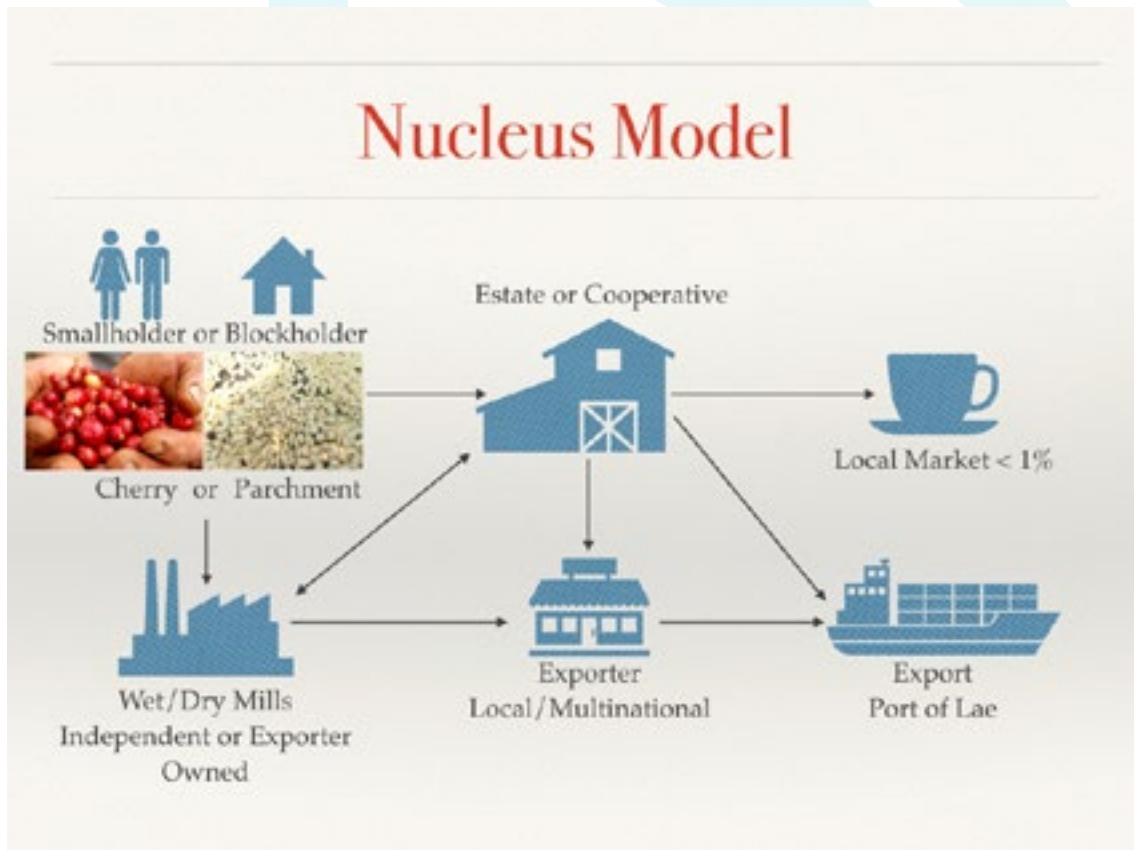


Figure 8 Nucleus group production model

Organization into coffee farming communities and cooperatives that standardize practices and share resources is recommended to improve both downstream quality and return premium incentives to individual farmers.

Many of the initiatives recommended by this report (e.g. technical training, extension services, market traceability) will be difficult to implement one farmer at a time on a large scale without local organization of smallholders into semiautonomous groups.

Nucleus groups are a good alternative. A nucleus group refers to small to mid-size farming estates that collaborate with surrounding smallholder farmers. This creates a mutually beneficial relationship between estate and independent farmers. In practice, this operates in a similar manner as a cooperative. Farmers benefit by having the guidance, tools, and market access that would otherwise not be available to an independent smallholder. The estate benefits from access to a larger quantity of guaranteed coffee produced following internal business practices. A small number of these groups are in operation now, supported by PPAP or operating independently.

PPAP, with the collaboration PHAMA and other relevant stakeholders (e.g. Fairtrade) should continue to develop cooperatives and nucleus groups to achieve self-governance and export capability. This should be considered a high priority activity.

Supply smallholder credit, finance training

The lack of available credit at every level in the coffee value chain of PNG inhibits business conduct and growth. Farmers lack credit necessary to purchase inputs or other supplies needed routinely during the year, agents and exporters purchase cherries or parchment limited to cash-on-hand, and the financing of invoiced shipments is available only to the largest of the country's exporters.

Past credit programs failed due to low repayment rates. (Giovannucci & Hunt, 2009) A more recent credit scheme was introduced and also later suspended by CIC as being ineffective. Information was not immediately available at the time of this analysis to determine why. An investigation into the situation and feasibility study of the program that began in 2016 is not yet completed.

Credit is necessary for businesses to operate effectively. Coffee, like other seasonal agricultural crops, requires continual year-round maintenance but only yields a dividend once annually. The cost of production is also not steady and increases dramatically during the harvest season. Careful budgeting is necessary to ensure that sufficient funds are available to last throughout the year.

Credit helps the situation to be more manageable for both businesses and individuals. It also allows for the buildup of debt that accumulates prior to payment. Without credit, businesses cannot expand.

This is not a problem unique to Papua New Guinea. Farm credit and particularly the issue of lending to rural smallholder farmers is a challenge worldwide. PNG can learn from credit schemes implemented elsewhere to customize one that meets the needs of its coffee industry.

Provide savings and budgeting training to cooperatives and other smallholder groups. A program funded by the Bill & Melinda Gates Foundation in Tanzania identified that doing so produced a positive track record of credit history and by itself improved saving, which reduced the need for costly credit products. (Stiegel & Tobias, 2016)

The same program identified that traders and exporters are in a better position to offer pre-harvest finance to growers than commercial banks due to their direct interest in the coffee as collateral and better access to farmers. Underwriting loans serviced by traders and exporters may be more effective than direct lending to farmers.

Other financial products may assist the industry to control risks. Specifically, commodities market hedging can reduce losses from coffee trading activity. Products are available for large and small businesses, as well as farming groups.

Conduct a financial products training seminar and hedging workshop for SMEs and farming groups.

Promote domestic consumption

Coffee growers always benefit from increased domestic consumption. (P&A Marketing, 2004) Additional demand from the retail sector provides a convenient local outlet for coffees, which may be more competitively priced for consumers than foreign imports. It also provides opportunities for vertical integration of businesses to capture additional value from roasting and retailing of domestically grown coffee. It's a win-win situation for coffee stakeholders and consumers that should be pursued as a strategic priority.

Perceived as "low-value," the local market for consumption is often overlooked as a desirable target for sales. In reality, income level has not been shown to be a barrier impeding coffee sales. Habits formed from repeated consumption are a greater driver

of behavior. In Brazil, spending on coffee as a portion of minimum wage income has historically reached as high as 12%. (P&A Marketing, 2004)

A two-tier model to promote domestic consumption was established by Brazil in the 1990's and later chronicled by the ICO in its report, "A Step-by-Step Guide to Promote Coffee Consumption in Producing Countries." It is arguably the most effective campaign ever mounted to increase domestic coffee consumption. Once a small consumer of coffee, Brazil is now the second largest coffee consuming country in the world (20.5 million bags 2017) and a valuable market for domestic coffee producers. Strong growth is also currently being seen in other historical producing nations, including India and Latin America.

The first tier focused on creating an environment that incentivized coffee industry to enter the domestic market for production and trade; removing barriers created by taxation or quotas or price controls, by making funds available for promotion of the industry, and creating the legal framework to support a coffee quality scheme (100% pure seal program). The second tier focused on direct marketing to consumers using traditional techniques, as well as specially targeted programs.



Figure 9 Duffy Cafe, Harbourside East, Port Moresby, photo credit: Andrew Hetzel



Figure 10 Brazil domestic consumption promotion strategy

Harvest new value from waste and environmental sustainability

Environmentally responsible practices protect natural resources and health. It can also add value to coffee production through the development of derivative products created from waste or contribute to branding. Environment sustainability is a key buying motivator in mature specialty coffee markets.

Effluent wastewater from coffee wet processing is considered an industrial toxin and should be neutralized before discharging into water sources. "The stream of discharge from polluted wastewater degrades the overall environment of the farm, and negatively affects down-stream neighbors, agriculture and livestock." (Michael Marsolek, 2012)

Simple settling pits can be used to allow sediment to separate from water, which is then released. Sophisticated farms may include anaerobic digestion with the capture of gasses, which can be used as fuel. Some certifications regulate the handling of wastewater, such as Organic and Fairtrade, which contribute additional value.

Conduct best practice training on wastewater treatment for communities and cooperatives.

Pulp solids extracted from this process are an excellent food source for vermicomposting, resulting in valuable organic fertilizer. This may be used on the farm to increase plant yield or sold to other agriculture industries, such as flower and vegetable production.

Conduct best practice training on vermiculture and composting. Promote the development of an organic fertilizer business that will be a new value-added segment of coffee production, and also beneficial in other areas of PNG agriculture.

Dried coffee skins can be sold as a consumable product, brewed like tea. Known as "cascara" (Latin America), "keshir" (Ethiopia/East Africa), or "qishir" (Yemen/Arabian Peninsula), it can fetch more per weight than the value of green coffee. (Perez, 2018) Opportunities for exports are small but growing as awareness and popularity of coffee skin tea grows. Startup consumer product companies like Kona Red and Kishr have developed RTD beverages based on coffee husks/skins. A bigger potential exists

to develop coffee husk tea products for domestic consumption within PNG. Similar additional secondary opportunities exist for coffee used in candies or confections. Chocolate-coated coffee beans are popular gift items in producing areas, including but not limited to Hawaii.

Promote the awareness and development of husk tea products for sale within PNG; consider exporting.

Use coffee in other food products, including but not limited to candies or confectionary items.



Figure 11 Vermiculture or worm composting to create organic fertilizer, photo credit: Andrew Hetzel

Maintain international market presence

PNG retains a generally positive brand image among specialty green coffee buyers. Much of its reputation was built on the solid performance of estates prior to 2010. A younger generation of coffee professionals has entered the workforce in the past decade with little or no exposure to PNG coffee.

With the exception of private industry marketing communications activity and a small number overseas shows sponsored by IPA¹¹ to exhibit roasted coffee products at food shows, there is little evidence of effort to maintain industry awareness. CIC does post occasional news to its blog, but the last published newsletter available is from 2016.

Outbound communication to a global marketplace with multiple languages, cultures, and interests can be overwhelming. It does not, however, need to be extremely expensive. Editorial content is easy and inexpensive to develop internally and free or near-free to distribute by social media, such as a Facebook and Twitter or on an organization's website.

Press releases can be distributed to trade media at similarly low cost, describing new advances, activities and accomplishments of the national coffee industry and its individual stakeholders.

PNG's absence at international coffee events is conspicuous among the dozens of global coffee production nations. The 2018 Specialty Coffee Association conference in Seattle attracted 13,500 coffee professionals from over 100 countries. It is the world's largest annual professional coffee conference and exposition. Of the top twenty coffee producing nations, only three did not have national participation at the event: Vietnam, Cote d'Ivoire, and Papua New Guinea. (SCA, 2018) That's two low-value commodity robusta-growing countries and Papua New Guinea.

¹¹ In 2016, IPA sponsored Banz Kofi to promote roasted products at Fine Foods and the Passifika Festival in NZ. 2017 IPA sponsored Superior Coffee to participate at Fine Foods Australia. 2018 sponsored Namalu Coffee to participate at the Passifika Festival. IPA is currently organizing plans to participate at the 2018 Seoul Café Show.



Figure 12 2016 Specialty Coffee Association Expo, photo credit: Specialty Coffee Association



8000
N.A. HOUSE & BOND

7000

Cerá

Cerá

COLECTIVO

Cafetto
Sponsor
2014
Art

Fully aware supply constraints are a higher priority, PNG's absence as a nation at these infers a message to buyers: "we have nothing to offer and are not a part of this community." It is only a matter of time until the cachet of PNG's past erodes and is forgotten by new generations.

The benefit of attending international coffee events is not strictly to attract new business. In fact, sales transactions are rarely conducted on the exhibit floor. Participation gives the producing nation:

- 1) recognition and contacts in new markets;
- 2) the opportunity to learn about new markets and competitive trends;
- 3) the chance to observe competition and sample competitors' offerings;
- 4) time to discover new information and learn best industry practices in lectures and skills training workshops; and,
- 5) experiences to engage with the international community of producers and buyers and to exchange ideas as an equal. (Hetzel, 2018)

PNG should develop a marketing communications plan to help maintain brand awareness and desirability.

Marketing Communications Plan Elements

- Identification of ideal potential markets (geographic, market segment, other niche), and potential clientele within each;
- A message and the identification of methods and goals of communicating with each market;
- Small volume shipments of green coffee should be exempted from current regulations, except as required by international customers.
- Creation of resource guides and marketing materials to support stakeholders;
- Creation of a calendar and activity planner with budget to conduct international market promotion in 24-36 mos.

Participate in International Coffee Events

Representatives of the origin (private industry, CIC, volunteer and/or sponsored) should be encouraged to participate at major international coffee activities. First as an observer, and later as an exhibitor. **Note that up to one year of planning is necessary to participate in these activities, so organization should begin as early as possible.**

Ultimately the goal should be to maintain a national banner presence that invites and/or facilitates the participation of green coffee exporters.

Major events on the annual industry calendar include:

- The Specialty Coffee Association Expo in the United States
- SCA World of Coffee in Europe
- Melbourne International Coffee Expo
- Specialty Coffee Association of Japan event
- Seoul Café Show
- Trieste Espresso
- Other regional or international events with a significant coffee trade presence may be suitable, including Hotelex / FHA China, FHA Singapore, HOST Milan, Gulfhost Dubai or similar. (Hetzel, 2018)

Organize a private industry association

The PNG Coffee Industry Working Group is an excellent platform to facilitate collaboration between stakeholders across the value chain in a neutral setting. It's also a good launching pad to someday organize more formally as a self-perpetuating private industry association. Possibly, as a Papua New Guinea chapter of the Specialty Coffee Association.¹²

There are 30 national chapters of the Specialty Coffee Association. (SCA, 2018) Presently these are mostly within consuming countries. The chapter system originated with the Specialty Coffee

¹² The author of this report, Andrew Hetzel, is a board director of the nonprofit Specialty Coffee Association.



Figure 13 PNG Coffee Industry Working Group

Association of Europe organization, which had few producer members prior to merging with the Specialty Coffee Association of America to form SCA in 2017. Applications have since been received by numerous producer nations and are in process.

Chapters are operated and governed locally by private industry volunteers but must meet criteria published by SCA. A minimum of 25 members are required to form a chapter with 3-5 taking on leadership duties as a national coordinator, membership coordinator, marketing communications contact, education coordinator and events coordinator. (SCA, 2017)

Benefits of chapters include direct access to SCA communications and content, national chapter branding, accredited national competitions (barista, roasting, etc.) with pathways to world championship events, and a structure for volunteers dedicated to each chapter role that help to advance national coffee culture.

Organize the PNG Coffee Industry Working Group into a self-sustaining national industry association representing private industry interests across all segments of the value chain.

Collaborative purchasing

The PNG Coffee Industry Working Group or future association is also a good platform for collaboration to overcome some of the more tangible obstacles facing the industry, namely the procurement of supplies and services.

Interviews with stakeholders reveal a common frustration: a lack of basic materials necessary to conduct coffee business, specifically packaging for green and roasted coffee.

Develop a central purchasing scheme of common business supplies, e.g. packaging materials, common coffee production and retail supplies.

Similar potential exists for international air freight. By pooling small shipments of green and or roasted coffee together for international export by air, costs become significantly more affordable – as much as 50% or less below published rates.

Air Niugini Cargo has expressed an interest to collaborate with industry to establish routine international shipment service to a foreign distribution hub(s) with local routes connecting from Mt. Hagen and Goroka, making air freight a more effective distribution system.¹³

Explore collaborative international air shipment scheme to reduce air freight costs.

¹³ Interview with Gus Klaus, Sales & Marketing Manager, Air Niugini Cargo.



Figure 14 Coffee origin tour visitors in Myanmar, photo credit: Andrew Hetzel

Develop agritourism

200,000 tourists visit Papua New Guinea each year. (TPA, 2018) The majority¹⁴ are from Australia (88,000), New Zealand (10,000), The Philippines (14,000) and the United States (12,000), which are all significant coffee-consuming nations. The potential exists to promote PNG's coffee heritage by developing short agritourism programs.

Tourists to PNG are likely to enjoy outdoor activities, cultural events and ecotourist attractions. This is a potential audience of visitors to farms, who can see firsthand how coffee is grown, learn about the country's history in coffee, and purchase roasted coffee at a visitor center.

Promote the development of tourist visitor centers on accessible farms and tour programs in cooperation with tour operators and resorts.

¹⁴ A significant number also arrive from China (13,000), which is of less interest for coffee business, but may provide opportunities for coffee husk tea



There are already coffee displays promoting locally roasted PNG coffee at the international airport. These too can be expanded with additional information about the culture and importance of coffee in PNG.

Create coffee industry exhibit or display at international airport and seaport featuring local farmers and roasters. If applicable, use the kiosk to promote coffee agritourism programs.



Figure 15 Simple coffee display at Jacksons International Airport, photo credit: Andrew Hetzel

Promote quality from tree to cup

CIC is following a strategic policy of improving coffee quality “from tree to cup.” This is particularly needed in the section between “tree to port,” as smallholder farm productivity and quality control are significant barriers to increasing trade value.

The low quality and inconsistency of quality found in smallholder exports restricts PNG as an origin to low pricing. Low quality coffees are commodities,

which are interchangeable and sold at exchange prices that do not reflect the cost of production. Countries like Brazil and Vietnam have comparative advantages producing high volumes of low quality coffee very efficiently, making head-to-head competition a losing proposition for PNG.

Improvements to productivity will allow farmers to earn more from the same area of land. At the same time, differentiation from quality achievement, traceability, and to a lesser extent certification will help coffee production to be a more equitable profession.



Figure 16 Productive coffee trees flowering in Brazil, photo credit: Fernando Rebêlo, Wikimedia Commons

Implement updated quality grading standards

Modernized and simplified grading standards for PNG coffee were announced in 2015. Under the new system, smallholders are no longer automatically disadvantaged for their size of production, and more emphasis is placed on cup quality, which is more indicative of specialty coffee value. Despite a positive market response, they have yet to be employed – three years later. These should be re-introduced to the market and implemented at the earliest opportunity.

Establish service bureau mills

A lack of convenient access to wet milling equipment in rural communities reduces cherry value and creates inconsistencies in production. Initiatives to support the development of new wet mills will allow communities to pulp and dry coffee to parchment. This improves value and makes the coffee more durable for storage and transportation. Installing advanced new generation eco-pulping equipment reduces water usage, effluent waste, as well as improve quality results.

Dry mills are presently owned by estates and larger exporters, limiting smallholder groups seeking independent direct export trade. An independent service bureau or farmer cooperative dry mill that processes coffee for a fee will encourage small exports from communities.

Expand farmer extension services

Programs may be developed that train lead representatives (train-the-trainer) from producing communities who later are responsible to distribute information to others. As mentioned earlier, it is important to involve women in leadership roles wherever possible in this process.

Partnerships with exporters and, NGO's or aid groups help to distribute information more widely. Central coordination among these groups is necessary to ensure message consistency and geographic area of coverage.

Teach intercropping to increase smallholder farmer earnings with complimentary crops. This also protects coffee from being completely replaced during years of low-value.

As literacy rates are low in rural communities, printed job aids may be drawn and distributed that demonstrate best practices visually. The end deliverable of this process looks similar to an airline passenger safety card, but specific to various coffee practices.

Field training centers may be established at rural points across the country to serve as a resource and hub of training activity. This further helps to increase training multipliers that reach larger audiences.



Figure 17 Coffee training course led by national instructor, Uganda, photo credit: Andrew Hetzel



Figure 18 Cup of Excellence competition in Brazil, photo credit: Andrew Hetzel

Offer cup quality, roast and brew training

Expand training for cup quality, roasting, and barista skills. Recommended programs include but are not limited to the SCA Coffee Skills Program and the CQI Q Grader certificate exam. Raising internal quality capacity improves market understanding, quality performance, and domestic consumption.

The CIC training laboratory in Goroka is nearly completed and is a good location to host courses. Certification of the facility by SCA is recommended to ensure quality standards but not strictly required to host certificate courses if reasonable conditions are met.

Private industry and CIC are encouraged to consider establishing shared training facilities at other points across the country, field cupping training centers in producing areas and cupping/roasting and/or barista training school in Port Moresby as a for-profit or community benefit business.

Capacity should be developed internally for PNG nationals to be instructors in SCA and CQI programs. Time to become a SCA Authorized Skills Trainer (AST) is approximately 1-2 years from a first course participation. Time to become a Q Instructor is approximately 5 years, as the applicant must be a valid Q Grader certificate holder for 3 years prior to starting the instructor training apprenticeship.

Strengthen and expand national cupping event

Cupping competitions run by independent and credible authorities are an effective way of rewarding coffee farmers for their accomplishments in coffee quality and also act as a way of making lesser known origins more accessible to buyers - particularly smaller specialty buyers willing to pay high premiums for quality.

The national cup competition event established by CIC is a good program and should be continued. It can be additionally strengthened to add value, leading to increased international participation.

Perform community outreach before competition (during the season) should explain the purpose and benefits of competition to participating farmers. Post competition outreach can be used to explain results for diagnostic purposes and prepare for the next year of competition.

Participation by widely recognized head judge(s) and trade media increases international visibility and marketing value of the activity.

Detailed information about each top scoring community offering micro-lots should be available online immediately following the event.

Winning lots, if possible, should be available for sale to reinforce program ideals.

There should not be a cash prize for winners. Advance arrangements may be made with buyers participating as international judges to purchase lots at a premium.

National cuppers should be included to develop experience and internal capacity to sustain future events.

Promotion of results in trade media before, during, and after competition, and by participating international visitors increases visibility and value of the activity.



Figure 19 Competitors in the first Timor-Leste national barista competition, photo credit: Asian Development Bank

Host a national barista, coffee cocktail, and roasting competition

The World Barista Championship (WBC) has grown from friendly gathering of coffee-obsessed enthusiasts in the early 1990's to a popular global sporting event.

The 2018 World Barista Championship will be hosted in Amsterdam in June at the SCA World of Coffee Event. Over 60 countries will send national barista champions, who will each prepare four espressos, four cappuccinos, and four signature drinks to exacting standards for a panel of judges in fifteen minutes. There will be thousands of spectators on-hand in person for the event and hundreds of thousands more watching online.

Competitions are an exciting way to motivate youth to become coffee professionals. They glamorize learning the pursuit of excellence in

performance. When organized efficiently, the competitions can also be profit centers attracting audiences and private industry or consumer product sponsorship.

There are international championships hosted by World Coffee Events¹⁵ beyond the WBC, including:

- Coffee roasting (World Coffee Roasting Championship)
- Coffee cocktail making (Coffee in Good Spirits)
- Latte art (World Latte Art Championship)
- Sensory evaluation/triangulation (World Cup Tasters Championship), and
- Brewing (World Brewing Championship).

The rules and equipment requirements necessary to organize all of these events are publicly available on the WCE website. A large number of coffee-growing nations conduct their own national championships in one or more of these categories. In 2011 and 2012, coffee producers from El Salvador, and Guatemala won the prestigious title of World Barista Champion back-to-back.

Organize one or more national coffee competitions each year to encourage exceptional performance in PNG's coffee retail sector and attract future coffee professionals to the industry.

Begin with a national unaccredited competition to promote the concept and participation by competitors while learning how to execute the logistics of an event;

Pursue WCE sanctioning in the second year, with plans for the national champion(s) from Papua New Guinea advancing to the global championship alongside 60+ others.

¹⁵ World Coffee Events is a Specialty Coffee Association subsidiary company




Establish regions and flavor profile map

As the specialty industry of PNG evolves it may be beneficial to develop the awareness and reputation of individual geographic regions within the country (e.g. Western Highlands, Eastern Highlands, Morobe, etc.). The purpose of this activity is to recognize cup characteristics inherent to regional microclimates for both diagnostic information and so they can be better communicated to buyers.

This activity can be incorporated with the national cup quality competition by collecting GPS coordinate information for each sample. Sensory results from competition may be used to populate a database and analyzed to identify trends. When superimposed using GIS mapping technology, it can identify regional boundaries with similar sensory characteristics.

The development of regional profiles by Anacafé, the national coffee association of Guatemala, have been helpful to articulate the difference between coffees of Antigua and Coban. Where both previously were categorized as “Guatemalan,” they now enjoy greater specificity sold by region to buyers seeking those characteristics.

Cross-referencing sensory characteristics with GIS mapping programs can be relatively simple, designed as marketing support or extremely intricate, to identify areas of quality performance and need for extension support.

-  Collect flavor sensory data from the national cupping competition for the purpose of identifying regional profiles.
-  Create regional brand identities corresponding to collected data for marketing and communications activities.
-  Analyze collected profile data for diagnostic purposes, such as extension support and field planning.

Brazilian Coffee Origins

Sources: MAPA, Conab and Embrapa Café

Minas Gerais

Sources: IMA, APROCAM, INPI, Emater-MG, Federação dos Cafeicultores do Cerrado

1. Sul de Minas
2. Mantiqueira de Minas
(Geographic Indication)
3. Chapada de Minas
4. Matas de Minas
(Montanhas de Minas)
5. Cerrados de Minas
6. Cerrado Mineiro (Designation of Origin)

São Paulo e Minas Gerais

Sources: INPI, AMSC

7. Alta Mogiana (Geographic Indication)

São Paulo

Sources: Câmara Setorial do Café, IAC, CIAAGRO

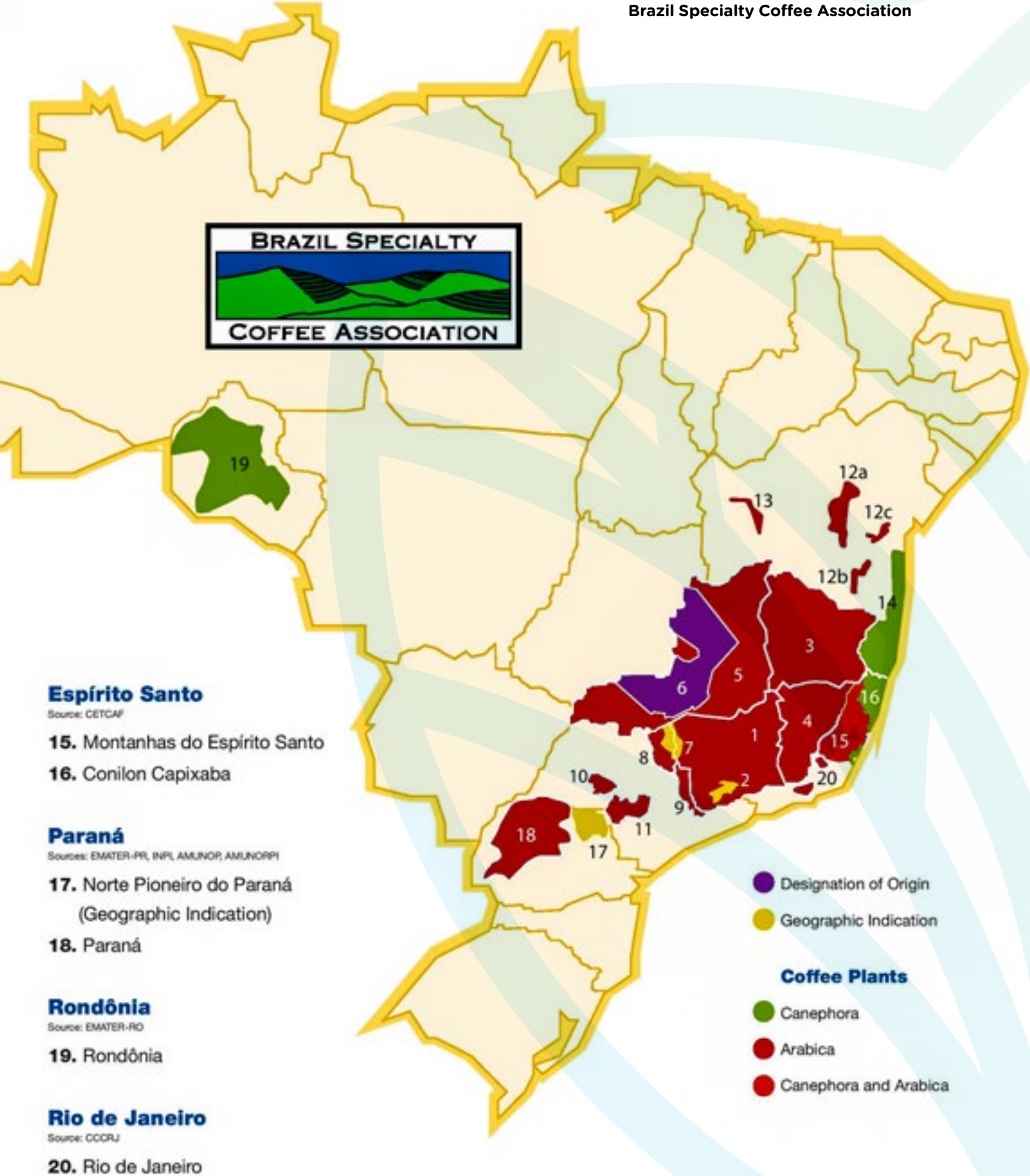
8. Mogiana
9. Média Mogiana
10. Marília e Garça
11. Ourinhos e Avaré

Bahia

Source: SEAGRI

12. Planalto Baiano:
 - a. Chapada Diamantina
 - b. Planalto de Vitória da Conquista
 - c. Serrana de Itiruçu/Brejões
13. Cerrado Baiano
14. Atlântico Baiano

Figure 20 Regional profile map of Brazilian coffee origins, Copyright Brazil Specialty Coffee Association



Espírito Santo

Source: CETCAF

- 15. Montanhas do Espírito Santo
- 16. Conilon Capixaba

Paraná

Sources: EMATER-PR, INPI, AMUNOP, AMUNORPI

- 17. Norte Pioneiro do Paraná (Geographic Indication)
- 18. Paraná

Rondônia

Source: EMATER-RO

- 19. Rondônia

Rio de Janeiro

Source: CCCRJ

- 20. Rio de Janeiro

WORLD COFFEE MARKET DISCUSSION

The long-term market forecast for coffee demand is positive. Consumption is growing nearly everywhere but is more pronounced in developing nations. By 2030, worldwide demand could reach 200m bags (McFerron, 2015), which is a 1.8% growth per annum, from 156m in 2016. Today's world market for coffee trade presents opportunities for Papua New Guinea across its range of available qualities, but particularly so for higher-quality specialty coffees.

Established markets are maturing

Total coffee demand in the largest established consuming markets of Australia, North America, Western Europe, and Japan is experiencing slow but steady growth. (FAS, 2017)

The volume of consumption is not as impressive as the shift in consumer behavior observed in these markets. Maturity has led to segmentation catering to a wide variety of options to suit individual style, budget, and other preferences as coffee beverages have become ever-increasingly a ubiquitous part of life.



Figure 21 Starbucks Reserve business segment caters to the refined interests of Millennial customers, photo credit: Starbucks Newsroom

Single cup preparation, the proliferation of new specialty coffee shops, and the buying interests of a new generation of Millennial¹⁶ consumers have shifted the coffee consumption landscape of the developed world.

The three combined have changed both the buying practices and pricing model of the coffee roasting industry. While past generations purchased coffees by weight of roast and ground product (dollars per pound or kilogram), today's consumers buy coffee in dollars per cup.

The behavior and attitudes of the younger generation have also placed new emphasis on issues of environment and social sustainability, as well as corporate ethics. They are the most skeptical of any consumer age group today and also more likely to be familiar with sustainability certifications, like Organic, Rainforest Alliance, and Fairtrade. (Ward, *The Millennial Marketplace: Shifting Values*, 2015)

“Millennials have shifted the value proposition, placing experience above the product.”

Heather Ward, SCA Research

It is now estimated by multiple sources¹⁷ that while overall coffee consumption will grow by approximately 2% p.a., specialty consumption is growing by 7-9% p.a. and as possibly by double-digit percentages in the United States.

¹⁶ Ages 19 - 34

¹⁷ Information collected from SCA, NCA Drinking Trends Report and Allegra Strategies

In the United States, the National Coffee Association now estimates that over 59% of cups sold in the \$75 billion retail market are higher-quality specialty coffees. (NCA, 2018) The small percentage (10-15%) of coffees sold in America are responsible a disproportionate percentage of the value of trade, accounting for \$42 billion in 2016. (SCA, 2016)

New markets are emerging

While established coffee consuming markets demand more differentiated specialty coffees, new regions to trade coffees of all quality levels are emerging.

Consumers of Asia, Eastern and Southern Europe are switching to coffee from tea and developing a domestic café culture. China alone quadrupled its coffee imports from 600,000 bags in 2009 to over 2 million in 2017 (ICO, 2018) and is projected to become a major market for coffee with import volumes comparable to the United Kingdom in the next few years. Underscoring its importance as a future consuming market, major coffee retailer Starbucks recently announced plans to open one new store in China every 15 hours through 2022. (Bloomberg, 2018) This is due to a combination of access to imported coffees and globalization, which has accelerated the rate of adoption in developing and emerging nations.

Producers are becoming consumers

Brazil, the world's largest coffee producer and India, the fifth largest producer are experiencing substantial increases in internal domestic consumption. Both are projected to become net consumers, reducing export quantities of low quality stocks.

Despite a robust rebound of production in Brazil during the 2018 harvest season (to 60.2m bags) following a down year in 2017, (FAS, 2018) coffee production volumes and quality worldwide regions are falling short of potential. A combination of rising labor costs and shortages, urbanization of farming land, and damage from unstable weather patterns limits output.

Commodity prices remain low

Demand has not led to price increases for commodity coffee, which remains low. With the exception of short term price spikes resulting from supply shocks and a few brief periods of catastrophic price drops, the baseline 'C' contract price of coffee generally remains near its historic median of \$1.20 per pound (10.48 K per kg). (Eldridge, 2016) That means commodity green coffee is gradually becoming cheaper each year, as it is not adjusted for the cost of inflation.

Coffee sold in 1973 was worth 660% of what it is today in the United States. (US BLS, 2018) At the same time, the cost of production (inputs, fuel, transportation, labor etc.) has risen, making coffee production an even less profitable activity.

Only the most efficient producers that maintain large volumes can expect to sustain operations in this low-value market. Those who cannot will continue to see their activities decline in value until no longer economically viable. Faced by declining returns from commodity coffee production, producing nations are pursuing their areas of comparative advantage to maximize value.

There are two approaches to this challenge:

1. Increase productivity

Follow a sophisticated agribusiness commodity model: earn a small amount per kilogram of coffee produced from a large volume of trade. Origins like Brazil, Vietnam, India and others focus on increased productivity, taking advantage of technological advancements and automation, plant breeding programs that yield high volume varieties, irrigation that minimizes the impact of inclement weather, organized labor forces, and large areas of land for farming.



Figure 22 Mechanized coffee harvesting in Brazil, photo credit: Andrew Hetzel





Figure 23 Cuppers evaluate coffees in the Best of Panama competition, an event where coffees sold at auction can attract hundreds of dollars per pound. Photo credit: Specialty Coffee Association of Panama.

2. Specialize to pursue differentiated markets

Locate and develop a geographic or ideological niche market willing to pay a premium for some distinctive and differentiating characteristic. This may be quality or flavor, certification (environmental, social sustainability), or something intangible like consumer desirability of the origin. (ITC, 2012)

This is not an either/or decision. Every industry must choose how to balance the variables of productivity versus quality in order to maximize value creation for farmers and producers.

Short-term productivity initiatives and investment in long-term quality advancement is the best solution. Both are necessary to ensure the future viability of the country's coffee sector.

Grow more, differentiate faster.

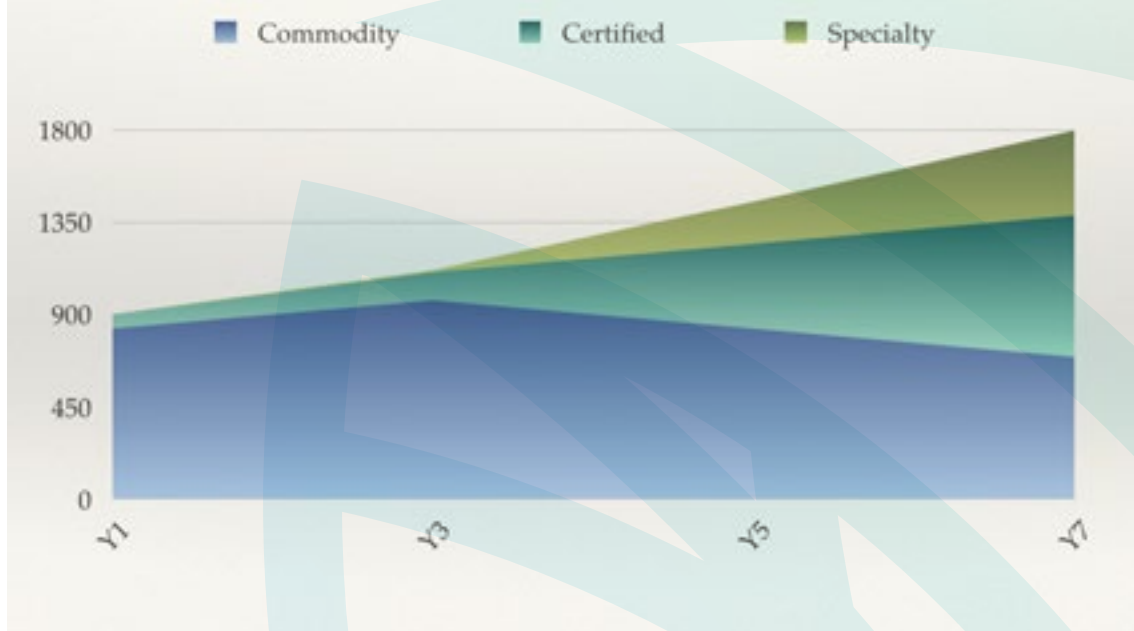


Figure 24 Model showing increased production and increased differentiation of production into higher value tiers

The combined application of good agricultural practices to increase productivity and an emphasis on differentiation can yield more than their individual parts.

Figure 24 shows the approximate total production of PNG's coffee sector in 2017, or 900,000 60-kilo bags. The implementation of farm level best practices, including pruning and replacement of aging trees, has been shown to increase coffee yields by as much as 300% (Technoserve, 2013) in rural communities.

The effect can be approximated by estimating commodity FOB prices (US\$1.10 / lb), Fairtrade Organic (US\$1.55 / lb), and quality differentiated specialty coffee (US\$2.50 / lb) with a seven-year intensive national rehabilitation program. As yield double over that time period, export value triples. This results from a tenfold increase in certified stocks to approximately 38% of production and quality-differentiated production of approximately 20%.

COFFEE IN PNG

Today's world market for coffee presents opportunities for Papua New Guinea across a range of available qualities but particularly so for higher-quality specialty grades. Stakeholder interviews yielded comparable comments from buyers in Australia, the United States, and in Europe: there is no lack of demand for high grade coffee from PNG. Supply is the primary constraint.

Strategic relevance

The coffee industry remains a key sector in the country's dual economy. The industry comprises 85% smallholders, 10% blockholders and 4% plantations, 1% in roasting coffee with the majority growing *Coffea arabica* at high altitudes contributing to PNG's preferable specialty flavor profiles. Participation in the industry provides cash income for up to 2.5 million people, or up to 40% of the country's population. (WB, 2014) The Industry has an Industry body, the Coffee Industry

Corporation (CIC) which is empowered under the Coffee Industry Corporation Statutory Powers and Functions Act 1991. CIC has the responsibility to provide both leadership and services to the PNG coffee industry as stipulated in its Constitution.

The government of PNG is committed to drive private sector development with a focus on growing small and medium enterprises (SMEs). There are a number of government interventions and forms of support for SME growth. The SME stimulus package of 2013 and national

Vision 2050 development plan target private sector development as a key development priority for PNG. The Vision 2050 plan calls for the facilitation of more business opportunities for PNG citizens by improving the business environment and for the empowerment of citizens as entrepreneurs. (PNG, 2011)

Papua New Guinea's Vision 2050 and Development Strategic Plan (DSP) 2010 - 2030 recognize that the true potential of the high value export crops such as coffee have yet to be realized. The DSP goal for the agriculture sector is: "A world class agricultural sector that is responsive to international and domestic markets for a diverse range of products and provides the best available income and job opportunities". The Medium-Term Development Plan 2 (2016-2017) promises to "support large scale agricultural enterprises and smallholder growers more generally to meet domestic and international needs" by prioritizing the following strategies:

- Improvement of institutional capacity;
- Improvement of access to land;
- Development of key supply chains to link producers to markets;
- Provision of appropriate extension services;
- Development of coping and mitigation strategies for pests and diseases and climate change;
- Funding of research and development;
- Enforcement of CODEX marketing standards; and
- Utilization of Economic Corridors for agricultural development

Both documents target an increase from 63,000 (2008) to 500,000 tons of coffee produced by 2030. In addition, quality improvements and access to organic and Fair Trade differentiation schemes represent very real opportunities to increase the value of the coffee industry. The PNG government has also committed to "Inclusive Green Growth" providing new challenges to the industry to achieve industry-wide "green" processes and equity for all those along the value chain. (DNPM, 2014)

PNG will host the APEC leadership summit in November 2018. In the lead-up to that meeting, the government of PNG is establishing processes to review PNG's Doing Business rankings and examine pathways to reform. The APEC Economic Committee has five pillars and focuses on reducing the challenges of doing business and trialing inclusive growth pathways through digital economy.

The APEC Business Advisory Council (ABAC) will be targeting regulatory reforms as a means of promoting business development in PNG. There is also a strong momentum in the private sector where lead firms are now subsidizing assessments for SMEs in their supply chains to be assessed and accredited as reputable SMEs. Exxon Mobil supports these national assessments currently implemented by the Institute of Banking and Business Management (IBBM).

Market position

Export volumes have ranged between 700,000 and 1 million bags green coffee for past 10 years. Despite a strong year in 2016, ICO data indicates that production volumes are falling in PNG. (ICO, 2018) Industry stakeholders reference and face a number of significant challenges referenced earlier in this report that place downward pressure on future seasons.

Most of the better-quality coffees are presently being sold as "A", "AX", "X", or "PSC" grades¹⁸, though it is possible some individual farmers achieving specialty quality may be undiscovered within the "Y" category. Identification and segregation of those coffees prior to homogenization with others of lower quality is crucial to preserving their value.

The majority of Papua New Guinea's coffee is sold within the low-value commodity market to Australasia, the United States and commercial re-exporters in Europe. (CIC, 2017) Commodity market buyers are price sensitive. Futures contract prices that determine their value are largely outside of producers' control.

¹⁸ "A", "AX", and "X" grades designate coffees produced only by plantations. "PSC" is an abbreviation of "Premium Smallholder Coffee," which is quality-graded smallholder coffee, segregated from other bulk smallholder "Y" offerings.

Using financial markets to hedge against futures prices can help to minimize the losses and provide some stability for coffee exporters. These financial products are not widely used or easily accessible for individual smallholders but offer some promise for exporters and farming groups.

Data for 2016/17 shows exports of certified/speciality coffees continuing to show significant growth at 78% compared to the corresponding crop in 2015/16. (CIC, 2017) However, “Y” grade coffee still dominates export categories at around 70% sales.

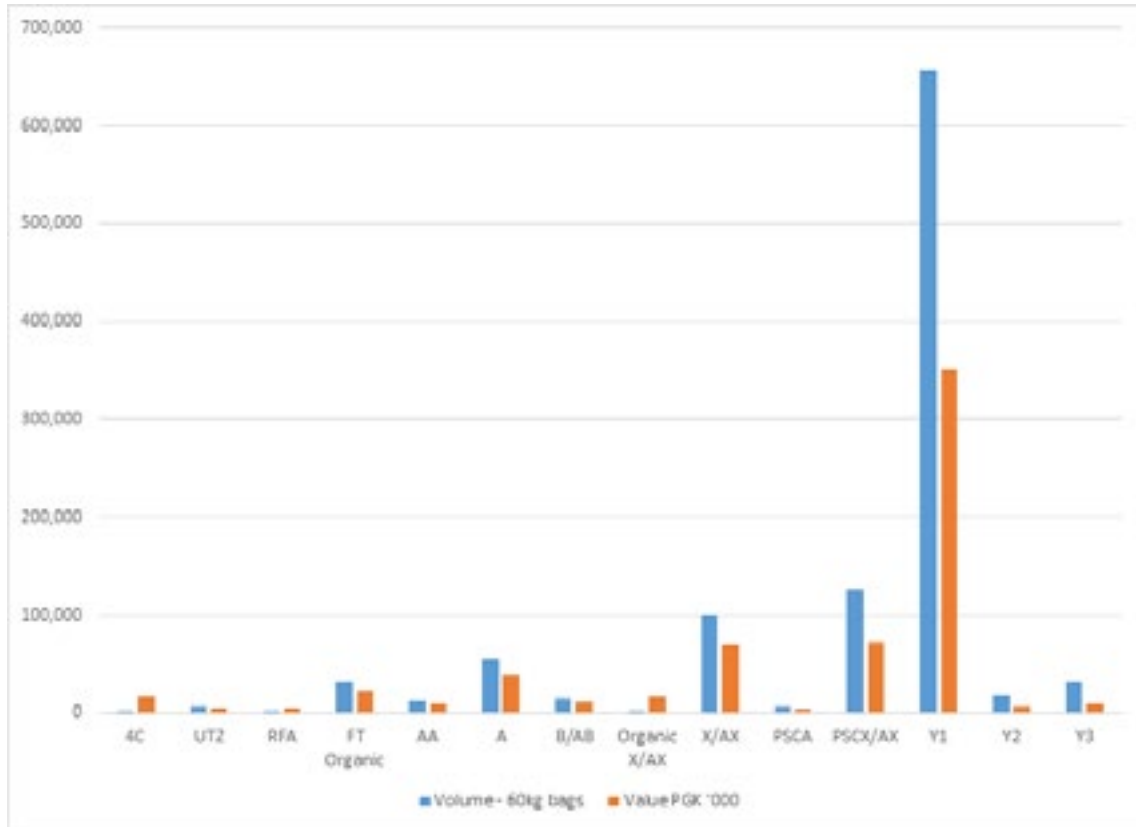


Figure 25 2016 exports by Grade, Volume & Value (K'000)

PNG coffee is viewed by coffee buyers as having the potential to achieve specialty quality but is currently inconsistent.¹⁹ Consistency of coffee quality is equally important to coffee buyers than inconsistent high-quality achievement. Unknowns are undesirable for those managing a consumer product line, thus making the purchase of product of inconsistent quality risky.

In a global market of increasing competition this leaves Papua New Guinea in the challenging position of competing against larger, more efficient and productive origins for market share of an interchangeable low-value commodity. A clear strategy for PNG’s coffee industry is needed to reorient the nation to pursue its comparative advantages.

¹⁹ Information obtained in stakeholder interviews



COMMODITY, DIFFERENTIATED, AND SPECIALTY

The world coffee market is divided into two categories: commodity and specialty. It is important to understand the distinction between the two classes of product but at the same time recognize that both are a part of the same industry. This is not an either/or decision. Every industry must choose how to balance the variables of productivity versus quality in order to maximize value creation.

Commodity coffees are exchange-grade generic Arabica or Robusta coffees that represent the vast majority (85-90%) of world consumption. Commodities are generic and interchangeable, benefitting the producer who can make the most at the lowest cost.

Specialty coffees, are the small 10-15% share of distinctive coffees possessing superior and uniquely identifiable sensory characteristics. (ITC, 2012) These characteristics result from following best industry practices in cultivation,

harvesting, processing, storage, and transportation matched with favorable plant genetics and environmental conditions.

Even when following best practices, a large percentage of coffee harvested from any origin will fall short of specialty parameters due to the necessary byproducts of production. Not every coffee cherry picked will be picked on time, not every lot of coffee collected will be free of pest damage, unexpected rains can cause mold damage to drying parchment.

Most commodity coffee contract trade volume is computer-driven activity conducted by institutional speculators that do not intend to take delivery of the commodity, thus creating extremely volatile coffee commodity prices that give little consideration to actual global supply and demand or other real-world factors, such as the cost of coffee production.

By contrast, specialty coffees are traded by dedicated coffee importers and exporters or through relationships developed between the producer (farmer, cooperative or exporter) and ultimately with the consumer.

The industry lacks a universally accepted definition of what the word “specialty,” means, so other methods of price differentiation are sometimes also used to reach premium niche markets.

Organic certification or social and environmental program standards established by organizations, such as Fairtrade International, and Utz / Rainforest Alliance are also differentiators that may increase the value of coffee when compared to commodity contract pricing.

Quality is not a metric of most certification programs, so certified coffees generally fall short of the price potential achieved by coffees differentiated by quality. Therefore, certification programs are most effectively applied as a floor price or hedging mechanism to gain additional value from low quality crops.

Specialty coffee prices are established:

1. between buyer and seller at some negotiated premium differential tied directly to commodity market prices and fixed on conditions agreed to in advance by both parties;
2. between buyer and seller at a fixed price negotiated for each lot of coffee independent of the global market price of commodity coffee; or
3. at public or private auction (in person or online) organized by the producer, export trade association or third party independent entity.

In all three scenarios, specialty coffees are sold at higher price premiums, often 1½ times and as much as 20 times or more

the price of commodity contracts and with less price volatility.

The specialty coffee trade is historically a more sustainable market option for coffee producers. Terms for specialty trade may be agreed at the beginning of a season to better manage finances or include creative nonmonetary compensation, like a pledge of processing equipment or community facilities that provide stability. Exclusive agreements between communities and regular customers may provide security and reduce the ongoing cost of marketing, at the risk of limiting flexibility to sell at higher prices to other buyers.

Specialty buyers tend to prefer direct lines of communication with producer representatives in order to more effectively discuss preferences or otherwise conduct business in a fashion that is beneficial for long-term availability of desirable supply.

Traceability

Traceability is an important intangible that adds to the value of coffee production. Coffee buyers increasingly want more information about the coffees they purchase and people responsible for its production. In some cases, detailed information is required by business practice standards or government regulations for ethics and safety. This goes far beyond an in-country grade, and may include the geographic source location, date(s) of harvest, ethnic, gender, and historical information about the producing community, dates and location of transportation and storage, information about inputs and pesticides, and compensation for each actor in the value chain. Understanding where coffee comes from, who is responsible for its production and trade, as well as how it was produced gives a buyer confidence about its authenticity and sustainability.

Origin branding

Origin branding and producer marketing support play a vital role in establishing the value of specialty coffee, with the highest premiums paid for coffees that not only exhibit exemplary characteristics but also are reinforced by an authentic story. These are supported by traceability of a source.

In recent years, exceptional coffee-producing origins like Panama and individual estates like Hacienda Esmeralda (Panama) or Fina El Injerto (Guatemala) have built an authentic and valuable reputation through brand promotion and messaging coupled with consistent quality performance that enhances market reception of extraordinary prices. Specialty coffees are branded and marketed by producers not only by country or regional origin designation, but by cooperative, mill or farm name, producer name, sometimes even as precise as individual production lot name.

Grades assigned to coffees by in-country export authorities are used as a guideline but are not the ultimate measure of value within the specialty industry. Important sensory characteristics may vary dramatically in two samples of green coffee with the same in-country grade.

Origin branding is a critical component of specialty coffee differentiation, because it:

- 1. establishes a favorable bias of quality and value of coffee assessed by professional buyers that can dramatically impact sensory perception;**

Despite assurances by buyers to the contrary, subjectivity is present standard methods of coffee quality evaluation. In nearly all cases, a cupper's assessment of blind coffee samples will improve when told that sample originates from an origin generally perceived as favorable (e.g. Ethiopia) or by a popular producer; and

- 2. provides the buyer with additional content that is necessary to articulate many complex factors in coffee production and explain value to consumers in a way that is approachable and easy to comprehend.**

In consumer sales, coffee retailers rely on technical information about the harvested lot and a story about the people, the place, the process and the culture produced the coffee as evidence that demonstrates its uniqueness and their own proficiency. Consumers that remain unconvinced or are otherwise not motivated by claims of quality may purchase based on a human-interest story behind a coffee, for exotic origin intrigue or for the general belief that the purchase is doing good.



Figure 26 Coffee nursery growing seedlings in Myanmar, photo credit: Andrew Hetzel

ROASTING FOR EXPORT

The drawbacks of roasting at origin for export to consuming nations outweigh market opportunities, (ITC, 2012) making the focus on improving overall green coffee quality and differentiating high-value green exports a better solution to increase overall industry performance. Although some roasted exports are possible, for example, internet orders shipped to individual consumers or small wholesale customers abroad, the domestic market remains the best destination for most coffees roasted within Papua New Guinea.

Perishability

Roasted coffee is much more perishable than green coffee, which makes roasting an activity best performed within the consuming market, close to retail customers. Although green coffee can be stored and used for up-to one year in ideal conditions, the shelf life of whole bean roasted coffee is approximately two to three weeks from the time of roast. Grinding coffee exposes more coffee particle surface area to oxygen, reducing

the useable life by a factor of ten. High barrier packaging with inert gas flushing technology has been shown to slow the effect of staling but does not stop the process of degradation. (Bladyka, 2012)



Figure 27 Coffee packaging with roast date

Transporting the roasted product to foreign markets from origin can take a considerable amount of time and this puts the exporter at a disadvantage compared to a local roaster that is able to offer the retailer a product with a longer usable shelf life. Exporters of roasted coffee therefore need to develop speedy distribution systems in order to minimize this disadvantage. This usually requires the active collaboration of agents or specialized importers or roasters in the target market(s). (ITC, 2012)

Although it may be possible for representatives from a coffee producing origin to maintain a retail and roasting presence in a foreign consuming country, the cost of doing so effectively negates any additional value earned through later stages of post-harvest processing.

Sourcing, branding, and specialization

Coffee roasters and retailers in consuming markets invest significant resources into

^{20A} blended coffee may contain as few as 2 or as many as 15 different coffee origins, each theoretically contributing some characteristic beneficial to the whole. Most coffee blends contain 3-5 coffees, sometimes with the same coffee roasted in multiple profiles.

building their businesses. Exceptional performance leads to strong and trusted consumer brands that develop over many years. Most coffee consumers are not familiar with origin countries and the unique characteristics of their coffees, and subsequently purchase coffee at the recommendation of trusted roasters.

Roasting businesses maintain flexibility to purchase green coffees from multiple producing origins and sometimes multiple suppliers from within each origin, which is necessary to compensate for shortages or quality fluctuations in origin source quality.

Coffee is seasonal, meaning that a roasters' consumer offerings may change depending on what is fresh and available at a given time of the year. Top tier coffee roasters in advanced consumer nations favor a farm-to-table style approach, serving coffees only during peak freshness each season.

Roasters may sell one or more blended coffee products. Blended coffees contain multiple origin source coffees²⁰ that produce a desirable taste and price result when consumed together. Espresso-focused countries like Australia and New Zealand blend a significant proportion of roasted coffee in order to achieve desirable complexity that is difficult to obtain with a single origin coffee. Since coffee quality often changes throughout the season, roasters may substitute the source of supply of source components to maintain a consistent flavor profile. Roasting and serving coffee from only one origin puts a roasting business at a significant competitive disadvantage against those who have the flexibility to change as conditions require.

Farming, roasting, and retailing are three separate and distinct business models that require discrete business skills and capital equipment to operate successfully as profitable businesses. Vertical integration is possible, but the cost and complexity of doing so well increases exponentially with each added layer. This is the reason that few wheat growers are also pastry chefs in addition to being restaurateurs. To obtain the highest possible premiums, specialization is necessary at each stage of the value chain.

EXPORT MARKET OPPORTUNITIES

The main markets for PNG coffee by volume are Germany at (36%) of total exports, followed by United States (25%), Australia (16%) and Japan (5%), Belgium (5%), New Zealand (2%) and Russia (2%). Together, these countries account for over 90% of trade. (CIC, 2018) The largest percentage of coffee exports from Papua New Guinea is low grade “Y” smallholder coffees, shipped to the United States, Europe, and Australia. Opportunities exist within these same markets to sell coffees of higher value, with practically no limit on demand. Emerging markets of Asia present opportunities for more commercial quality coffees

United States

At 25 million bags of green coffee imports (FAS, 2017) (~15% of world consumption) and valued at more than \$75 billion annually (SCA, 2016), the United States alone is second only to the whole European Union as a consumer of coffee and the world’s single largest market for coffees differentiated by quality. The average U.S. consumption per capita is

approximately 3kg in 2018. (NCA, 2018) The majority of green coffee imports into the USA come from Brazil (27%), followed by Colombia (20%), Vietnam (16%) and many other origins. (ITC, 2012)

The United States is the world’s leading market for differentiated coffee, with an estimated 59% of all brewed cups sold in 2018 meeting specialty standards. (NCA, 2018) The single origin market for

specialty coffee in America is the largest in the world.

In addition to being PNG's second largest market for exports, it demands a high percentage of better-quality grades. CIC data shows that exports of "A," "X," and "PSC," grades account for 39.7% of the nation's imports from PNG, or approximately 97,000 bags in 2016. (CIC, 2017)

This supports anecdotal evidence obtained through stakeholder interviews that North America is the largest potential market for quality-differentiated premium-priced coffees from PNG. When asked the question, "which markets should PNG pursue to add new value?" the United States was unanimously the answer.

Interview sessions included specialty coffee importers in North America and Australia, as well coffee buyers representing leading retail businesses in both countries. America's consumers are largely unaware of Papua New Guinea and its coffee. This is particularly true among younger consumers, who have little exposure to the country but are likely to be receptive to its cultural diversity, social challenges, and natural beauty.

American specialty coffee consumers are motivated by philanthropic interests more so than Asian or European counterparts, meaning American specialty roasters pay for extrinsic value in coffees connected to environmental or social programs.

Availability of better quality coffees and traceable specialty micro-lots is the main constraint to increased trade with the United States. Once production improves, a simple industry-focused campaign recognizing past problems and informing on the status of change will be sufficient to spark demand. Data, particularly about the communities responsible for producing each micro-lot should be made available to support direct trade for enhanced premiums.

Australia / New Zealand

The coffee markets of Australia and New Zealand are small, but arguably the most sophisticated and competitive in the world. These are extremely important markets for PNG and provide a stable environment for ongoing trade.

In 2014-15, this coffee segment is estimated to generate revenue of \$1.3 billion. Australian research company IBISWorld estimates that more than one billion cups of coffee are consumed in Australian cafes, restaurants and other outlets each year, representing a 65.0% increase over the past 10 years.

"One billion cups of coffee are consumed in Australian cafes, restaurants and other outlets each year"

IBISWorld Research

This phenomenal growth is driven by Australia's booming coffee culture. As a result, instant coffee has fallen as a share of total coffee consumed. (Lin, 2015) ICO estimates the total consumption of coffee in Australia at more than 1.8 million bags in 2016 (ICO, 2018), an increase of 25% since 2010. The estimated annual consumption per capita is 1.9 kg.

Nearly all coffee consumed in Australia and New Zealand is prepared as espresso and consumers in both countries have cultural connections with PNG. This presents a substantial market opportunity for coffees exported to be used as staple espresso blend components or highlighted single origin coffees.

58.7% of coffees imported to Australia in 2016 were higher grades, totaling approximately 60,000 bags. The amount of higher grade imports is impressive, when you consider this is two thirds of U.S. imports in the same category from PNG – for a country that imports one tenth the volume of coffee from all producers.

The Australasian market is among the most mature in the world for specialty coffee with both Australian and New Zealand consumers demanding high quality coffees and traceable sustainability. (FNC, 2016)

The economic forecast for Australia remains positive, with healthy growth expected at 3% annually. (OECD, 2018) Australia's largest coffee importers do not necessarily share the same optimism²¹, citing concerns that a weak Australian dollar in combination with high energy prices has slowed sales of the highest-end specialty coffees.

Consequently, Australian buyers are more likely to purchase upper-middle market certified coffees with consistent characteristics for use in espresso blends than the highest-priced micro-lots. As with other stakeholders interviewed, coffee buyers at some of Australia's largest and most influential coffee businesses suggested that the only limit prohibiting the increased volume of trade is availability of suitable qualities of supply, with the potential to increase purchasing by 100%, or double current quantities.



Figure 28 Trendy Istanbul Coffee Festival draws over 35,000 visitors each year, photo credit: Andrew Hetzel

Europe

The major importing countries of Germany, Italy and France are well-established coffee markets that are heavily reliant on Brazil and Vietnam for commodity coffees. Potential exists in these markets to introduce subspecialty coffees from Papua New Guinea but should be considered a lower priority than others with greater or more immediate anticipated return on marketing investment.

Opportunities of higher value exist in the small but quickly growing specialty markets for coffee found predominantly in the United Kingdom and Scandinavia, followed by Eastern Europe, Turkey and Greece. (Ward, The 2017 Western European Coffee Market Size Report, 2017) (De Sousa, 2017)

Scandinavia, specifically, is home to three of the four top coffee consuming markets per capita: Finland, Sweden and Denmark are countries of brisk development for specialty coffee culture.

²¹ Information obtained from stakeholder interviews



Asia and Oceania

Since 1990, Asia has experienced the most dynamic growth in coffee consumption of any region in the world. From 2010 - 2016 consumption in this region grew by over 45%. As a result, the Asian coffee market has increasingly become the focus of the world coffee industry. (Comunicaffe, 2017)

Markets within Asia offer the most overall potential for the whole of Papua New Guinea's coffee production industry, with near term opportunities to sell commodity/ subspecialty grade crops and significant long-term potential to sell differentiated specialty arabica coffee as consumption in the region matures.

With the exception of the well-established Japanese coffee market (importing 8 million bags annually) (ICO, 2018), the markets of Asia are a relatively new and exciting opportunity for all coffee producers. Although small relative to their size of population, per capita coffee consumption across Asia is growing quickly.

In China, consumption per capita is extremely low but has increased nearly tenfold since 1990 to exceed 2 million bags in 2016, as western-style cafes become a fashionable symbol of status. Although slow to adopt a national coffee drinking culture, China has the potential to quickly become a leading coffee consumer as the result of its large population. Café culture in China is predicted by the China Coffee Association in Beijing to expand by as much as 20% annually, making it among the most attractive grow markets for coffee in the world. (Parnham, 2017)

The South Korean market has exploded onto the global coffee scene in just a few years; for purpose of illustration, the Seoul Café Show established less than a decade ago now draws more than 100,000 attendees, 99% of whom are from within Korea. Korea's total coffee imports are now approaching 3 million bags annually. (ICO, 2018)

A small but dedicated specialty coffee movement grows in Thailand, Taiwan, Singapore and Malaysia. The Philippines has a similarly quick growing specialty coffee scene fueled by a young generation of white collar workers with disposable income and the fashionable perception of coffee as a western luxury. (FAS, 2017)

Only 5% of PNG's better grades are shipping to Germany of nearly 400,000 bags annually. (CIC, 2017) This is low-cost, low-value production at which PNG is comparatively disadvantaged to Brazil and Vietnam.

A large concentration of sales into one regional market may be risky. Germany's position as a powerful global re-exporter of commodity grade coffees provides some insulation from total exposure to European economic concerns.

PNG will be better positioned from diversification into new geographic and niche markets as the eurozone faces potential future instability. (Munchau, 2018) A collapse of the Euro will have a negative global impact on trade, but particularly those reliant on the region as a primary source of revenue.



Figure 29 Audience for the national barista competition of Japan 2015, photo credit: Andrew Hetzel

Japan

Japan is the world's 4th largest coffee importing nation (behind the USA, Brazil and Germany) and the most valuable in all of Asia. (ICO, 2014) Japanese buyers purchase coffees of all qualities from low quality robusta used primarily as soluble coffee to the most expensive specialty arabica auction lots sold each year.

Brazil is the single largest origin at 29% of Japan's total imports, followed by Colombia (19%), Indonesia (14%) and Vietnam at 10%. It should be noted, however that coffee imports from S.E. Asian countries have increased by 2.8% per year since 2000, while coffee from S. America have stagnated and Central America and Africa have fallen. (ICO, 2014)

Consumption in Japan is split evenly between in-home (31%) and out-of-home cafes or restaurants (29%) with the larger balance of consumption in the form of

ready-to-drink (40%) coffee products sold primarily in vending machines and convenience stores. (Ohnishi & Nakahara, 2014)

60.7% (22,500) of the total 37,000 bags shipped to Japan in 2016 were its highest grades - this is the highest percentage of any region importing PNG coffees in 2016. (CIC, 2017)

Japan is a large and established market that is steadily growing and offers opportunities for purchasing coffee of all qualities from Papua New Guinea with substantial premiums available for coffees of exceptional quality. Once production quantities of better grade coffees increase, Japan is recommended as a market for new business development activity for Papua New Guinea's coffee exports.



Figure 30 Coffee served in a Seoul specialty cafe, photo credit Andrew Hetzel

South Korea

South Korea's per capita coffee consumption is five times greater than the rest of the Asia-Pacific. (FAS, 2015) Korean green coffee imports increased 40% from 2010 - 2016. (ICO, 2018) The trend is expected to continue as younger generations embrace western style café culture. As of 2016 there were 17,000 specialty coffee shops in the capitol city of Seoul, or approximately 17 for each 10,000 residents. (Lee & Kim, 2016)

Approximately two thirds of green coffee imports into Korea are arabica, one third is robusta; however, evidence suggests that arabica consumption is growing steadily at 5% while Robusta imports have been declining each year since 2000. Vietnam is the largest imported origin (31%) (almost entirely robusta), followed by Brazil (21%), Colombia (11%) and others primarily in Central and South America.

The majority of coffee consumption in Korea is in the form of soluble coffee and instant 3-in-1 drink mixes (43% combined), which include a combination of soluble coffee, powered dairy and sweetener in one product, followed by out-of-home consumption (32%) mostly in chain-based retail cafes and RTD products (24%). (Ohnishi & Nakahara, 2014)

Trends indicate a steady shift to out-of-home consumption as café chains rapidly expand and independent café operators increase in numbers. In recent years Korean coffee chain operators have expanded internationally, developing a significant brand presence and exporting roasted coffee to abroad to China and the United States.

South Korea is a young but aggressively developing market with immediate opportunities for the sale of subspecialty coffee from Papua New Guinea and expanding opportunities for specialty sales as the market continues to mature.

The Philippines

The Philippines produces coffee but is a net importer overall with domestic consumption ten times that of production. From 2010 - 2018, total coffee consumption increased by 65% to 3 million bags. At 1.6kg per person, it boasts among the higher per capita consumption of coffee in Asia.

The country is in an era of strong economic growth. In 2017, the economy of the Philippines expanded 6.7% and is forecast to continue at 6.8% and 6.9% in 2018 and 2019, respectively. (ADB, 2018) This contributes to increased disposable income and higher consumer spending. Nearly all coffees imported are from Asian countries, specifically Vietnam (54%) and Indonesia (44%), leading to the logical assumption that the vast majority of consumption is robusta.

Coffee is a household staple among all economic classes in The Philippines, with a large percentage (up to 90%) estimated to be soluble coffee or 3-in-1 products (including RTD). With coffee drinking as cultural norm, transition to out-of-home specialty café consumption has occurred rapidly, fueled by a young and emerging class of white collar workers with an interest in western lifestyle trends.

A young generation of Millennial coffee drinkers in The Philippines and specifically Manila are employed in the business process outsourcing (BPO) industry that work long or varied work, making an influx of nearby cafés ideal waiting or social meeting points between shifts. As a result, **the specialty coffee shop industry of the Philippines is projected to sustain growth of 10-15 percent p.a. over the next five years.** (FAS, 2017) Analysts attribute this expansion to the growing consumer preference for specialty coffee and the improving image of coffee in general.

The Philippines is a small but quickly growing consumer market for coffee that Papua New Guinea is competitively advantaged to pursue as it transitions from robusta to arabica.

China

Coffee consumption per capita remains extremely low in China, less than .05 kg (5 cups or fewer) per person annually in urban areas but growing. China's total consumption of coffee grew from 1 to 2 million bags in just five years between 2011 and 2016. (ICO, 2018)

The International Coffee Organization (ICO) summarizes China's coffee market in its official 2013 Coffee in China report as being, "something of a puzzle." Despite having extremely low per capita consumption when amortizing its present volume of imports over 1.3 billion residents, its potential for growth is unlike any other on the planet, should it follow a similar path to coffee like Japan.

Unlike Japan, however, China is also a coffee producing nation undergoing large planting initiatives capable of meeting some of its own domestic demand, primarily in the Yunnan province. In 2009 ITC estimated Yunnan's production at approximately 40,000 tons, predicting increases as much as 80% by 2016 (ICO, 2015) prior to announcements indicating that coffee cultivation would be promoted by the Yunnan and Pu'er governments. Consequently, domestic production in China (nearly all Arabica) exceeded 82,000 tons in the 2012/2013 harvest and continues to expand.

The same ICO report indicates that a "proliferation of sales outlets for coffee companies on every street corner in China's big cities indicates the existence of a potential for coffee consumption," noting that these same companies, "carry out promotion activities targeted mainly at the young, who are more receptive to change and to Western lifestyles."

Coffee consumption in China continues to increase, with organizations including national chain SPR Coffee and the China Coffee Association of Beijing estimating growth at between 15-20% annually, figures that are buoyed by an influx of expatriate coffee drinkers drawn by economic opportunities. There is unquestionably substantial interest and investment by coffee companies in China but as of yet, per capita consumption continues to lag behind other Asian nations.

Coffee chain Starbucks is betting heavily on future growth with the announcement to open 6,000 new locations on the Chinese mainland in the next four years. That is one new retail shop every fifteen hours. (Bloomberg, 2018)

The business culture of China is complex and difficult for foreigners to navigate. Potential exists, however, to build a brand image and reputation now. The Colombian Coffee Growers Federation and Brazil

Specialty Coffee Association both have country offices open in China to promote the interests of differentiated coffees.

Marketing materials developed in Mandarin and trade promotion activities conducted in collaboration with Mainland Chinese or Taiwanese importers with mainland investments present a current opportunity to establish awareness in this new and leading future market.



Figure 31 Young Chinese coffee professionals study coffee quality, photo credit Andrew Hetzel

Singapore, Malaysia and Taiwan

The smaller markets of Singapore, Malaysia and Taiwan have a well-developed specialty coffee culture and may also be gateways to larger trade volumes in other markets throughout Asia. Taiwan and Singapore, particularly, have among the highest percentage of arabica consumption versus robusta in the region, pay substantial premiums for high quality coffees and are also the hub of trade for regional companies that operate in other ASEAN countries and developing markets like China.

Robusta coffee

Market opportunities for robusta coffee are not featured in this report. Opportunities to market robusta coffees do exist, as there is a demand for coffee of all types and quality levels worldwide. Robusta coffees are particularly well-suited to low-acid applications and those requiring high solubility, such as in espresso that is widely consumed in Australasia or Europe, or in soluble coffee production.

Robusta species produce approximately two times the volume of arabica species per hectare and have greater heat tolerance. This means robusta may be grown at lower elevations than arabica species. It also matures more slowly than arabica (approximately 2 months longer to harvest), meaning that farming communities may plant both arabica and robusta at different elevations, harvesting robusta once the arabica harvest is completed. Market prices are low for robusta coffee exports, but this may be offset by the increased productivity of the plant and larger area of land mass available for cultivation.

Unfortunately, only a small differentiated market exists for higher price premiums for certified robusta coffees and practically none for quality-differentiated specialty robusta. The species has a negative stigma in many consuming nations. Roasters fear putting the word "robusta" on a consumer package even when the robusta they purchase is better/more expensive than arabica, simply because their competition will use it against them.

Robusta coffee should be considered as an option to increase overall national value from coffee production but at a lower priority than the improvement of existing arabica cultivation.





Figure 32 Ripe robusta species cherries.
Photo credit: Andrew Hetzel.

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APPENDIX A DOMESTIC STAKEHOLDER CONSULTATIONS

| Name of Organisation | Business Type | Discussion Participants | Contact(s) |
|-----------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| PORT MORESBY | | | |
| ARABICAS Coffee Limited | Coffee roaster/exporter | Mr. Robert Nilkare | Robert Nilkare |
| Superior Enterprises Ltd | Coffee roaster/exporter | Mr. Romias Mills Waki | Romias Mills Waki |
| Duffy's Coffee | Coffee roaster/shop/restaurant | Mr. Travers Chue | Theresa Aitsi (PA) |
| Vitis Industries Ltd, | Coffee exporter/beverages | | Isacc |
| GOROKA | | | |
| Coffee Industry Corporation (CIC) | Government Coffee Board | Mr. Sam Manega, Mr. Johnem Pausa, Ms. Jacqueline Ruguna, Steeler (M) Brian (M) | Jacqueline Ruguna, Steven Tumae |
| Kongo Coffee | Coffee exporter | Mr. David Rumberumba | David Rumberumba, Technical Support Manager, Jerry Kapka, Managing Director |
| New Guinea Highlands Coffee Exports Ltd | Coffee exporter | Mr. Grant Jephcott | Grant Jephcott, General Manager |
| Coffee Connection | Coffee exporter | | George Ainu, Managing Director |
| Sirigine Coffee Producers | Coffee roaster, processor, exporter | Mr. Paul Sirigine | Paul Sirigine |
| Productive Partnerships in Agriculture (PPAP) | World Bank funded project | Mr. Bill Humprehey, Ms. Maureen Kahento, Mr. Alphy Sam, Emmily (F), Mr. Potasai Hombunaka | Potaisa Honbunakam, Project Manager |
| Yogio Coffee Ltd, | Coffee producer | Mr. Jon Yogiyo | Jon Yogiyo |
| Colbran Coffeeland | Coffee roaster/exporter | Mr. Nichol Colbran, Mr. Chris Colbran | Chris Colbran / Nichol Colbran |
| Korona Coffee Producers | Coffee processor | Mr. Maureen Kahento | Maureen Kahento |
| Ian Mopafi | Roadside buyer | Mr. Ian Mopafi | |
| Outspan PNG Ltd - Coffee Division | Coffee exporter | Mr. Babber Singh | Babber Singh, General Manager |

| Name of Organisation | Business Type | Discussion Participants | Contact(s) |
|-------------------------------------------------|------------------------------------------|---------------------------------------|---------------------------------|
| PNG Women in Coffee | Coffee Association / Coffee Exporter | Mr. Sally Lomutopa | Sally Lomutopa |
| Care International | International NGO | Mr. Charles Iha | Charles Iha |
| PNG Coffee (Nowek Limited) | Coffee exporter | Mr. Terry Shelly | Terry Shelly, Managing Director |
| PNG COFFEE EXPORTERS LIMITED | Coffee Association / Coffee Exporter | Mr. Jon Edwards | Jon Edwards, General Manager |
| JIWAKA | | | |
| Kosem Coffee Ltd | Coffee processor and exporter | Mr. Mark Munnul, Mr. John Munnul | Mark Munnul |
| MT HAGEN, WESTERN HIGHLANDS | | | |
| Rilke Limited | Coffee processor/ exporter / Wet mill | Mr. Bryan Leahy, Mr. Bernie Leahy | Bryan Leahy, Managing Director |
| Banz Kofi Fektor | Coffee roaster and exporter, coffee shop | Mr. Patrick Kiloran | Patrick Killoran |
| WR Carpenters - Pacific Trading Co Ltd | Coffee and tea producer and manufacturer | Mr. John Sathya Chelladura | John Sathya Chelladura, Manager |
| Highlands Arabicas Limited (Mandan Plantation) | Coffee processor/ Wet mill | | Larry Hull, Managing Director |
| LAE, MOROBE PROVINCE | | | |
| Coffee Industry Corporation (CIC) | Government Coffee Board | Ms. Rose Romalus, Ms. Marie Kiliawe | Rose Romalus, Quality Director |
| PNG Customs Authority | Customs Authority | Mr. Michael Kurah, Josian (M) | Michael Kurah |
| Express Freight Management (EFM) | Logistics/freight management | Mr. Dan Simpson, Mr. Daniel Olole | Daniel Simpson |
| Consort Express Lines Ltd | Logistics/freight management | | Grant Johansen |
| Swire Shipping | Logistics/freight management | Mr. Graeme Gangloff, Ms. Yvonne Stuat | Graeme Gangloff |
| NKW operating under Morobe Blue Mountain Coffee | Coffee processor/ Wet mill | Mr. Finan Romaso | Finan Romaso |

| Name of Organisation | Business Type | Discussion Participants | Contact(s) |
|------------------------------------------------------------------|---------------------------------|-----------------------------------|---------------------------------|
| National Agriculture Quarantine and Inspection Authority (NAQIA) | Quarantine/ Competent Authority | Mr. Bigmalu Ogisi | Bigmalu Ogisi |
| Australian High Commission Consulate-General Office Lae | High Commision Consulate | Mr. Paul Murphy | Carolyn Pia'afu |
| MAPAI Transport and Logistics | Logistics/ Momase Region | | Luke Jacob |
| NEKNASI COFFEE COOPERATIVE | Local Producer | | |
| Fair Trade | Private certification | | Gabriel Iso |
| PORT MORESBY | | | |
| Paul Barker, Director Institute of National Affairs/ CIMC | Think-tank | | Paul Barker, Executive Director |
| Air Niugini Cargo | Freight | Ms. Stephanie Bawo, Mr. Gus Klaus | Stephanie Bawo |
| Air PNG, Elton Gorogo, Cargo Manager | Freight | | |
| Investment Promotion Authority | Govt/ regulatory | | |

APPENDIX B

INTERNATIONAL STAKEHOLDER CONSULTATIONS

| Organization | Business Type | Website |
|---------------------------------------------------|-----------------------------|--------------------------------------------------------------------------------------|
| Café Imports | Importer | www.cafeimports.com |
| Campos Coffee | Roaster / Retailer | www.camposcoffee.com |
| Dragonfly Coffee Roasters | Roaster | www.dragonflycoffeeroasters.com |
| H.A. Bennetts | Importer | www.hab.com.au |
| Mick Wheeler | ICO representative | www.ico.org |
| MTC Group | Importer | www.mtcgroup.com.au |
| Numero Uno Coffee | Roaster | www.numerouno.com.au |
| Paradise Coffee Roasters & Isla Coffee | Roaster & Importer | www.islacoffees.com |
| Peet's Coffee | Roaster / Retailer | www.peets.com |
| Raw Material Coffee & Flight Coffee NZ | Importer & roaster/retailer | www.rawmaterial.coffee |
| Single Origin Coffee | Roaster / Retailer | www.singleo.com.au |
| SPC Group | Roaster & conglomerate | www.spc.co.kr |
| Specialty Coffee Association | Nonprofit trade association | www.sca.coffee |
| Veneziano Coffee Roasters | Roaster | www.venezianocoffee.com.au |
| Wolff Coffee Roasters | Roaster / Trainer | www.wolffcoffeeroasters.com.au |

| Location | Country | Contact | Title |
|------------|-----------|-------------------|-------------------------------------|
| Minnesota | USA | Piero Cristiani | Asia/Pacific Buyer |
| Sydney | Australia | Lloyd Thom | Director of Coffee |
| Colorado | USA | Tamas Christman | Owner |
| Melbourne | Australia | Scott Bennett | Owner |
| London | UK | Mick Wheeler | PNG Representative to the ICO |
| Sydney | Australia | Harrison Koch | PNG Trader |
| Sydney | Australia | Gina Di Britta | Owner |
| Hawaii | USA | Miguel Meza | Partner |
| California | USA | Phil Maloney | Director of Coffee |
| Sydney | Australia | Matt Graylee | Partner |
| Sydney | Australia | Wendy DeJong | Director of Coffee |
| Seoul | Korea | Steve Lee | Director of Coffee |
| California | USA | Kim Elana Ionescu | Director of Sustainability |
| Melbourne | Australia | Jack Allisey | Director of Coffee |
| Brisbane | Australia | Peter Wolff | Owner |



APPENDIX C
PNG COFFEE INDUSTRY
WORKING GROUP
MEETING PARTICIPANTS

| | |
|------------------------------|---------------------------------------|
| GUS KRAUS | Air Niugini Cargo |
| STEPHANIE BAWO | Air Niugini Cargo |
| ROBERT NILKARE | Arabicas Coffe Co. Ltd |
| PATRICK KILLORAN | Banz Kofi |
| LORENTA RITSI | Bougenville Toursim |
| MATERUA TAMARUA | Business Council |
| CHARLES IHA | Care International |
| JACQUELINE RUGUNA | CIC |
| CHARLES DAMBUI | CIC |
| STEVEN TUMAE | CIC |
| ROSE ROMALUS | CIC |
| BRIAN MANNY | CIC |
| DR. RUBEN SENGERE | CIC-Aiyura |
| CLAIRE PARIK | Cocoa Board |
| GRANT JOHANSEN | Consort |
| CHAKRIYA BOWMAN | DFAT |
| SIMOM DAWKINS | DFAT |
| JULIENNE LEKA-MALIAKI | DFAT |
| DANIEL OLAOLA | EFM |
| ELAINE BATE | Egwalau Tours |
| GABRIEL ISO | FairTrade |
| KEN PEP | Investment Promotion Authority |

| | |
|------------------------------------|---------------------------------------|
| AMBANE MEREGEMBO | Investment Promotion Authority |
| IAN MOPAFI | Kenilogo |
| JONATHAN PEARSON | Korona Coffee |
| MARK MUNNUL | Kosem |
| ANNETTE SETE | Maku Gifts |
| FINAN ROMASO | Morobe Blue mountain |
| FRED SABUMEI | Namalu Coffee |
| DR. AMANDA MARARUAI | NAQIA |
| UME HEBONE | NAQIA |
| NANCY & ANDREW RUNAWERY | PNG SME Magazine |
| MARTIN POWELL | PPAP Cocoa |
| POTAISA HOMBUNAKA | PPAP Coffee |
| MARY MISIMA | Simbu Provincial Government |
| SAMUEL RAFFAN | Sirigine |
| ROMIAS WAKI | Superior Coffee |
| GRAEME GANGLOFF | Swire |
| ISSACK INI | Vitis Industries |
| DR. JOEL WARAMBOI | Wia Trading |
| SALLYN LOMUTOPA | WIC |
| ALLAN OLIVER | World Bank |
| JOHN SATHYA CHELLADURAI | WR Carpenters |
| JON YOGIYO | Yogiyo Coffee |





