

WORLD BANK/IFC

**THE FRUIT OF HER
LABOR:**

**Promoting Gender-Equitable Agribusiness
in Papua New Guinea**

June 30, 2014

Acknowledgments

This joint World Bank-IFC report was prepared by C. Mark Blackden and Maxie Makambo Dominic (consultants), under the overall leadership and guidance of Anuja Utz (World Bank) and Amy Luinstra (IFC) (co-task team leaders).

The team benefited from the valuable support of Franz Drees-Gross (Country Director for Timor-Leste, Papua New Guinea, and the Pacific Islands, World Bank), Tania Lozanky (Senior Manager, East Asia and Pacific Advisory Management, IFC), Gavin Murray (Regional Manager, IFC) and Steffi Stallmeister (Country Manager for Papua New Guinea, World Bank). Helpful guidance provided by Laura Bailey (former World Bank Country Manager, Papua New Guinea) and Carolyn Blacklock (IFC Resident Representative, Papua New Guinea) is especially appreciated.

The team is grateful for the valuable support and insights provided by the staff of the World Bank and IFC in Port Moresby, especially Liam Grealish (IFC) and Allan Oliver (World Bank). Nicole Jenner, Erik Caldwell Johnson, Kofi Nouve, and James Reichert (World Bank), and Deepak Adhikary, Charles Lor, Serah Sipani, and Rahmad Syakib (IFC) provided useful inputs throughout the drafting process.

The report endeavors to reflect the ideas and perspectives of stakeholders met during the in-country consultations in January-February 2014, and of the participants at the stakeholder workshop that was held in Port Moresby in April 2014. This workshop brought together some sixty participants — from government, the private sector, think tanks, research institutes, NGOs, women’s groups, and the donor community — who are actively engaged in the supply chains for coffee, cocoa and fresh produce in Papua New Guinea. The workshop was facilitated by Deepak Adhikary, IFC. The team appreciates the valuable time given by many people in the provinces (listed in Annex 2), and especially the women (and men) farmers in Lae, Rabaul, Goroka, and Mt. Hagen, who gave generously of their insights and experience.

The draft report was discussed at a joint World Bank-IFC decision meeting in June 2014. The team is grateful to Mona Sur (World Bank) and Roy Murray-Prior (Curtin University) who served as peer reviewers for this report.

Finally, the team would like acknowledge the excellent support provided by Tasha Sinai, Summerville Kave and Jeffrey Mavu from the World Bank and IFC offices in Port Moresby in arranging the field visits and associated logistics in Papua New Guinea, and to Craig Stemp for his help and advice on security issues. We also thank Kirsten Bartlett, IFC for her help on the overall design of the report.

Currency Equivalents

(Exchange Rate Effective June 12, 2014)

Currency Unit	=	Papua New Guinea Kina (PGK)
PGK 1.0	=	US\$ 0.36
US\$ 1.0	=	PGK 2.71

Abbreviations and Acronyms

ACIAR	Australian Centre for International Agricultural Research
ADB	Asian Development Bank
ARB	Autonomous Region of Bougainville (PNG)
CAS/CPS	Country Assistance Strategy/Country Partnership Strategy (World Bank)
CCI	Cocoa and Coconut Institute (PNG)
CGA	Country Gender Assessment (World Bank)
CIC	Coffee Industry Corporation (PNG)
CEDAW	Convention on the Elimination of All Forms of Discrimination Against Women (UN)
CPB	cocoa pod borer
CSR	corporate social responsibility
DSP	Development Strategic Plan (GoPNG)
EHP	Eastern Highlands Province (PNG)
ENB	East New Britain Province (PNG)
EU	European Union
FHH	female-headed household
FPDA	Fresh Produce Development Agency (PNG)
FSV	family and sexual violence
FSVAC	Family and Sexual Violence Action Committee (PNG)
GDP	gross domestic product
GoPNG	Government of Papua New Guinea
HDI	Human Development Index (UNDP)
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IATP	Integrated Agriculture Training Program
ICCO	International Cocoa Organization
ICT	information and communication technology
IDA	International Development Association (World Bank Group)
IEG	Independent Evaluation Group (World Bank)
IFAD	International Fund for Agricultural Development (UN)
IFC	International Finance Corporation (World Bank Group)
IFOAM	International Federation of Organic Agriculture Movements
ILO	International Labour Organization (UN)
IPDM	Integrated Pest and Disease Management
LLG	local-level government
LNG	liquefied natural gas (project in PNG)
LSS	Land Settlement Scheme (PNG)
MCH	maternal and child health
MDG	Millennium Development Goals (UN)
MHH	male-headed household
NARI	National Agricultural Research Institute (PNG)
NASAA	National Association of Sustainable Agriculture, Australia
NDB	National Development Bank (PNG)
OECD	Organization for Economic Cooperation and Development (EU)
PML	PNG Microfinance Limited

PMV	public motor vehicle
PNG	Papua New Guinea
POM	Port Moresby
PPAP	Productive Partnerships in Agriculture Project (World Bank)
PRAP	Participatory Rural Appraisal and Planning
QEB	Quarterly Economic Bulletin (Bank of PNG)
RIC	Rural Industries Council (PNG)
SHP	Southern Highlands Province (PNG)
UNDP	United Nations Development Programme
UNFPA	United Nations Fund for Population Activities
USAID	United States Agency for International Development
WBG	World Bank Group
WDR	World Development Report (World Bank)
WHP	Western Highlands Province (PNG)
WIA	Women in Agriculture (PNG)
WIM	Women in Mining (PNG)

World Bank/IFC
The Fruit of her Labor: Promoting Gender-Equitable
Agribusiness in Papua New Guinea

Table of Contents

OVERVIEW.....	VII
I BACKGROUND AND CONTEXT.....	VII
A <i>Objective of the Report</i>	vii
B <i>Supply Chains</i>	vii
C <i>Importance of Agriculture</i>	viii
D <i>Country Gender Assessment</i>	viii
II PRINCIPAL FINDINGS.....	IX
A <i>Women are Key to Quality</i>	ix
B <i>Broader Labor Dynamics Affect Outcomes</i>	xi
C <i>Provision of Key Support Services is Limited</i>	xiii
D <i>Systemic Issues Persist and Affect Supply Chain Performance</i>	xiv
III PRINCIPAL RECOMMENDATIONS.....	XV
A <i>Focus on Women as Key to Quality</i>	xv
B <i>Tackle Gender Differences in Labor Dynamics</i>	xvii
C <i>Improve Gender-Responsiveness of Key Services</i>	xviii
D <i>Address Systemic Barriers Affecting Supply Chain Performance</i>	xviii
1 INTRODUCTION: BACKGROUND, CONTEXT, AND APPROACH.....	1
1.1 BACKGROUND.....	1
1.2 CONTEXT: STRENGTHENING THE FOCUS ON GENDER ISSUES.....	1
1.3 PURPOSE OF THIS REPORT.....	2
1.4 APPROACH AND METHODOLOGY.....	3
1.5 ORGANIZATION OF THIS REPORT.....	4
2 GENDER ISSUES IN PAPUA NEW GUINEA.....	5
2.1 COUNTRY OVERVIEW.....	5
2.2 MEN AND WOMEN IN THE PNG ECONOMY.....	5
2.3 NON-MARKET WORK AND TIME USE.....	6
2.4 GENDER-BASED VIOLENCE.....	6
2.5 GENDER DYNAMICS AND ECONOMIC OPPORTUNITY IN PNG.....	7
2.5.1 <i>Household Dynamics and Subordination of Women</i>	7
2.5.2 <i>Labor Dynamics</i>	8
3 THE COFFEE SUPPLY CHAIN.....	10
3.1 GENDER ISSUES IN THE COFFEE SUPPLY CHAIN.....	10
3.1.1 <i>Gender Roles and Responsibilities</i>	10
3.1.2 <i>Gender-Based Constraints and Implications for the Supply Chain</i>	15
3.2 CERTIFICATION.....	18
3.3 CONCLUDING OBSERVATIONS.....	19
4 THE COCOA SUPPLY CHAIN.....	21
4.1 GENDER ISSUES IN THE COCOA SUPPLY CHAIN.....	21
4.1.1 <i>Gender Roles and Responsibilities</i>	26
4.1.2 <i>Gender-Based Constraints and Implications for the Supply Chain</i>	26
4.2 CERTIFICATION.....	30
4.3 CONCLUDING OBSERVATIONS.....	30

5	THE FRESH PRODUCE SUPPLY CHAIN.....	31
5.1	GENDER ISSUES IN THE FRESH PRODUCE SUPPLY CHAIN	31
5.1.1	<i>Gender Roles and Responsibilities.....</i>	<i>31</i>
5.1.2	<i>Gender-Based Constraints and Implications for the Supply Chain.....</i>	<i>37</i>
5.2	OTHER SECTORS	40
5.3	CONCLUDING OBSERVATIONS.....	41
6	TOWARD GENDER-EQUITABLE AGRIBUSINESS	42
6.1	KEY FINDINGS AND CONCLUSIONS	42
6.1.1	<i>Women are key to quality.....</i>	<i>42</i>
6.1.2	<i>Broader labor dynamics affect outcomes.....</i>	<i>45</i>
6.1.3	<i>Provision of key support services is limited.....</i>	<i>47</i>
6.1.4	<i>Systemic issues persist in PNG and affect outcomes.....</i>	<i>48</i>
6.1.5	<i>There are different views about tackling gender inequality in PNG</i>	<i>49</i>
6.2	PRINCIPAL RECOMMENDATIONS	51
6.2.1	<i>Women are key to quality.....</i>	<i>51</i>
6.2.2	<i>Tackle the broader gender dynamics of labor allocation.....</i>	<i>53</i>
6.2.3	<i>Strengthen key services.....</i>	<i>53</i>
6.2.4	<i>Address systemic barriers affecting all supply chains.....</i>	<i>54</i>
ANNEX 1	BIBLIOGRAPHY AND REFERENCES.....	57
ANNEX 2	LIST OF PERSONS CONSULTED	64
ANNEX 3	CONCEPTUALIZING SUPPLY CHAINS	67
A	CONCEPTUAL FRAMEWORK	67
B	GENDER AND SUPPLY CHAINS	68
C	DATA LIMITATIONS	69
ANNEX 4	BACKGROUND ON COFFEE AND COCOA IN PNG.....	71
A	BACKGROUND TO THE COFFEE SECTOR.....	71
	<i>Coffee Sector Policies and Strategies</i>	<i>73</i>
B	BACKGROUND TO THE COCOA SECTOR.....	73
	<i>Cocoa Sector Policies and Strategies.....</i>	<i>75</i>
ANNEX 5	THE FRESH PRODUCE (HORTICULTURE) SECTOR IN PNG.....	77
A	BACKGROUND TO THE SECTOR.....	77
B	FRESH PRODUCE SECTOR POLICIES AND STRATEGIES	77
C	DYNAMICS OF FRESH PRODUCE SUPPLY CHAINS	79
ANNEX 6	SUMMARY RESULTS OF THE STAKEHOLDER WORKSHOP	90
A	SUMMARY OF REPORT FINDINGS	91
B	SUMMARY OF GROUP DISCUSSIONS	91
	<i>Coffee Group.....</i>	<i>91</i>
	<i>Cocoa Group.....</i>	<i>93</i>
	<i>Fresh Produce Group</i>	<i>95</i>
	<i>Cross-Cutting Issues Group.....</i>	<i>96</i>
C	SUMMING UP BY TANIA LOZANSKY, IFC.....	98
ATTACHMENT 1	WORKSHOP AGENDA.....	103
ATTACHMENT 2	LIST OF STAKEHOLDER WORKSHOP PARTICIPANTS	104
ANNEX 7	TASK TERMS OF REFERENCE	109

World Bank/IFC
The Fruit of her Labor: Promoting Gender-Equitable
Agribusiness in Papua New Guinea

Overview

I Background and Context

A Objective of the Report

The overall goal of this report is to assist the World Bank Group (WBG) to achieve greater impact for women from its current activities in agribusiness in Papua New Guinea (PNG), and to provide clear recommendations on additional interventions aimed at improving outcomes for women. The report focuses on the supply chains for coffee, cocoa, and horticultural products (fresh produce), as there is a wealth of knowledge on these supply chains and on gender issues, and these provide the best opportunity to identify entry points for follow-up activities. Given the importance of smallholders in PNG, and the need to understand gender dynamics in farming, this report pays particular attention to the roles and constraints faced by smallholders, without in so doing wishing to diminish the importance of the roles played by other actors in these supply chains.

An earlier draft of this report was discussed at a Stakeholder Workshop in Port Moresby on April 15, 2014. This provided participants with an opportunity to review the findings presented in this report, to identify the major problems affecting women's participation in these supply chains, and to propose solutions that can be implemented with the support of the WBG and other partners. Key outcomes of workshop deliberations are presented in Annex 6.

B Supply Chains

A study of the fresh produce sector in PNG outlines a useful approach to analysis of supply chains (Martin and Jagadish 2006). Key elements of a supply chain, in this view, are that: (i) chains create value for all participants along the chain through operations (product transformation or enhancement), integration of processes, quality control, and logistics; (ii) firms are the key players, and "chain leaders" play a critical role; (iii) relationships are critical for the functioning of the chain, as are the information flows that support value-creation; (iv) such relationships are usually driven by "product characteristics and market segments"; and (v) chain leaders "internalize" critical chain functions through vertical integration of key processes to create competitive advantage. Conceptually, therefore, behind the idea of a supply chain is the notion that processes are linked, and that actors in the chain have both interest and power to make the chain work for all involved.

It should be noted, however, that a purely business-focused view of supply chains assumes a degree of economic rationality and operational coherence that may not always be present in PNG. Consequently, it is also important to look at the wider socio-economic context in which these chains operate, and which continues to exert a

powerful influence on economic activity in general, and on the ways in which these chains perform in particular.

C Importance of Agriculture

Agriculture accounts for approximately one-third of GDP, and the sector is dominated by smallholder farming systems. Along with oil palm, coffee and cocoa are the main cash crops, with respectively over 30 percent and 20 percent of the total labor force involved in their production, processing and sale. The **coffee** industry in PNG is a major contributor to national income and employment. Almost 3.0 million people depend directly or indirectly on coffee for their livelihoods. The industry is made up of about 400,000 households, 680 blocks ranging from 1-30 hectares, 7 plantations, 17 registered exporters, 59 registered processors, and over 6,000 roadside buyers. Productivity is low, with yields on average 30-50 percent of their potential, and quality has also been deteriorating. **Cocoa** is one of the major agricultural export crops for PNG with an estimated 151,000 households, or about 1.0 million people, involved in the industry. The cocoa sector has been devastated by the emergence of cocoa pod borer (CPB). To-date, nine cocoa growing provinces have been confirmed to have CPB. In East New Britain, which was once the leading cocoa producing region, production is estimated to have declined by 80% as a result of CPB. The **fresh produce** (horticulture) industry has great potential in PNG. A recent study looking at the feasibility of a wholesale market for fresh produce in Port Moresby (POM) indicated that the total demand for fresh produce in POM alone is now estimated to be 167,000 tonnes/annum, compared to 140,500 tonnes/annum in 2008. Market demand for fresh produce is likely to remain high in years to come, due largely to resource-led development, increased urbanization, and a general rise in standards of living, with a doubling of demand in POM alone projected over the next 20 years (Bonney et al 2012). Large quantities of fresh produce can be grown in the Highlands provinces of PNG, while the major markets are situated in the more highly populated coastal areas around POM, Lae and Madang. Virtually all farmers in PNG grow food crops, mostly for subsistence needs, with an increasing number producing surpluses for sale.

D Country Gender Assessment

The World Bank undertook a Country Gender Assessment (CGA) in 2012, which identified key gender issues in PNG. It specifically addressed issues related to the challenge of providing gender-inclusive access to employment and economic resources. The main CGA findings relating to economic opportunity are:

- There are inequalities in men's and women's economic opportunities in the agriculture sector that lead to inefficient use of the country's labour resources.
- Women farmers do not receive the level and type of training and extension support that they need to contribute their full potential to the agricultural economy.
- Women traders are more disadvantaged than men by unsafe and insanitary markets, and poor transport infrastructure.
- There are continuing differences and inequality between women and men in formal labour force participation, occupations and wages.
- In general, women and girls work longer hours than men and boys.
- Women are more negatively affected by the social impacts of, and receive fewer benefits from, resource extraction industries. Some good models exist for giving

women a share of the benefits from extractive industries, but these are not applied across all sites and industries (World Bank 2012a).

II Principal Findings

A Women are Key to Quality

Women provide substantial labor in both coffee and cocoa cultivation, and they predominate in the fresh produce sectors. More important than the amount of labor women provide, our analysis of the supply chains indicates that the specific tasks women undertake have a substantial bearing on the quality of the final product: women are critical to improving the quality of coffee, cocoa, and

fresh produce in PNG. Data from the PPAP baseline survey show the importance of harvesting and post-harvest processing in the overall labor allocation for coffee. These are tasks predominantly carried out by women. Clearly, many factors determine the quality of the cocoa and coffee that is exported, and the fresh produce that is sold in both local and more distant markets. As pointed out at the Stakeholder Workshop, improving road infrastructure, establishing cold storage facilities for fresh produce, promoting the direct sale of red ripe cherry (coffee) where feasible, expanding certification, and strengthening marketing systems and market linkages for farmers are all key drivers of quality. All of these factors, alongside strengthening women's key role, need to be in place if PNG is to maximize the quality of its agricultural products.

Women are directly engaged at critical stages of coffee and cocoa production and processing; in coffee: picking (often strip picking) cherry, pulping, fermenting, and drying; in cocoa: harvesting, breaking the pods, sorting of beans, transport of wet beans for fermenting, putting wet beans in the fermentary, and managing the drying. All of these are time-critical tasks: they must be undertaken promptly in relation to harvesting, and for a specific amount of time. In both sectors, these tasks substantially determine the quality of the coffee and cocoa delivered to the exporter.

The recent IFC baseline study for the coffee growing areas supported by the PPAP (Murray-Prior 2014) shows men's and women's perceptions of their role in various coffee-related and other tasks (Table 1). Of note is that women see themselves as having more of a role than men in weeding, picking, milling, and drying, and that they also see themselves as being involved in selling, albeit not to the same extent as men, and as having a substantial role in land clearing. These perceptions also bear out the disproportionate burden of domestic work that falls on women. The labor and time requirements for cocoa harvesting differ in significant ways, as are the earnings that can be obtained (Table 2).

If PNG wants to improve the quality of its coffee and cocoa on world markets, and obtain corresponding premiums for better quality product, it must necessarily enable women to fulfill these roles effectively. Doing so will have both "push" (operational efficiency) and "pull" (market responsiveness) effects on the performance of the coffee and cocoa supply chains. It should also be noted that while improvements in production and processing will lead to better quality of coffee and cocoa produced, it will be

Table 1: Perceptions of Roles in Key Coffee and Domestic Tasks (% Main + Equal Main)

Activity	Men	Women
Land Clearing	78	76
Planting	73	48
Weeding	61	77
Picking	53	83
Wet Milling	48	58
Drying	49	62
Selling	82	61
Domestic Chores	25	96

Source: Murray-Prior 2014, Tables A11 and A12.

essential to ensure that there is adequate road and transport infrastructure, so as to ensure that the best quality product can reach exporters in a timely manner. Investing in road infrastructure aligned with production potential for these crops is an essential input into delivering better quality.

In the case of fresh produce, women's role in determining quality is just as important. Women dominate production, harvesting, sorting, packaging, transport to local markets, and, in some instances, the first stages of transport to the roadside or to more distant markets. When and how these tasks are undertaken has a bearing on the quality of the fresh produce that reaches the market, and has a direct impact on the extent of product loss and waste.

In the fresh produce sector, quality is largely driven by product enhancement. The product enhancement process (washing, sorting, grading, trimming, packing) begins on the farm with the women once the produce is harvested. However, several factors contribute to product loss and diminished quality. These include: (a) lack of knowledge and skills in post-harvest management practices among women; (b) inability on the part of women to access, or to afford, recommended appropriate packaging materials for various crops; (c) lack of cool storage on the farm site, and of cool storage facilities at markets, depots, and ports; (d) the use of inappropriate types of transport (including PMVs) on poor roads; and (e) weak communications and alignment of key actors along the supply chain, effectively contributing to greater losses. As a result, the quality of fresh produce starts to diminish right on the farm, and, as women attempt to move their produce from the farm to the nearest market, the loss/waste in fresh produce increases. Moreover, larger issues of poor infrastructure (including lack of cool chain and storage, and the poor condition of roads), compounded by persistent violence and insecurity along transport routes, are further factors that reduce quality substantially.

Three inter-related issues affect the ability of women in PNG to contribute to the maximum extent to improving the quality of coffee, cocoa, and fresh produce. These are:

- **Incentives.** The economic incentives for women either to allocate sufficient labor to these tasks, or, equally importantly, to do them well, are low. There is a substantial gap between the work done by women in the coffee and cocoa sectors and the benefit they obtain, since women do much (if not most) of the work, but have much less access to, or control of, the resulting income. Conflicting incentives among men and women are a major factor in low coffee productivity in PNG. Until women have the same motivation as men to engage fully in coffee and cocoa production, or have more of an opportunity to share in the income, the critical quality-enhancing tasks for which women are responsible will not be done adequately, and quality will suffer.

Table 2: Key Characteristics of Wet and Dry Bean Cocoa Production Strategies

Item	Wet Bean	Dry Bean
Duration of harvest round (days)	0.36	2.3
Laborers per harvest group (avg #)	1.78	4.4
Labor days spent on harvest (avg #)	0.68	10.46
Labor Allocation	More women	More men
Income earned per harvest round (PG Kina avg)	17.00	374.22
Control of income	Harvester	Male HH head
Transport costs	Nil/Low	High
Share of cocoa in HH income (%)	40	77

Source: Curry et al. 2007:59.

As one study notes, although average returns to labor were found to be higher for coffee than in food production, women persevered with the heavy and less rewarding work of planting, harvesting, and carrying food crops because the incentives were better. They exercised more personal control over production, could intentionally produce a surplus over subsistence requirements for sale, and were able to control and spend most of cash earned from selling food crops. *Source: World Bank n.d.(3).*

- **Knowledge and Information.** Women's access to the knowledge and skills required to carry out these tasks is extremely limited, as important gaps in education, literacy, skills, and participation in extension and training activities persist. Key issues are: (i) extension services and training reach a very small number of farmers, despite considerable effort by private sector players; (ii) discussions in the field suggest that about 75% of the extension effort/messages relate to "social" issues not "agronomy;" (iii) women are substantially less likely to benefit from extension and training than men; and (iv) it appears likely that neither men nor women fully appreciate the need for women to receive, and then be able to apply, the agronomic extension messages specifically related to the tasks for which they are primarily responsible. Moreover, generally low levels of education and literacy among women constitute a systemic barrier to unleashing women's productive potential in these sectors.

There are important gender differences in access to resources and knowledge. In the areas surveyed by the IFC baseline study, education and literacy levels were found to be very low, with 25% of men and 75% of women not being able to read and write in *Tok Pisin*. *Source: Murray-Prior 2014.*

- **Socio-Cultural Dynamics.** There are important gender-specific dynamics at work in PNG society that differentially affect men's and women's capacity to exercise economic agency. PNG society is largely patriarchal, and the literature suggests that, even in matrilineal regions, men are seen as household heads and primary decision-makers. As a result, women have less access to, and control of, the resources needed to function economically, notably land and capital (financial services). While the PPAP baseline survey indicates that 56 percent of women perceive themselves as primary receivers of income from coffee, what is less clear is the extent to which women have control over the use of that income. Consequently, it will be important to analyze further the dynamics of household decision-making in PNG, and the extent to which women have an effective say in how income is used by smallholder households.

Men face many of the same issues confronting women in the agricultural sectors, including poorly developed infrastructure, access to markets, pressure on land from population increases, and new pest and disease threats. However, women's lack of access to land, assets, and extension services, their lack of financial autonomy, the absence of collective action and entrepreneurial opportunities, create, as one study notes, significant additional barriers, which are legal, cultural and situational, this latter pointing to the fact that women are more likely to be victims of law and order issues. The systemic and consistent discrimination experienced by women belies their potential and significantly hinders agricultural productivity and development opportunities. *Source: WIA 2014.*

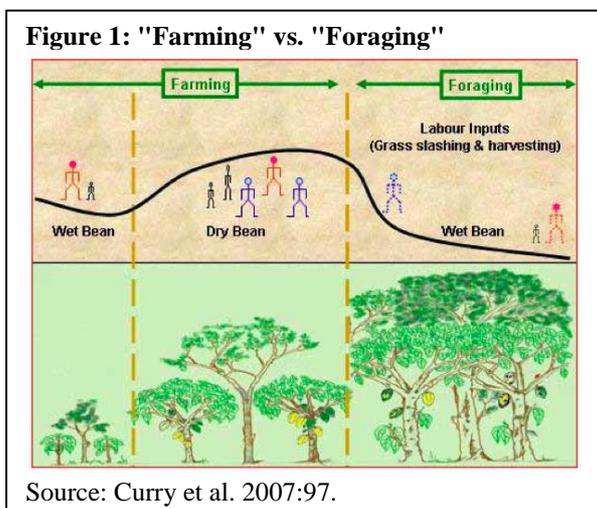
B Broader Labor Dynamics Affect Outcomes

Labor issues cut across all the sectors, and have far-reaching implications for the performance of these agribusiness supply chains. Of particular importance are gender differences in labor allocation and in rewards to labor, and the ways in which social and

economic factors intersect in determining labor use. The importance of focusing on labor activities undertaken by women to improve quality needs to be set against the broader socio-cultural dynamics of labor use in PNG, which are key to understanding the performance of these agribusiness supply chains. This is the case for five principal reasons, outlined below.

- **Smallholders do not view their activity as a "business."** In coffee, where earnings are seasonal, farmers see coffee as a "mechanism to facilitate livelihoods," and not as an enterprise seeking maximum output and return (in some instances leading smallholders to replace coffee with fresh produce). The different stages of cocoa cultivation, reflecting the age and potential of the cocoa trees, are what gives rise to the distinction between "farming" and "foraging." This distinction reflects very different mind-sets on the part of farmers as to how to approach cocoa cultivation (Figure 1), where farmers tend to see their older blocks more as an "ATM" from which to obtain cash as and when needed.

- **A lot of labor is allocated for social purposes.** Social factors and obligations are at least as important as economic ones, if not more so, in determining what gets done. Church and community work absorbs a lot of people's time. Consequently, relationships along supply chains can be seen to have at least as much to do with clan and culture as with product characteristics and market dynamics. At the same time, decisions about what to cultivate, and what labor to allocate to it, are made largely without reference to



Source: Curry et al. 2007:97.

market drivers, and linkages with markets are weak. Notwithstanding, recent changes in labor dynamics, notably the evolution from a cooperative model (*wok bung wantaim*) to a more commercially-oriented model (*makim mun*), suggest that economic signals and market drivers are beginning to have an ever more important role in decisions about labor use (Curry and Koczberski 2009a).

- **Farmers experience labor shortages.** Households do not have enough labor to do all the things they need to do, or to do the things at the right time and in the right way. Alongside social obligations, food production requirements are seen as more important than tree crop cultivation in determining labor allocation priorities. Given women's dominant role in food production, this directly affects their ability to allocate either sufficient or timely labor to key tree crop production and processing stages. Data from the 1990s suggest that rural labor is occupied for around 4.25 hours/day, and it might be tempting to interpret this as indicating that labor is

Table 3: Labor Allocation by Task and Sex, 1993 (hours/worker unit/day)

Task	Male	Female	M=1; F=
Food	1.21	4.31	3.56
Coffee	0.67	0.96	1.43
Household	0.41	2.69	6.56
Total	2.29	7.96	3.48

Source: Overfield 1998, and authors' calculations.

abundant. Overfield (1998) warns against this interpretation by pointing out that the division of labor is unequal: these data indicate that women work more than 3 times as much as men, especially when household work is included. Even in the area where there is the greatest parity between men and women in their labor allocation, namely the coffee sector, women still allocate nearly half as much time again as men do in this sector (Table 3). Moreover, seasonal peaks, and the time-critical nature of key tasks, further exacerbate labor constraints in all three sectors.

Even before the advent of CPB, which is estimated to have reduced cocoa yields by 80% in East New Britain Province, labor shortages were identified as a critical issue in the cocoa sector. CPB exacerbates the labor constraint by requiring an even more labor-intensive approach to cocoa block management and cultivation, while simultaneously reducing the output from these blocks. It is estimated that it takes 2-3 times as much labor to manage cocoa blocks effectively since the advent of CPB. However, as pointed out at the Stakeholder Workshop, this is a temporary situation, and, once CPB is under control, labor allocation to cocoa cultivation can return to normal, pre-CPB, levels. *Source:* Curry et al. 2007.

- **Farming systems are highly diversified.** With perhaps few exceptions, smallholder farmers are very diversified, producing a range of fresh produce/food crops, alongside their cash crops. Diversification makes sense, in that it is a risk management strategy, reducing dependence on one crop for cash income. However, it is also possible that some smallholder farmers are trying to do too much with the limited labor they have, further contributing to labor shortages, especially at peak seasonal times for particular crops.
- **Women are mostly confined to, and can only benefit from, short supply chains.** Lack of mobility—through being more restricted to the homestead and not having access to transport services, compounded by persistent insecurity—means that women are largely excluded from key downstream activities along the supply chains, where cocoa and coffee is sold to exporters (done by men, who, according to many women interviewed, then pocket the cash). This, alongside heavy workloads and cultural constraints, contributes to women being confined to, and largely only being able to benefit from, shorter supply chains in the fresh produce sector, where produce is sold in local markets close to the homestead.

C Provision of Key Support Services is Limited

Several key services are either absent or insufficient. In addition to the limited reach, and focus, of extension services, other key services are often not available to smallholders. Input supply is weak and inconsistent. New varieties are not readily available to farmers, and need to be developed to take account of PNG's specific climate and agricultural requirements. This is especially important in the fresh produce sectors, and in further developing cocoa clonal varieties that are resistant to cocoa pod borer (CPB). The importance of having a consistent supply of reliable, quality and affordable agricultural inputs, in particular, vegetable seeds for the fresh produce sectors, was highlighted among smallholder farmers.

There is limited access to financial services. The inability of smallholder farmers to meet the lending criteria of microcredit and financial institutions, particularly collateral, is hindering their ability to access credit when needed. There are also important gender-specific barriers to accessing finance, as women tend not to own the land, fixed assets, or other resources that are needed to meet collateral requirements.

It is estimated that around 5 percent of PNG coffee exports are "specialty" coffees, including organic, Fair Trade, Rainforest Alliance, and Utz certified. Certification schemes pursue a range of social and environmental sustainability goals. For the most part, gender issues are not especially prominent in certification schemes, though opportunities exist to promote more gender-responsive schemes. The PPAP baseline survey indicates that 13% of households claim to have any knowledge of certification (2% "strong" knowledge). This is highly concentrated in provinces where exporters work. Around 8% reported having certification for their coffee, and, of these, 1/2 expressed little or no interest in continuing. Half of the households surveyed were not interested in paying for certification, a finding which suggests, according to the baseline survey, that the benefits of certification are not sufficient to justify paying for it. *Source:* Murray-Prior and Padarath 2013.

D Systemic Issues Persist and Affect Supply Chain Performance

Insecurity (especially for women) is pervasive and remains a significant issue. Crime and violence remain at high levels in PNG, especially along transport corridors. It affects women's ability to serve in the field as researchers and extension agents. It has direct implications for extension services, in that key players indicate that pervasive insecurity essentially precludes them from deploying women to areas or communities unknown to them. Insecurity directly affects the transport of goods, especially on the Highland highway, where transporters face losses from crime and violence, or are reluctant to provide the full range of services that might be needed. Moreover, insecurity is a major concern for those women selling produce in open urban markets. Improving security at Port Moresby's principal food markets is the subject of an interesting project supported by UN Women, and priority needs to be given to projects of this kind to make market spaces better places for women to work.

Poor infrastructure limits the performance of all supply chains and substantially raises the cost of doing business in PNG. Key infrastructure issues include: (i) transport links are poor and costs are high; (ii) the absence of a cold chain and cold storage facilities is a significant problem for the fresh produce sectors, and leads to high product losses and waste; (iii) lack of electricity, and frequent power cuts, add to the operating costs for actors along the supply chains; and (iv) poor communication infrastructure and high costs are an obstacle limiting information flows throughout the chains. These infrastructure barriers, coupled with insecurity, lead to delays in transport of goods to markets and ports, non-use of refrigerated trucks along key highways, lack of communication between farmers, buyers, and exporters as to volumes of produce to ship, and timing of ship arrivals and departures, all of which lead to high levels of delay, uncertainty, and waste of product.

Lack of information, knowledge, communications, and services (including education and health) more generally, is a further systemic barrier to gender-equitable agribusiness, as cogently articulated by the participants at the Stakeholder Workshop (see Annex 6). Specifically, stakeholders pointed out weaknesses in communications and information services throughout the supply chains, which result in insufficient knowledge of market dynamics and requirements, poor coordination with transport and other services, lower productivity, and persistence of subsistence-focused, as opposed to business-oriented, farming. At the same time, poor education and health services, and lack of public expenditure prioritization and accountability also affect the performance of these supply chains.

An issue common to all three agribusiness sectors is the lack of business orientation by smallholder farmers, while the need for farmers to treat these activities as a business is perhaps at the core of developing successful supply chains in these sectors. Indeed, one of the critical challenges facing these sectors in PNG is to shift smallholders toward a more business-oriented view of their work. Yet, as the fresh produce sector aptly illustrates, market linkages are weak, so much so that the feasibility study for a POM wholesale market begins with a question: "Yu Tokim Mi Long Planim Kai kai Na Maket We"? -- *You ask me to plant vegetables, but where is the market?* (Bonney et al. 2012). If farmers are to become more business-focused, there need to be the business opportunities and market linkages to support the change.

Enabling women to be at least as much a part of these shifts as men is perhaps one of the critical avenues available to PNG to improve performance and incomes throughout these chains, and especially in the fresh produce sector, where, as noted, women are confined to, and can only benefit from, very short supply chains, i.e., such markets as exist in the immediate vicinity of their production sites. This in turn requires not only better linkages between farmers in general and the markets they serve, but also, and especially, better access by women to these markets and to the opportunities they present. Bringing markets closer to women, or enabling women to have access to more distant markets, might well be key contributors to shifting farmers (men and women) to a more business-focused approach to their work. As this report discusses elsewhere, it will not be possible to improve the "business" orientation of farmers, whether men or women, if market linkages are weak or non-existent.

III Principal Recommendations

The recommendations below reflect, in part, the deliberations of the Stakeholder Workshop held in Port Moresby on April 15, 2014, which gave a wide range of stakeholders in these sectors an opportunity to discuss the findings of this report, to identify key issues and challenges, and to propose solutions, based on their own experience and priorities. The principal results of the Stakeholder Workshop, and the sector-specific recommendations are summarized in Annex 6, and the recommendations below should be read in conjunction with that summary.

A Focus on Women as Key to Quality

Incentives

- Improve the capacity of women to benefit directly from the income earned in the cocoa, coffee, and fresh produce sectors, through a series of interconnected measures: (i) facilitate the establishment of direct payment systems, where women are supported in opening bank accounts, accessing financial services, and obtaining electronic payment for their produce directly from the buyer, or, in the case of fresh produce, the aggregator; (ii) support the aggregation of production by cooperatives or associations and groups in which women are represented, thereby taking decision-making outside the household, and promoting greater transparency between men and women in the income received and how it is used; and (iii) support training and sensitization efforts (including through PV training) aimed at shifting cultural norms and mind-sets relating to women's economic contribution.

- Examine the extent to which **certification schemes** in the coffee and cocoa sectors (Rainforest Alliance, 4C, UTZ, Fair Trade, Organic) include gender equality provisions in capturing "social" co-benefits, how these provisions are being implemented, and how compliance is monitored. Strengthen the gender focus of these certification schemes, notably as they relate to narrowing the gap between work done and benefit obtained, and how they support or facilitate greater female participation in family decision-making over use of income. As this issue goes beyond PNG and these agribusiness supply chains, the WBG, and notably the IFC, could play a catalytic role in promoting a global gender equality standard in certification criteria and validation processes.
- Use planned data collection and analysis, notably in the coffee and cocoa sectors, including farmer profiling, time use surveys, and analysis of economic opportunity in these sectors, to strengthen the business case for women's involvement in these supply chains. This in turn should help to underpin prioritization of critical infrastructure investments (roads, transport, storage, cold chain) aimed at raising quality and production in these sectors.
- In parallel, support measures to ease women's overall labor burdens in the household, and measures to facilitate direct sale by women of produce to buyers, and direct payment (non-cash) to women for produce sold.

Knowledge and Information

- Support commodity exporters and others in their initiatives to structure the design and delivery of extension and training services in ways that maximize women's inclusion. Consider adoption of a specific target (of 30% or 40%) of female participation in extension and training programs. Stakeholders suggested establishing farmer field schools in cocoa and coffee areas, setting up a coffee college for women extension agents, and developing women-friendly curricula, and using new technologies (example: "digital green") to communicate knowledge and to facilitate women's access to training opportunities.
- Re-focus extension and training messages specifically toward the quality-enhancing tasks for which women are responsible. In coffee, this may mean making sure that the importance of not strip picking coffee cherries from the trees, and of properly drying the coffee beans (to green bean stage), is sufficiently internalized by the women who actually have to do this work. In cocoa, this may mean focusing on timely processing after harvest, including sorting, pod opening, fermentation, and drying. In fresh produce, this may involve focusing on post-harvest practices, product enhancement, and transport/storage issues.
- In the cocoa sector, focus on developing women's technical skills and capacities to work in nurseries and bud gardens, and develop this as a possible career path for women toward training and employment as extension agents in the sector. Concurrently, it is important to focus on the economic viability of cocoa nurseries.
- Assess the impact and effectiveness of the "social" components of extension messages to provide a baseline and targets against which to measure changes in the "socio-cultural" factors that affect agricultural performance and productivity. Key areas to explore would be changes in the benefits women obtain for work done (i.e., having a larger share of income from farming activities) and changes in burden-sharing (division of labor) for domestic tasks within the household.
- Put in place measures to enable more female extension agents to be deployed in the field. This could be undertaken through: (i) improving the overall climate of security

and safety, by reducing community violence, and violence against women specifically; (ii) expanding the numbers of female extension agents and technicians, including through support to a scholarship/training scheme to build the pipeline of female graduates in the agricultural sciences for careers in both extension and research; and (iii) designing extension schemes in ways that enable people (especially women) to serve as extension agents in their own communities, where, it is argued, they are more likely to be safe from random violence.

- Consider strengthening the use of quality protocols at each step of the three supply chains, outlining the critical steps (and who does them) involved in maximizing quality. This can build on the work already done by coffee and cocoa exporters, and by the FPDA in developing quality standards for selected crops. Concurrently, it is essential to ensure that these protocols are integrated into extension and training packages, to improve farmer knowledge of quality issues at all stages of production and processing, and of the impact of quality on the prices they obtain for their produce.

Socio-Cultural Dynamics

- Assess the impact of personal viability (PV) training, specifically as this relates to improving women's income-earning/sharing and participation in decision-making. If warranted, support continued personal viability (PV), or related forms of training, aimed at strengthening women's voice in the household and the community. Related to this is the importance of conducting training for the "whole family," as stressed during the Stakeholder Workshop (Annex 6), and ensuring that both men and women participate jointly in training activities, thereby improving spousal communication and partnership.
- Identify, and work with, existing rural-based networks, such the PV network, or other farmer cooperatives and associations who, in one way or another, have advocated for women's greater participation in the development process, and support ways (including through PV training) to facilitate greater burden-sharing between men and women of domestic work.
- Support measures aimed at reducing family and sexual violence (FSV) in agricultural communities. Specifically, develop and put in place relevant measures (e.g., phone banking) that allow women and girls not to have to carry cash. Other measures include fostering and maintaining strong partnerships with concerned parties such as village councillors, village magistrates, the police and the churches, to work jointly to put in place prevention, treatment, social, and justice services aimed at reducing FSV incidence and risk in the community.

B Tackle Gender Differences in Labor Dynamics

- Gather baseline data on women's and men's involvement in each stage of the agricultural cycle, as called for in the PPAP baseline. This should include shared and separate tasks, and provide a basis for examining changes over time in the division of labor for agricultural and other tasks between males and females.
- Implement a program to analyze the dynamics of labor allocation at the smallholder level, and in different regions of the country, including addressing evolving market-

based and paid vs. community and family mutual support mechanisms of labor mobilization.

- Commission time use surveys and research to generate new and updated data on the gender division of labor in each of these sectors to inform policy-making and program design. Such surveys need to include data collection and analysis of all tasks undertaken by men and women, including domestic work, so that a more complete picture of the labor uses of men and women can be obtained.
- Identify, and incorporate into program design, crop-, task-, and season-specific labor shortages and constraints, disaggregated by sex, in each of these sectors.
- Identify, and incorporate into program design, region- and farming-system specific differences in the dynamics of labor allocation.
- Address what a Stakeholder Workshop participant described as "absurd demands on women's time" through support to programs aimed at providing key household-level infrastructure services (this applies especially to improving water supply and sanitation, and expanding access to energy at the household level, especially for cooking), and labor-saving technologies to women to alleviate women's domestic workloads.

C Improve Gender-Responsiveness of Key Services

- Build and strengthen market analysis and research capacity in key institutions (notably CCI, CIC, FPDA).
 - Establish market research capacity to identify specific market opportunities for PNG in the three sectors.
 - Identify, and develop, market opportunities of particular interest for, and benefit to, women. In this respect, identify economically productive activities that women could engage in, where priors about male control are either absent or much weaker. These could include: apiculture, floriculture, spices and essential oils, coconuts (not just copra), poultry, pig-farming, peanuts, and generating further value-added along the supply chain in cocoa, for example by producing chocolate in PNG (Paradise Foods).
- Improve the supply of agricultural inputs (notably seeds, fertilizer, pesticides), in a manner that is consistent and reliable, and that incorporates the development of new varieties of key products. Develop further the recommendation made at the Stakeholder Workshop to establish seed production, storage, and distribution facilities in the fresh produce sector in key provincial and regional centers. Put in place measures to enable NARI and FPDA to work collaboratively with the private sector in both identifying and meeting the needs of farmers for seeds and inputs that are appropriate and accessible. One option to consider, discussed at the Stakeholder Workshop, was to explore agribusiness dealer approaches, which would bring retail outlets for inputs closer to farmers.
- Assess the current organizational capacities of Women's Groups (including PNG Women in Agriculture, PNG Women in Coffee, and other NGOs/CBOs, who are directly involved in promoting gender-inclusive agricultural development). On the basis of the assessment, develop and implement relevant strategies to improve the overall capacities of these women's groups to lead and assist women farmers in producing, processing, and marketing of coffee, cocoa, and fresh produce.

D Address Systemic Barriers Affecting Supply Chain Performance

Transport system/roads need building/upgrading

- Of particular importance for the fresh produce sectors will be upgrading and maintaining the Highlands Highway, and other major roads, and giving consideration to building new roads such as the proposed Jimi–Madang Highway or the Kerema–POM Highway.
- Bring infrastructure development and prioritization into greater alignment with the productive potential in these three agribusiness sectors. To do this will require: (i) better data collection and analysis of farming activities, including tree counts, farmer profiling, and production possibilities; (ii) using these data to strengthen the business case for farming and for building associated infrastructure, as a means of expanding the productive potential of these sectors; and (iii) prioritizing infrastructure, notably road construction and maintenance, transport services, and establishment of cold chain and storage facilities, in ways that support and strengthen the productive potential of these sectors.

Cold chain/storage facilities accessible to small-scale producers

- In the fresh produce sector, participants at the Stakeholder Workshop recommended the establishment of cool storage facilities at key provincial and central locations, which would be managed by a private sector company. This company would provide key support services to farmers, and would be responsible for managing the cool storage facilities and managing all transportation and distribution requirements, thus enabling farmers to sell their produce at the farm gate. This approach would have the additional advantage of shortening the supply chain, from the farmer's perspective, considerably, thus enabling women farmers to reap direct benefits from their production.

Improved security along transport corridors and in markets

- Strengthen existing initiatives that are currently in place to address insecurity, for instance, working with the UN Women in addressing insecurity among women in the open urban markets throughout the city of Port Moresby. Key measures to consider include provision of banking and financial access services within market spaces; providing toilet and child care facilities for women inside markets; substantially strengthening market security through adequate policing and provision of security services; and facilitating women's greater participation in market management, oversight, and decision-making.
- Coordinate transporting and marketing activities on behalf of women – working with established groups including cooperatives or associations, coordinate the marketing and transporting of women's produce. This will allow women to remain where they are – in their homes or village – but still sell their produce and earn cash incomes. Women would not have to travel to market their produce where they are more exposed to danger.
- Work with existing networks to reduce family and sexual violence experienced by women in rural communities. To this effect, work closely with relevant parties (the police, elected Village Councillors, Magistrates and Churches) to reduce men's access to alcohol and drugs.
- Strengthen community-level capacity to deal with theft of coffee and cocoa, as this was identified as a significant issue in the Stakeholder Workshop. Specifically,

ensure that communities and local-level government agencies take ownership of this issue, and implement locally-appropriate solutions, including strengthening village courts, building community-level government, and providing sufficient manpower and resources (policing) commensurate with the need in the communities concerned.

Broader knowledge and information systems need strengthening

Modern communications technology (notably internet and mobile telephony) can be used pro-actively to improve women's access to critical information and services. Based on the recommendations of the Stakeholder Workshop, two key initiatives could be prioritized.

- Establish a *Communications Initiative* in each of the three supply chains, in partnership: (a) with private sector providers of mobile phone and internet services; and (b) with input suppliers traders, aggregators, shippers, and buyers, to facilitate information flows between producers and these other actors in the supply chains on input requirements, production schedules, weather and related issues, security conditions, prices, market conditions, transport links, shipping schedules, and emerging market opportunities (for example food provisioning for LNG and other mining sites), to strengthen both the operating efficiency ("push" factors) and market responsiveness ("pull" factors) of the supply chain. In so doing, pro-actively facilitate the access of women farmers, groups, and associations to these communications services, and provide training and capacity-building in their use. This could involve building further on existing collaboration with Digicel in the context of the IFC Agribusiness Project.
- Support banks and other financial service providers, and work in collaboration with buyers and traders, to develop products and services which enable women: (i) to open bank accounts in their own name, and/or to do so jointly with their husbands; (ii) to obtain non-cash payment for products sold to buyers; (iii) to access financial services in markets where fresh produce is sold; and (iv) to access a broader range of financial services, including credit and insurance.

World Bank/IFC

The Fruit of her Labor: Promoting Gender-Equitable Agribusiness in Papua New Guinea

1 Introduction: Background, Context, and Approach

1.1 Background

The World Bank Group (WBG) has been active in supporting agriculture in Papua New Guinea (PNG) since 1969, before independence in 1975. In 2009, the Bank undertook to support a Productive Partnerships in Agriculture Project (PPAP), which has been under implementation since 2010. The project focuses on the cocoa and coffee sectors. The PPAP aims to improve the livelihoods of smallholder cocoa and coffee producers through improvement of the performance and sustainability of value chains in cocoa- and coffee-producing areas. The project has three components:

- *Institutional strengthening and industry coordination.* The objective of this component is to improve the performance of sector institutions and to enhance industry coordination in the coffee and cocoa sectors. Existing stakeholder platforms for industry coordination will be consolidated to address short- and long-term issues such as sector governance, skills development in the industry, improvement in extension services, industry strategy on threats to quality and quality promotion, information within the industry, market development and crop diversification.
- *Productive partnerships.* The objective of this component is to increase the integration of smallholder producers in performing and remunerative value chains by developing and implementing productive alliances between smallholders and the private sector aiming at improving market linkages in the project areas.
- *Market access infrastructure.* The objective of this component is to improve market access for smallholder cocoa and coffee growers in the areas targeted in the project.

To-date, 25 partnerships (between smallholder farmers and lead partners including exporters, processors, knowledge and service providers) have been approved and about 18,000 farmers are directly benefiting from the project in six provinces of PNG.

The International Finance Corporation (IFC) provides Investment and Advisory Services in the Agribusiness Sector in PNG. Taking an investment-led approach, IFC's Agribusiness-PNG project aims to enable 4,500 lead firm-linked coffee and cocoa farmers, including 1,485 women farmers, to graduate into more productive and sustainable enterprises through the adoption of better farming practices, application of higher quality inputs, such as seeds and tools, as well as increased use of market information in managing farm operations. IFC is also currently providing support to the National Catering Service (NCS), one of the key providers of food services to the country's large mining sector operations.

1.2 Context: Strengthening the Focus on Gender Issues

The WBG has been actively engaged in addressing gender issues in PNG. Starting in 2006, the Bank has supported a Women in Mining program in PNG, aimed at enabling women to contribute to, and benefit from, investments in the mining sector (see

Popoitai and Ofosu-Amaah 2013). More recently, and notably since the publication of the World Bank's flagship 2012 World Development Report (WDR) on *Gender Equality and Development* (see World Bank 2011b), the WBG has been keen to address gender more systematically in its operational work. In 2011-12, the Bank, in close collaboration with the Asian Development Bank (ADB), other key partners, and the Government of PNG (GoPNG), undertook a Country Gender Assessment (CGA), which outlined key issues and recommendations for the WBG to address gender in its work. Key findings of the CGA are summarized in Box 2.1 in Chapter 2. The WBG's 2013-16 Country Partnership Strategy (CPS) explicitly focuses on achievement of development outcomes that are gender-responsive (World Bank 2012b). Following on the publication of the gender WDR, the WBG has supported further work specifically in PNG on women's voice and agency (Andrew 2013), as well as work to tackle crime and violence in the country, which led to a pioneering set of stakeholder consultations on the subject in March 2014. This work includes focus on "family and sexual violence," which is widely regarded as a major issue in PNG (see discussion in Section 2.4 below).

The WBG is undertaking a joint program on *Gender Empowerment in the Pacific*, which includes activities to help improve equality for women in the Pacific. The objectives of this program are to:

- Promote women's migration to formal sector employment;
- Improve women's access to public services and financial services;
- Enhance women's security and safety, in private and public spaces; and
- Increase the number of women in positions of leadership in business and society.

The program is now in its pre-implementation phase, and is aiming to establish the baseline and analytical diagnostics needed to design effective advisory services to enhance gender empowerment in the Pacific, including the conduct of "gender audits" for key businesses.

These various gender-related activities provide the foundation for deepening the focus on gender in the WBG's operational work in PNG in the coming years. In fact, the WB PPAP and IFC Agribusiness projects have been notably pro-active in both analyzing the relevance of gender issues for these operations (see notably World Bank n.d.(3); Agrifood Consulting International 2009; Giovannucci and Hunt 2009; Murray-Prior and Padarath 2013; and Murray-Prior 2014), and in addressing the issues raised in the design and implementation of projects. These extensive analyses constitute a valuable platform for deepening the understanding of gender issues in these agribusiness supply chains, from which this report seeks to draw.

1.3 Purpose of this Report

The overall goal of this report is to assist the WBG in achieving greater impact for women from its current activities in agribusiness and the associated supply chains in PNG, and to provide clear recommendations on additional interventions aimed at improving outcomes for women in agribusiness supply chains. As noted in the task TORs (Annex 7), agribusiness and related supply chains include crop production, agricultural extension services, seed supply, agrichemicals, farm machinery, distribution, transport, processing, marketing, and retail sales and food services.

The study focuses on the supply chains for coffee, cocoa, and horticultural products (fresh produce). These have been chosen, as organized supply chains exist for these three commodities. There is also a wealth of knowledge that has been accumulated on the supply chains for these products and on gender aspects by the World Bank and the IFC, as well as by other partners (see bibliography in Annex 1). Working in these supply chains therefore provides the best opportunity to identify entry points for follow-up activities. Given the importance of smallholders in PNG, and the need to understand gender dynamics in farming, this report pays particular attention to the roles and constraints faced by smallholders, without in so doing wishing to diminish the importance of the roles played by other actors in these supply chains.

Based on this analysis, the report aims to identify both short- and longer-term interventions that the WBG can implement to address obstacles and to strengthen opportunities for women in these sectors. To this end, an earlier draft of this report helped to inform the deliberations at a Stakeholder Workshop held in Port Moresby on April 15, 2014, which led to identification of key issues in each sector, and to articulation of key action points. The principal outcomes of this workshop are summarized in Annex 6.

1.4 Approach and Methodology

This report is based on: (i) a review of available literature aimed at facilitating a better understanding of the key agribusiness sectors in the country and the principal gender issues facing the country, including social and cultural factors as these affect agriculture—the literature reviewed, and other relevant materials consulted are listed in Annex 1; (ii) in-country consultations and field visits, to meet with key stakeholders throughout the relevant supply chains, as well as with researchers, practitioners, and NGOs—the list of people met during the January-February 2014 consultations in PNG is in Annex 2; (iii) review of WBG activities (projects and analytical work) in these sectors that support identifying and acting on gender issues in the WBG's operational programs in PNG; and (iv) conduct of a Stakeholder Workshop and an internal WBG planning workshop in April 2014, allowing key stakeholders to review an earlier draft of this report and to present their own ideas and recommendations to address the issues identified.

It is important to bear in mind that, as discussed further in Annex 3, there are significant limitations with respect to the data available in PNG for the kind of gender-focused analysis that is needed. Specifically, data on the allocation of men's and women's labor to the range of tasks along the supply chain, notably with respect to production and post-harvest processing, are virtually non-existent, as the only study to provide estimates of men's and women's time use dates from the late 1990s, and relies on data collected in 1992-93 (Overfield 1998). Moreover, this study relates only to the coffee sector, and knowledge gaps with respect to the gender division of labor in cocoa are greater. Recent analyses, including the PPAP baseline survey (UniQuest 2013) and the IFC Coffee baseline (Murray-Prior 2014), do not provide data from time-use surveys, but they do provide valuable information on perceptions by farmers as to who plays dominant (main worker) and subordinate roles at different points in the production and processing cycle, as discussed in Chapters 3 and 4. In the absence of detailed sex-disaggregated data on labor use, it is also not possible to attribute to men or to women

their respective contributions to value-addition in these supply chains, nor to determine the specific distribution of income or other benefits from chain activities between men and women. In this respect, the report relies on findings from the extensive, though often qualitative, literature in PNG. Moreover, while the PPAP baseline survey does provide information on the share of women receiving income from coffee, it does not address the underlying dynamics of intra-household decision-making, and this is clearly an area about which little is known and where more research needs to be done.

1.5 Organization of this Report

Following this introduction, Chapter 2 presents a summary of key gender issues in PNG, with particular reference to how these affect the agribusiness sectors. Chapters 3-5 discuss the key characteristics, and associated gender issues, in the coffee, cocoa, and fresh produce sectors, respectively. Chapter 6 presents the main findings and recommendations. Annex 1 contains the bibliography of literature reviewed and other references, and the people consulted in Port Moresby, and in Lae, Rabaul, Kerevat, Goroka, and Mt. Hagen, are listed in Annex 2. Additional conceptual and background information on supply chains in general, and their gender dimensions in particular, is in Annex 3. More detailed background material on the coffee and cocoa sectors is in Annex 4, while a more extensive treatment of the fresh produce sector is in Annex 5. The main results of the April 2014 Stakeholder Workshop are summarized in Annex 6, and task terms of reference are in Annex 7.

2 Gender Issues in Papua New Guinea

2.1 Country Overview

The World Bank's 2011-12 Country Gender Assessment (CGA) provides critical insights into gender disparities and issues in PNG (World Bank 2012a). Key findings are summarized in Box 2.1.

Box 2.1: Principal Findings from the PNG Country Gender Assessment

- **Legal Status and Rights.** The constitution provides for gender equity and equality, but customary law, recognised by the constitution, discriminates against women in relation to rights and property.
- **Voice and Representation.** Papua New Guinea remains close to the bottom of the world's scale for women's parliamentary representation and participation. As of November 2012, only 3 of PNG's 111 parliamentarians are women (2.7%).
- **Education.** There is a persistent gap in the percentage of girls and boys of eligible age enrolled in secondary school, tertiary education and training institutions. At primary school level, the gender gap has narrowed in the last 15 years. Concerns for girls' safety are a significant barrier to their school attendance. There are persistent rural-urban gaps, with urban respondents 30 percent more likely to report being literate than rural respondents. Significant regional variations also exist; for example, women are quite close to parity in literacy in the Islands region but very far behind in the Highlands region.
- **Health.** There has been little improvement in key health indicators (e.g., maternal mortality, access to reproductive health care, malnutrition among women and children) especially for the majority rural population. Health services have declined in rural areas, and the impact of this is larger for women who face greater obstacles to accessing such care than men. For example, when women need to travel to health care centres they face greater security risks and bear greater opportunity costs than men. Gender inequality at home (decision making and control over resources) hinders women's health seeking behaviour, for instance, causing delays in seeking medical help during delivery and decisions on the use of family planning methods.
- **HIV/AIDS.** Gender relations and gender inequality are significant drivers of the HIV and AIDS epidemic in Papua New Guinea. Women and girls are more vulnerable to HIV infection and other STIs. Women's lack of power and rights in sexual relations and the high risk of gender-based violence increase the likelihood of HIV transmission.

Source: Drawn from World Bank 2012a.

2.2 Men and Women in the PNG Economy

The CGA addressed the key issues related to the development challenge of providing gender-inclusive access to employment and economic resources. Its main findings were:

- There are inequalities in men's and women's economic opportunities in the agriculture sector that lead to inefficient use of the country's labour resources.
- Women farmers do not receive the level and type of training and extension support that they need to contribute their full potential to the agricultural economy.
- Women traders are more disadvantaged than men by unsafe and insanitary markets, and poor transport infrastructure.
- There are continuing differences and inequality between women and men in formal labour force participation, occupations and wages.
- In general, women and girls work longer hours than men and boys.
- Women are more negatively affected by the social impacts of, and receive fewer

benefits from, resource extraction industries. Some good models exist for giving women a share of the benefits from extractive industries, but these are not applied across all sites and industries (World Bank 2012a:xvii).

The findings of this report, discussed in the chapters that follow, confirm that each of these key points directly relates to the agriculture sector, namely inequality in access to economic opportunity, differences in access to training and extension support, traders disadvantaged by poor market conditions and infrastructure, and the wider problem of longer working hours (see Section 2.3 below).

2.3 Non-Market Work and Time Use

There is very little information available on the ways in which men and women use their time, nor of the division of tasks between men and women and the balance between domestic and economic work. Murray-Prior and Padarath (2013) state that many rural women in PNG work long hours for the wellbeing of their households and engage in a variety of livelihood strategies to support their families, their communities and themselves. Caring for children, the elderly and the ill; collecting water and fuel for cooking and heat; planting food gardens; and maintaining households and preparing food are largely women's responsibilities. They note that the PPAP Baseline Study (see box 3.1 below) found that only 14% of households surveyed had drinking water available at the house. They conclude that the unequal division of labor within the household creates a heavy time burden for rural women, which is exacerbated by inadequate or inaccessible social and health infrastructure, and a lack of facilities and institutional support.

The study undertaken by Overfield (1998) is focused on the coffee sector, but his data set includes the labor allocated by men and women for food production and for household tasks. As Table 3.1 below shows, men allocate relatively little time to household tasks (0.41 hrs/day) compared with an allocation of 2.69 hrs/day by women, i.e., women devote more than 6 times as many hours to household work as do men. When the full range of tasks carried out by men and women is taken into account, it is apparent that women's workloads are considerably greater than those of men, and that their time use is much more constrained than is the case for men. As will be seen notably in the coffee and cocoa supply chains, this has implications for labor use for time-critical agricultural tasks.

One positive aspect to emerge from consultations undertaken for this report and in the research literature is that men acknowledge that women do more work than they do, even though men do not then think about or devise ways to share the workload with women. As expressed by a community leader in the Baiyer Valley of the Western Highlands Province, *'women work more than men in those activities they listed down. They do more than men. Women in our community work harder than men'* (Pamphilon et al. 2013:108). This acknowledgement by men that women do more work is a good entry point for developing specific strategies aimed at promoting greater sharing of the workload between men and women.

2.4 Gender-Based Violence

The CGA indicates that gender-based violence in PNG appears to be widely accepted and culturally condoned (World Bank 2012a:xviii). It suggests that violence against women is common throughout the country, and it makes the point that such violence, and the threat or fear of it, significantly reduces the range of actions a women can undertake to support her family (World Bank 2012a:xvi). Many of the family and sexual violence offences committed in agricultural communities are related to the consumption of alcohol and drugs, such as marijuana, by men and boys. When they need money to buy beer and drugs, they beat up their wives, mothers, and sisters for money to go and drink. This climate of violence and insecurity has important implications for women's mobility (access to transport services and markets for agricultural produce), and limits their capacity to serve as field workers and extension agents, thus restricting outreach by key agricultural services to women farmers.

Murray-Prior and Padarath (2013) confirm that "family and sexual violence" (FSV) is an "extremely serious problem" throughout PNG, noting that "endemic levels of violence have implications for public health and social policy, economic development, and justice and law enforcement" (Murray-Prior and Padarath, 2013:11).

2.5 Gender Dynamics and Economic Opportunity in PNG

2.5.1 Household Dynamics and Subordination of Women

The CGA (World Bank 2012a) discusses the frequent identification of the household as the productive unit, with the assumption that members of the household share economic interests and production incentives. Overfield emphasizes that the "unitary" household, prevalent in economic theory, is not applicable in PNG.

In many ways the household as a single economic unit does not appear to exist in the fashion portrayed by many writings in neoclassical theory Even if the household does exist and could be collapsed into a single unit following unified goals, resource allocation would still probably not reach an efficiency position due to high levels of market failure. The basis of this market failure is the social subordination of women; female labour is in relatively short supply yet the price of this labour (hourly cash returns) is extremely low compared to that of men whose labour is in relative abundance. The price, and therefore supply, of different types of labour is not economically, but socially, determined. Models using the price of labour to explain its allocation are flawed in this context. Markets cannot produce efficient allocation of resources where major sections of the labour force are heavily discriminated against. This exerts considerable influence on household performance in coffee production ... (Overfield 1998:61).

Overfield links these social drivers of economic opportunity to a broader discussion of the importance of patriarchy in PNG. He outlines a model that seeks to explain patterns of resource allocation, and the distribution of benefits, within PNG households, where labor is allocated and rewards are determined according to criteria that have little or nothing to do with economic signals.

It is necessary to keep in mind that gender inequalities in PNG are "systemic" in nature (World Bank 2012a:106, see also WIA 2010:4), which do not lend themselves to easy solutions and which in any case are beyond the purview of any one sector. As argued in the WIA report (2010:4), this systemic discrimination "belies women's potential and significantly hinders agricultural productivity and development opportunities." It is why an initiative launched by one lead firm in the coffee export business seeks to apply a "women's empowerment framework" to the task of enabling women to participate

more fully in the sector (see discussion in Chapter 3, and Box 3.2 below). Consequently, it is essential to act on these issues, alongside those directly related to improving the functioning of the supply chains, if durable gender-inclusive improvements in performance are to be obtained.

One of the ways in which PNG has been addressing these deeper systemic gender biases is through personal viability (PV) training, supported by the PPAP (Box 2.2).

Box 2.2: Personal Viability Training

PV aims to change the mindsets of rural people, including smallholder farmers, by addressing the human being in a holistic way and by providing skills and knowledge in mental, emotional, physical, spiritual, and financial dimensions. Both men and women, who have graduated from this training program, for example, from the Polga Club House in the Western Highlands Province, have expressed that their lives have been transformed after this training. This change process is not manifested in terms of immediate economic gains for families or communities, but has more to do with changes in people's perspectives, beliefs, norms about life and society, and, in particular, the treatment of women by men. Strengthening existing networks of this kind at the smallholder level has the potential to promote women's effective participation in economic development and to increase women participation in all levels of decision making.

Source: Authors.

2.5.2 Labor Dynamics

As will be argued throughout this report, labor issues, and especially gender differences in labor allocation and rewards to labor, and the intersection of social and economic factors in determining labor use, cut across all the sectors, and have far-reaching implications for the performance of these agribusiness supply chains. It is therefore important to place labor dynamics in PNG in a wider context.

Labor mobilization strategies have evolved over time, in response both to changing social norms and expectations, generational differences, and commercial dynamics associated with wage or paid labor. A study in PNG has outlined the evolution of labor mobilization strategies from a cooperative model (*wok bung wantaim*) to a more commercially-oriented model (*makim mun*), with implications for labor availability and productivity that are far-reaching. While this study was undertaken for the oil palm sector, it has wider application to labor issues across sectors and regions (Box 2.3). These shifts suggest that economic signals (incentives) are gaining traction in PNG as a driver of labor allocation, leaving open the possibility that market-focused instruments (bank accounts, payment mechanisms, incentives) can play a role in addressing labor use in these sectors. Moreover, to the extent that it will be essential to mobilize youth to remain in (or to return to) farming, economic incentives will be paramount, as will ensuring the economic viability of farming activity altogether.

Box 2.3: Evolving Labor Mobilization Practices

The *wok bung wantaim* production strategy used in oil palm production emerged from the labour strategies underpinning subsistence production. Generally, for heavy, labour-intensive subsistence tasks such as the cutting, clearing, and fencing of new food gardens, the planting and harvesting of root crops, house building or the preparation of communal feasts, the lineage and often other members of the broader kinship group contribute labour. These large co-operative work groups in which the labour of the extended family and kinship group is mobilised to perform intensive agricultural or community work are commonly used by rural households in PNG. These same indigenous strategies for mobilising labour for subsistence production have been carried over into cash crop production to ensure an adequate labour supply for harvesting, which is particularly important during high crop periods. ...

Labour contributions to subsistence production both structure and are structured by kinship and social relationships. They can be on a balanced reciprocal basis where a labour contribution is later reciprocated with a similar gift of labour as often happens amongst agnatic individuals and groups in patrilineal societies. Some are based on relationships of inequality where there is no obligation to reciprocate the labour contribution with a similar gift of labour. Relationships based on inequality often characterise those between wife-giving and wife-taking groups in which the latter can give labour without the expectation of a later reciprocation of labour. While relationships of inequality can lead to one party contributing labour without a material return, the other party, if giving labour, may receive a return in labour, cash, or wealth items that vastly exceeds the market value of the original labor contribution. ... An important aspect of the co-operative *wok bung wantaim* strategy is that the 'payment' of labour does not necessarily reflect labour input but instead is governed more by gender, age, and kinship status, as well as by the perceived financial needs of individual family members in much the same way as labour is deployed and valued in the non-market subsistence economy. ...

[C]hanging and contested notions of labour value are undermining cooperative oil palm production strategies among migrant households on the LSS. Beginning in the early to mid 1990s on the Hoskins LSS, second generation co-resident married sons increasingly began challenging the *wok bung wantaim* cooperative production strategy, which started to give way to a new production strategy where harvesting and the associated income were rotated on a monthly schedule amongst individual co-resident households. This new production strategy, known locally as *makim mun* (literally marked month), coincides with the milling company's monthly payments to smallholders. Under the *makim mun* production strategy, labour is drawn predominantly from the household whose month it is to harvest, with occasional recruitment of additional labour from co-resident or off-block households. There is less inter-household cooperation in harvesting, and typically, work groups are smaller than those following the cooperative, *wok bung wantaim* production strategy.

The *wok bung wantaim* production strategy that had dominated smallholder production came under pressure on several fronts, not least by the demands and aspirations of a generation of younger men who began challenging the foundations upon which this production strategy relied: centralised control over labour and income, and indigenous norms and values, particularly those relating to the indigenous concepts of labour value. In the contest between generations, between leaseholder and ordinary block resident, between the individual and the group, between modernity and tradition, and between market and indigenous economic relations and values, social stresses were heightened and the *makim mun* production strategy was born.

Ironically, the transition to a more market based value of labour through adoption of the *makim mun* strategy is associated with lower productivity. This is because the capacity to mobilise labour under this strategy is reduced, particularly if the *makim mun* strategy emerged in response to prolonged conflict between co-resident households. When co-resident households adopt the *makim mun* strategy and act more autonomously, typically the family whose month it is to harvest is unable to call on co-resident households for labour. With less inter-household cooperation, harvesting work groups are usually smaller and therefore less of the crop is harvested in the three-day harvesting window, especially during high crop periods. The total income and production for the block is therefore less than it would be under a *wok bung wantaim* strategy.

Source: Curry and Koczberski 2009a:8-12.

3 The Coffee Supply Chain

Agriculture accounts for approximately one-third of GDP, and the sector is dominated by smallholder farming systems. Together with oil palm, coffee and cocoa are the main cash crops, with respectively over 30 percent and 20 percent of the total labor force involved in their production, processing and sale (World Bank 2010:1). Further background information on the coffee sector in PNG is in Annex 4.

3.1 Gender Issues in the Coffee Supply Chain

Key gender-relevant data for the coffee sector from the PPAP baseline survey are summarized in Box 3.1.

Box 3.1: Key Gender-Relevant Data from the PPAP Baseline Survey: Coffee Areas

- Household (HH) headship: Male (M) =98%; Female (F) =2%.
- High variability in ease of access to water: 29% of all households had to walk more than 20 minutes to water source; 42% had access in the household or within 5 minutes walk.
- High variability in men's and women's participation in training: on average only 13% of training participants are women, ranging from 0% in 7 locations to 53% in Goroka Rural.
- Schooling (no grade completed): M=34%; F=44%.
- Share of coffee in total household income (all HHs): 51.5%
- Bank Accounts: M=85%; F=2%; Joint = 13%.
- Men primary sellers of coffee for 90% of households. Income receivers: M=44%; F=56%.)
- Information/Training (Production): M=80%; F=20%. Prices M=67%; F=33%.
- Most important coffee price information source: M=Other farmers; F=Buyers.

Source: UniQuest 2013.

A summary of the key steps, tasks, and indicative gender division of labor in the coffee supply chain is presented in Table 3.2 below. The table also synthesizes key systemic issues affecting the performance of the chain, along with the main gender issues and opportunities identified in this report. The following paragraphs discuss these points in more detail.

Table 3.1 Labor Allocation by Task and Sex, 1993 (hours/worker unit/day)

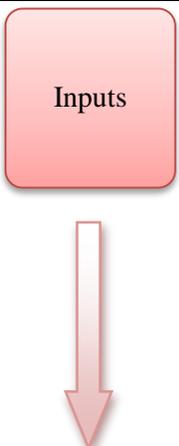
Task	Male	Female	M=1; F=
Food	1.21	4.31	3.56
Coffee	0.67	0.96	1.43
Household	0.41	2.69	6.56
Total	2.29	7.96	3.48

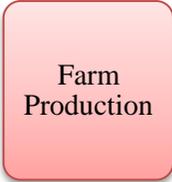
Source: Overfield 1998, and authors' calculations.

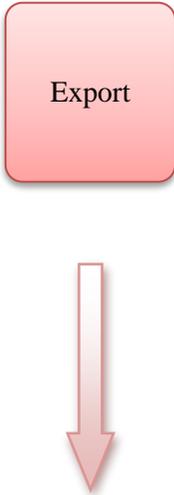
3.1.1 Gender Roles and Responsibilities

Coffee production is heavily determined by labour inputs, where women exert a substantial influence—a simple reflection of the fact that they do more of the work (Overfield 1998). There would appear to be no reason to believe that the data in Table 3.1, and the differential labor burdens they indicate, have changed in any substantive manner, notwithstanding that the data are now more than 20 years old. Overfield indicates that the data show that people on average work only 4.25 hours/day; it is therefore tempting to conclude that there is no labor constraint, and that people in rural areas are under-employed.

Table 3.2: The Coffee Supply Chain–Key Characteristics and Issues

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
	<ul style="list-style-type: none"> Smallholder Farmers (84%) Plantations (13%) Block holder (3%)* 	<ul style="list-style-type: none"> Provides/allocates land for farming 	○	<ul style="list-style-type: none"> Land shortage, due to population pressure Competing uses for land given volatility of world/mkt prices 	<ul style="list-style-type: none"> Men own land and decide on its use Women only have "use rights" on land 	<ul style="list-style-type: none"> Increase women's ownership (or joint ownership) of land Strengthen women's participation in land use decisions
	<ul style="list-style-type: none"> Nurseries CIC (seedlings) Brian Bell, Ltd. Farmset Ltd. etc. Agmark 	<ul style="list-style-type: none"> Nurseries & Bud Gardens 	○	<ul style="list-style-type: none"> Unreliable inputs Poor quality seedlings and materials Limited varieties High cost of inputs 	<ul style="list-style-type: none"> Women largely excluded from transport networks 	<ul style="list-style-type: none"> Opportunity for women to work in this area ("more careful")
		<ul style="list-style-type: none"> Transport 	○			
	<ul style="list-style-type: none"> Provision of seedlings, chemicals, materials 	○				
<ul style="list-style-type: none"> Technical and other support services CIC CARE International Coffee exporters GoPNG 	<ul style="list-style-type: none"> Provide technical knowledge and skills for coffee farming Provide extension service Provide business management skills for coffee cultivation Provide knowledge/skills on livelihood strategies Undertake research on coffee-related issues Develop new materials and techniques based on research Introduce new varieties, seedlings, material 	○○	<ul style="list-style-type: none"> Poor knowledge and skills Lack of business focus (coffee farming not seen as business) Lack of management skills Extension services reach very small number of farmers Extension messages largely focus on "social" issues 	<ul style="list-style-type: none"> Women are poorly represented among researchers and extension agents Insecurity limits women's capacity to work in the field Men primary beneficiaries of extension and training services Women's tasks insufficiently addressed 	<ul style="list-style-type: none"> Build capacity of women to undertake agricultural research and to serve as extension agents Focus agronomic extension services and training on the key production and processing tasks undertaken by women, which are critical to quality of product Strengthen role of women's groups and associations in coffee 	
<ul style="list-style-type: none"> Financial services Micro banks SMDC National Development Bank (NDB) 	<ul style="list-style-type: none"> Provide financial services for coffee farmers 	○○	<ul style="list-style-type: none"> Lack of credit 	<ul style="list-style-type: none"> Gender bias in credit access, women face greater barriers, i.e, lack of collateral and fixed assets 	<ul style="list-style-type: none"> Improve women's access to financial services, including bank accounts, payment systems, financial products that address gender-specific constraints (collateral requirements) 	

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
 <p>Farm Production</p>	Coffee producers: ▪ Smallholder Farmers (84%) ▪ Plantations (13%) ▪ Block holder (3%)* ▪ Support Services: CIC, CARE, Exporters, GoPNG	▪ Land preparation ▪ Land rehabilitation	⊙⊙	▪ Lack of basic farm tools, chemicals, materials ▪ Land disputes (over land to allocate to coffee) ▪ Competing uses of land	▪ Predominantly male tasks, but women contribute to these activities as well ▪ Perceived by men and women as a "men's" crop	▪ Opportunity to sensitize both men and women to women's contribution to coffee (quality) and to greater sharing of crop benefits
		▪ Shade tree preparation	⊙⊙			
		▪ Drainage	⊙			
		▪ Planting ▪ Re-planting	⊙⊙			
		▪ Weeding and Pruning	⊙⊙			
 <p>Harvest & Post-Har- vest Activities</p> 	Coffee producers: ▪ Smallholder Farmers (84%) ▪ Plantations (13%) ▪ Block holder (3%)* ▪ Farmers selling cherry (53%) ▪ Buyer (exporter) ▪ Middlemen ▪ Farmers selling parchment (70%) and green bean (3%) ▪ Buyer (exporter)	▪ Harvesting (cherry picking) Farmers sell: ▪ Cherry (53%) ▪ Parchment (70%) ▪ Green Bean (3%)**	⊙	▪ Strip picking to save labor time ▪ Diminished quality ▪ Diminished future harvest potential	▪ Women's task ▪ Time constraint: not sufficient or timely labor allocation	▪ Improve picking practices (not "strip picking") key to quality ▪ Opportunity for women to contribute directly to better quality of product
		▪ Bagging	⊙⊙	▪ Poor transport infrastructure ▪ High cost of transport ▪ insecurity ▪ Product loss/waste	▪ Women largely excluded from transport networks	▪ Expand opportunities for women to provide/participate in transport services
		▪ Transport to exporter/processor	⊙	▪ Lack of access to pulper	▪ Most cash transactions handled by men	▪ Build capacity of women's groups and organizations
		▪ Sale to coffee exporter ▪ Sale to plantation, other farmer, or processor	⊙			
		▪ Pulping ▪ Fermenting ▪ Drying	⊙ ⊙ ⊙	▪ Time-critical task ▪ Labor and management-intensive work ▪ Key to quality of final product	▪ Primarily women's responsibility	▪ Time critical task ▪ Opportunity for women to contribute directly to better quality of product ▪ Knowledge required
		▪ Bagging	⊙⊙			
		▪ Transport to exporter	⊙	▪ Poor transport infrastructure ▪ High cost of transport	▪ Women largely excluded from transport networks	

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
				<ul style="list-style-type: none"> ▪ Insecurity ▪ Product loss/waste 		
		<ul style="list-style-type: none"> ▪ Sale to exporter 	○	<ul style="list-style-type: none"> ▪ Low quality ▪ Low volumes ▪ Variable prices affecting income and incentives 	<ul style="list-style-type: none"> ▪ Most cash transactions handled by men ▪ Conflict and domestic violence 	<ul style="list-style-type: none"> ▪ Improve incentives for women through greater sharing of coffee income
 <p>Export</p>	<ul style="list-style-type: none"> ▪ Coffee traders, exporting companies, intermediaries ▪ Monpi ▪ NGHC ▪ PNG Coffee Exports ▪ Kongo Coffee ▪ PAMSL ▪ Others 	<ul style="list-style-type: none"> ▪ Milling 	○			
		<ul style="list-style-type: none"> ▪ Grading and sorting 	○○	<ul style="list-style-type: none"> ▪ Poor quality product ▪ Low income 		
		<ul style="list-style-type: none"> ▪ Bagging 	○			
		<ul style="list-style-type: none"> ▪ Transport to wharf 	○	<ul style="list-style-type: none"> ▪ Poor transport infrastructure ▪ High cost of transport ▪ Insecurity ▪ Product loss/waste 	<ul style="list-style-type: none"> ▪ Women largely excluded from transport networks 	
		<ul style="list-style-type: none"> ▪ Compliance tests (CIC) 	○○			
		<ul style="list-style-type: none"> ▪ Customs and other clearances 	○○			
		<ul style="list-style-type: none"> ▪ Shipment to Importer 	○			
		<ul style="list-style-type: none"> ▪ Specialty producers ▪ Exporters: Kongo Coffee, Sigri Coffee, others ▪ Certification agencies 	<ul style="list-style-type: none"> ▪ For specialty coffee 		<ul style="list-style-type: none"> ▪ Certified and/or organic coffee small share of production ▪ Need to broaden certification and enable farmers to meet criteria 	<ul style="list-style-type: none"> ▪ Gender issues not substantively addressed in "social" criteria for certification
FINAL CONSUMER						

Key: **GDL** = Gender division of labor. ○ = Predominantly/Exclusively Male; ◎ = Predominantly/Exclusively Female; ○◎ = shared/joint tasks.

Sources: * Murray-Prior and Padarath, 2013:6. ** UniQuest 2013:31.

Overfield warns against this interpretation by pointing out that the division of labor is unequal: these data indicate that women work more than 3 times as much as men, especially when household work is included. Even in the area where there is the greatest parity between men and women in their labor allocation, namely the coffee sector, women still allocate nearly half as much time again as men do in this sector. Moreover, it is specifically during the "flush" period from April to August, when coffee is harvested, that the female labor constraint is most apparent (Overfield 1998:55).

Table 3.3: Labor Days for Coffee

Activity	Main worker		Support 1		Support 2		Support 3		Total days
	Days	Count	Days	Count	Days	Count	Days	Count	
Clearing Land	10.0	474	8.5	216	4.8	71	7.4	11	30.6
Lining / transplant	7.8	347	7.2	113	4.4	18	3.3	4	22.7
Shade est't / control	4.5	417	4.7	49	3.8	8	2.3	3	15.2
Nursery operations	6.0	142	5.8	23	3.0	7	2.5	4	17.3
Weeding	12.1	732	11.6	401	7.6	138	4.4	20	35.7
Fertilizing / mulching	7.7	52	3.3	6	4.5	2	0	0	15.5
Fencing	8.3	144	7.7	18	15.9	7	34.0	2	65.9
Drains mgmt.	8.3	490	8.2	141	7.4	48	3.0	6	26.9
Pruning / renovating	8.0	602	7.1	87	6.1	17	9.8	5	31.0
Pest / disease mgmt.	7.3	55	11.1	7	1.0	1	2.0	1	21.5
Coffee picking	16.9	754	16.4	628	13.3	331	11.0	77	57.6
Pulping / washing	7.1	555	6.9	389	7.3	106	4.4	11	25.6
Drying / bagging)	11.7	552	10.9	399	7.2	107	4.7	13	34.5
Farm record keeping	1.8	12	2.5	2	0	0	0	0	4.3

Source: UniQuest 2013:39.

Data from the PPAP baseline survey (UniQuest 2013), though not sex-disaggregated, show the importance of harvesting and post-harvest processing in the overall labor allocation for coffee (Table 3.3). These are tasks predominantly carried out by women.

This is borne out by the recent IFC baseline study for the coffee growing areas supported by the PPAP (see Murray-Prior 2014). Information is provided on men's and women's perceptions of their role in various coffee-related and other tasks. The principal categories are "main worker" and "equal main worker." While it is not entirely clear how these perceptions of workloads can be interpreted, they can nonetheless be seen as perhaps giving some indication of the level of effort provided by men and women, and of how important a role they see themselves as playing in these activities. Table 3.4 summarizes the key perceptions for selected tasks. Of note is that women see themselves as having more of a role than men in weeding, picking, milling, and drying, and that they also see themselves as being involved in selling, albeit not to the same

Table 3.4: Perceptions of Roles in Key Coffee and Domestic Tasks (% Main + Equal Main)

Activity	Men	Women
Land Clearing	78	76
Planting	73	48
Weeding	61	77
Picking	53	83
Wet Milling	48	58
Drying	49	62
Selling	82	61
Domestic Chores	25	96

Source: Murray-Prior 2014, Tables A11 and A12.

extent as men, and as having a substantial role in land clearing. These perceptions also bear out the disproportionate burden of domestic work that falls on women.

3.1.2 Gender-Based Constraints and Implications for the Supply Chain

Labor. Labor shortages are a major issue for the coffee sector, but the problem of labor cuts across all sectors. As reported by Murray-Prior and Padarath (2013), in a study in the Lufa District in the Eastern Highlands Province where coffee production is high, women interviewed found it difficult to do all the labour necessary to tend food crops and coffee (West 2012). In this area women often discussed their unequal burden in terms of horticultural labour and the need to weigh the time and returns they get from garden work against the time and returns they get from coffee garden work. They talked about labour-saving techniques like multigenerational and multi-lineage weeding parties, where women from several lineages weed each other's coffee gardens in rotation so that the work can be done more quickly and efficiently (Murray-Prior and Padarath 2013:9). Though their analysis is not sex-disaggregated, Batt et al. (2009:35) point out that at the farm level lack of labor affects the ability to harvest cherry at the correct time.

Specifically in relation to coffee, already in the early 1990s Overfield (1998) grappled with the issue of the ways in which lower returns to women from their labor in coffee, coupled with their larger overall work burdens, might affect the economic welfare of coffee-growing households. Overfield's principal insight is that explanations for what he characterizes as the "underdevelopment" of the highlands in PNG have not considered the "influence of intra-household factors and specifically gender" (Overfield 1998:56). Women's lack of bargaining power, the lower returns to their labor, and the overall high labor burdens women face, all contribute to the inability of the PNG highlands to maximize their development potential.

It is perhaps with respect to choices about labor allocation that the issue of not regarding the cash crop as a "business" has the most traction. This is well captured in the distinction between "foraging" and "farming" that is made in one of the seminal works of the literature on cocoa (see Curry et al. 2007 and the discussion in Section 4.1.1 below). The essence of the distinction is that tree crop plantings are not regarded as sources of income to be managed systematically (i.e., these holdings are farmed) but are instead occasional, if unreliable, sources of cash when needed (i.e., holdings are foraged). As Murray-Prior and Padarath point out (2013:10), socio-cultural factors influence farming decisions as much as economic ones, but there is little understanding of these factors.

Resources and Knowledge. There are important gender differences in access to resources and knowledge to carry out coffee operations (Table 3.5). In the areas surveyed by the IFC baseline study, education and literacy levels were found to be very low, with 25% of men and 75% of women not being able to read and write in *Tok Pisin*. (Murray-Prior 2014:iv). Murray-Prior and Padarath (2013) point out that rural women in PNG are constrained by unequal access to productive resources and services, including coffee extension services. While extension can help in improving productivity and overall wellbeing, rural women tend to make less use of, or have less access to, extension services. Women are allocated fewer resources and attention than men, and extension and training in rural livelihoods has focused on the needs of men,

thereby creating a barrier for women (Cahn and Liu 2008). Overfield (1998) found that women’s access to capital – such as coffee pulpers – is much lower than men’s.

Discussions with CIC in Goroka suggest that about 75% of the extension effort/messages relate to "social" issues not "agronomy." Social dimensions of extension training cover a broad spectrum:

training is offered in areas such as: Business Acumen/Financial Management, Business Registration, HIVAIDS, Healthy Community Living, Rural Housing, Eco-tourism, Gender Equality in Development, Livelihood Strategies, Climate Change, Resource Boom and 'Dutch Disease,' Law and Order, Spiritual or Faith-based Training, Awareness on Drugs and Alcohol, and Human Development. This kind of training is often undertaken in conjunction with Personal Viability (PV) training (see Box 2.2 above).

Land. Land access differs for men and women, and this in turn is linked with their capacity to make decisions. Murray-Prior and Padarath indicate that land tenure in the Highlands, and many other areas in PNG, is predominantly patrilineal, and a woman accesses land by activating use rights to her husband's land. Coffee is therefore seen as belonging to men and women are considered to hold only secondary use rights (Overfield 1998). SPC (2012:9), citing the PNG’s 2009 CEDAW Report, states that women are often excluded from owning registered land, and they cannot enforce rights to land and property nor claim income from cash crops or land leases such as for mining, logging, and infrastructure construction.

Decision-Making. It is often men who are the major decision-makers and who control the marketing of ‘formal sector’ crops such as coffee, cocoa, and oil palm (Cahn and Liu 2008). This is substantiated by the PPAP Baseline, which found that men are considered to be the primary decision-makers for coffee production and management (95%) (UniQuest 2013). Furthermore, in PNG’s male-dominated society, there is a deep-rooted social belief that women are subordinate to men (father, husband or brother) and are expected to obey men (Cahn and Liu 2008). Differences in decision-making mean that, even when women are able to participate in extension training, they are often unable to apply their learning to coffee gardens, as decisions over inputs are largely made by men (Murray-Prior and Padarath 2013:10). The IFC Coffee baseline finds that women appear to have an important role in decision-making about coffee and household management, with many decisions made jointly, although their spouses do not always acknowledge this (Murray-Prior 2014:25). The IFC baseline distinguishes between "primary" and "equal primary" decision-makers in the coffee sector, finding that around half of women perceive themselves as equal primary decision-makers with their spouses. However, this finding is difficult to interpret, as it is not clear exactly what this distinction captures, and more research is needed on the dynamics of intra-household decision-making.

Table 3.5: Gender Differences in Accessing Knowledge in Key Areas of Coffee Cultivation

Item	Men	Women
Training in post-harvest processing (% receiving)	57	11
Training in coffee nursery (% receiving)	54	8
Training in coffee marketing (% receiving)	56	12
Rating of usefulness of post-harvest training (5=best)	4.4	3.6
Topic information on post-harvest processing (% accessing)	38	9
Overall training (% receiving)	50	10-15

Source: Murray-Prior 2014.

Income. Income streams from coffee largely belong to men. Notwithstanding the fact that women do more of the work in coffee cultivation than men, income from cash crops, including coffee, is generally considered as belonging to the man of the household. He in turn may have considerations other than those of his wife and other family members when it comes to deciding on how income is spent, and this is a source of intra-household conflict (Murray-Prior and Padarath 2013:11). Evidence indicates that cash incomes are not distributed evenly in households; on average, women receive approximately one-third the income of their male counterparts (Overfield 1998:58). Overfield noted that this became more extreme as coffee prices increased, suggesting that men held onto most of the price increases with only small benefits being passed on to women. The finding from the PPAP baseline survey, namely that 85% of accounts are primarily operated exclusively by men (2% by women) and that selling of coffee is largely done by men (90%), demonstrates men's control over income from coffee (UniQuest 2013:30). Several interlocutors in Mount Hagen, associated with a PPAP-funded project, affirmed in a recent interview (on February 13, 2014) that men have greater control over income from coffee because it (coffee) is a man's crop. Another group in Goroka, representatives of PNG Women in Coffee, also shared the same sentiments, saying that men have greater control over income from coffee, and the main reason is that, up in the Highlands region, coffee is very much accepted as a man's crop. However, it is also important to bear in mind that behavior in this respect can differ substantially from one household to another, and that it is not appropriate to generalize behavior patterns across communities or the country as a whole.

Incentives. Because of these limited benefits, the incentives to be involved in coffee production differ for men and women. This is so in large part because the rewards to labor differ: there is a persistent disconnect between the work done by women and the benefit they obtain. This has been well documented in the coffee sector by Overfield (1998).

The relative incentives for women to be involved in coffee production are not as great as for men. It is also apparent that they have much greater control (and responsibility) for food production than they do for coffee. ... [I]n coffee with respect to planting, harvesting and selling it was the male head of household having control with women having very little influence. However, when it came to the planting and sale of food, women exerted far greater influence. This provides women with both the incentive and opportunity to move into an alternative source of income. (Overfield, 1998:58).

The background paper on gender issues in coffee and cocoa production prepared for the PPAP (see World Bank n.d.(3)) reiterates that conflicting incentives among men and women are a major factor in low coffee productivity in PNG, and makes the important point, confirming Overfield's observation above, that, "although average returns to labor were found to be higher for coffee than in food production, women persevered with the heavy and less rewarding work of planting, harvesting, and carrying food crops because the incentives were better. They exercised more personal control over production, could intentionally produce a surplus over subsistence requirements for sale, and were able to control and spend most of cash earned from selling food crops" (World Bank n.d.(3):2).

It is widely acknowledged that men face many of the same issues confronting women in the agricultural sectors, including poorly developed infrastructure, access to markets, pressure on land from population increases, and new pest and disease threats (WIA

2010:4). However, the report emphasizes that women's lack of access to land, assets, and extension services, their lack of financial autonomy, the absence of collective action and entrepreneurial opportunities, create "significant additional barriers, which are legal, cultural and situational," this latter pointing to the fact that women are more likely to be victims of law and order issues. The report concludes that the "systemic and consistent discrimination experienced by women belies their potential and significantly hinders agricultural productivity and development opportunities" (WIA 2010:4).

3.2 Certification

It is estimated that around 5 percent of PNG coffee exports are "specialty" coffees, including organic, Fair Trade, Rainforest Alliance, and Utz (Murray-Prior and Padarath 2013:7). Sustainable certification labels now come in many forms, but there are four main agencies (ITC 2011:53):

- Fair Trade; www.fairtrade.net
- Rainforest Alliance; www.rainforest-alliance.org
- Utz Certified; www.utzcertified.org
- The Common Code for the Coffee Community (4C Association) www.4c-coffeeassociation.org
- "Organic" Certification: for PNG see:

In addition, there is a broader category of certification that determines whether a crop is produced in a way that can be considered "organic." In PNG, more than 2,600 coffee growers are registered with Coffee Connections Ltd., (see: http://www.coffeeconnections.biz/organic_certification.htm), and certification is obtained through the National Association of Sustainable Agriculture, Australia (NASAA), which is recognized worldwide through the International Federation of Organic Agriculture Movements (IFOAM). These various initiatives are rapidly gaining market share and by 2010 it was estimated that they represented around 5% of the total world trade in coffee (ITC 2011:53). Batt et al. (2009:119-131) provide a useful summary of the principal certification schemes operating in PNG.

Certification is essentially concerned with sustainability. How sustainability is defined, and what elements thereof are prioritized, determine the focus of certification schemes. Certification schemes pursue a range of goals. Briefly, *Fair Trade* aims to enable organizations of smallholder producers to improve their conditions of trade, i.e., to obtain more equitable and more stable prices. The *Rainforest Alliance* certification scheme focuses on environmental sustainability, and incorporates the social and environmental principles of the Sustainable Agricultural Network, including one requiring fair treatment and good conditions for workers. The *UTZ* sustainability program is centered on the UTZ CERTIFIED Code of Conduct, which is based on international production standards and contains a set of strict product specific criteria for socially and environmentally appropriate coffee growing practices and economically efficient farm management. The *Common Code for the Coffee Community* (4C Association) is an inclusive, membership driven organization of coffee farmers, trade and industry, and civil society. Members work jointly towards improving economic, social and environmental conditions in the coffee chain through the promotion of more sustainable and transparent practices for all who make a living in

the coffee sector. According to IFOAM, organic certification is based on four principles, namely, health, ecology, fairness, and care, and one of its key provisions relates to social justice, including equal opportunity, fair treatment of workers, and non-discrimination (IFOAM 2012). This brief outline shows that, for the most part, gender issues are not especially prominent, and rarely explicit, in certification schemes, though opportunities exist to promote certification schemes that are more gender-inclusive.

The PPAP baseline survey indicates that 13% of households claim to have any knowledge of certification (2% "strong" knowledge). This is highly concentrated in provinces where exporters work. Around 8% reported having certification for their coffee, and, of these, 1/2 expressed little or no interest in continuing. Half of the households surveyed were not interested in paying for certification, a finding which suggests, according to the baseline survey, that the benefits of certification are not sufficient to justify paying for it (UniQuest 2013:51-53).

3.3 Concluding Observations

The private sector is actively engaged in finding ways to improve women's involvement in coffee cultivation, not least in recognition of the substantial labor contributions women make to the sector. One lead firm supported by the PPAP has chosen to adopt a women's empowerment framework developed by CARE International to underpin its approach to enabling women to contribute more to, and benefit more from, the sector (Box 3.2). The rationale for this approach, though specifically applied to the coffee sector, has wider relevance for the other sectors and for PNG as a whole.

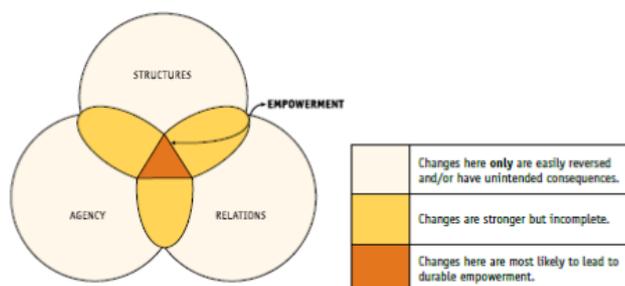
Women's meaningful involvement in the coffee industry requires much

more than simply inclusion in training. Modest knowledge and income gains will not translate into sustained change if a woman's family, community and entire society continue to impose limits to her potential contribution. Therefore it is necessary to look at the entire system – the larger community in which women live – and ensure that community members and industry stakeholders understand the economic and social benefits of women's involvement throughout the coffee industry (Murray-Prior and Padarath 2013:12).

Box 3.2: The CARE Women's Empowerment Framework

In addressing the issue of increasing the role and empowerment for women in the coffee industry, the baseline uses the Women's Empowerment Framework developed by CARE International (Figure). This framework focuses on empowering women through:

- Improvements in agency whereby women have increased capacity (skills, knowledge, resources), capabilities (confidence, bargaining power, collective voice), and support.
- Changes to relations in women's lives that can either promote or hinder their empowerment e.g. immediate family, communities or other influential relationships.
- Improvements to structures so that agricultural service, value chain, and market environments of relevance to women are more competitive, gender-inclusive and environmentally sustainable.



Source: Murray-Prior 2014:2.

In the coffee subsector, some initiatives are currently underway to address the twin problems of supporting a greater "business" focus by smallholder farmers and, concurrently, strengthening women's ability to contribute to, and benefit from, engagement in the sector. Cooperatives are currently being formed and used to mobilize farmers to grow and sell coffee. At present, there are two coffee cooperatives working in the Eastern Highlands and Morobe Provinces. The cooperatives are unique in how they are set up, in that income generated through the cooperative is directed toward meeting the 'tangible or physical and real time' needs of cooperative members, including school fees, building permanent houses, or buying solar units. However, these efforts remain at a micro or community level and are still in the early stages of development.

Cooperative societies or commodity-specific cooperatives are not new to PNG, though, historically, there have been many failures, and caution is needed in promoting cooperative arrangements. The success of a cooperative society depends on many factors including good leadership. Cooperatives can support a greater business orientation by smallholders, and facilitate greater participation by women in the sector, through the following key actions:

- work through cooperatives or established groups (at the village/tribe level);
- target the family unit but involve the whole community;
- undertake marketing of coffee and cocoa through the cooperative in a way that removes decision-making as to income earned and how it is distributed out of the (male-controlled) household while increasing transparency and accountability for all household members;
- establish and manage a savings and loan society/mechanism for cooperative members, with particular focus on ensuring that women have their own bank accounts, payment cards, and other mechanisms for capturing more of the income from the labor they provide;
- show smallholder farmers a clear 'road map' of where they are now and where they can be in 2, or 5, or 7 years if they continue to save their money;
- identify the 'individual' needs (school fees, a permanent house, tractor) of cooperative members and plan together with them how these needs can be met;
- identify training needs of cooperative members and facilitate training, for both men and women;
- offer incentives and reward good performance.

4 The Cocoa Supply Chain

Cocoa is one of the major agricultural export crops for PNG with an estimated 1.0 million people involved in the industry (Cocoa Board 2013). Further background information on the cocoa sector in PNG is in Annex 4. A summary of the key steps, tasks, and indicative gender division of labor in the cocoa supply chain is presented in Table 4.2 below. The table also synthesizes key systemic issues affecting the performance of the chain, along with the main gender issues and opportunities identified in this report. The following paragraphs discuss these points in more detail. Key gender-relevant data for the coffee sector from the PPAP baseline survey are summarized in Box 4.1.

Box 4.1: Key Gender-Relevant Data from the PPAP Baseline Survey : Cocoa Areas

- Household (HH) headship: Male (M) =94%; Female (F) =6%.
- Participation in cooperatives: M=27%; F=14%.
- Variability in ease of access to water: 15% of all households had to walk more than 20 minutes to water source; 63% had access in the household or within 5 minutes walk.
- High variability in men's and women's participation in training: HH member participation in cocoa processing training; ENB M=20%; F=3%; ARB M=8%; F=0%.
- Schooling (no grade completed): M=19%; F=19%.
- Bank Accounts: M=62%; F=10%; Joint = 28%.
- Men primary sellers of cocoa for 78% of households. Income receivers: M=68%; F=32%.
- Information/Training (Production): M=80%; F=20%. Prices M=67%; F=33%.
- Most important coffee price information source: M=Other farmers; F=Buyers.
- Production: Households with operating fermentaries: 20%.
- Households reporting cocoa affected by CPB: ENB=99%; ARB=50%.
- Decision-making: Primary decision-maker: M=86%; F=14%.

Source: UniQuest 2013. ENB=East New Britain Province; ARB=Autonomous Region of Bougainville.

4.1 Gender Issues in the Cocoa Supply Chain

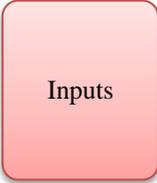
Curry et al. point out that the lengthy process of fermenting and drying cocoa beans is typically a male-controlled activity. While men, women, and children contribute labor to harvesting tasks, women's labor contribution largely ceases once the wet bean is harvested and carried to the fermentary, though data on the precise division of labor are lacking, and more cocoa-specific research is needed. Men are involved in transport of firewood for drying, and they supervise the fermentation and drying process. The male household head typically takes responsibility for transporting the dry bean to the nearest town for sale, and women's involvement in processing is minimal (Curry et al. 2007:51). The labor and time requirements for cocoa harvesting and processing differ in significant ways, as are the earnings that can be obtained (Table 4.1).

Table 4.1: Key Characteristics of Wet and Dry Bean Cocoa Production Strategies

Item	Wet Bean	Dry Bean
Duration of harvest round (days)	0.36	2.3
Laborers per harvest group (avg #)	1.78	4.4
Labor days spent on harvest (avg #)	0.68	10.46
Labor Allocation	More women	More men
Income earned per harvest round (PG Kina avg)	17.00	374.22
Control of income	Harvester	Male HH head
Transport costs	Nil/Low	High
Share of cocoa in HH income (%)	40	77

Source: Curry et al. 2007:59.

Table 4.2: The Cocoa Supply Chain–Key Characteristics and Issues

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
 <p>Inputs</p>	<ul style="list-style-type: none"> Cocoa producers: ▪ Plantations ▪ Smallholder Farmers 	<ul style="list-style-type: none"> ▪ Provides/allocates land for farming 	○	<ul style="list-style-type: none"> ▪ Land shortage, due to population pressure ▪ Competing uses for land given volatility of world/mkt prices 	<ul style="list-style-type: none"> ▪ Men own land and decide on its use ▪ Women only have "use rights" on land 	<ul style="list-style-type: none"> ▪ Increase women's ownership (or joint ownership) of land ▪ Strengthen women's participation in land use decisions
	<ul style="list-style-type: none"> ▪ Suppliers of agricultural inputs ▪ Brian Bell Ltd. ▪ Farmset Ltd. ▪ Agmark ▪ Nurseries: CCIL 	<ul style="list-style-type: none"> ▪ Nurseries & Bud Gardens provision of seedlings, chemicals, and other materials 	○○	<ul style="list-style-type: none"> ▪ Unreliable inputs ▪ Poor quality seedlings and materials ▪ Limited varieties ▪ High cost of inputs ▪ Need CPB resistant clones 	<ul style="list-style-type: none"> ▪ Women have less mobility and greater food production and domestic obligations 	<ul style="list-style-type: none"> ▪ Opportunity for women to work in this area ("more meticulous") - can lead to better quality seedlings/ plant material
		<ul style="list-style-type: none"> ▪ Transport 	○	<ul style="list-style-type: none"> ▪ Poor roads ▪ Lack of adequate transport services ▪ Insecurity and crime 	<ul style="list-style-type: none"> ▪ Women largely excluded from transport networks 	
	<ul style="list-style-type: none"> ▪ Technical support services ▪ Extension agents ▪ CCI ▪ Cocoa Board ▪ Cocoa Exporters ▪ PPAP ▪ Other donor-funded projects 	<ul style="list-style-type: none"> ▪ Provide technical knowledge and skills for cocoa farming ▪ Provide extension services & funding for research and extension ▪ Provide business management skills for cocoa cultivation ▪ Provide knowledge/skills on livelihood strategies ▪ Undertake research on cocoa-related issues, e.g., addressing CPB ▪ Develop new materials and techniques based on research ▪ Introduce new varieties, 	○○	<ul style="list-style-type: none"> ▪ Poor knowledge and skills ▪ Lack of business focus (cocoa farming not seen as business) ▪ Lack of management skills ▪ Extension services reach very small number of farmers ▪ Extension messages largely focus on "social" issues ▪ CPB major threat to the sector ▪ CPB requires major shift toward more labor-intensive 	<ul style="list-style-type: none"> ▪ Women are poorly represented among researchers and extension agents ▪ Insecurity limits women's capacity to work in the field ▪ Men primary beneficiaries of extension and training services ▪ Specificity of women's tasks insufficiently addressed ▪ Decision-making power primarily with men 	<ul style="list-style-type: none"> ▪ Build capacity of women to undertake agricultural research and to serve as extension agents ▪ Focus agronomic extension services and training on the key production and processing tasks undertaken by women, which are critical to quality of product ▪ Strengthen role of women's groups and associations in cocoa

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
	<ul style="list-style-type: none"> ▪ Financial services ▪ Micro banks ▪ SMDC ▪ National Development Bank (NDB) 	seedlings, material <ul style="list-style-type: none"> ▪ Provision of financial services 	<ul style="list-style-type: none"> ●● 	practices <ul style="list-style-type: none"> ▪ Lack of credit 	<ul style="list-style-type: none"> ▪ Gender bias in credit access, women face greater barriers, i.e, lack of collateral and fixed assets 	<ul style="list-style-type: none"> ▪ Improve women's access to financial services, including bank accounts, payment systems, financial products that address gender-specific constraints (collateral requirements)
<div style="border: 1px solid black; border-radius: 15px; background-color: #f8d7da; padding: 10px; width: fit-content; margin: 0 auto;"> <p>Farm Production</p> </div>	Cocoa producers: <ul style="list-style-type: none"> ▪ Plantations ▪ Smallholder Farmer ▪ Cooperatives ▪ Youth and Women's Groups 	<ul style="list-style-type: none"> ▪ Land preparation ▪ Land rehabilitation ▪ Shade tree preparation ▪ Drainage ▪ Planting ▪ Re-planting ▪ Weeding and Pruning ▪ CPB management: integrated pest mangement techniques 	<ul style="list-style-type: none"> ○ ○ ○ ○ ●● ●● 	<ul style="list-style-type: none"> ▪ Lack of basic farm tools, chemicals, materials ▪ Land disputes (over land to allocate to cocoa) ▪ Competing uses of land ▪ Impact of CPB ▪ Greater labor-intensity required ▪ "Farming" vs. "Foraging" cocoa 	<ul style="list-style-type: none"> ▪ Predominantly male tasks, but women contribute to these activities as well ▪ Perceived by men and women as a "men's" crop 	<ul style="list-style-type: none"> ▪ Opportunity to sensitize both men and women to women's contribution to cocoa (quality) and to greater sharing of crop benefits
<div style="border: 1px solid black; border-radius: 15px; background-color: #f8d7da; padding: 10px; width: fit-content; margin: 0 auto;"> <p>Harvest & post- harvest Processing Activities</p> </div>	<ul style="list-style-type: none"> ▪ Cocoa producers sellers of wet beans ▪ Buyers of wet beans ▪ Plantations ▪ Exporters ▪ Cooperatives ▪ Youth and Women's Groups ▪ Cocoa producers/sellers of dry beans with dryers ▪ Plantations ▪ Smallholder Farmers ▪ Cooperatives 	<ul style="list-style-type: none"> ▪ Harvesting/Picking ▪ Sale of wet beans ▪ Transport of wet beans to buyer ▪ Harvesting/Picking ▪ Sorting (Pod opening) ▪ Transport to fermentary ▪ Fermentation ▪ Drying 	<ul style="list-style-type: none"> ●● ○ ○ ●● ○ ●● ○ ●● 	<ul style="list-style-type: none"> ▪ "Farming" vs. "Foraging" cocoa ▪ No access to dryers ▪ Poor roads ▪ Lack of transport services ▪ Insecurity and crime ▪ "Farming" vs. "Foraging" cocoa ▪ Time-critical task ▪ Labor and management-intensive work 	<ul style="list-style-type: none"> ▪ Men lose interest in older plantations ▪ Lack of investment in replanting/upgrading ▪ Women largely excluded from transport networks ▪ Many of these tasks are primarily women's responsibility ▪ Time constraints and other work 	<ul style="list-style-type: none"> ▪ Opportunity for 'kwik moni' for women in foraged blocks ▪ Time critical task ▪ How this is done directly affects quality of final product ▪ Opportunity for women to contribute directly to better quality of product

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
	<ul style="list-style-type: none"> Others (producers and processors) with dr 	<ul style="list-style-type: none"> Bagging, Packing, and Storage at household level 	⊙⊙	<ul style="list-style-type: none"> Low quality resulting from lack of timely and effective management practices Poor and untimely drying practices lead to "smoke taint" and lower quality product 	<ul style="list-style-type: none"> responsibilities limit labor allocation to these tasks in sufficient quantity and in timely manner Incentives for women differ from those of men because of differences in benefit obtained for work done 	<ul style="list-style-type: none"> Need to target extension and training services on the specific quality-enhancing role of women's work Provide women better incentives to allocate labor through greater share of resulting income Need to alleviate overall labor burdens of women (including domestic tasks)
<div style="border: 1px solid black; border-radius: 15px; background-color: #f8d7da; padding: 10px; text-align: center; width: 60px; margin: auto;">Export</div>	<ul style="list-style-type: none"> Export companies, Agmark and others, Transporters Other traders CCI PNG Cocoa Board PNG Customs PNG Ports Other authorities 	<ul style="list-style-type: none"> Sale of dry beans to exporter/trader 	⊙	<ul style="list-style-type: none"> Low quality Low prices 	<ul style="list-style-type: none"> Sales and control of cash largely the domain of men Conflict and domestic violence 	<ul style="list-style-type: none"> Improve incentives for women through greater sharing of cocoa income Bank accounts and payment systems Cooperatives and transparency
		<ul style="list-style-type: none"> Transport to Exporter and to wharf 	⊙	<ul style="list-style-type: none"> Poor roads Lack of transport services Insecurity 	<ul style="list-style-type: none"> Women largely excluded from transport networks 	
		<ul style="list-style-type: none"> Compliance tests and assessments (CCI) 	⊙⊙			
		<ul style="list-style-type: none"> Customs and other clearances 	⊙⊙			
		<ul style="list-style-type: none"> Shipment to Importer 	⊙			
	<ul style="list-style-type: none"> Specialty producers Exporters Certification agencies 	<ul style="list-style-type: none"> For specialty cocoa 		<ul style="list-style-type: none"> Certified and/or organic cocoa small share of production Need to broaden certification and enable farmers to meet criteria 	<ul style="list-style-type: none"> Gender issues not substantively addressed in "social" criteria for certification 	<ul style="list-style-type: none"> Opportunity to strengthen gender inclusion, notably around cooperatives, in cocoa certification
FINAL CONSUMER						

Key: **GDL** = Gender division of labor. ● = Predominantly/Exclusively Male; ◎ = Predominantly/Exclusively Female; ●◎ = shared/joint tasks.

4.1.1 Gender Roles and Responsibilities

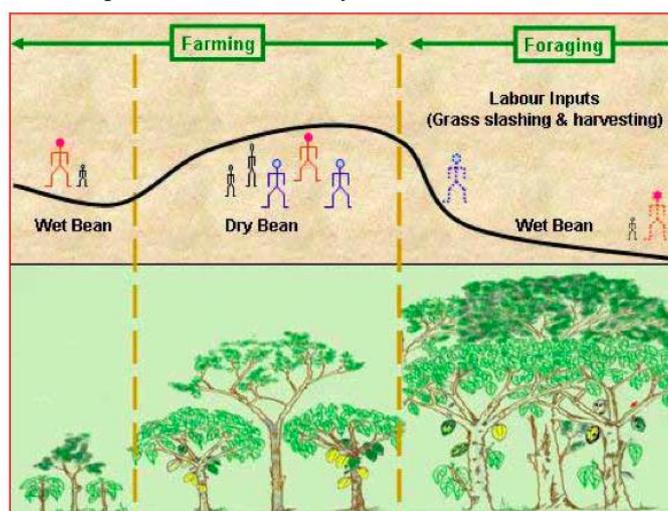
The different stages of cocoa cultivation, reflecting the age and potential of the cocoa trees, are what gives rise to the distinction, made by Curry et al. (2007) between "farming" and "foraging." This distinction reflects very different mind-sets on the part of farmers as to how to approach cocoa cultivation (Box 4.2).

Significantly, with respect to cocoa, it is recognized that when a "foraging" mindset is operative (see discussion for coffee above and Curry et al. 2007), this essentially means that the little production and processing work that is undertaken is done by women: "[o]nce the foraging stage sets in, trees are either left for occasional pod harvesting and wet beans sales (mainly by women and children) or abandoned (Agrifood Consulting International 2009:64).

It is particularly striking that this analysis pre-dates the advent of the cocoa pod borer (CPB) in the cocoa-growing areas of PNG. Indeed, while there are references to pests and diseases, and to the importance of sound block management practices to combat them, there is little to suggest how important these issues were to become, as the full implications of the impact of CPB, which has led to an 80% decline in yields since 2008, become apparent.

Box 4.2: The Stages of Cocoa Development: Farming vs. Foraging

When a cocoa stand enters Stage 3, income from the block declines rapidly to low levels, and dry bean production ceases. Cooperative household work groups are disbanded and production strategies revert to those similar to Stage 1 development, that is, very small quantities of cocoa harvested by women working alone or with young children (Figure). During Stage 3, the small quantities of cocoa harvested are sold as wet bean and production is driven by short-term needs.



Typically, families use their Stage 3 cocoa blocks like bank ATMs: the cocoa block is visited only when cash is required for immediate consumption (e.g., church donations or small store purchases such as soap, kerosene, or food for the evening meal). Growers call this type of income 'kwik moni' because the income is earned quickly and with little effort. Block visits rarely involve more than a few hours of harvesting during which time one or two baskets of wet beans are collected and sold (average harvest 17.7 kg — see Table 4.6). Very little or no time is allocated to block maintenance. This type of production practice is known as 'forage harvesting'. Male farmers have lost almost all interest in their cocoa block as it enters the Stage 3 senile phase.

Source: Curry et al. 2007:97.

4.1.2 Gender-Based Constraints and Implications for the Supply Chain

Labor. Even before the advent of CPB, labor shortages were identified as a problem for cocoa growers in ENB province (Curry et al. 2007:26). Farmers relied extensively on unpaid family labor for cocoa production. Shortages arise for various reasons,

including, according to one source cited by Curry et al., lack of cooperation among family members, illness and death disrupting work schedules, reduced access to extended family labor, increase in the size of holdings leading to insufficient labor for the area planted, and the rising cost of hired labor (Curry et al. 2007:26). Labor shortages were identified in the Curry et al. study as one of four main constraints to cocoa production:

- theft of cocoa pods (in some cases, an indication of under-harvesting) (27%);
- poor block condition (overgrown cocoa trees, over-shading and high levels of pests and diseases) (26%);
- labor shortages (19%);
- limited knowledge of proper block management practices (especially regarding the new hybrid cocoa clones) (9%).

Curry and Koczberski argue that labor shortages do not necessarily reflect a lack of available labor, but rather a low level of cooperation of family members in production, and a reluctance of farmers to use hired labor. They suggest that labor constraints may be temporary (e.g., illness or the diversion of labor to other activities), or they may be more enduring because of household demographic factors, such as an elderly household head without co-resident sons. Sometimes family members are discouraged from providing labor when they feel they are not being adequately remunerated for their labor. They specifically suggest that women often divert their labor away from export crop production when they, or their family as a whole, are not benefiting from the income earned (Curry and Koczberski 2009a, in Agrifood Consulting International 2009:43).

CPB exacerbates the labor constraint by requiring an even more labor-intensive approach to cocoa block management/cultivation, while simultaneously reducing the output from these blocks. Curry et al. (2009) specifically articulate the view that "the survival of the cocoa industry in ENBP depends on smallholder farmers moving to a higher labor-input system of production" (Curry et al. 2009:xi). Discussions held with the representatives from CCI and the PNG Women in Agriculture Association (on the 28th January 2014 at Kerevat) indicate that it takes 2-3 times as much labor to manage cocoa blocks since the advent of CPB. However, as pointed out at the Stakeholder Workshop (Annex 6), this is a temporary situation, and, once CPB has been controlled, labor allocation to cocoa cultivation can return to more normal levels.

Curry et al. point out that understanding why some households are unwilling or unable to overcome labor shortages and how labor availability influences a household's cocoa harvesting strategy (wet bean or dry bean) requires further attention in cocoa research (Curry et al., 2007:65). Of course, as they also point out, labor issues are not the only determinants of cocoa production strategies, since the age and condition of the cocoa blocks also play an important part in determining whether dry or wet bean production strategies are adopted. Specifically, they argue:

Although other variables, such as labor supply, price and access to a fermentary are important for explaining smallholder harvesting strategies, the quantity of accessible healthy ripe pods is critically important and must be above some minimum threshold quantity for smallholders to invest time and labor in their cocoa blocks. If the quantity of ripe pods falls below this threshold level, smallholders will switch to strategies of lower labor inputs and will not invest labor in grass slashing. On the other hand, when the quantity of healthy ripe crop is above this threshold

level (e.g., during flush periods or on high-yielding younger blocks), growers are motivated to spend more time on their blocks, both grass slashing and harvesting for dry bean production. Indeed, farmers with both young and old cocoa blocks invest more harvesting and maintenance labor in their higher producing younger blocks where access is easier and where pest and disease levels are lower (Curry et al., 2007:68).

In essence, to borrow these terms from Curry et al., the impact of CPB has been to bring the quantity of healthy ripe pods below this minimum threshold, with major implications for labor allocation and returns to investment in the cocoa sector. This is why it is argued that, if the industry is to survive, smallholders must adopt a much more (labor) intensive production strategy. It is also why that is so difficult to achieve. Consequently, this analysis takes the view that labor availability is the binding constraint, as, with adequate labor, more work could be put into block maintenance and, as needed, replanting old cocoa stock.

The non-adoption of good cocoa farming practices leads to a mutually reinforcing set of negative outcomes: low productivity, low quality, greater vulnerability to pests and disease, little investment in replanting or rehabilitating existing gardens, low income-earning and labor absorption, a missed opportunity to reduce poverty, and inefficient use of land and waste of resources (Agrifood Consulting International 2009:63-65). However, it is the gender-specific dynamic of labor allocation and the disconnect with benefits obtained that is, perhaps, the most important single driver of labor constraint in the cocoa production and processing cycles. In a "farming" approach to cocoa cultivation, substantial labor (male and female) is mobilized, whereas under a "foraging" approach, minimum labor is deployed (mostly female, as males have "lost interest" in the cocoa blocks), with attendant implications for yields and returns.

Resources and Knowledge. As mentioned above, Curry et al. (2007) identified limited knowledge of proper block management practices (especially regarding the new hybrid cocoa clones) as one of the four major constraints to cocoa production, though it was the one mentioned least, by 9% of farmers. A case study of the Integrated Agriculture Training Program (IATP) in East New Britain examined the Program's attempts to ensure the integration of the interests of rural women. It found that in spite of success in implementing training appropriate for women, meeting their needs and having positive impact on women's livelihoods, the Program's success in responding to gender concerns was limited by constraints that were themselves due to gender inequality. These included low participation of women in the courses, the lower educational levels of women, and difficulties women have in implementing changes to their livelihoods after training. Another factor was cultural limitations that make contact between unrelated men and women unacceptable in many areas. Extension and training for women is thus made even more difficult if the trainers and extension staff are men. Furthermore, only a limited number of women have the education and qualifications to enable them to become trainers and/or agricultural extension staff (Cahn and Liu 2008).

Training venues present another potential barrier for women's participation, as travel to training courses can be difficult for women in the context of remote villages, limited transport, and fears about safety, as well as the heavy workloads associated with women's roles. This is exacerbated if the courses are held all day over several days and/or husbands disapprove of their participation (Cahn and Liu 2008).

Land. Gender roles in PNG agriculture might best be understood in relation to authority over land and fixed assets in systems of traditional tenure, in which rights of control generally reside with men, regardless of whether the social system of descent and inheritance is matrilineal or patrilineal (World Bank n.d.(3):1-2).

Gardens planted with annual food crops do not secure long-term usufructuary rights over land, as do small plantations of perennial crops such as cocoa, coffee and coconuts. Food gardens are generally transient, whereas plantations of perennials are semi-permanent markers of property rights and confer status on the men who control them. The primary objective in planting perennial tree crops such as cocoa, coffee and coconuts may be to establish long-term rights to land in traditional tenure systems, rather than to establish an agricultural business. It is common for smallholdings to receive minimum maintenance and for harvesting to occur when cash is needed, rather than to be operated on a business-like basis (World Bank n.d.(3):1-2).

Income. Income from cocoa and coffee is usually considered to belong to the man who controls the smallholding (World Bank n.d.(3):2). Disputes over allocation of income are a major source of conflict in PNG households. Incomes from cocoa have diminished dramatically since the advent of CPB, and livelihoods in the cocoa-growing areas are threatened. With men's primary income source largely removed, shifts are occurring in household strategies and labor allocation. One perhaps unintended benefit of CPB is reduced expenditure on beer, with women reporting less crime associated with drunkenness, such as domestic violence (Curry et al. 2009:52).

Incentives. Gender differences in incentives to contribute labor to cocoa cultivation, as noted in several studies, also play a part. They suggest not only that it is important, in the cocoa sector, as elsewhere, to mobilize female labor, but that, to succeed with such mobilization, it will be essential to address these incentive differences and to ensure that the benefit women obtain from their labor is commensurate with the work they do. The gender analysis conducted for the PPAP Project Implementation Manual (PIM) notes that, while smallholders recognize that labor shortages are a significant constraint to improving cultivation and processing practices, it was unlikely that women would increase their allocation of time to cocoa management and production because the incentives were less attractive than other means of earning income (World Bank n.d.(3):2). Differences in incentives are not only relevant for women's labor allocation and choices. These studies point out that younger males (sons of household heads) also resist allocating their labor to cocoa cultivation if they feel that they are not being sufficiently compensated for the work undertaken. This view was affirmed by the members of the PNG Women in Agriculture Association (who are mostly mothers), during the field consultations held in late January 2014 in Kerevat, who stated that the youth (young men) were not particularly interested in cocoa, so the Association was looking at various options, such as fish farming, to integrate the young men into the economic life of their communities.

Moreover, improvement of cocoa cultivation practices, for example by doing away with the stage 3 (foraging) period, would have the perhaps unintended effect of removing a modest income-earning opportunity for women. Through foraging in stage 3 blocks, women have the opportunity to generate a small amount of cash (*kwik moni*), because men no longer have any interest in the stage 3 block, and have directed their energy elsewhere. While it is true that benefits of this kind are necessarily short-lived and would gradually disappear altogether, the loss of this income source does mean that women may need even more of an incentive than is perhaps currently the case to

provide their labor to the task of engaging fully in the much more labor-intensive stage 1 and 2 cocoa cultivation that is needed if CPB is to be tackled effectively.

4.2 Certification

Certification has been less of a concern in the cocoa sector than for coffee (see discussion of certification in Chapter 3). According to the Cocoa Board, certification is now becoming a much more important subject in the cocoa trade as well. It is widely believed that by 2020 all cocoa bean products will be marketable only if they are certified under any of the certification labels currently known, such as Fair Trade, Rainforest Alliance, and UTZ Certified (Cocoa Board 2013). This provides an important opening not only to promote certification among cocoa growers and throughout the supply chain, but also, and importantly, to do so in a way that is gender-inclusive, i.e., that certification schemes, where they are focused on "social" co-benefits, emphasize benefits accruing to women from cocoa cultivation and marketing.

4.3 Concluding Observations

The cocoa sector has been devastated by CPB, leading to an 80% drop in yields. This has radically changed the labor dynamics operating in the sector. To combat CPB effectively requires 2-3 times as much labor for block cultivation and management than was the case before. However, as pointed out at the Stakeholder Workshop (see Annex 6), this situation is temporary, and once CPB is under control, labor allocation can return to pre-CPB levels. At the same time, CPB means that there are fewer healthy beans to harvest, and, consequently, less revenue. Consequently, there is little investment in renewing cocoa plantations, and many blocks are in stage 3 production. This in turn leads to adoption of a "foraging" rather than "farming" approach to cocoa cultivation, and the residual work on these blocks is largely undertaken by women, for whom this is a source, albeit gradually declining, of modest income.

One of the ways to mobilize sufficient labor for cocoa cultivation will be to enable women to obtain more of the benefit from stage 1 and 2 cocoa cultivation, and to have the incentive to allocate more labor to these tasks. It is equally important in the PNG context to mobilize youth to remain in (or return to) agriculture, and to address the incentives required for youth to re-engage in cocoa production. As indicated elsewhere, a mechanism to support farmers in adopting a more business-focused approach to cocoa cultivation, and to enable women to contribute more to, and benefit more from, the sector, is through the use of cooperative associations. The Cocoa Board of PNG is encouraging farmers to form cooperatives through which they can process and market their cocoa.

5 The Fresh Produce Supply Chain

Despite lack of recent data, it is widely accepted that the fresh produce (horticulture) industry has great potential to contribute to the country's development. This is reflected in several of the key strategic documents of the GoPNG, such as the PNGSDP 2010-2030. A more detailed treatment of the structure and characteristics of PNG's fresh produce sector is in Annex 5.

A summary of the key steps, tasks, and indicative gender division of labor in the fresh produce supply chain is presented in Table 5.1 below. The table also synthesizes key systemic issues affecting the performance of the chain, along with the main gender issues and opportunities identified in this report. The following paragraphs discuss these points in more detail.

5.1 Gender Issues in the Fresh Produce Supply Chain

5.1.1 Gender Roles and Responsibilities

In PNG, it is well established that women are the primary producers of food crops (Pamphilon et al. 2013:103; Spriggs et al, 2004:1). The role of women as primary producers of food crops was offered as a justification for a recent baseline study undertaken to improve the business knowledge and practices of women smallholder farmers in two communities in the Western Highlands and the East New Britain Provinces. The justification offered for this study also succinctly summarizes the role that women play along the supply chain of fresh produce, i.e., that women are the primary producers and sellers of food crops, as well as taking an increasing role in cash cropping, which pays for education, health and family obligations (Pamphilon et al. 2013:103).

Consultations were held with a wide range of people and organizations associated with the fresh produce industry in an effort to understand the constraints that women encounter and to identify opportunities that might be available to women. These consultations revealed that women face great difficulties along the fresh produce supply chain. They confirm many of the findings of other studies (notably Bonney et al. 2012; Martin & Jagadish 2006): (i) many different markets exist with varying needs; (ii) complex relationships exist among players; (iii) individuals and organizations adopt widely varying strategies to respond to the needs of the market; (iv) there is massive product waste, due to lack of proper post-harvest management practices, poor communication among players, and lack of consistent supply of quality agricultural inputs. Beyond these, poor or non-existent infrastructure (notably storage, cold chains, and transport), and persistent insecurity have particularly detrimental effects on the fresh produce sector. All of these affect value creation along the fresh produce supply chain.

Table 5.1: The Fresh Produce Supply Chain Marketing System–Key Characteristics and Issues

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
<div style="border: 1px solid black; border-radius: 10px; background-color: #d9ead3; padding: 5px; text-align: center; width: 60px; margin: 0 auto;">Inputs</div> <div style="text-align: center; margin: 10px 0;"> </div>	<ul style="list-style-type: none"> ▪ Smallholder farmers 	<ul style="list-style-type: none"> ▪ Provides/allocates land for farming 	○	<ul style="list-style-type: none"> ▪ Land shortage, due to population pressure (in some areas) 	<ul style="list-style-type: none"> ▪ Men own land and decide on its use ▪ Women only have "use rights" on land 	<ul style="list-style-type: none"> ▪ Increase women's ownership (or joint ownership) of land ▪ Strengthen women's participation in land use decisions
	<ul style="list-style-type: none"> ▪ Suppliers of agricultural inputs & materials ▪ Brian Bell Ltd. ▪ Farmset Ltd. ▪ Agmark Machinery ▪ Micro banks ▪ SMDC ▪ National Development Bank (NDB) 	<ul style="list-style-type: none"> ▪ Provision of agricultural inputs, seeds, fertilizers, machinery 	○	<ul style="list-style-type: none"> ▪ Limited stock/variety ▪ Outdated/expired supplies ▪ Low/poor quality ▪ Inconsistent supply ▪ High cost 	<ul style="list-style-type: none"> ▪ High cost: inputs not affordable ▪ Women have less "cash" to pay for inputs ▪ Men control decision as to resource use 	<ul style="list-style-type: none"> ▪ Ensure consistent and reliable supply of fresh produce (vegetable) seeds. for women in FP sector to improve quality of production
	<ul style="list-style-type: none"> ▪ Provision of financial services (loans, credit, savings) to farmers 	○	<ul style="list-style-type: none"> ▪ Lack of credit ▪ Limited availability of financial services in rural areas and serving rural communities 	<ul style="list-style-type: none"> ▪ Women face gender-specific barriers to credit access, including lack of collateral 	<ul style="list-style-type: none"> ▪ Facilitate men's and women's access to bank accounts, payment systems ▪ Develop credit facilities accessible to women farmers 	
	<ul style="list-style-type: none"> ▪ Other stakeholders: ▪ FPDA ▪ DAL ▪ PDAL ▪ Mining companies ▪ NGOs, others 	<ul style="list-style-type: none"> ▪ Research and market analysis ▪ Development and introduction of new varieties/technology ▪ Supply seedlings 	○○	<ul style="list-style-type: none"> ▪ Poor farmer knowledge and skills ▪ Lack of market information and facilitation ▪ Lack of livelihood strategies ▪ Impact of insecurity (crime, violence) 	<ul style="list-style-type: none"> ▪ Gender differences in education and literacy ▪ R&D not sufficiently focused on women's tasks and women's crops 	<ul style="list-style-type: none"> ▪ Expand # and capacities of women researchers and extension agents ▪ Improve quality and timeliness of seed supplies
<div style="border: 1px solid black; border-radius: 10px; background-color: #d9ead3; padding: 5px; text-align: center; width: 60px; margin: 0 auto;">Farm Production</div>	<ul style="list-style-type: none"> ▪ Smallholders, cooperatives, youth and women's groups, NGOs ▪ Extension Agents such as FPDA and DAL ▪ Other providers of extension and training services 	<ul style="list-style-type: none"> ▪ Land preparation 	○○	<ul style="list-style-type: none"> ▪ Lack of appropriate farm equipment and machinery 	<ul style="list-style-type: none"> ▪ Little or no mechanization, manual labor used 	<ul style="list-style-type: none"> ▪ Improve women's access to farm equipment and tools ▪ Time savings ▪ Expansion of production
		<ul style="list-style-type: none"> ▪ Fencing 	○			
		<ul style="list-style-type: none"> ▪ Nursery establishment 	○○	<ul style="list-style-type: none"> ▪ High level of waste in seed establishment 	<ul style="list-style-type: none"> ▪ □□□□□ multiple tasks, overwork 	<ul style="list-style-type: none"> ▪ Focus extension and training on women's tasks and needs
		<ul style="list-style-type: none"> ▪ Nursery maintenance 	○	<ul style="list-style-type: none"> ▪ Poor farmer knowledge and skills 	<ul style="list-style-type: none"> ▪ Insufficient labor for timely inputs 	<ul style="list-style-type: none"> ▪ Expand # and capacities of women researchers and extension agents
		<ul style="list-style-type: none"> ▪ Field planting 	○	<ul style="list-style-type: none"> ▪ Lack of market 	<ul style="list-style-type: none"> ▪ Women benefit less from 	
	<ul style="list-style-type: none"> ▪ Weeding 	○				

Key Steps/ Elements of the Supply Chain		Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities			
<div style="border: 1px solid black; border-radius: 10px; background-color: #d9ead3; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">Harvesting Packing Transport</div> <div style="text-align: center; margin: 10px 0;">↓</div>			<ul style="list-style-type: none"> ▪ Fertilizer application ▪ Chemical application 	<ul style="list-style-type: none"> ○ ○ 	<ul style="list-style-type: none"> information and facilitation ▪ Lack of business management knowledge & skills ▪ Lack of livelihood strategies ▪ Impact of insecurity (crime, violence) on extension delivery ▪ Variable labor costs 	<ul style="list-style-type: none"> training and extension services ▪ Gender differences in education and literacy ▪ Women lack confidence and motivation when interacting with outsiders ▪ Insecurity has greater impact on women 	<ul style="list-style-type: none"> ▪ Improvement in security conditions will enable women to be more involved in extension delivery 			
		<ul style="list-style-type: none"> ▪ Smallholders, cooperatives, youth and women's groups, NGOs 	<ul style="list-style-type: none"> ▪ Harvesting ▪ Sorting ▪ Packing 	<ul style="list-style-type: none"> ◎ ◎ ◎ 						
		<ul style="list-style-type: none"> ▪ Transport companies ▪ PMV owners ▪ Other transporters 	<ul style="list-style-type: none"> ▪ Transport to local markets 	<ul style="list-style-type: none"> ◎◎ 				<ul style="list-style-type: none"> ▪ High cost of transport ▪ Access to means of transport ▪ Use of inappropriate transport (PMVs) for fresh produce, with high wastage 	<ul style="list-style-type: none"> ▪ □□□□ largely excluded from transport networks and services ▪ women less mobile, more difficulty securing demand 	<ul style="list-style-type: none"> ▪ Transport services accessible to women ▪ Improve communications between farmers, transporters, and buyers
		<ul style="list-style-type: none"> ▪ Smallholders, cooperatives, youth and women's groups, NGOs 	<ul style="list-style-type: none"> ▪ Sale for cash in local markets (open markets in urban centers or roadside markets) 	<ul style="list-style-type: none"> ◎ 				<ul style="list-style-type: none"> ▪ Unhygienic market conditions (lack of shelter, sanitary facilities, animals roaming) ▪ Cash transactions ▪ No banking facilities ▪ No other services (child care, washrooms) ▪ Crime and violence ▪ Insecurity 	<ul style="list-style-type: none"> ▪ Women bear the brunt of poor conditions ▪ Lack of child care and other services ▪ Greater risk for women of robbery, violence, and harassment 	<ul style="list-style-type: none"> ▪ Improve market security (policing) ▪ Provide market area services (banking, washrooms, child care) ▪ Women have direct access to this income ▪ Women have more decision power on use of this income
<div style="border: 1px solid black; border-radius: 10px; background-color: #d9ead3; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">Consolidation of produce</div>		<ul style="list-style-type: none"> ▪ Middlemen buyers ▪ Aggregators ▪ Wholesale buyers ▪ Transporters ▪ Best Buy & Wizzy Fresh (Mt. Hagen) 	<ul style="list-style-type: none"> ▪ Produce consolidated (aggregated) from farmers at open market (e.g., Mt. Hagen) 	<ul style="list-style-type: none"> ◎◎ 	<ul style="list-style-type: none"> ▪ Price variability ▪ Inconsistent supply ▪ Variable and often poor quality ▪ High level of waste and product loss 	<ul style="list-style-type: none"> ▪ Women have less access to "credit" ▪ Few women involved in aggregation or trade ▪ Women largely excluded from transport networks 	<ul style="list-style-type: none"> ▪ Increased opportunity for entrepreneurial women to operate as aggregators (2 in Mt. Hagen market area) 			

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
				<ul style="list-style-type: none"> Purchases made on credit (mining companies) 		
<div style="border: 1px solid black; border-radius: 10px; background-color: #d9ead3; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">Storage & Transport</div> <div style="text-align: center; width: 20px; height: 20px; background-color: #f4cccc; border: 1px solid #d9534f; margin: 0 auto;">↓</div>	<ul style="list-style-type: none"> Traders, buyers, transporters, aggregators 	<ul style="list-style-type: none"> Re-sorting, repacking 	◎◎	<ul style="list-style-type: none"> Variable costs of packaging 		
		<ul style="list-style-type: none"> Cool storage, handling 	◎◎	<ul style="list-style-type: none"> Lack of cool storage facilities High level of waste and product loss 		
		<ul style="list-style-type: none"> Transport by road to ports, airports, or directly to more distant markets 	◎	<ul style="list-style-type: none"> Poor communication between farmers and transporters 	<ul style="list-style-type: none"> Women largely excluded from transport networks "Heavy" cargo often excludes women from handling tasks 	
	<ul style="list-style-type: none"> Air freight companies Air Niugini 	<ul style="list-style-type: none"> Transport by air to POM and other markets 	◎	<ul style="list-style-type: none"> High cost of transport, especially air transport 		
	<ul style="list-style-type: none"> Shipping companies Consort Shipping Bismarck Shipping 	<ul style="list-style-type: none"> Transport by ship to POM and other markets 	◎	<ul style="list-style-type: none"> Poor transport use (including PMVs) High level of waste and product loss Delays in transport lack of cool storage at wharf/airport 		
<div style="border: 1px solid black; border-radius: 10px; background-color: #d9ead3; padding: 5px; text-align: center; width: fit-content; margin: 0 auto;">Distribu- tion & Marketing</div>	<ul style="list-style-type: none"> Traders, buyers, market owners Supermarkets: CPL Group, J-Mart, Garamut Enterprises, Papindo Supermart, Rimbunan Hijau PNG, SVS Supermarkets Catering Companies: National Catering Services (NCS), Alliance Group (TAG) Wholesaler: Green 	<ul style="list-style-type: none"> Sorting & repacking 	◎◎	<ul style="list-style-type: none"> Product losses 		
		<ul style="list-style-type: none"> Distribution & transport 	◎◎	<ul style="list-style-type: none"> Quality differentials Poor communication 	<ul style="list-style-type: none"> Women largely excluded from transport networks 	
		<ul style="list-style-type: none"> Sale in urban markets or to businesses 	◎◎	<ul style="list-style-type: none"> Insecurity in markets Variable quantities and demand 	<ul style="list-style-type: none"> Differences in business skills and opportunities 	<ul style="list-style-type: none"> Role as buyers for supermarkets and catering services Strengthen linkages with producers (predictability of supply and quality) Women already strongly engaged in community development in mining areas

Key Steps/ Elements of the Supply Chain	Principal Actors	Principal Tasks and Activities	GDL	Overarching Supply Chain Issues	Gender-Based Constraints	Gender-Based Opportunities
	Fresh Ltd. ▪ Kai bars ▪ Mining companies					
CONSUMER	▪	▪		▪	▪	▪

Key: GDL = Gender Division of Labor. ♂ = Predominantly/Exclusively Male; ♀ = Predominantly/Exclusively Female; ♂♀ = shared/joint tasks.

Along the supply chain, women undertake most of the tasks associated with the cultivation of fresh produce. Traditionally, the role of women is perceived as providing food for the family's sustenance. Hence, the tasks involved in producing fresh produce come naturally as a woman's role. However, as smallholders venture more into farming crops for cash incomes, men play a pivotal role in both the production and marketing of fresh produce. Two tomato farmers from the Dei Council Area in the Western Highlands Province stated that tomato is a high-priced crop but one that requires tender love and care. Given its delicacy and high level of perishability, men undertake most of the tasks associated with production and marketing of tomato. The tomato farmers also emphasized that women are less aggressive in finding markets for their fresh produce, and, as a result, men take over the marketing role.

Women play an active role in selling fresh produce in informal markets throughout the country. Men undertake most of the transportation and handling tasks associated with transporting fresh produce, particularly from the Highlands to distant markets in Lae, POM, and elsewhere. For the formal marketing system, fresh produce is consolidated by both men and women. These men and women are either buyers or middlemen buying for their clients. All tasks associated with consolidation of fresh produce – re-sorting and re-packing, transportation, cool storage, and freighting to distant markets – is shared between men and women. However, men are usually tasked with the responsibility of providing transportation/handling and security for women, while women carry the cash and do the actual purchasing of produce. At present, there are two active female aggregators at the Mount Hagen market (see sidebar). These women aggregate fresh produce on a daily basis and ship it out to their clients in distant markets in Lae and Port Moresby.

Naomi Nolick is one of the female aggregators of fresh produce operating out of the Mount Hagen market. She aggregates fresh vegetables twice a week from smallholder farmers based in the Western Highlands and Jiwaka Provinces and sends these vegetables to her clients in Port Moresby.

Naomi commenced as an aggregator in 2008 and has been moving 8 tonnes of fresh vegetables every week. However, the volume has dropped to 3 tonnes since late 2013 due to competition from other players.

Naomi indicates that aggregating produce is not a problem. But the challenges lie in terms of cold storage and transportation, e.g. delayed flights resulting in high wastages due to lack of cold storage facilities.

Sweet potato cultivation provides a useful example of gender roles in this sector. According to ACIAR research, overall, 55% and 28% of male household members are engaged in sweet potato production and marketing, respectively. By contrast, 68% and 62% of female household members are engaged in sweet potato production and marketing, respectively. The analysis shows that women play a greater role in decision-making in this sector (Box 5.1). These figures are consistent across groups, and highlight the importance and role of women in the sweet potato supply chain in the PNG highlands, and the need to focus research and training activities for post-harvest and marketing on women (Chang, Irving, and Villano 2013:52). Interestingly, the analysis of the choice of sweet potato varieties that are grown shows that most farmers do not grow sweet potato specifically for the market, instead they sell what they are growing—an indication of production/supply orientation, as opposed to

customer/market orientation (Chang, Irving, and Villano 2013:53). This further corroborates the argument that women's understanding of what it takes to obtain maximum quality of the product concerned, and their ability to act on that understanding, goes a long way to determining the ultimate quality of the product.

5.1.2 Gender-Based Constraints and Implications for the Supply Chain

In participatory research by ACIAR, the following physical constraints to women's full participation in the fresh produce industry, especially marketing, were identified:

- Poor conditions of the city market in Goroka: variable gate fees, roaming pigs, no adequate toilet facilities or shelter, let alone safe child-care facilities, were identified as problems women faced in selling fresh produce.
- Inadequate and unsafe transportation: this constraint affected participation in local and formal markets. Women often had to walk several kilometres to the main road to catch a bus into town. Buses were overcrowded and overheated, damaging fragile produce. Transport to larger centres for more formal markets posed a physical risk to women of robbery from gangs, assault and, at the extreme, sexual assault. As a consequence, formal marketing was left to men.

Box 5.1: The Roles of Husbands and Wives in Sweet Potato Production and Marketing

Women played greater roles in many decisions, especially those regarding varietal selection and marketing of sweet potato, with overall gender role scores of 4.0 and 3.8, respectively (Table). A number close to 4.0 means that the decision is made mainly by the wife. By comparison, numbers close to 2.0, such as borrowing/credit and training and extension for Group 3, mean that those decisions are made mainly by the husband.

Table: Gender roles in various activities by survey group^a

Decision-making on:	Group number					Average of all groups
	1	2	3	4	5	
Farming activities	3.9	3.8	2.8	3.7	2.7	3.6
Varietal selection	4.4	4.0	3.3	4.2	3.4	4.0
Marketing	4.2	3.9	3.5	3.5	3.2	3.8
Income	3.8	3.8	2.8	2.9	2.8	3.5
Savings	3.9	3.6	2.9	3.2	2.9	3.5
Expenditure	3.7	3.7	3.1	3.5	3.2	3.5
Borrowing/credit	4.1	3.6	1.9	3.3	2.7	3.5
Training and extension	4.3	3.7	2.1	3.5	2.4	3.6
Future farming activities	3.4	3.6				
Average	4.0	3.7	2.8	3.5	2.9	3.6

^a Where a value of 1 indicates husband only is making the decision; 2 = mainly husband; 3 = both husband and wife; 4 = mainly wife; 5 = wife only

Overall, an average gender role score of 3.6 was obtained, with groups 1, 2 and 4 attaining 4.0, 3.7 and 3.5, respectively. By contrast, groups 3 and 5 scored 2.8 and 2.9, respectively. This means that, for the former groups, household decisions are made mainly by women, while for the latter groups, they are made jointly by husband and wife. ... However, the results indicate that a gender-sensitive extension and training strategy is needed, as women are major contributors of labor for sweet potato production and important decision-makers in agricultural production and marketing. To the extent that some activities are gendered, targeting extension advice by gender would be a rational strategy.

Source: Chang, Irving, and Villano, 2013:56-57.

- Need for storage depots: the poor transportation available, meant that women had nowhere to store fresh produce prior to and after market (Spriggs and Chambers, 2007:43).

Labor. Women identified insufficient time for gardening/marketing as a key constraint: women are largely responsible for child care, cooking, school supervision and fees, clothing and provision of supplementary household goods. Gardening and marketing have to be fitted around this busy schedule (Spriggs and Chambers, 2007:43). One reason is that families do not provide adequate labor to the farm, while inadequate access to transport in turn leads to longer waiting times for women, with less time spent on actual selling (Chambers et al. 2012:10).

Resources and Knowledge. Access to credit was highlighted as a major constraint among fresh produce

farmers. Most of the farmers consulted during the mission indicated that the inability to access credit when needed limited their capacity. In a meeting with FPDA's contact farmers in Goroka, the farmers (the majority of whom were women) rated 'access to credit' as their number one priority after being asked to list, in order of preference, the kind of support they wanted from external partners such as the World Bank. The members of PNG Women in Agriculture, both at the Lae and Rabaul branches, expressed similar sentiments, stressing that lack of credit was hindering their ability to improve their fresh produce businesses along the supply chain. The farmers indicated that funds were needed to assist them with the transportation of their produce, mechanizing their farming operations, and in the overall enhancement of the product to meet customer requirements. However, in conjunction with improving access to credit, women also need capacity-building support to improve their skills in financial management, as, for example, some collectors of fresh produce operating within the Mount Hagen market indicated that they were currently operating on a credit basis, but they were facing severe financial constraints in their ability to sustain their operations.

Rural women and men face the same constraints in accessing finance. However, rural women are far more disadvantaged than men because: (1) women do not own land and fixed assets, resulting in lack of collateral; (2) women are mostly illiterate in many key aspects of business acumen (business planning, business management, financial literacy, recording keeping, accounting); (3) they have greater difficulties with

Female farmers are discouraged from growing and marketing fresh produce involving distant markets due to high risks and costs. Rachael Jubal, a female farmer from Goroka in the Eastern Highlands Province, has encountered great difficulties in producing, transporting and marketing sweet potato (kaukau) in distant markets (Lae or Port Moresby). In summing up her experiences, Rachael indicated that it has cost her more to produce, transport and market her kaukau in POM than the income she earned from its sale. She stated that every task required along the supply chain is a cost to her: hiring labor to prepare land, buy tubers for planting, planting the tubers, maintaining the garden, harvesting the crop, transporting the crop (from farm gate to main road and further down the Highlands Highway), paying for shipment, wharf and handling fees in POM, transport from wharf to market, storage, market, and security fees, lodging fees, etc.

Having learned that Rachael has made several attempts at this, the question was posed; 'why do you continue this activity when you know you are making a loss?'. Rachael responds; 'what else is there for me?'

communication (many rural women cannot speak in English); and (4) rural women lack self confidence (shying away) when interacting with outsiders, which hinders their ability to articulate their business ideas clearly or even to negotiate confidently for win-win outcomes with financial institutions.

The information needs of farmers and the ability to access to such information varies between regions and even within segments of a group or region. Some groups, given their specific focus on a crop, expressed that there were information gaps that needed filling in order to maximize their operations. Members of Women in Agriculture in Rabaul, for example, indicated that they required additional information on marketing of taro. But, in general, the need for information and the subsequent desire to access such information did not feature highly as a constraint among fresh produce farmers.

The PPAP gender report (World Bank n.d.(3)) indicated that a review of the village extension worker program for the FPDA found that extension workers visited more male contact farmers than female farmers, except in the Western Highlands province (where 55% of visits were to women contact farmers). The difference was not very great, however, with 59% of visits to male farmers and 41% to female farmers. Significantly more women than men were found to be additional participants in extension visits. The interest among women in commercial fresh produce production undoubtedly reflects the greater incentives it offers them, over and above women's traditional responsibilities for food production (World Bank n.d.(3):3).

Mobility. Lack of mobility—through being more restricted to the homestead and not having access to transport services, compounded by persistent insecurity—means that women are largely excluded from key downstream activities along the supply chain where cocoa and coffee is sold to exporters (done by men). The same is true for fresh produce, where marketing of "hardy" crops (cabbage, sweet potato, carrots, English potato) requires transport to Lae and Port Moresby; transport is provided by men, who then, the women say, pocket the money. Small-scale fresh produce ("informal sector") is marketed by women in local markets close to home. Consequently, it can be said that women are largely confined, in the fresh produce sector, to "short" supply chains.

Land. Approximately 90% of PNG's land mass is under customary ownership. Whilst women have rights to access the land, they have limited control over the land. Men determine most, if not all, decisions pertaining to its use (SPC 2012). In some communities, land is inherited through the maternal line, but even there, most of the decisions regarding the use of land is made by the males such as husbands, brothers and other male relatives of the women (JICA 2010). Women are often excluded from owning registered land in patrilineal societies (SPC 2012) and, as established in a recent study undertaken to improve the business knowledge and practices of women food crop farmers in the WHP and ENBP, in a patrilineal society, male inheritance rights are taken for granted as part of PNG culture (Pamphilon et al. 2013:104).

In some parts of PNG, a trend is developing where women are accessing land, both at the family and business levels, and are making decisions on how to maximize the economic use of the land. In the Tambul area of the Western Highlands Province, for example, a female farmer has been successfully growing seed potatoes using rented land. Her seed potato business has been successful in that she has now diversified into

other businesses such as PMVs. Furthermore, in a study done to identify the socioeconomic constraints to improving sweet potato quality and post-harvest management practices, it was demonstrated that women played greater roles in many decisions especially those regarding varietal selection and marketing of sweet potato (Chang et al. 2013:57).

Decision-Making. In general, men dominate decision-making in relation to money and its use. As the society of PNG is for the most part patriarchal, women are placed in an inferior position in decision-making, particularly with regard to money, effectively promoting male dominance (Palaniappan et al. 2013:67). While this is largely true for most parts of the country, women are starting to make a breakthrough in this largely male-dominated arena. In the Western Highlands, Jiwaka, and East New Britain provinces, there are very clear examples of female role models, who are taking the leading in the production and marketing of fresh produce and taking control of the income generated from it.

In PNG, as a largely patrilineal society, men control household incomes and make decisions on how the income will be used. However, these perceptions and practices are no longer relevant in some parts of the country. In the Jiwaka Province, for example, female farmers are making a real impact in the lives of their families and the wider community by having direct access to income and making decisions on the use of the income. Cathy David, who hails from the Jiwaka Province, is a living testimony. Cathy started producing vegetables under FPDA's VEW program in 1999. Since then, Cathy's efforts have improved tremendously and she is transforming the living conditions of her family, e.g. building a permanent home for her family and sending her daughter to a distant school in POM.

Income. Findings from a 2008 survey of commercial fresh food producers in PNG indicate that, where women are solely or jointly engaged in selling the product, they may retain more cash in their own hands. (World Bank n.d.(3)). In the Integrated Agriculture Training Program (IATP), the savings, credit, and book-keeping modules proved to be popular with women, who reasoned that this would provide them with the means to control cash income (Cahn and Liu 2008), though the extent to which this is the case in practice is less clear, suggesting a need for more focused research on decision-making dynamics in PNG households. In the ACIAR research, women indicated that they obtained an insufficient share of income: women did not have an equal share of income from fresh produce, and what they did earn went to support their families. Women complained that when men sold produce at formal markets, instead of buying reliable replacement seeds, they tended to gamble profit (Spriggs and Chambers, 2007:43).

5.2 Other Sectors

While this report focuses on the three principal agribusiness sectors, it is evident from meetings throughout the country that other agricultural sub-sectors merit some attention, even if these do not, or do not yet, generate employment or revenues anywhere near those of the cocoa, coffee, or fresh produce sectors. Addressing these other sectors is a way of capturing the considerable diversity in agricultural activities in PNG, as the mix of crops on which communities rely for their livelihoods is itself often highly diverse and specific to the agronomic and climatic conditions in each locality. This diversity is

an important element of risk management, where reliance on one crop for cash can be problematic, as the case of cocoa in East New Britain (ENB) Province illustrates, in the aftermath of the CPB infestation.

Two issues are of particular importance in looking at opportunities in other agricultural sub-sectors. The first concerns labor allocation, in view of the issues of labor shortage and lack of timely labor inputs into critical tasks alluded to in the coffee and cocoa sectors. While it may be inappropriate to argue that farmers are "too diversified," a case can be made that farmers are already trying to do too much with the labor that is available to them, and that some rationalization or consolidation of labor use, including perhaps greater use of mechanization, may be necessary going forward, if farmers are to accomplish all the tasks they set out to accomplish in a manner that is efficient and timely.

The second issue relates to the question of control over income resulting from undertaking agricultural activities in these other sectors. While it is clear that, in the PNG socio-cultural environment, the major tree crops are considered as "men's crops," this is much less the case in the fresh produce sectors, where women have more direct control over income earned from these crops. This suggests that, beyond finding ways for women to obtain a greater share of tree crop income, commensurate with the labor they provide, it would also be appropriate in the PNG context to develop agricultural activities in crops where priors about male control are either absent or much weaker. These include: apiculture, floriculture, spices and essential oils, coconuts (not just copra), poultry, pig-farming, peanuts, and generating further value-added along the supply chain in cocoa, say by producing chocolate in PNG.

Moreover, viewing these sectors as supply chains indicates that there are potential entry points along the supply chain in processing and marketing, where the potential to add value, and to capture that added value for the benefit of the farming communities that produce the crops, is considerable.

5.3 Concluding Observations

Martin and Jagadish (2006:5) point out that value creation in the fresh produce supply chain takes place both through vertical integration and through relationship management along the chain (see also Annex 3, Box 1). However, this and other studies indicate that relationships along the chain are opportunistic, and supply chains in the fresh produce sectors are fragmented. Poor logistics and infrastructure raise costs and reduce the efficiency of supply chains in the fresh produce sectors. Women's lack of mobility, and their greater domestic workloads, mean that women are essentially confined to "shorter" supply chains in the fresh produce sectors, where production and markets remain close by.

Poor communications and lack of timely delivery of inputs and supplies also affect the performance of the fresh produce supply chain. Martin and Jagadish note that in a number of the fresh produce chains they studied, there was an information breakdown between input suppliers and smallholders with respect to seed supply. This lack of alignment among players along the chain, exemplified by the lack of timely and quality seed supply, diminishes the creation of value-added throughout the chain.

6 Toward Gender-Equitable Agribusiness

6.1 Key Findings and Conclusions

One could spend vast resources trying to unravel the mysteries of complex PNG smallholder farmers. Most farmers grow multiple crops, or mixtures of trees and crops, and often on the same parcel of land. Apart from biophysical complexity, there is the added dimension of PNG farmer goals and aspirations. It was recognized that these are multifaceted, and often go beyond income-related parameters to encompass more psychic and cultural benefits (e.g., acceding to clan or family obligations). The sharing aspect that pervades PNG society is a dimension that can inhibit productivity improvements at the individual level.

Source: Menz, 2013:116.

6.1.1 Women are key to quality

Women provide substantial labor in both coffee and cocoa cultivation, and they predominate in the fresh produce sectors. This alone suggests that, in situations of labor scarcity and the need, for example, to adopt more labor-intensive cultivation practices in cocoa to combat CPB in the short term, it is essential not only to mobilize women's labor but also to ensure that women have both the capacity and the incentive to carry out the work they do effectively.

More important than the amount of labor women provide, our analysis of the supply chains indicates that the specific tasks women undertake have a substantial bearing on the quality of the final product: women are key to improving the quality of coffee, cocoa, and fresh produce, in PNG. Women are directly engaged at critical stages of coffee and cocoa production and processing; in coffee: picking (often strip picking) cherries, pulping, fermenting, and drying; in cocoa: harvesting, breaking the pods, sorting of beans, transport of wet beans for fermenting, putting wet beans in the fermentary, and managing the drying. All of these are time-critical tasks: they must be undertaken promptly in relation to harvesting, and for a specific amount of time. In both sectors, these tasks substantially determine the quality of the coffee and cocoa delivered to the exporter. If PNG wants to improve the quality of its coffee and cocoa on world markets, and obtain corresponding premiums for better quality product, it must necessarily enable women to fulfill these roles effectively. Doing so will have both "push" (operational efficiency) and "pull" (market responsiveness) effects on the performance of the coffee and cocoa supply chains.

In the case of fresh produce, women's role in determining quality is just as significant. Women dominate production, harvesting, sorting, packaging, transport to local markets, and, in some instances, the first stages of transport to the roadside or to more distant markets. When and how these tasks are undertaken has a bearing on the quality of the fresh produce that reaches the market, and has an impact on the extent of product loss and waste. The product enhancement process (washing, sorting, grading, trimming, packing) begins on the farm with the women once the produce is harvested. However, several factors contribute to product loss and diminished quality. These include: (a) lack of knowledge and skills in post-harvest management practices among women; (b) inability on the part of women to access, or to afford, recommended appropriate packaging materials for various crops; (c) lack of cool storage on the farm site, and of cool storage facilities at markets, depots, and ports; (d) the use of inappropriate types

of transport (including PMVs) on poor roads; and (e) weak communications and alignment of key actors along the supply chain, effectively contributing to greater losses. As a result, the quality of fresh produce starts to diminish right on the farm, and, as women attempt to move their produce from the farm to the nearest market, the loss/waste in fresh produce increases. Moreover, larger issues of poor infrastructure (including lack of cool chain and storage, and the poor condition of roads), compounded by persistent violence and insecurity along transport routes, are compounding factors that reduce quality substantially.

It is necessary to keep in mind that many factors determine the quality of the cocoa and coffee that is exported, and the fresh produce that is sold in both local and more distant markets. As pointed out at the Stakeholder Workshop, improving road infrastructure, establishing cold storage facilities for fresh produce, promoting the direct sale of red ripe cherry (coffee) where feasible, expanding certification, and strengthening marketing systems and market linkages for farmers are all key drivers of quality. All of these factors, alongside recognizing and strengthening women's key role, need to be in place if PNG is to maximize the quality of its agricultural products.

To enable women to contribute to the maximum extent to quality, however, PNG will need to tackle, in the colorful words of John Spriggs, not just the "tame" problems (physical and technical) but also, and importantly, the "wicked" problems (human and social) affecting the performance of these supply chains. Three inter-connected issues require particular attention.

- **Incentives.** The economic incentives for women either to allocate sufficient labor to these tasks, or, equally importantly, to do them well, are low. There is a substantial gap between the work done by women in the coffee and cocoa sectors and the benefit they obtain, since women do much (if not most) of the work, but have much less access to, or control of, the resulting income. As is frequently pointed out, tree crops and their income streams belong to men. Consequently, it is logical, and economically rational, that women often prefer to engage in less remunerative food and fresh produce cultivation, where they have greater control over the resulting income, or that women seek to engage in cultivation activities where the priors relating to male control over the resulting income are either weak or absent. Until women have the same motivation as men to engage fully in coffee and cocoa production, or have more of an opportunity to share in the income, the critical quality-enhancing tasks for which women are responsible will not be done adequately, and quality will suffer. Similar incentive issues affect the participation of youth in farming activities in PNG.
- **Knowledge and Information.** Women's access to the knowledge and skills required to carry out these tasks is extremely limited, as important gaps in education, literacy, skills, and participation in extension and training activities persist. Four issues are relevant in this respect. First, extension services and training reach a very small number of farmers, despite considerable effort by private sector players (coffee and cocoa exporters) and others (NGOs, CIC, CCI, NARI) to fill gaps. Second, discussions with CIC in Goroka suggest that about 75% of the extension effort/messages relate to "social" issues not "agronomy," though more detailed analysis of the content of training would be needed to obtain a more accurate picture of the precise or most appropriate balance among the various topics covered. Social

dimensions of extension training cover a broad spectrum: training is offered in areas such as: Business Acumen/Financial Management, Business Registration, HIVAIDS, Healthy Community Living, Rural Housing, Eco-tourism, Gender Equality in Development, Livelihood Strategies, Climate Change, Resource Boom and 'Dutch Disease,' Law and Order, Spiritual or Faith-based Training, Awareness on Drugs and Alcohol, and Human Development. This kind of training is often undertaken in conjunction with Personal Viability (PV) training. This approach to training undoubtedly reflects the needs of the community, but it may also reflect a view that farmers already understand and "know" the agronomic side, so it is appropriate to focus on the social/community issues. Third, women are substantially less likely to benefit from extension and training than men – cf. 50% men vs. 10-15% women receiving training, according to the IFC baseline (Muray-Prior 2014). Fourth, it appears likely that neither men nor women (whether farmers or in extension agencies) fully appreciate the need for women to receive, and then be able to apply, the agronomic extension messages specifically related to the tasks for which they are primarily responsible.

- **Socio-Cultural Dynamics.** There are important gender-specific dynamics at work in PNG society that differentially affect men's and women's capacity to exercise economic agency. PNG society is largely patriarchal, and the literature suggests that, even in matrilineal regions, men are seen as household heads and primary decision-makers. As a result, women have less access to, and control of, the resources needed to function economically, notably land and capital (financial services). While some socio-cultural factors affect both men and women (as discussed below), others have a disproportionate effect on women. In particular, gender-based differences in domestic responsibilities and in mobility combine to limit women's capacity to engage in downstream activities along the supply chains (marketing/sale of cocoa/coffee, longer distance marketing of fresh produce). As one study notes, the "systemic and consistent discrimination experienced by women belies their potential and significantly hinders agricultural productivity and development opportunities" (WIA 2010:4).

Giovanucci and Hunt argue that the underlying social and economic constraints facing the coffee sector, as outlined above, appear unlikely to change in the near future, and that, consequently, the emphasis needs to be on "better coffee rather than more coffee." They argue that this focus will have two distinct benefits. First, it will help position PNG coffee as a quality origin that will likely offer more permanent competitive benefits than the fleeting economic benefits of more production, particularly when periodic global market saturations occur. Second, it can give producers greater remuneration with the same land area and reduce the need for physical expansion (Giovanucci and Hunt 2009:9).

One of the key drivers of better quality coffee, according to interviews with coffee exporters, is the way coffee is picked. Since this is a task largely undertaken by women, the manner in which this task is accomplished can be said to have a direct impact on the quality of the final product. The practice of strip picking coffee, which is directly detrimental to quality, causes the additional problem of limiting any later harvest of ripe cherries, and is driven in no small part by the fact that it is a time- and labor-saving measure. As pointed out by some stakeholders, however, other factors contribute to strip picking, including a rising incidence of theft, where red and green cherries are

mixed in the bag, and where roadside traders and wet mills continue to buy inferior quality cherry, with detrimental effects on PNG's reputation as a producer of high quality coffee. At the same time, inattention to drying also has a negative impact on quality (Box 6.1). Women have neither the time, nor the incentive, since they do not receive or control the resulting income, to do a better job, and the end-result is that most PNG smallholder coffee is of a low grade (Y). Though the focus here is on picking and drying, it should be borne in mind that pulping and fermentation also play a key role in quality.

It is important to keep in mind that, while production and processing tasks have a determining effect on quality, so too does having the necessary infrastructure to ensure that the highest quality cherry can be sold and transported expeditiously to the buyer, processor, and exporter. In the absence of road infrastructure enabling buyers to access the cherry picked by farmers, no amount of improvement in production and picking practices will lead to improved quality of green bean exported. Ensuring that infrastructure investments are aligned with production potential is a necessary complementary step to improving farm-level cultivation practices.

6.1.2 Broader labor dynamics affect outcomes

As this report makes clear, labor issues cut across all the sectors, and have far-reaching implications for the performance of these agribusiness supply chains. Moreover, a gender perspective requires that non-market labor, and the differential burdens borne by women through their domestic workloads, be factored into any discussion of labor availability and use, as mentioned in Section 2.3 of this report. Consequently, it is appropriate to consider the complex issues of labor as going beyond any one, or even all three, of the supply chains.

There are divergent views as to how to reconcile labor and income requirements in the tree crop sectors. Some argue that smallholders should determine how much income they want from their agricultural activities, say in their cocoa blocks, i.e., how many trees they will plant, maintain, and harvest, and then allocate labor to meet these requirements, so that their income goals can be attained. Others argue that labor is the binding constraint, and that smallholders need to plant, maintain, and harvest only the number of trees that the available labor can handle. The importance of focusing on labor activities undertaken by women to improve quality needs to be set against the broader socio-cultural dynamics of labor use in PNG, which are key to understanding

Box 6.1: Keys to Coffee Quality: Selective Picking, Careful Processing and Drying

The best quality is obtained from selective picking in which only red, ripe cherries are gathered by hand in successive picking rounds until most of the crop has been harvested. When coffee prices are low, this time and labor consuming method is expensive, whereas stripping allows individual pickers to harvest between three and four times more per day, thereby reducing the number of picking rounds quite considerably. ...

Like wet processing, drying is also of extreme importance. At this stage a coffee's quality can literally be destroyed. Correct harvesting, processing and drying require maximum management input: having spent an entire year tending to and investing in the crop, do not then entrust its harvest and handling to poorly trained, unsupervised labor. Many potential candidate coffees fail to make it to the specialty market, and certainly to the exemplary segment, because their green appearance shows shortcomings during drying and storage.

Source: ICT 2011:191, 194.

the performance (strengths and limitations) of these agribusiness supply chains. This is the case for five principal reasons, outlined below.

- **Smallholders do not view their activity as a "business."** In coffee, where earnings are seasonal, farmers see coffee as a "mechanism to facilitate livelihoods," and not as an enterprise seeking maximum output and return (in some instances leading smallholders to replace coffee trees with fresh produce). In cocoa, farmers tend to see their older blocks more as an "ATM" from which to obtain cash as and when needed (Curry et al. 2007:107). As discussed in Chapter 4, this is well captured in the distinction between "farming" and "foraging" in cocoa. In both cases, a certain economic rationality underlies this, as the tree crop alone will not suffice to meet family cash needs, so undertaking other cash-earning activities is essential. In fresh produce, it is mostly subsistence farmers selling a surplus, and product varieties are not necessarily chosen for characteristics relating to their marketability or durability. The expectation is that farmers can and will shift their "mindset" toward more of a business orientation, though the timeframe for this to occur is unclear. As Murray-Prior points out in commenting on this report, given farmers' lack of knowledge about the potential returns to different crops and what is required to achieve these returns, it is not surprising that there is a lack of business orientation and inappropriate allocation of labor resources.
- **A lot of labor is allocated for social purposes.** Social factors and obligations are at least as important as economic ones, if not more so, in determining what gets done. Church and community work absorbs a lot of people's time. Consequently, relationships along supply chains can be seen to have at least as much to do with clan and culture as with product characteristics and market dynamics. At the same time, decisions about what to cultivate, and what labor to allocate to it, are made largely without reference to market drivers, and linkages with markets are weak. As much of the literature points out, socio-cultural factors influence farming decisions as much as economic ones, but there is little understanding of these factors. This means both that conventional supply chain analysis has important limitations in PNG, if social and cultural factors are not addressed, and that technical solutions alone will not improve the performance of these supply chains.
- **Farmers experience labor shortages.** Households do not have enough labor to do all the things they need to do, or to do the things at the right time and in the right way. In Lae, for example, members of the Necnasi Coffee Cooperative indicated that the "average" family cannot manage more than 1 ha of coffee. Community labor sharing schemes appear to be giving way to more market-based (cash payment) mechanisms of labor allocation, resulting in reduced labor access at critical peak times, and, therefore, lower harvests of key crops. Effectively combating CPB requires a massively expanded labor-intensive approach to cocoa cultivation ("every pod, every tree, every week"), but farmers are often reluctant or unable to commit the labor required. Alongside social obligations, food production requirements are seen as more important than tree crop cultivation in determining labor allocation priorities. Given women's dominant role in food production, this directly affects their ability to allocate either sufficient or timely labor to key tree crop production and processing stages.

- **Farming systems are highly diversified.** With perhaps few exceptions, smallholder farmers are very diversified, producing a range of fresh produce/food crops, alongside their cash crops. Diversification makes sense, in that it is a risk management strategy, reducing dependence on one crop for cash income. The devastation caused by CPB to livelihoods in ENB Province has shown the costs of dependence on cocoa. However, it is also possible that some smallholder farmers are trying to do too much with the limited labor they have, further contributing to labor shortages, especially at peak seasonal times for particular crops.
- **Women are mostly confined to, and can only benefit from, short supply chains.** Lack of mobility—through being more restricted to the homestead and not having access to transport services, compounded by persistent insecurity—means that women are largely excluded from key downstream activities along the supply chains where cocoa and coffee is sold to exporters (done by men). The same is true for fresh produce, where marketing of "hardy" crops (cabbage, sweet potato, carrots, English potato) requires transport to Lae and Port Moresby, which is done by men. In the process, women lose control over the income stream, which remains with men. This, alongside heavy workloads and cultural constraints, contributes to women being confined to, and largely only being able to benefit from, shorter supply chains in the fresh produce sector, where produce is sold in local markets close to the homestead.

6.1.3 Provision of key support services is limited

Several key services are either absent or insufficient. In addition to the limited reach, and focus, of extension services, alluded to earlier, other key services are often not available to smallholders. Input supply is weak and inconsistent. New varieties are not readily available to farmers, and need to be developed to take account of PNG's specific climate and agricultural requirements. This is especially important in the fresh produce sectors. The need to have a consistent supply of reliable, quality and affordable agricultural inputs, in particular, vegetable seeds for the fresh produce sectors, was highlighted among smallholder farmers in a recent study to assess the feasibility of a new wholesale fresh produce market in POM (Bonney et al. 2012:20).

There is limited access to financial services. Access to credit, is a major constraint to smallholder farmers involved in coffee, cocoa and fresh produce, despite the wide range of products and services offered by many of the microcredit and financial institutions currently operating in the country. The inability of smallholder farmers to meet the lending criteria of microcredit and financial institutions, particularly collateral, is hindering their ability to access credit when needed. There are also important gender-specific barriers to accessing finance, as women tend not to own the land, fixed assets, or other resources that are needed to meet collateral requirements. Another gender-specific barrier to accessing finance is that, over and above general education and literacy disparities, women often have little financial literacy, and have little knowledge of many key aspects of business planning, management, record-keeping, or accounting, and many women also lack self confidence when interacting with outsiders. This in turn hinders their ability clearly to articulate their business ideas or even to negotiate with confidence mutually beneficial arrangements with financial institutions.

The IFC baseline study notes that ignoring women's role in coffee would be counterproductive, and extension and training strategies must focus on involving them

more. The study proposes that a target be set requiring that 40% of all participants be women (Murray-Prior 2014:iv). Recognizing that training needs to be more gender-inclusive, the study makes recommendations to achieve this, including through changes in management and training of extension services and in the content and design of training and extension activities (Box 6.2).

Box 6.2: Structuring Training and Extension to Include Women

To overcome the obvious gender bias in training and delivery of extension materials to women in the coffee chain, the lead firm needs to develop strategies and subsequently materials for improving access of women to training and other opportunities in the coffee chain. Such strategies and materials will need to be consistent with the low level of literacy and numeracy of women including the fact that many are not fluent in *Tok Pisin*. This program should:

- Adopt a target for percentages of women at all professional levels of the coffee trade.
- Examine and adopt strategies to deal with issues that will affect the employment and the daily work activities of female extension officers, e.g., safety and security.
- If this has not occurred already, all staff, in particular extension staff, should receive gender training.
- Adapt training to be more gender inclusive including:
 - Implement a policy to target 40% of people trained to be women.
 - Conduct training on gender awareness for both genders as part of the coffee training, including using the results from this survey.
 - Use learning methods that ensure active participation by women in the process.
 - Use audio-visual media where possible and demonstrations, games and role play to make the information easier to absorb.
 - Conduct the training during the times indicated in this survey, but ensure to consult with particular locations to confirm that these times are suitable.
 - Encourage management and budgeting training to be done as couples.
 - Develop women-only training and deliver them at appropriate locations and times.
 - Deliver appropriate training in same-sex groups (all women or all men) or for husband-wife couples, as well as the normal mixed-sex groups.

Source: Drawn from Murray-Prior 2014:51-52.

6.1.4 Systemic issues persist in PNG and affect outcomes

Insecurity (especially for women) is pervasive and remains a significant issue. Crime and violence remain at high levels in PNG, especially along transport corridors. This means, as one interlocutor put it, that women, for the most part, are confined to very short supply chains, where both production and marketing/sale remain close to their homestead. Insecurity affects every aspect of the performance of these supply chains. It affects women's ability to serve in the field as researchers and extension agents. It has direct implications for extension services, in that key players (CIC, CCI, FPDA, and private sector operators) indicate that, while they're willing to train women as extension agents, the pervasive insecurity essentially precludes them from deploying women to areas or communities unknown to them. This in turn calls into question the prevailing model of extension services, where people are trained centrally and then deployed to all parts of the country depending on need. Instead, a security-conscious approach to extension delivery would focus on ensuring that extension agents (especially females) would be drawn from within the communities they serve. This would provide a much greater measure of security for women, where everyone is known, and where people would look out for each other.

Insecurity directly affects the transport of goods, especially on the Highland highway, where transporters face losses from crime and violence, or are reluctant to provide the full range of services that might be needed. Moreover, insecurity is a major concern for those women selling produce in open urban markets, such as Gordons and Koki in Port Moresby, and the Mount Hagen market. The presence of police personnel and the establishment of a police station inside markets, in particular, Gordons market in Port Moresby, reflects the level of danger that prevails within these markets. This affects the ability and willingness of women to engage in marketing activities, where the fear of crime and violence, the lack of banking or other facilities to safeguard the cash used in market transactions, and the lack of policing and other support services, limit their capacity and willingness to sell produce in open markets. Improving security at Port Moresby's principal food markets is the subject of an interesting project supported by UN Women, and priority needs to be given to projects of this kind to make market spaces better places for women to work.

Poor infrastructure limits the performance of all supply chains and substantially raises the cost of doing business in PNG. Key infrastructure issues include: (i) transport links are poor and costs are high; (ii) the absence of a cold chain and cold storage facilities is a significant problem for the fresh produce sectors, and leads to high product losses and waste; (iii) lack of electricity, and frequent power cuts, add to the operating costs for actors along the supply chains; and (iv) poor communication infrastructure and high costs are an obstacle limiting information flows throughout the chains. These infrastructure barriers, coupled with insecurity, lead to delays in transport of goods to markets and ports, non-use of refrigerated trucks along key highways, lack of communication between farmers, buyers, and exporters as to volumes of produce to ship, and timing of ship arrivals and departures, all of which lead to high levels of delay, uncertainty, and waste of product.

Lack of information, knowledge, communications, and services (including education and health) more generally, is a further systemic barrier to gender-equitable agribusiness, as cogently articulated by the participants at the Stakeholder Workshop (see Annex 6). Specifically, stakeholders pointed out weaknesses in communications and information services throughout the supply chains, which results in insufficient knowledge of market dynamics and requirements, poor coordination with transport and other services, lower productivity, and persistence of subsistence-focused, as opposed to business-oriented, farming. At the same time, poor education and health services, and lack of public expenditure prioritization and accountability, also affect the performance of these supply chains.

6.1.5 There are different views about tackling gender inequality in PNG

Views differ as to how best to address systemic gender inequalities in PNG. Tackling systemic issues is interpreted by people interviewed during the preparation of this report as focusing on women's lack of access to and control of economically productive resources—including land and income—and lack of participation in decision-making within the family as to how family income is used. Interviewees (men and women) subscribe to two very different approaches to tackling these issues, while recognizing that different approaches, and combinations of these approaches, would most likely be needed in different parts of the country.

- **Parallel track.** In this approach, the focus is to support activities that are specifically women-focused, and exclusively involve women, where control of resulting income resides with women or is less unequal *vis-a-vis* men (the fresh produce sectors can be seen as an example of this approach, in that these are seen as "women's crops" where women earn and control the resulting income).
- **Integrated family unit.** In this approach, the focus is on the family as the productive unit, and the aim is to sensitize men principally to recognize the vital contributions of women and to move toward greater sharing of income and decision-making (family budgeting, financial awareness/management, personal viability training).

Associations: A promising approach has been developed by women's groups, associations, and cooperatives, operating in the cocoa and coffee sectors. These groups are putting mechanisms in place that enable women to capture more of the income received from these crops for the labor they provide. This is done where cooperatives collect the crops on behalf of their members, and distribute the income, transparently, to their members when sale is completed. This essentially takes the decision-making process outside the exclusive domain of the (male-controlled) household. In the coffee subsector, some initiatives are currently underway to address the twin problems of supporting a greater "business" focus by smallholder farmers and, concurrently, strengthening women's ability to contribute to, and benefit from, engagement in the sector.

An issue common to all three agribusiness sectors, as this report has pointed out, is the lack of business orientation by smallholder farmers, while the need for farmers to treat these activities as a business is perhaps at the core of developing successful supply chains in these sectors. Indeed, one of the critical challenges facing these sectors in PNG is to shift smallholders toward a more business-oriented view of their work. Yet, as the fresh produce sector aptly illustrates, market linkages are weak, so much so that the feasibility study for a POM wholesale market begins with a question: "Yu Tokim Mi Long Planim Kai kai Na Maket We"? -- *You ask me to plant vegetables, but where is the market?* (Bonney et al. 2012). If farmers are to become more business-focused, there need to be the business opportunities and market linkages to support the change.

Enabling women to be at least as much a part of these shifts as men is perhaps one of the critical avenues available to PNG to improve performance and incomes throughout these chains, and especially in the fresh produce sector, where, as noted, women are confined to, and can only benefit from, very short supply chains, i.e., such markets as exist in the immediate vicinity of their production sites. This in turn requires not only better linkages between farmers in general and the markets they serve, but also, and especially, better access by women to these markets and to the opportunities they present. Bringing markets closer to women, or enabling women to have access to more distant markets, might well be key contributors to shifting farmers (men and women) to a more business-focused approach to their work. As this report discusses elsewhere, it will not be possible to improve the "business" orientation of farmers, whether men or women, if market linkages are weak or non-existent.

6.2 Principal Recommendations

The recommendations below reflect, in part, the deliberations of the Stakeholder Workshop held in Port Moresby on April 15, 2014, which gave a wide range of stakeholders in these sectors an opportunity to discuss the findings of this report, to identify key issues and challenges, and to propose solutions, based on their own experience and priorities. The principal results of the Stakeholder Workshop, and the sector-specific recommendations are summarized in Annex 6, and the recommendations below should be read in conjunction with that summary.

6.2.1 Women are key to quality

Incentives

- Improve the capacity of women to benefit directly from the income earned in the cocoa, coffee, and fresh produce sectors, through a series of interconnected measures: (i) facilitate the establishment of direct payment systems, where women are supported in opening bank accounts, accessing financial services, and obtaining electronic payment for their produce directly from the buyer, or, in the case of fresh produce, the aggregator; (ii) support the aggregation of production by cooperatives or associations and groups in which women are represented, thereby taking decision-making outside the household, and promoting greater transparency between men and women in the income received and how it is used; and (iii) support training and sensitization efforts (including through PV training) aimed at shifting cultural norms and mind-sets relating to women's economic contribution.
- Examine the extent to which **certification schemes** in the coffee and cocoa sectors (Rainforest Alliance, 4C, UTZ, Fair Trade, "Organic") include gender equality provisions in capturing "social" co-benefits, how these provisions are being implemented, and how compliance is monitored. Strengthen the gender focus of these certification schemes, notably as they relate to narrowing the gap between work done and benefit obtained, and how they support or facilitate greater female participation in family decision-making over use of income. As this issue goes beyond PNG and these agribusiness supply chains, the WBG, and notably the IFC, could play a catalytic role in promoting a global gender equality standard in certification criteria and validation processes.
- Use planned data collection and analysis, notably in the coffee and cocoa sectors, including farmer profiling, time use surveys, and analysis of economic opportunity in these sectors, to strengthen the business case for women's involvement in these supply chains. This in turn should help to underpin prioritization of critical infrastructure investments (roads, transport, storage, cold chain) aimed at raising quality and production in these sectors.
- Undertake research into the gender dynamics of decision-making within PNG smallholder households, with a view to understanding how men and women contribute to decisions on the uses of income, and what factors determine how decisions are made.
- In parallel, support measures to ease women's overall labor burdens in the household (see Section 6.2.2 below), and measures to facilitate direct sale by women of produce to buyers, and direct payment (non-cash) to women for produce sold.

Knowledge and Information

- Support commodity exporters and others in their initiatives to structure the design and delivery of extension and training services in ways that maximize women's inclusion (see Box 6.2 above). Consider adoption of a specific target (of 30% or 40%) of female participation in extension and training programs. Stakeholders suggested establishing farmer field schools in cocoa and coffee areas, setting up a coffee college for women extension agents, and developing women-friendly curricula, and using new technologies (example: "digital green") to communicate knowledge and to facilitate women's access to training opportunities.
- Re-focus extension and training messages specifically toward the quality-enhancing tasks for which women are responsible. In coffee, this may mean making sure that the importance of not strip picking coffee cherries from the trees, and of properly drying the coffee beans (to green bean stage), is sufficiently internalized by the women who actually have to do this work. In cocoa, this may mean focusing on timely processing after harvest, including sorting, pod opening, fermentation, and drying. In fresh produce, this may involve focusing on post-harvest practices, product enhancement, and transport/storage issues.
- In the cocoa sector, focus on developing women's technical skills and capacities to work in nurseries and bud gardens, and develop this as a possible career path for women toward training and employment as extension agents in the sector. Concurrently, it is important to focus on the economic viability of cocoa nurseries.
- Assess the impact and effectiveness of the "social" components of extension messages to provide a baseline and targets against which to measure changes in the "socio-cultural" factors that affect agricultural performance and productivity. Key areas to explore would be changes in the benefits women obtain for work done (i.e., having a larger share of income from farming activities) and changes in burden-sharing (division of labor) for domestic tasks within the household.
- Put in place measures to enable more female extension agents to be deployed in the field. This could be undertaken through: (i) improving the overall climate of security and safety, by reducing community violence, and violence against women specifically; (ii) expanding the numbers of female extension agents and technicians, including through support to a scholarship/training scheme to build the pipeline of female graduates in the agricultural sciences for careers in both extension and research; and (iii) designing extension schemes in ways that enable people (especially women) to serve as extension agents in their own communities, where, it is argued, they are more likely to be safe from random violence.
- Consider strengthening the use of quality protocols at each step of the three supply chains, outlining the critical steps (and who does them) involved in maximizing quality. This can build on the work already done by coffee and cocoa exporters, and by the FPDA in developing quality standards for selected fresh produce crops. Concurrently, it is essential to ensure that these protocols are integrated into extension and training packages, to improve farmer knowledge of the drivers of quality at all stages of production and processing, and their knowledge of the impact of quality differentials on the prices they obtain for their produce.

Socio-Cultural Dynamics

- Assess the impact of personal viability (PV) training, specifically as this relates to improving women's income-earning/sharing and participation in decision-making. If

warranted, support continued personal viability (PV), or related forms of training, aimed at strengthening women's voice in the household and the community. Related to this is the importance of conducting training for the "whole family," as stressed during the Stakeholder Workshop (Annex 6), and ensuring that both men and women participate jointly in training activities, thereby improving spousal communication and partnership.

- Identify, and work with, existing rural-based networks, such the PV network, or other farmer cooperatives and associations who, in one way or another, have advocated for women's greater participation in the development process, and support ways (including through PV training) to facilitate greater burden-sharing between men and women of domestic work.
- Support measures aimed at reducing family and sexual violence (FSV) in agricultural communities. Specifically, develop and put in place relevant measures (e.g., phone banking) that allow women and girls not to have to carry cash. Other measures include fostering and maintaining strong partnerships with concerned parties such as village councillors, village magistrates, the police and the churches, to work jointly to put in place prevention, treatment, social, and justice services aimed at reducing FSV incidence and risk in the community.

6.2.2 Tackle the broader gender dynamics of labor allocation

- Gather baseline data on women's and men's involvement in each stage of the agricultural cycle, as called for in the PPAP baseline. This should include shared and separate tasks, and provide a basis for examining changes over time in the division of labor for agricultural and other tasks between males and females.
- Implement a program to analyze the dynamics of labor allocation at the smallholder level, and in different regions of the country, including addressing evolving market-based and paid vs. community and family mutual support mechanisms of labor mobilization.
 - Commission time use surveys and research to generate new and updated data on the gender division of labor in each of these sectors to inform policy-making and program design. Such surveys need to include data collection and analysis of all tasks undertaken by men and women, including domestic work, so that a more complete picture of the labor uses of men and women can be obtained.
 - Identify, and incorporate into program design, crop-, task-, and season-specific labor shortages and constraints, disaggregated by sex, in each of these sectors.
 - Identify, and incorporate into program design, region- and farming-system specific differences in the dynamics of labor allocation.
- Address what a Stakeholder Workshop participant described as "absurd demands on women's time" through support to programs aimed at providing key household-level infrastructure services (water supply, energy, especially for cooking), and labor-saving technologies to women to alleviate women's domestic workloads.

6.2.3 Strengthen key services

- Build and strengthen market analysis and research capacity in key institutions (notably NARI and FPDA), with particular focus on the fresh produce sectors.

- Establish market research capacity to identify specific market opportunities for PNG, notably in the fresh produce sectors.
- Identify, and develop, market opportunities of particular interest for, and benefit to, women. In this respect, identify economically productive activities that women could engage in, where priors about male control are either absent or much weaker. These could include: apiculture, floriculture, spices and essential oils, coconuts (not just copra), poultry, pig-farming, peanuts, and generating further value-added along the supply chain in cocoa, for example by producing chocolate in PNG (Paradise Foods).
- Improve the supply of agricultural inputs (notably seeds, fertilizer, pesticides), in a manner that is consistent, and that incorporates the development of new varieties of key products. Develop further the recommendation made at the Stakeholder Workshop to establish seed production, storage, and distribution facilities in the fresh produce sector in key provincial and regional centers. Put in place measures to enable NARI and FPDA to work collaboratively with the private sector in both identifying and meeting the needs of farmers for seeds and inputs that are appropriate and accessible. One option to consider, discussed at the Stakeholder Workshop, was to explore agribusiness dealer approaches, which would bring retail outlets for inputs closer to farmers.
- Assess the current organizational capacities of Women’s Groups (including PNG Women in Agriculture, PNG Women in Coffee, and other NGOs/CBOs, who are directly involved in promoting gender-inclusive agricultural development). On the basis of the assessment, develop and implement relevant strategies to improve the overall capacities of these women’s groups to lead and assist women farmers in producing, processing, and marketing of coffee, cocoa, and fresh produce.
- In the fresh produce sector, participants at the Stakeholder Workshop recommended the establishment of cool storage facilities at key provincial and central locations, which would be managed by a private sector company. This company would provide key support services to farmers, and would be responsible for managing the cool storage facilities and managing all transportation and distribution requirements, thus enabling farmers to sell their produce at the farm gate. This approach would have the additional advantage of shortening the supply chain, from the farmer's perspective, considerably, thus enabling women farmers. to reap direct benefits from their production.

6.2.4 Address systemic barriers affecting all supply chains

Transport system/roads need building/upgrading

Better road and transport infrastructure is an essential part of improving the functioning of these agribusiness supply chains. It will be important for GoPNG to work with partners to upgrade and improve the road system in PNG. Of particular importance for the fresh produce sectors will be upgrading and maintaining the Highlands Highway, and other major roads, and giving consideration to building new roads such as the proposed Jimi–Madang Highway or the Kerema-POM Highway. Improved road systems in the country will benefit almost everyone, including smallholder farmers by: (1) reducing costs of business, (2) increasing participation among smallholder farmers in economic activities, thereby resulting in increased incomes to the family unit, and (3) increased savings by customers due to reduced prices for fruit and vegetables.

It will be important to bring infrastructure development and prioritization into greater alignment with the productive potential in these three agribusiness sectors. To do this will require: (i) better data collection and analysis of farming activities, including tree counts, farmer profiling, and production possibilities; (ii) using these data to strengthen the business case for farming and for building associated infrastructure, as a means of expanding the productive potential of these sectors; and (iii) prioritizing infrastructure, notably road construction and maintenance, transport services, and establishment of cold chain and storage facilities, in ways that support and strengthen the productive potential of these sectors.

Cold chain/storage facilities accessible to small-scale producers

There is a wide consensus among many players associated, both directly and indirectly, with the fresh produce industry that, for the fresh produce supply chain to function properly and to deliver the expected outcome, the immediate development of a cold chain and storage facilities is paramount. Recent analysis of the feasibility of establishing a wholesale fresh produce market in Port Moresby concluded that a wholesale facility should be established soon to cater for the growing demand for fresh produce among residents in Port Moresby and elsewhere. The need for a cold chain and better storage facilities along the supply chain of fresh produce was highlighted frequently during consultations, and has been recommended in the literature, and in policy declarations, for many years. It will be important to work in close consultation with other interested parties to explore avenues to set up cold chain /storage facilities for fresh produce. In view of increased demand from the LNG project, and other mining sites, a partnership involving fresh produce suppliers to these sites could help to establish cold chain and storage facilities specifically to benefit this market segment.

Improved security along transport corridors and in markets

Given the impact of insecurity and violence on women in PNG, and the implications for their mobility and capacity to engage in economic activity, it is essential to focus on measures that reduce security risks for women:

- Strengthen existing initiatives that are currently in place to address insecurity, for instance, working with UN Women in addressing insecurity among women in the open urban markets throughout the city of Port Moresby. Key measures to consider include provision of banking and financial access services within market spaces; providing toilet and child care facilities for women inside markets; substantially strengthening market security through adequate policing and provision of security services; and facilitating women's greater participation in market management, oversight, and decision-making.
- Coordinate transport and marketing activities on behalf of women – working with established groups including cooperatives or associations, coordinate the marketing and transporting of women's produce. This will allow women to remain where they are – in their homes or villages – but still sell their produce and earn cash incomes. Women would not have to travel to market their produce where they are more exposed to danger.
- Work with existing networks to reduce family and sexual violence experienced by women in rural communities. To this effect, work closely with relevant parties (the

Police, elected Village Councillors, Magistrates and Churches) to reduce men's access to alcohol and drugs.

- Strengthen community-level capacity to deal with theft of coffee and cocoa, as this was identified as a significant issue in the Stakeholder Workshop. Specifically, ensure that communities and local-level government agencies take ownership of this issue, and implement locally-appropriate solutions, including strengthening village courts, building community level government, and providing sufficient manpower and resources (policing) commensurate with the need in the communities concerned.

Broader knowledge and information systems need strengthening

Modern communications technology (notably internet and mobile telephony) can be used pro-actively to improve women's access to critical information and services. Based on the recommendations of the Stakeholder workshop, two key initiatives could be prioritized.

- Establish a *Communications Initiative* in each of the three supply chains, in partnership: (a) with private sector providers of mobile phone and internet services; and (b) with input suppliers traders, aggregators, shippers, and buyers, to facilitate information flows between producers and these other actors in the supply chains on input requirements, production schedules, weather and related issues, security conditions, prices, market conditions, transport links, shipping schedules, and emerging market opportunities (for example food provisioning for LNG and other mining sites), to strengthen both the operating efficiency ("push" factors) and market responsiveness ("pull" factors) of the supply chain. In so doing pro-actively facilitate the access of women farmers, groups, and associations to these communications services, and provide training and capacity-building in their use. This could involve building further on existing collaboration with Digicel in the context of the IFC Agribusiness Project.
- Support banks and other financial service providers, and work in collaboration with buyers and traders, to develop products and services which enable women: (i) to open bank accounts in their own name, and/or to do so jointly with their husbands; (ii) to obtain non-cash payment for products sold to buyers; (iii) to access financial services in markets where fresh produce is sold; and (iv) to access a broader range of financial services, including credit and insurance.

Annex 1 Bibliography and References

- ADB [Asian Development Bank], 2008. *Foundation for the Future: A Private Sector Assessment for Papua New Guinea*, Asian Development Bank, Manila, Philippines.
- ADB, 2012a. *Breaking Down the Barriers to Business, More Private Sector Reform Stories*, Pacific Department, Asian Development Bank, Manila, Philippines.
- ADB, 2012b. *Papua New Guinea: Critical Development Constraints*, Country Diagnostics Studies, Asian Development Bank, Manila, Philippines.
- Agrifood Consulting International, 2009. *Preparation of a Strategic Plan for the Cocoa Sector in PNG. Final Report*. Funded by Mars, Incorporated to assist the preparation of the World Bank Productive Partnerships in Agriculture Project (PPAP), 29 May, Bethesda, Maryland.
- Andrew, Marjorie, 2013. *Gender and Economic Choice in Papua New Guinea: Results from a Rapid Qualitative Assessment in Sixteen Districts*, The World Bank, Port Moresby, November.
- Batt, Peter J., Roy Murray-Prior, Charles Dambui, Fabian Apa, Leo Kepa Aroga, and the Coffee Industry Corporation (CIC), 2009. *Assessing and extending schemes to enhance the profitability of the PNG coffee industry via price premiums for quality*, Australian Centre for International Agricultural Research (ACIAR), Canberra, Australia.
- Bank of Papua New Guinea, *Quarterly Economic Bulletin (QEB)*, End-Year QEBs for 2004-2012.
- Bonney Laurie, Mark Worinu, Pauline Muscat, 2012. *Yu Tokim Mi Long Planim Kaikai Na Maket We? A feasibility Study for a New Wholesale Fresh Produce Market in Port Moresby*, New Zealand Aid Programme, Ministry of Foreign Affairs and Trade, New Zealand.
- Bonney L., Palaniappan G, Atuai, M, Gwabu, C; Sparrow L, Boersma M, Doyle R, Birch C. *Using value chain systems modelling to develop more sustainable cool temperate vegetable marketing systems in a transitional economy: a case study in PNG*, http://aciarc.gov.au/files/node/13992/using_value_chain_systems_modelling_to_develop_mor_13660.pdf
- Boudet, Ana Maria Munoz, Patti Petesch, and Carolyn Turk, with Angelica Thumala, 2012. *On Norms and Agency: Conversations about Gender Equality with Women and Men in 20 Countries*, World Bank, Washington, D.C.
- Brouwer, Elizabeth C., Bruce M. Harris, and Sonomi Tanaka, Eds., 1998. *Gender Analysis in Papua New Guinea*, World Bank, Washington, D.C., November.
- Cahn, Miranda, and Mathias Liu, 2008, "Women and rural livelihood training: a case study from Papua New Guinea," *Gender and Development*, 16 (1), 133-146.
- Chambers, Barbara, Norah Omot, Barbara Pamphilon, Barbara Tomi, Maria Linibi and Cathy McGowan, 2012. *Improving women's business acumen in PNG: working with women smallholders in horticulture*, Report No. FR2012-23, Australian Centre for International Agricultural Research (ACIAR), Canberra.

- Chan, Man-Kwun, 2010. *Improving Opportunities for Women in Smallholder-based Supply Chains: Business case and practical guidance for international food companies*, Prepared for the Bill and Melinda Gates Foundation, with advisory input from Stephanie Barrientos.
- Chang Hui-Shung (Christie) Chang, Zenaida Mira and Garry Griffith, 2012. *The Market Development Project: A case of government failure?* Paper presented in the Australasian Agribusiness Perspectives Vol. 20, Paper 93, 7/3/12
- Chang, Hui-Shung (Christie), Eleo Dowa, Regina Malie, Iga Anamo, Peter Dekene, Conrad Anton, and Debora Bubun, 2013. "Improving access to credit for smallholder farmers in Papua New Guinea: issues and lessons learned," in G. Hickey, Ed., *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5–6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- Chang, Hui-Shung (Christie), Donald Irving, and Rene Villano, 2013. "Identifying socioeconomic constraints to improving sweetpotato quality and post-harvest management in Papua New Guinea: preliminary results from a farm survey and marketability trials," in G. Hickey, Ed., *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5–6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- Cocoa Board, 2013. *Cocoa Industry Brief*, [Powerpoint presentation pdf file], October.
- Coles, Christopher, and Jonathan Mitchell, 2011. *Gender and Agricultural Value Chains: A Review of Current Knowledge and Practice and their Policy Implications*, ESA Working Paper No. 11-05, Agricultural Economics Development Division, Food and Agriculture Organization (FAO), Rome, March.
- Collett, George, 2009. *Socioeconomic and Institutional Factors Affecting Smallholder Coffee Production in PNG, Review of published literature, project evaluations and reports, and summary of discussions with researchers and selected industry representatives*, February (mimeo).
- Curry, George N., Gina Koczberski, E. Omuru, and R.S. Nailina, 2007. *Foraging or Farming: Household Labor and Livelihood Strategies Amongst Smallholder Cocoa Growers in Papua New Guinea*, Black Swan Press, Curtin University of Technology, Perth, Western Australia.
- Curry, George N., Joachim Lummani, and Eric Omuru, 2009. *Social and Economic Impacts of Cocoa Pod Borer in East New Britain Province, Papua New Guinea: Strategies for Restoring Livelihoods*, Curtin University of Technology, Australian Centre for International Agricultural Research, Perth WA.
- Curry, George N., and Gina Koczberski, 2009a. "Relational Economies: Social Embeddedness and Valuing Labor in Agrarian Change: An Example from the Developing World," *Geographical Research* 50 (4) 377-392.
- Curry, George N., and Gina Koczberski, 2009b. *Improving productivity and the participation of youth and women in the Papua New Guinea cocoa, coconut, and oil palm industries*, Report No. FR-2009-02, Australian Centre for International Agricultural Research, Canberra.
- DAL [Department of Agriculture and Livestock], 2006. *National Agriculture Development Plan 2007 – 2016*, Department of Agriculture and Livestock, Konedobu.

- Demirguc-Kunt, A., and L. Klapper. 2012. *Measuring Financial Inclusion: The Global Findex Database*, Policy Research Working Paper 6025, World Bank, Washington, D.C.
- Eftimie, Adriana, Katherine Heller, and John Strongman. 2009a. *Mining for Equity*, Oil, Gas, and Mining Policy Division, World Bank, Washington, D.C.
- Eftimie, Adriana, Katherine Heller, and John Strongman. 2009b. *Mainstreaming Gender into Extractive Industries Projects: Guidance Note for Task Team Leaders*, Oil, Gas, and Mining Policy Division, World Bank, Washington, D.C.
- FAO [Food and Agriculture Organization], 2011. *The State of Food and Agriculture 2010-11: Women in agriculture--closing the gender gap for development*, FAO, Rome.
- FIAS [Foreign Investment Analysis Service], 2008. *Removing Barriers to Enterprise Formalization in Papua New Guinea: A Gender Analysis*, Report prepared by Womenable for the International Finance Corporation, Washington, D.C.
- FPDA [Fresh Produce Development Agency], 2009. *FPDA Strategic Plan 2010-2030*, Fresh Produce Development Agency, Goroka, PNG.
- Giovannucci, Daniele, and John Hunt, 2009. *Papua New Guinea Strategic Assessment of the Coffee Sector*, Prepared for the World Bank PPAP, April.
- GoPNG [Government of Papua New Guinea], 2010. *Papua New Guinea Development Strategic Plan 2010-2030*, Department of National Planning and Monitoring, Port Moresby, Papua New Guinea
- GoPNG and World Bank, 2010. *Climate Change in Papua New Guinea: Framework for the National Climate Change Strategy and Action Plan*. June.
- Grellier, Rachel, and Eric Omuru, 2008. *The Potential Impact of HIV and AIDS on Agricultural Systems and Nutrition in Papua New Guinea*, Options Alliance South Africa, Draft Report, April.
- Hedditch, Sonali, and Clare Manuel, 2010. *Papua New Guinea Gender and Investment Climate Reform Assessment*, Report prepared in collaboration with AusAID, International Finance Corporation, Washington, D.C., January.
- Hickey, G. [Ed.], 2013. *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5-6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- Hunt, J., 2009. *Papua New Guinea assessment of agricultural extension in relation to coffee and cocoa sectors*, Report prepared for the World Bank, August.
- IFOAM [International Federation of Organic Agriculture Movements], 2012. *The IFOAM Norms for Organic Production and Processing*, Version 2012. Die Deutsche Bibliothek.
- ITC [International Trade Center], 2011. *The Coffee Exporter's Guide*, Third Edition, Geneva.
- JICA [Japanese International Cooperation Agency], 2010. *Country Gender Profile*, IMC Inc.,

- Kaiulo, James and Billy Manoka, 2010. *The Cocoa Subsector Review*, Agricultural Research and Development Support Facility (ARDSF 2008-2012, an AusAID funded initiative), Port Moresby.
- Kuman, Noel, 2013. *Developing systems and capacities and fostering linkages amongst PNG value chain players to effectively supply LNG camps with locally grown crops of commercial significance*, Report Updates 2013, Fresh Produce Development Agency, Program Manager--Special Project (LNG), Goroka.
- Lakhani, Sadaf, and Alys M. Willman, 2012. *Trends in Crime and Violence in Papua New Guinea*, Briefing Note No. 1, Social Cohesion and Violence Prevention Team, Social Development Department, World Bank, Washington, D.C., November.
- M4P [Making Markets Work Better for the Poor], 2008. *Making Value Chains Work Better for the Poor: A Toolbook for Practitioners of Value Chain Analysis*, Version 3, M4P Project, UK Department for International Development (DfID). Agricultural Development International: Phnom Penh, Cambodia.
- Martin, Sandra, and Ayyamani Jagadish, 2006. *Agricultural Marketing and Agribusiness Supply Chain Issues in Developing Economies: The Case of Fresh Produce in Papua New Guinea*, Paper presented at the New Zealand Agricultural and Resource Economics Society Conference, 25-27 August.
- Mayoux, Linda, and Grania Mackie, 2007. *Making the strongest links: A practical guide to mainstreaming gender analysis in value chain development*, International Labour Organization, Addis Ababa.
- Mearns, Robin, and Andrew Norton, Eds. 2010. *Social Dimensions of Climate Change: Equity and Vulnerability in a Warming World*, World Bank, Washington, D.C.
- Menz, Ken, 2013. "Report on workshop discussion sessions," in G. Hickey, Ed., *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5-6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- Murray-Prior, Roy, 2014. *IFC Agribusiness PNG: Monpi Coffee Exports and Monpi Cocoa Exports Baseline Study, Draft Final Report*, Prepared for International Finance Corporation, AgriBiz RD&E Services, (mimeo).
- Murray-Prior, Roy, and Anna Padarath, 2013. *Evaluation of the Structure and Performance of the CIC Extension Service*, Report prepared for the PNG Coffee Industry Corporation and the Productive Partnerships in Agriculture Project Coffee Component, Final Report, [Port Moresby], August.
- NARI [National Agricultural Research Institute], 2002. *Strategies for Agriculture and Rural Development in Papua New Guinea*, Proceedings of the National Consultative Workshop on Agriculture and Rural Development: Issues and Strategies, Melanesian Hotel, Lae, NARI, FAO, and World Bank, July.
- Overfield, Duncan, 1998. "An Investigation of the Household Economy: Coffee Production and Gender Relations in Papua New Guinea," *Journal of Development Studies* 38 (5) 52-70.
- Pamphilon, Barbara, Katja Mikhailovich, Lalen Simeon and Barbara Chambers, 2013. "Two-way learning: key gender lessons from participatory community workshops with

- smallholders in the Baiyer Valley and Kerevat areas of Papua New Guinea,” in G. Hickey, Ed., *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5–6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- Popoitai, Yasap, and Waafas Ofosu-Amaah, 2013. *Negotiating with the PNG Mining Industry for Women's Access to Resources and Voice: The Ok Tedi Mine Life Extension Negotiations for Mine Benefit Packages*, World Bank Institute, World Bank, Washington, D.C.
- Robinson, Rebecca, and Chris Gard, 2009. *Report Working Paper No. 6, Social Assessment*, Prepared for PNG Department of Agriculture and Livestock by URS Australia Pty, Adelaide, July.
- Rubin, Deborah, Cristina Manfre, and Kara Nichols Barrett, n.d. *Promoting Gender-Equitable Opportunities in Agricultural Value Chains: A Handbook*, Prepared for USAID under the Greater Access to Trade Expansion (GATE) Project, by Development and Training Services, Washington, D.C.
- Seta-Waken, Philmah, Barbara Chambers, Gomathy Palaniappan, and Colin Birch, 2013. “Impact of Training on Horticultural Adoption by Women Smallholders in Central Province Papua New Guinea”, in G. Hickey, Ed., *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5–6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- Simchi-Levi D., Clayton A. and Raven B., 2013. "When one size does not fit all," *Massachusetts Institute of Technology (MIT) Sloan Management Review* 54(2), 15–17.
- Siop, Paulina, Flora Carruthers, and Sisi Kini, 2006. *Assessment of Women's Associations/Groups in the Mining and Petroleum Project Impact Areas of Papua New Guinea*, Final Consolidated Report. World Bank, May-June.
- SPC [Secretariat of the Pacific Community], 2012. *Stocktake of the Gender Mainstreaming Capacity of Pacific Island Governments PAPUA NEW GUINEA*, A publication prepared as part of the Institutional Stocktake of National Women’s Machineries in the Pacific Island Countries project, funded by ABD and UN Women.
- Spriggs, John, and Barbara Chambers, 2007. *Improving the marketing system for fresh produce of the highlands of PNG*, Australian Centre for International Agricultural Research (ACIAR), Canberra.
- Spriggs, John, Barbara Chambers, and Norah Omot, 2013. "Towards socio-economic change in the fresh produce supply chains of the Papua New Guinea highlands," in G. Hickey, Ed., *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5–6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- Stotsky, Janet. 2006. *Gender and its relevance to Macroeconomic Policy: A Survey*, IMF Working Paper 06/233, International Monetary Fund, Washington, D.C.
- Sunday Chronicle, The, 2014. *Government Revitalizes the Coffee Industry*, Port Moresby, March 9, 2014, 17-18.
- UNDP [United Nations Development Programme], 2012. *Sustainable Development: Time for Action*, Brochure prepared for the Rio+20 Conference, June.

- UniQuest [UniQuest Pty Limited], 2013. *Productive Partnerships in Agriculture Project Baseline Survey, Final Report*, Prepared for the Government of Papua New Guinea.
- Wei, Sherrie, Daryl Joyce, Sim Sar, and Nicholar Boas-Singomat, 2013. "Developing floricultural supply chain strategies--Papua New Guinea case study," in G. Hickey, Ed., *Socioeconomic agricultural research in Papua New Guinea. Proceedings of a workshop held in Lae, PNG, 5–6 June 2013*. ACIAR Proceedings No. 141. Australian Centre for International Agricultural Research: Canberra.
- West, P 2012, *From modern production to imagined primitive: the social world of coffee from Papua New Guinea*, Duke University Press, Durham and London.
- WIA [Women in Agriculture]. 2010. *Women in Agriculture Report*, Document prepared for the Productive Partnerships in Agriculture Project (PPAP), World Bank, Washington, D.C.
- World Bank, 1988. *Papua New Guinea--Agricultural Assessment Review*, Report No. 7090-PNG, Asia Regional Office, World Bank, Washington, D.C.
- World Bank, 1997. *Papua New Guinea--Accelerating Agricultural Growth: An Action Plan*, Report No. 16737-PNG, Agricultural Operations Division, East Asia and Pacific Region, World Bank, Washington, D.C.
- World Bank, 2004. *Papua New Guinea: Poverty Assessment*, East Asia and Pacific Region, World Bank, Washington, D.C.
- World Bank, 2007a. *Country Assistance Strategy for Papua New Guinea for the Period FY08-FY11*, Report No. 41571-PG, East Asia and Pacific Region, World Bank, Washington, D.C., November.
- World Bank, 2007b. *Project Appraisal Document for a PNG Smallholder Agricultural Development Project*, Report No. 38558-PG, Rural Development, Natural Resources and Environment Unit, East Asia and Pacific Region, World Bank, Washington, D.C.
- World Bank, 2010. *Project Appraisal Document for a PNG Productive Partnerships in Agriculture Project*, Report No. 51493-PG, Social Environment and Rural Sustainable Development, East Asia and Pacific Region, World Bank, Washington, D.C., March.
- World Bank, 2011a. *Women, Business, and the Law: Removing Barriers to Economic Inclusion, Measuring Gender Parity in 141 Economies*, World Bank, Washington, D.C.
- World Bank, 2011b. *World Development Report 2012: Gender Equality and Development*, World Bank, Washington, D.C.
- World Bank, 2011c. *Reproductive Health At a Glance: Papua New Guinea*, Washington, D.C., April.
- World Bank, 2011d. *Papua New Guinea Economic Briefing: Enjoying the opportunities -- and facing the challenges -- of resurgent commodity prices*, World Bank Country Office, Port Moresby.
- World Bank, 2011e. *Project Appraisal Document for a PNG Small and Medium Enterprise Access to Finance Project*, Report No. 57484-PG, Financial and Private Sector Development Unit, East Asia and Pacific Region, World Bank, Washington, D.C.

- World Bank, 2012a. *Papua New Guinea Country Gender Assessment, 2011-12*, World Bank Country Office, Port Moresby, December.
- World Bank, 2012b. *Country Partnership Strategy for Papua New Guinea for the Period FY2013-2016*, Report No. 71440-PG, East Asia and Pacific Region, World Bank, Washington, D.C. November.
- World Bank, 2012c. *Inclusive Green Growth: The Pathway to Sustainable Development*, World Bank, Washington, D.C.
- World Bank, 2013a. *Project Appraisal Document for a PNG Energy Sector Development Project*, Report No. 74445-PG, Sustainable Development, East Asia and Pacific Region, World Bank, Washington, D.C.
- World Bank, 2013b. *Doing Business 2013--Smarter Regulations for Small and Medium-Size Enterprises, Economy Profile: Papua New Guinea*, World Bank, Washington, D.C.
- World Bank, 2013c. *Papua New Guinea Country Gender Action Plan (CGAP), FY14-16*, (mimeo).
- World Bank, n.d.(1). *Reducing the Risk of Disasters and Climate Variability in the Pacific Islands: Papua New Guinea Country Assessment*, World Bank, Global Facility for Disaster Reduction and Recovery (GFDDR), and South Pacific Applied Geoscience Commission (SOPAC), Washington, D.C.
- World Bank, n.d.(2). *Engendering Mines in Development: A Promising Approach from Papua New Guinea*, East Asia and Pacific Region Social Development Notes, Innovation, Lessons, and Best Practice, No. 67982, Washington, D.C.
- World Bank, n.d.(3). *Gender Issues in Smallholder Cocoa and Coffee Production*, Productive Partnerships in Agriculture Project (mimeo).
- World Bank, Food and Agriculture Organization (FAO), and International Fund for Agricultural Development (IFAD), 2009. *Gender in Agriculture Sourcebook*, Washington, D.C.

Annex 2 List of Persons Consulted

Name, Title	Institution/Location	Contact Information
Private Sector & NGOs		
Kila, Dorothy, National Supply Chain Manager	NCS Holdings Ltd.	dorothy.kila@ncs.com.pg (675) 7199 2207
Bennet, Lesley	Women in Mining Program, PNG Chamber of Mines and Petroleum	Phone: 321 2988 / Mob:7196 4367
Aiuni, Graham, Executive Officer	Rural Industries Council Director, NASFUND	grahamainui@online.net.pg (675) 7153 2043
Chitteti, Sankar R. Chief Operating Officer	PNG Microfinance Ltd.	crsankar@pml.com.pg (675) 7031 2759
Mathew, George, Chief Executive Officer	PNG Microfinance Ltd. PO Box 704 Port Moresby, NCD	george.mathew@pml.com.pg (675) 7190 8167
McNally, Graham, Agricultural Production Manager	Agmark Group of Companies	gmcnally@agmark.com.pg (675) 7178 2993
Quirk, Chris, PNG Rice Project, Sr. Field Officer	Trukai Industries Ltd., Mataram St, Lae	cquirk@rrapl.com (675) 7031 1785
Edwards, Jon W. General Manager	PNG Coffee Exports PO Box 138, Goroka, EHP	jedwards@pngce.com.pg (675) 7200 1066
Kalwi, Joeri	MONPI	jkalwij@ecomtrading.com Ph.5322752 /72902752
Mada, Egi, Manager, Agricultural Supplies	Brian Bell, PO Box 1228 Boroko, NCD	bbsales@brianbell.com.pg (675) 325 5411
Thorpe, Brian, National Agency and Lae Operations Manager	Consort Express Lines Ltd. PO Box 2191, Lae Morobe Province	brian.thorpe@consort.com.pg (675) 7281 6901
Peate, David, Managing Director	Paradise Foods Ltd. PO Box 1624, Boroko NCD	david.peate@paradisefoods.com.pg
Arek, Theresa, Director	Amruqa	tarek.png@live.com (675) 7391 3216
Jephcott, Grant, General Manager	New Guinea Highlands Coffee	grbj@nghce.com.pg (675) 7290 1881
Orrell, Ian, Executive Director	PNG Palm Oil Council	ian.orrell@pngpalmoilcouncil.org (675) 7211 7777
Walis, Yakam	Family and Sexual Violence Action Committee (FSVAC)	Phone: 321 1714 /321 1397 Wallis.yakam@cimcpng.org
Wainetti, Ume	Family and Sexual Violence Action Committee (FSVAC)	Phone: 321 1714 /321 1397 Wainetti.ume@cimcpng.org
Shahi, Raj, Produce Manager	CPL Group	rshahi@cpl.com.pg (675) 7212 0004
Winston, Roselyn, + other Members of the PNGWIA (POM Sector)	PNG Women in Agriculture (PNGWIA)	Mob: 7286 7431 c/- NARI POM
DuBose, Hilary, Coffee Industry Support Proj. Mgr	CARE International, Goroka	hilary.dubose@careint.org (675) 532 2766
Padarath, Anna	CARE International, Goroka	Anna.Padarath@careint.org Ph. 532 2766 Mobile: 7196 5916
Lomutopa, Sally	PNG Women in Coffee (WIC)	Ph. 7007 7730
Tongene, Elizabeth + Staff Members of Wide Bay Conservation	Wide Bay Conservation Association, Rabaul	Phone: c/-982 8977

Name, Title	Institution/Location	Contact Information
Yorio, Darren, Programs Director	Adventist Development and Relief Agency (ADRA) Abel Tasman St., Lae	DYorio@adra.org.pg (675) 7693 8934
PNG Donor Partners		
Banks, Tony, First Secretary, Development	New Zealand High Commission	tony.banks@mfat.govt.nz (675) 7199 6002
Aipale, James	New Zealand High Commission	Phone: 325 9444 james.aipale@mfat.govt.nz
Jimenez, Alethia, Program Specialist, Safe Cities Program Team Leader	UN Women United Church Building 4th Flr. Port Moresby	alethia.jimenez@unwomen.org (675) 7030 9435
Flower, Emily	Australian Center for International Agricultural Research (ACIAR)	Phone: 325 9333 (ext 299) Mob: 7128 6629 E: Emily.flowers@dfat.gov.au
Public Sector Agencies		
Liripu, Greg, General Manager	Fresh Produce Development Agency (FPDA) PO Box 958, Goroka, EHP	greg.liripu@fpda.com.pg (675) 7055 0398
Powae, Wayne, Program Manager, Value Chain	Fresh Produce Development Agency (FPDA) PO Box 958 Goroka, EHP	wayne.powae@fpda.com.pg (675) 7166 9193
Malie, Regina + team	Fresh Produce Development Agency (FPDA), POM	Phone: 321 5520
Sar, Sim A., Program Director, Agricultural Systems Improvement	National Agricultural Research Institute (NARI), PO Box 4415, Lae, Morobe Province	sim.dar@nari.org.pg (675) 7347 3972
Bang, Sergie, Director	National Agricultural Research Institute (NARI), PO Box 4415, Lae, Morobe Province	sergie.bang@nari.org.pg (675) 7177 3843
Barker, Paul, Executive Director	Institute of National Affairs (INA), PO Box 1530, POM	Paul.Barker@cimcpng.org (675)
Kiteni	NARI, Rabaul	Mob: 7150 4303 kiteni.kurika@nari.org.pg
Maora, James	Cocoa and Coconut Institute (CCI)	Phone /Mob: 7292 6833 jasmaora@gmail.com
Parik, Claire Sailoia, Economist	Cocoa Board of Papua New Guinea, PO Box 532, Rabaul	csparik@gmail.com economics.mngr@cocoaboard.org.pg
Linibi, Maria	NARI + Women in Agriculture	Mob: 7276 5001 (c/- NARI Lae)
Romalus, Rose + others	Women in Coffee, Lae	Phone: 472 5044 (731 89231) Email: rromalus@gmail.com
Kakulai, Sarah	FPDA, Rabaul	PH: 9829886 C: 71845348 E: sarah.kakulai@gmail.com
Tadde, Eremas	Acting CEO, CCI, Rabaul	71721557 E: c/- Jacinta Palacham palachamj1902@gmail.com
Maroa, Josephine, S. Plant Entomologist	CCI, Kerevat	C: 71872654 josephinesaul@yahoo.com.au
Nalina, Robert S. Economist	CCI, Kerevat	senekanailina@yahoo.com
Labun, Matei,	CIC Extension Team (Gender), Goroka	Phone: 532 1266 or 537 3511 mlabun@cic.org.pg
Bruce, Kenny	CIC Extension Team (Gender), Goroka	mkenney@cic.org.pg Phone: 532 1266
WB/IFC Staff and Projects		

Name, Title	Institution/Location	Contact Information
Blacklock, Carolyn, Resident Representative	IFC	cblacklock@ifc.org (675) 3217 111
Bailey, Laura, Country Manager	World Bank Country Office Port Moresby NCD	lbailey@worldbank.org (675) 321 7111
Grealish, Liam, Project Manager	IFC Sustainable Business Advisory, East Asia/Pacific	lgrealish@ifc.org (675) 7150 1458
Oliver, Allan	PPAP, World Bank	PH: 3217111 E: aoliver1@worldbank.org
Sipani Serah Pamolak	Associate Operations Officer IFC Investment Climate, Pacific	ssipani@ifc.org (675) 7667 8878
Stemp, Craig, Security Specialist	World Bank, Port Moresby	cstemp1@worldbank.org (675) 7288 4144
Freyne, David F. Project Manager, Coffee Industry Corporation (CIC)	Productive Partnerships in Agriculture Project (PPAP)	ppap@cic.org.pg
Moxon, John, Project Manager, Cocoa Board of PNG	Productive Partnerships in Agriculture Project (PPAP)	pm@ppap.cocoaboard.org.pg (675) 7129 0171
Powell, Martin	Productive Partnerships in Agriculture Project (PPAP)	C2c@ppap.cocoaboard.org.pg (675) 7129 0171

Annex 3 Conceptualizing Supply Chains

A Conceptual Framework

This report endeavors to analyze the gender issues in the three agribusiness sectors through a gender-focused understanding of the supply chains operating in these sectors. There is an extensive literature on supply chains¹ and an emerging literature both on the gender dimensions of supply chains and how best to integrate gender analysis into supply chain development and upgrading (see notably Chan 2010; Coles and Mitchell 2011; M4P 2008; Mayoux and Mackie 2007; Rubin et al. n.d.).

A useful approach to supply chains is outlined in Annex 3, Box 1, which, appropriately perhaps, is from a study specifically focused on analysis of supply chains in the fresh produce sector in PNG (Martin and Jagadish 2006).

Annex 3, Box 1: Conceptualizing Supply Chains

[A] chain is envisaged as a **value-creation** process, whereby all firms in a chain link and align with each other to create value for the chain as a whole. It is argued that value creation occurs through firm operations, integration of processes, and logistics and quality control (product maintenance). It is further argued that value creation throughout the chain is supported by information flows, and achieved through vertical integration and relationship management.

Value creation occurs primarily through **operations**. This is achieved through product transformation (processing) or product enhancement (cleaning, grading, packaging or presentation). Value is also created through the **integration of processes** along the chain; that is, the seamless meshing of processes as the product moves from one point in the chain to the next. Value is further created through logistics (where product is transported from one point in the chain to the next in a cost and time effective manner) and quality control (where the quality of the product is maintained through packing, transporting and cool or cold chain procedures).

Value creation along a chain (and the **information flows** that support this) is achieved through **chain relationships**. These relationships underpin the functioning of the chain, and therefore, chain functions such as value creation, quality management and information flows, cannot be considered in isolation of chain relationships.

The types of relationships that characterise a chain will usually be driven by **product characteristics and market segments**. By their nature, urban markets are opportunistic, and this opportunism will then permeate relationships along the rest of the chain.

Usually, chain leaders will internalise critical chain functions through vertical integration of key processes that create competitive advantage for them. While there was some evidence that this was occurring, by and large, vertical integration of functions was not a feature of the fresh produce chains observed in this study. This is a reflection of the relatively opportunistic orientation of most of these chains, which in turn, reflects the characteristics of the market segments.

Source: Excerpted from Martin and Jagadish, 2006:3ff, emphasis added.

¹ Sometimes the terms "supply chain" and "value chain" are used interchangeably, though a useful distinction is that the concept of a supply chain focuses on the actors and processes involved in taking a product or service from its origins to the final consumer, while the concept of a value chain places more emphasis on seeking to establish the value-added provided to the product or service at each step along the chain. For purposes of this report, and in keeping with the task TORs (Annex 7), we use the term "supply chain" here, as this report does not attempt, largely because of data limitations, to disaggregate by sex quantitative value-addition along these agribusiness chains.

Conceptually, therefore, behind the idea of a supply chain is the notion that processes are linked, i.e., that they form a "chain," and that actors in the chain (firms) have both interest and power to make the chain work for all involved. Indeed, guidance specifically written to facilitate better integration of poverty reduction goals in supply chain development makes the point that "a value chain exists when all of the actors in the chain operate in a way that maximizes the generation of value along the chain" (M4P 2008:7).

Supply chain analysis requires understanding the key sequential **steps** in the chain, the principal **actors** involved, what **tasks** or activities these actors are engaged in, the nature of the **relationships** among these actors, including power and influence over chain activities, the **distribution of costs and benefits** among chain actors, and the flows of **information** among the actors along the chain. It also requires clear articulation of the overall goals of improving, or "upgrading" as it is often referred to in the literature, the overall performance of the supply chain. The literature identifies two key orientations for strengthening supply chains: *push* factors, which focus on improving operational efficiency along the chain; and *pull* factors, which focus on improving the market responsiveness of the chain (see Simchi and Levi, 2013, in Hickey 2013). Clearly, acting on both dimensions is necessary to improve chain performance.

B Gender and Supply Chains

Drawing from this understanding of supply chains, a gender perspective requires, at its simplest, that, in relation to the identified steps of the chain, the following key elements of analysis be undertaken:

- **actors and their activities:** that the presence of men and women operating as stakeholders, and that the specific roles and responsibilities undertaken by men and women at different points along the chain, are clearly identified (mapped) and understood;
- **relationships:** that the gender dynamics and specificity of relationships among the actors in the chain, including with respect to power and decision-making around chain activities, are clearly identified;
- **costs and benefits:** that the ways in which the costs and benefits of chain activities differ for men and women, notably with respect to income earned at different points along the chain, are clearly identified;
- **information:** that the ways in which communication, knowledge, and information flows required for chain functioning differ for men and for women
- **obstacles, opportunities, and implications for the chain:** that the obstacles and opportunities for men and women arising from the preceding analysis, and their implications for the performance of the supply chain, are identified; and
- **priority actions:** that key measures to be taken to address the identified obstacles, and to strengthen the opportunities for both men and women, be articulated and integrated into policies and programs aimed at "upgrading" or improving the performance of the chain.

The gender-focused literature on supply chains provides valuable pointers for this kind of work in PNG. A value chain guide (Chan 2010), written to engage international food

companies, notably in coffee, cocoa, and horticulture, presents a succinct summary of a gender-focused situation analysis. As will be discussed in subsequent chapters, the diagnostic is essentially applicable to the situation that prevails in PNG:

- fewer women than men are members of company contact farmer schemes;
- many companies source from established producer groups, but women are under-represented in membership and governance of such groups;
- on male-owned farms women do much of the work, but receive little of the income from crop sales and have little say in how that income is spent;
- women are much less likely than men to benefit from technical training and extension programs; and
- sustainability certification programs are less likely to benefit women (Chan 2010:8).

The rationale for engagement by international food companies in developing gender-responsive supply chains is summarized as follows:

- maintaining and improving quality--"upgrading" the chain;
- increasing productivity, including improving incentives for women;
- reducing management and coordination costs;
- growing the supply base;
- strengthening the brand and improving access to premium markets; and
- contributing to broader corporate social responsibility (CSR) and development goals (Chan 2010:17-24).

The guidance prepared for USAID on integrating gender into agricultural value chains points out that value chain programs that support gender-equity goals:

- understand men's and women's roles and relations;
- foster equitable participation;
- address the needs of women;
- support women's economic advancement;
- promote gender-equitable market-driven solutions;
- design gender-equitable benefit-sharing mechanisms; and
- include men in defining the "problem" and the solution (Rubin and Manfre, 2010:12).

C Data Limitations

There are important limitations with respect to the data available in PNG for the kind of gender-focused analysis that is needed. Specifically, data on the allocation of men's and women's labor to the range of tasks along the supply chain, notably with respect to production and post-harvest processing, are virtually non-existent, as the only study to provide estimates of men's and women's time use dates from the late 1990s, and relies on data collected in 1992-93 (Overfield 1998). Recent analyses, including the PPAP baseline survey (UniQuest 2013) and the IFC Coffee baseline (Murray-Prior 2014) do not provide data from time-use surveys, but they do provide valuable information on perceptions by farmers as to who plays dominant (main worker) and subordinate roles at different points in the production and processing cycle, as discussed in Chapters 3 and 4. In the absence of detailed sex-disaggregated data on labor use in these supply chains, it is also not possible to attribute to men or to women their respective contributions to value-addition in these supply chains, nor to determine the specific

distribution of income or other benefits from chain activities between men and women. In this respect, the report relies on findings from the extensive, though largely qualitative, literature in PNG.

To the extent possible, therefore, and taking account of these data limitations, this report seeks to provide information on the roles of men and women in these key agribusiness supply chains, to identify the issues (obstacles and constraints) faced by men and women, as and where they differ, to spell out the implications of these differences in roles and obstacles, and to outline measures to address these differences both to strengthen gender inclusion more generally in chain activities, and, just as importantly, to improve ("upgrade") the overall performance and functioning of these supply chains.

It should be noted, however, that, for reasons that are explored further in the discussion of the agribusiness supply chains in Chapters 3-5, this view of supply chains assumes a degree of economic rationality and operational coherence that may not in fact always be present in the PNG context. Consequently, while a supply chain approach provides a useful framework for analyzing performance issues in these sectors in PNG, it is also important to look at the wider socio-economic context in which these chains operate, and which continues to exert a powerful influence on economic activity in general, and on the ways in which these chains perform in particular. For example, it cannot really be said that, as cited above, "all of the actors in the chain operate in a way that maximizes the generation of value along the chain" (M4P 2008:7), when value-addition is not the primary motivation of the great majority of smallholders in PNG, who tend not to see their farming activities as a "business," as discussed elsewhere. Indeed, one of the critical challenges facing these sectors in PNG is to shift smallholders toward a more business-oriented view of their work. Enabling women to be at least as much a part of these shifts as men is perhaps one of the critical avenues available to PNG to improve performance and incomes throughout these chains. This in turn requires not only better linkages between farmers in general and the markets they serve, but also, and especially, better access by women to these markets and to the opportunities they present.

Specifically in relation to PNG, and of particular importance given the centrality of the ways in which socio-cultural factors intersect with economic ones in all of the supply chains examined in this report, is the colorful language used by John Spriggs et al. to make the distinction between the physical and technical aspect of supply chains, which they label as "tame" problems, and the human and social aspect of supply chains, which they label as "wicked" problems (Spriggs et al. 2013:11). In examining gender issues in PNG supply chains, this report is necessarily primarily concerned with "wicked" problems. Importantly, Spriggs et al. go on to make a point with which this report concurs: "What is critical for dealing with wickedness in problems is to engage with local stakeholders in a way that encourages consensus and ownership of the problems (and solutions) by those stakeholders" (Spriggs et al. 2013:11). This in turn provided both impetus and rationale for the Stakeholder Workshop, which was held in April 2014 to find ways to converge on solutions to address gender issues in these supply chains (see Annex 6).

Annex 4 Background on Coffee and Cocoa in PNG

Agriculture accounts for approximately 1/3 of GDP, and the sector is dominated by smallholder farming systems. Along with oil palm, coffee and cocoa are the main cash crops, with respectively over 30 percent and 20 percent of the total labor force involved in their production, processing and sale (World Bank 2010:1). Virtually all farmers are also engaged in food crop production, whether for subsistence, or, increasingly, for sale in local and distant markets.

A Background to the Coffee Sector

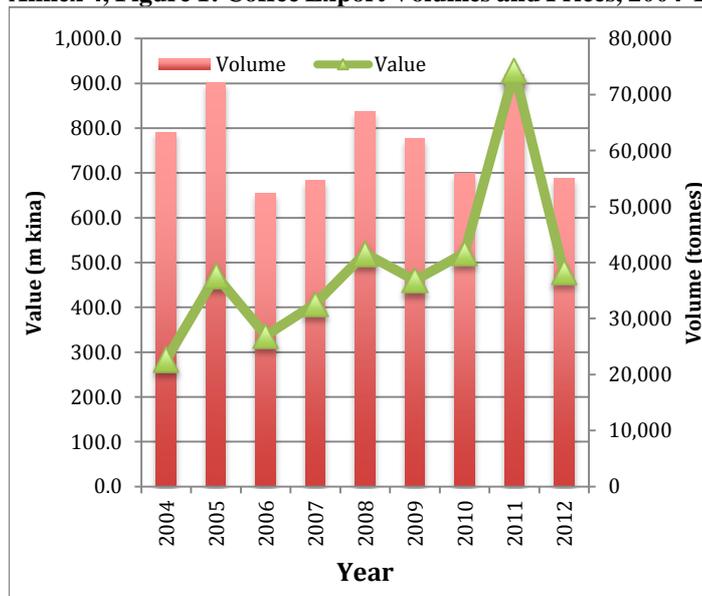
The coffee industry in Papua New Guinea is a major contributor to national income and employment. Almost 3.0 million people depend directly or indirectly on coffee for their livelihoods. The industry is made up of about 400,000 households, 680 blocks ranging from 1-30 hectares, 7 plantations, 17 registered exporters, and 59 registered processors and over 6,000 roadside buyers (Sunday Chronicle 2014:17-18). *Arabica* coffee comprises more than 95% of production and exports, while *robusta* accounts for less than 5%. The bulk of the production is produced by the smallholder sector, accounting for about 85% of annual production, followed by plantations (10%) and blocks (5%) (Sunday Chronicle 2014:17-18).

On a global scale, PNG is a modest exporter, ranking 13 among 39 *arabica* exporters (95% of PNG coffee exports) and also shipping very small amounts of *robusta* (less than 5% of PNG coffee exports). This represents around 1 percent of world market share. Coffee exports are second to palm oil in revenue. PNG annually exports nearly all of its production or close to a million 60 kg. bags. In the 2006-08 period, it averaged 951,000 bags. This represented a modest

decline from its 10-year average of 1,076,000, and its all-time high of 1.34 million bags (Giovannucci and Hunt 2009:6). According to data from the Quarterly Economic Bulletins (QEB) of the Bank of Papua New Guinea, there has been a gradual upward trend in the value of coffee exports, with some fluctuation and a peak in both volume and value in 2011 (Annex 4, Figure 1).

The major coffee producing provinces are Eastern Highlands, Western Highlands, Jiwaka, Morobe, Madang, and Simbu provinces, which account for over 84% of coffee production, while East Sepik, West Sepik, Oro, Milne Bay, Central, Gulf and East New Britain produce the balance. In the Highlands region of PNG, coffee forms a substantial

Annex 4, Figure 1: Coffee Export Volumes and Prices, 2004-12



Source: Bank of PNG, *Quarterly Economic Bulletins* (2004-12).

part of household cash income. The PPAP Baseline Survey (UniQuest 2013) found that it formed about half of households' cash income in 2011, for the coffee households interviewed, ranging from a low of 43% in Western Highlands province to 63% in Eastern Highlands province.

Productivity is low, with yields on average 30-50 percent of their potential, and quality has also been deteriorating. There is little empirical data available but the reasons behind low productivity have been documented in recent research: the lack of support services to promote improved tree husbandry practices; lack of adequate replanting (most of the trees are over 40 years old and well beyond their optimal production age); constraints to market access and quality issues that reduce farm-gate prices and smallholders' incentives to invest in or harvest coffee; and law and order issues (World Bank 2010:1). As discussed in this report, gender-based differences in labor availability, allocation, and incentives can also be seen as contributing factors to low productivity in the sector.

According to Murray-Prior and Padarath (2013), there are three main marketing routes for smallholder coffee in PNG. The majority of coffee is produced, picked, wet processed and sold as parchment by smallholder producers. This coffee is mostly sold as Y grade, although a small percentage ends up a PSC (Premium Smallholder Coffee). A much smaller percentage is essentially produced in the same way, but because it has been certified and in some cases has slightly higher quality controls is sold as Fair Trade or organic or Fair Trade/organic. In locations close to reasonable roads, particularly in the Western Highlands and Jiwaka provinces, farmers sell cherry to plantations or commercial wet mills. This coffee is turned into plantation-style coffee and sold at a premium to Y grade coffee. Smallholders selling cherry obtain a price, in parchment equivalent terms, around 30% higher than they obtain for the parchment they would otherwise produce (Murray-Prior and Padarath 2013:7).

Giovanucci and Hunt (2009) point out that coffee holdings have gradually fragmented from large plantation holdings to large numbers of smallholdings. Over the years, the numbers of plantations have gradually fallen, in part owing to land disputes, and smallholders have become increasingly engaged in coffee production. This process has converted local producers from laborers to producer-owners. Giovanucci and Hunt note that for many the transition did not come with adequate preparation or training in the business of coffee farming, and this has introduced considerable inefficiencies, though not, as they point out, a significant decrease in production (Giovanucci and Hunt 2009:9). Importantly, they note that non-economic factors play a significant role in determining the behavior of farmers, who are not necessarily motivated by the desire to expand output or quality.

Smallholder culture in the coffee growing areas is not necessarily responsive to purely economic or market demands. The domestic raw coffee market is a mechanism used by smallholders to facilitate their livelihoods but only a modest percentage have the drive to produce and market as much as possible. ... In many cases, social obligations and food production requirements are more important than expanding coffee. To alter the market situation requires understanding the motivations of producers and how they perceive the welfare benefits of more cash crops. For many, though certainly not all, the priority is not to have more and more coffee or even better coffee if that requires considerably more labor or investment (Giovanucci and Hunt 2009:8-9).

The Project Appraisal Document for the PPAP provides a useful summary of the broader issues facing both coffee and cocoa farmers in PNG:

Smallholder coffee and cocoa farmers are faced with similar constraints and significant market failures impede their performance and their ability to respond to market signals. They are disadvantaged by significant diseconomies of scale resulting in high transaction costs and limited market access. Following the collapse of publicly funded extension services, smallholder farmers have little access to information, new technologies, and improved planting material. Because of information asymmetries, few farmers have knowledge about quality or standards requirements for higher remuneration or other market opportunities. Finally, the location of many smallholder farmers means that they lack access to roads and the necessary infrastructure for coffee and cocoa processing. (World Bank 2010:2-3).

Coffee Sector Policies and Strategies

The Coffee Industry Corporation Limited (CIC) has formulated a 10-year strategic plan covering the period 2008-2018, which recognizes the need to improve industry coordination and to increase returns to smallholder growers, if the sustainability of the sector is to be ensured (World Bank 2010:1-2). To that end, there is increasing consensus within the industry that PNG should build on its competitive advantage in the higher-value segments of the market, including coffees differentiated by quality, sustainability certifications, and geographical indications (to designate product origin). The market for these coffees could be more remunerative and these are among the fastest growing segments of the global coffee industry. Improving coffee farming-systems by taking advantage of diversification opportunities is also an important part of the strategy to improve coffee growers' livelihoods. These elements of the strategic plan align closely with the concern expressed throughout this report: (a) that improving quality is critical, and likely to be more attainable than expanding output; and (b) that doing so requires greater attention to gender dynamics in labor allocation and remuneration in the sector.

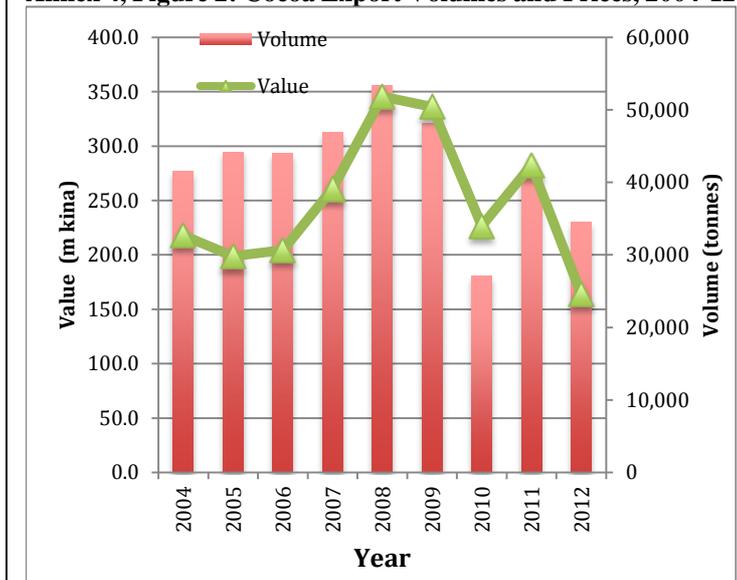
Giovannucci and Hunt argue that the most sound strategy to improve the coffee sector is likely to be two-pronged: improving technology for better productivity and quality without significantly increasing labor or the amount of land needed while also reducing costs of production and marketing. If this is done in an environmentally and socially sustainable manner and linked with private enterprise, especially mills and exporters, the sector should see a healthy improvement in its profitability and in its competitiveness and market reputation (Giovannucci and Hunt 2009:24). Here too, the emphasis on quality improvement over quantity, and the importance attached to not adding to existing labor burdens, are appropriate, as will be discussed further below.

B Background to the Cocoa Sector

Cocoa is one of the major agricultural export crops for PNG with an estimated 151,000 households, or about 1.0 million people, involved in the industry (Cocoa Board 2013). Cocoa is grown in 14 of the country's 22 provinces, with the main production areas being East Sepik, East New Britain, Bougainville, Madang, New Ireland, West New Britain, and West Sepik Provinces. It is the largest single source of income in East New Britain Province and in the Autonomous Region of Bougainville. According to the World Bank's PPAP documentation, about 85 percent of Papua New Guinea's cocoa is produced on smallholdings (World Bank 2010:2).

Cocoa has contributed over K300 million to the national economy over the last 5 years, of which an estimated 70% is usually transmitted directly to growers. Cocoa export volumes averaged around 46,000 tonnes over the 10 years from 2003 to 2012, peaking at over 53,000 tonnes in 2008. Exports have since been on a downward trend in line with the decline in production. From 2008 to 2011 earnings from cocoa remained above K300 million per annum,

Annex 4, Figure 2: Cocoa Export Volumes and Prices, 2004-12



Source: Bank of PNG, *Quarterly Economic Bulletins* (2004-12).

reaching their highest level in 2009 at K359 million. Thereafter, earnings started to decline, in part because of low production caused by cocoa pod borer (CPB) infestation, low world market prices for cocoa, and a stronger kina exchange rate (Annex 4, Figure 2).

PNG was classified as a 90% *fine flavour* producer by the *ICCO Ad-Hoc Panel on Fine Flavour* in 2010 (see Cocoa Board 2013). *Fine Flavour* cocoa is said to command a certain premium of between \$50 and \$200 on the world market. PNG cocoa is regarded as having high standards internationally and is used for blending with bulk cocoa from South East Asia. The biggest problem with PNG cocoa, however, is “smoke taint,” which was identified by the ICCO Ad Hoc Panel on Fine Flavour.

The cocoa sector has been devastated by the emergence of cocoa pod borer (CPB). The CPB pest (*Conopomorpha cramerella*) presents the biggest threat to the PNG cocoa industry. Indeed, the economic impact of CPB is considered as being comparable to the disruption caused by the 1994 volcano eruption that destroyed Rabaul (see Curry et al. 2009). It is 7 years since the Cocoa Pod Borer (CPB) pest was detected initially in East New Britain. To-date, nine cocoa growing provinces have been confirmed to have CPB (Cocoa Board 2013). In East New Britain, the leading cocoa producing region, production is estimated to have declined by 80% as a result of CPB (Cocoa Board 2013).

Technical solutions are available for CPB control. Key technical solutions include adoption of good agricultural practices, such as frequent harvesting, pruning, sanitation, and fertilization, and greater application of the Integrated Pest and Disease Management (IPDM) approach to controlling CPB (Cocoa Board 2013). The Cocoa and Coconut Institute (CCI) released 10 CPB-tolerant clones of cocoa in 2012. However, as the PPAP documentation notes, their adoption will require a substantial scaling-up of farmer support services and on-farm investments. At the same time, the PPAP points out that some diversification of cocoa-based farming systems will also be necessary if rural livelihoods in affected areas are to be restored (World Bank 2010:2).

Cocoa Sector Policies and Strategies

The Cocoa Board identifies seven key issue areas affecting the cocoa industry in PNG. These are: (i) CPB; (ii) declining smallholder productivity; (iii) poor transport and market infrastructure; (iv) under-funded research and extension; (v) poor access to, and affordability of, credit; (vi) law and order; and (vii) land tenure issues (see Cocoa Board 2013). Productivity is low: smallholder productivity has been estimated at 0.3 tonne/ha, compared with plantation yields under high management of 1.0-2.5 tonnes/ha, and research trials which have recorded yields of up to 2.5 tonnes/ha using the hybrid clone varieties. Poor infrastructure is costly to the industry: the Cocoa Board estimates, conservatively, that about 10,000 to 15,000 tonnes of cocoa do not reach the markets due to absent or insufficient transportation.

The sector has a strategic plan articulated as part of the PPAP (Agrifood Consulting International 2009). It provides for six main action areas, focused on governance, extension, CPB management, investment, quality and marketability, and research. While these areas are undoubtedly of importance, and have the overarching aim of improving productivity, performance, and returns to the sector, it is largely silent on the topic of gender. While advocating the importance of practical demonstrations of good practices for farmers, the strategy makes only passing reference to women: "The extension program would include women as beneficiaries and ensure that women facilitators and women farmers are part of the training" (Agrifood Consulting International 2009:4). The importance of women's role in cocoa farming (notably in processing), and their indispensable role in ensuring quality, requires explicit attention and pro-active focus as extension programs are designed and implemented. The proposal to ensure that extension agents come from within the communities concerned is, in this respect, a positive one.

It sets a target that at least 30 percent of the beneficiaries of training should be women, and at least 30 percent of beneficiaries of seed distribution and access to capital should be women. It will be important to monitor whether this is in fact occurring—what is the specific result of this orientation, and what obstacles have been encountered. The strategy acknowledges that, "in spite of women being active in cocoa cultivation, training and extension programs are mostly directed to men" (Agrifood Consulting International 2009:15).

The Cocoa Board emphasizes four key action areas to promote the cocoa industry. First, it argues that clonal cocoa is the way forward for the future, and that significant investment in new nurseries is necessary. This will provide farmers with clonal seedlings for replanting and clonal budwood for rehabilitation of their old cocoa trees. These need to be established in strategic locations in the growing provinces for farmers to have access to planting material. In the remote areas and provinces, hybrids can still produce the desired result given proper block management (Cocoa Board 2013). Here too, an opportunity for greater gender-inclusion is apparent. According to interviewees met during the January 2014 field visits, women are "more meticulous" and more careful in nursery and bud garden work, which could in turn have a positive impact on the quality of the varieties developed and of the plant material provided to cocoa growers.

Second, it is of the view that certification is become increasingly important in the cocoa industry, as discussed in Chapter 3. Third, it is more beneficial for farmers to work in organized grower groups rather than individually. This makes it easier to tap into services provided by both government and the private sector. A further advantage is that groups have greater bargaining power to negotiate better prices for farmers, and to exploit economies of scale.

Fourth, since the emergence of CPB, farmers are encouraged to use communal driers, as otherwise the small quantities of beans being harvested from farms are not sufficient for proper fermentation to occur. Usage of communal facilities would also make it easier for the Board's inspections and monitoring work to be conducted and can lead to the reduction in smoke taint.

Annex 5 The Fresh Produce (Horticulture) Sector in PNG

The fresh produce (horticulture) sector in PNG is markedly different from the coffee and cocoa sectors described in Annex 4. While the three sectors share the important characteristic that many smallholders are involved in production, indicating that production is highly fragmented, the fresh produce sector is also highly fragmented in distribution and marketing. Unlike coffee and cocoa, where the product is destined for export and the market is essentially limited to a small number of exporters, markets for fresh produce in PNG are very diverse, and the supply chains are extremely varied. For these reasons, and given that heretofore the WBG has paid less attention to the fresh produce sectors, a more extensive treatment of the fresh produce sector is provided in this Annex.

A Background to the Sector

Lack of recent and reliable data restricts an accurate assessment of the total economic value of the horticulture industry in PNG including any trends, both past and future, that prevail in the industry. However, it is widely accepted, as reflected in several of the key strategic documents of the Papua New Guinea Government such as the PNGSDP 2010-2030, that the horticulture industry has a huge potential in contributing to the country's national development. Hence, the development of the food sector is important. A recent study looking at the feasibility of a wholesale market for fresh produce in Port Moresby (POM) highlighted further the significant economic potential of this market, indicating that the total demand for fresh produce in POM alone is now estimated to be 167,000 tonnes/annum, compared to 140,500 tonnes/annum in 2008, representing an increase of 26,500 tonnes/annum (Bonney et al. 2012:11). This increased demand for fresh produce represents a growth rate of almost 19% during the period 2008-2012. Market demand for fresh produce is likely to remain high throughout the country in years to come, due largely to resource-led development, increased urbanization, and a general rise in the standards of living among the people (Bonney et al. 2012:11).

Food crops in the horticulture industry are divided into three main groups, namely: (1) traditional staples; (2) fruits and vegetables (classified as fresh food); and (3) rice and wheat. The staples are largely produced for home consumption and the surpluses are marketed. Fruits, vegetables, and nuts are regarded as commercial food crops, since they are mainly grown for sale in formal and informal markets (DAL 2006).

Large quantities of fresh produce can be grown in the Highlands provinces of Papua New Guinea. The Highlands provide an ideal environment for the production of temperate fresh vegetables, while the major markets are situated in the more highly populated coastal areas around Port Moresby, Lae and Madang (Martin and Jagadish 2006:1). Virtually all farmers in PNG grow food crops, mostly for subsistence needs, with an increasing number producing surpluses for sale.

B Fresh Produce Sector Policies and Strategies

The Papua New Guinea Government's national development policies, priorities and strategic directions are articulated in a number of key documents including the Vision

2050, the Medium Term Development Plan, and the PNG Development Strategic Plan 2010-2030.

The Vision 2050 identifies seven (7) pillars as the major focus areas for development and growth for PNG. Wealth Creation is Pillar Two. Under this focus area, the Government plans to develop agriculture, forestry, fisheries, tourism, and manufacturing ventures to generate around 70% of GDP by 2050, with the balance coming from mining, petroleum and gas ventures in the non-renewable sector. For agriculture, the vision proposes to establish two major impact agricultural projects in all 89 districts, expand production volume of all major cash crops to enable downstream processing, provide two agricultural extension officers per district, improve the employment conditions of agricultural officers, and establish a unified agricultural plan by 2015 (Kaiulo and Manoka 2010:8).

The Development Strategic Plan (DSP) 2010-2030 states the goal of the Agriculture & Livestock Sector as “a world class agriculture sector that is responsive to international and domestic markets for a diverse range of products and provides the best available income and job opportunities”. This Plan recognises the horticulture industry, among other key sub-sectors such as coffee and cocoa, as a growth area that needs further development to achieve this objective. Although there is no baseline against which to measure progress, the DSP has set a target of a five-fold increase in the production of horticultural products, including organic products.

The DSP also highlights a number of key strategies to achieve this target and these are: (i) efficient land administration, allowing landowners to profit from their land; (ii) develop roads and supply chains to link producers to markets; (iii) provision of effective extension services; (iv) utilise economic corridor concepts such as niche or organic farming or nucleus plantations; and (v) enforce CODEX² marketing standards. It is proposed that successful implementation of these strategies will improve agriculture production five-fold, creating an estimated 267,400 additional jobs and K7.2 billion additional income by 2030 (DSP 2010:90-91).

The National Agriculture Development Plan (NADP) 2007-2016 focuses on sectoral policies for the agriculture sector. The NADP highlights the importance of making the agriculture sector more efficient and competitive through private sector development and growth and increased agricultural exports. For the food and horticultural industry, the strategic areas of focus under the NADP include: (1) improved food production; (2) development of the Food Processing and Preservation Industry; and (3) market development and promotion (NADP 2006).

According to the Fresh Produce Development Agency’s Strategic Plan (2010-2030), the goal of FPDA is ‘improved food and nutrition security, quality of life, incomes and business opportunities for farming communities and others who depend on horticulture.’ FPDA aims to achieve this goal through ‘improved efficiency and productivity of female and male farmers and others in the value chain and a commercially and economically viable and sustainable horticulture industry.’ FPDA is

² The *Codex Alimentarius* is an international framework in which national actions can be undertaken to achieve food safety outcomes for consumers but at the same time promoting and facilitating fairness in international trade.

implementing a number of programs to achieve its aims: (1) Productivity Improvement; (2) Scaling-Up of Production and Supply; (3) Marketing Systems; (4) Information Management, Communication, and Outreach; (5) Enabling Regulatory and Policy Environment; and (6) Institutional Capacity Strengthening.

C Dynamics of Fresh Produce Supply Chains

The major stages of the fresh produce supply chain include; (1) supply of inputs (seeds, chemicals, fertilizer, equipment/tools, machinery and credit; as well as training in various skills); (2) farm production; (3) basic product enhancement on farm site (harvesting, washing, cutting /trimming, sorting, packing) and transport to largely open markets; (4) consolidation of produce; (5) improved product enhancement at the buyer /aggregator level (re-washing, re-sorting, re-packing into proper recommended boxes /cartons); (5) transportation cooling chillers and storage; (6) distribution and marketing to distant markets (freighting fresh produce via air and road transport). To provide a fuller appreciation of the constraints affecting women, this section discusses six main components of the supply chain: existing marketing and marketing requirements; production systems; value addition through processing and quality management; transportation; relationships and information flow; and systemic issues. Annex 5 Figure 1 depicts the main channels for moving fresh produce from the Highlands to POM.

Existing Markets & Market Requirements

The value addition process begins with having a fair understanding of the market's requirements. Once a customer's specific needs are established including his/her ability to pay for the improved quality, necessary investments are made and other relationships to facilitate the value creation process are put in place to deliver the required product.

In PNG, there are many different types of markets for fresh produce with varying needs (Martin and Jagadish 2006). Despite the differences, the marketing system for fresh produce is commonly categorized into formal and informal systems. The formal market involves the production and marketing of mostly "introduced fruits and vegetables"³ by sellers, where the major actors are top-end supermarket and hotel chains. The informal marketing system, by contrast, caters for the production and sale of both introduced and traditional staple fruits and vegetables. Farmers under this marketing system produce crops for immediate consumption and sell the surplus. The markets for fruits and vegetables in the informal sector include: roadside markets along major road systems, front yard markets, and open markets.

The key market segments for fresh produce include supermarkets of various types, institutions of various types, kai bars, distributors, and urban markets. As analyzed by Martin and Jagadish (2006), these markets require different product attributes from their suppliers, and these are:

- Top-end supermarkets require high quality produce that meets strict quality standards, good shelf-life, continuity of supply, and certain quantities.
- Mid-range supermarkets are usually prepared to accept product that is lower quality,

³ "Introduced" vegetables refer to what are considered to be Western-style vegetables such as broccoli, cauliflower, carrot, cabbages, radish, celery.

but still require good shelf-life, continuity of supply, and certain quantities.

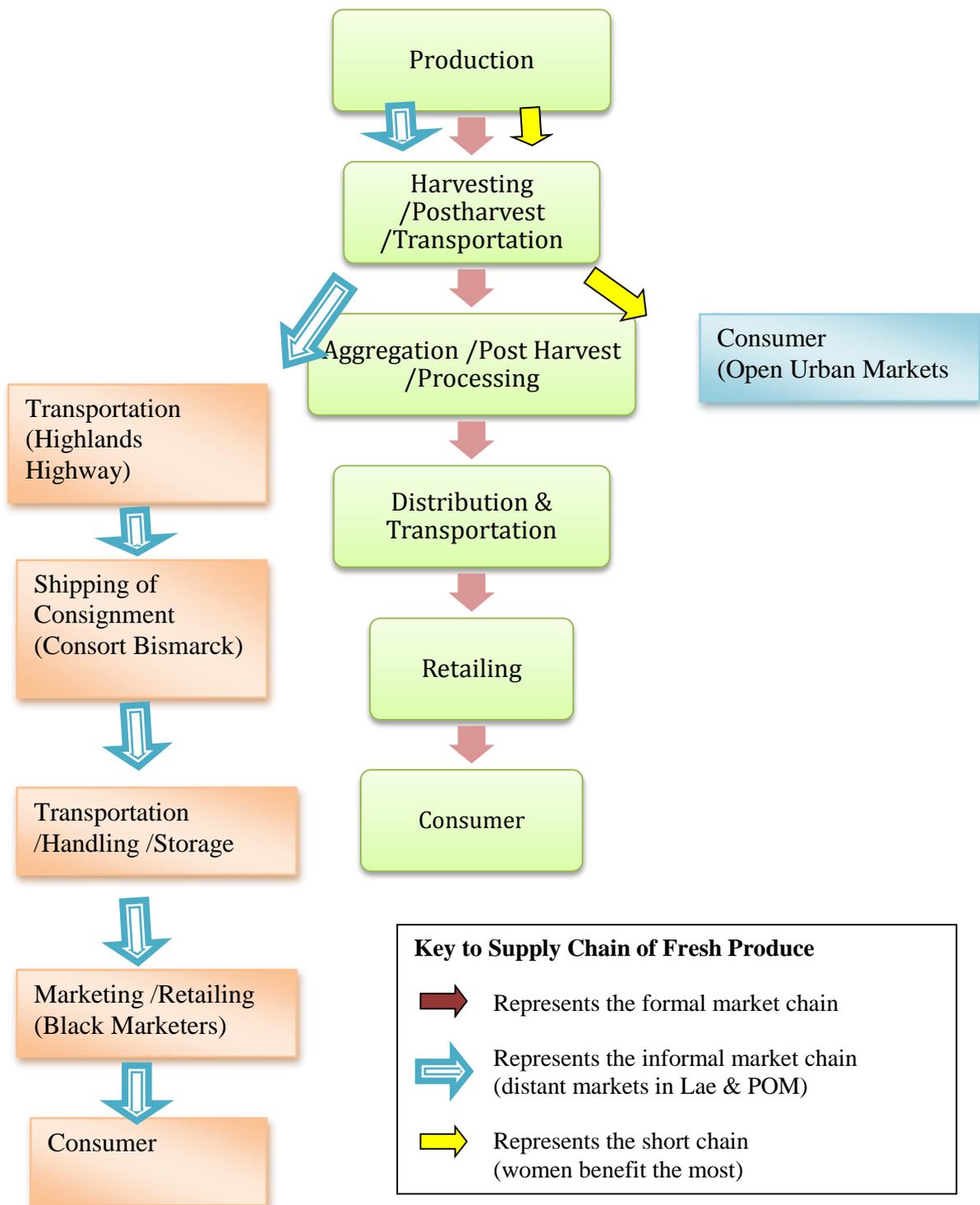
- Top-end institutions (such as international hotels) require high quality but there may be some latitude in what they accept; they also require continuity of supply, and certain quantities.
- Other institutions (such as universities, mines, etc.) do not have particularly high quality requirements, but will want continuity of supply, and certain quantities.
- Kai bars will require relatively low quality produce, continuity of supply, and certain quantities.
- Distributors perform the intermediation function of bringing buyers and sellers together; as such, they will determine what each of the above segments might require in a week (in terms of quality and quantity) and match this with supply from marketers or self-marketing farmers who approach them.
- The urban markets also perform an intermediation function of matching buyers with sellers, and all quantities and qualities are available for sale, with the discipline of the market leading to prices that reflect the demand and supply of various quantities and qualities.

The major players in the marketing and retailing of fresh produce include wholesalers, retailers, middlemen or ‘black marketers,’ and the final consumer. Drawing on the extensive analysis of Bonney et al. (2012), the following paragraphs summarize key characteristics of these players.

Consumers. There is little direct primary research on consumers in PNG though it is likely that PNG consumers, like those elsewhere, have a preference for local shopping.

Retailers. Retailers for fresh produce include supermarkets, urban markets, road sellers and small vendors. There are currently six main supermarket groups operating in PNG (as indicated in Table 5.1 above) and these groups have the principal strategic influence in the fresh produce market. These supermarket groups are a mix of home-grown retailers and international investors based elsewhere in Asia that have identified PNG as an emerging market opportunity in a highly competitive and increasingly concentrated global retailing environment. Supermarkets employ a range of procurement strategies, many encouraging smallholders by purchasing at the back door. Some also have direct supply arrangements with large farms (e.g., Sogeri Hydroponics), large collectors or farmer cooperatives. Supermarkets also grade the produce purchased, generally classifying imports in an expat/high income section with significantly higher prices in the fresh produce department and a ‘local produce’ section, which is of lower quality and price.

Annex 5, Figure 1: The Supply Chain for Fresh Produce



Middlemen or 'Black Marketers.' These are usually female entrepreneurs who buy fresh produce in bulk from local farmers who bring in their produce to sell at the open urban markets and re-sell the produce at the same market. At the time of this study, 'black marketers' were operating in two locations, namely, Port Moresby and Mount Hagen. In Port Moresby, local farmers arrive with their produce in PMVs to open urban markets such as Gordons market and sell their produce in bulk to the 'black marketers.'

These transactions usually occur outside the main market gate. Middlemen operating in these markets have a fair idea of where the PMVs are coming from and the likely quality and range of products. They compete aggressively for the best produce. When the produce is unloaded, several middlemen with their male bag carriers may crowd around the individual farmers (80% are women) badgering them to sell. Inevitably, with such pressure, farmers often sell for a very low price, particularly if it's after midday. Middlemen tend to sell one or a few vegetables. The majority of the 'black marketers' operating in the open urban markets throughout the city of Port Moresby are Highlanders. Bonney et al (2012), citing a study undertaken by FPDA, confirm that the 'black marketers' are Highlanders and provide a breakdown of their composition in four (4) main POM open urban markets as: 41% from SHP, 32% from EHP, and 23% from Chimbu.

In Mount Hagen, local farmers from the Western Highlands and Jiwaka Provinces bring in their produce to the Mount Hagen open urban market and sell their produce in bulk to the middlemen operating at the market. In almost all respects, the 'black marketers' in Mount Hagen operate in the same manner as the 'black marketers' in POM. However, there are some notable differences between the two markets, and this is observed in terms of the scale of operation: Mount Hagen is more commercially orientated, involving a large number of middlemen buyers, including wholesalers or aggregators who are buying and consolidating produce for on-selling to their clients in distant markets; large volumes of produce are consolidated on a daily basis, and all the farmers and the buyers congregate in one place to undertake such transactions almost every day. Inevitably, large amounts of cash are being exchanged on a daily basis in this market.

Wholesalers or Aggregators. These individuals consolidate produce from farmers for on-selling to supermarkets, resource companies, institutions, hotels, and restaurants. The exact volume of fresh produce consolidated and sold is not known and cannot be assessed due to lack of data. However, it appears that important changes have taken place between 2008 and 2012. For instance, in 2008 it was established that a total of twelve (12) wholesalers were operating in POM however this number has reduced to only three (3) wholesalers in 2012. Green Fresh Ltd is the largest of the three (3) wholesalers currently operating in POM. Alele Ltd operates depots in Mt Hagen and Kainantu, and Morobe Produce Marketing markets taro to POM. Part of this change has been driven by the needs of the LNG project, estimated to be 130 tonnes/week, 40% of which is from the Highlands (50 tonnes/week) and 60% (roughly 80 tonnes/week) from POM and Central Province.

There are two large catering services operating as wholesalers or aggregators of fresh produce: National Catering Services (NCS) and the Alliance Group (TAG). TAG is now part of NCS and NCS is now part of the Anitua Group. Both of these companies source fresh produce, and provide catering and other services to the LNG and resource projects throughout the country. Others providing catering services include Eurest (South Pacific) Ltd, Fubilan Catering Services Ltd and IPI Mountain Catering Pty Ltd. Two females were operating as wholesalers or aggregators of fresh produce at the Mount Hagen open urban market at the time of this study. These female aggregators buy produce from local farmers and on-sell the produce to their clients in distant markets such as Lae and Port Moresby.

Input Suppliers and Other Agencies. There are two major suppliers of agricultural

inputs associated with the fresh produce sector: Brian Bell & Co. Ltd, and Farmset Ltd. Both operate at the national level, having representation throughout the country and carry a wide range of products including agricultural supplies. The Fresh Produce Development Agency (FPDA) is the organization mandated by the PNG Government to provide extension services to all players along the supply chain of fresh produce.

Production Systems

Smallholder farmers operating at the subsistence level of farming produce food crops mainly for their immediate consumption and sell the surplus (Bonney, 2012; Martin & Jagadish 2006). At this level, farmers cultivate a range of traditional food crops such as taros, bananas, sugar cane and sweet potato (*kaukau*) for the family's direct consumption. Smallholder farmers do not require conventional agricultural inputs. Likewise, these farmers do not require technical knowledge or training on producing traditional staple crops. At the subsistence level, farmers do not require credit or financial support to expand their production.

The main tasks associated with growing food crops include: land preparation, collecting planting materials, planting of seeds, maintaining the crop including weeding and pruning, and fencing the land from animals. Women are directly responsible for the production of the family's food and they sell the surplus for cash incomes.

Commercial farmers, by contrast, produce fruits and vegetables for sale or income. The word commercial farmer is loosely used but for the purposes of this paper, a commercial farmer refers to those smallholders farmers who produce mainly introduced fruits and vegetables for sale (as opposed to direct consumption). A commercial farmer is not distinguished in terms of large scale farming operations using highly mechanized systems of production or specialized production of certain crops or mono-cropping covering hectares of land. A commercial farmer's production requirements differ greatly from that of the subsistence level farmer. Most commercial farmers grow introduced⁴ fruits and vegetables for sale. In order to grow introduced vegetables for sale, farmers require many of the conventional agricultural inputs (seeds, fertilizers, insecticides and other materials /equipment) and in some instances, even credit. Commercial farmers of fresh produce also require training in the technical aspects of growing and maintaining a crop.

The main tasks associated with growing introduced fruits and vegetables include; land preparation, purchasing planting materials such as seeds, purchasing other agricultural inputs such as fertilizers, establishing nurseries, maintaining nurseries, field planting, maintaining the crop whilst in the field including weeding, pruning, fertilizer application, spraying of insecticides, and fencing the land from animals.

In general, both men and women contribute labor towards the production of fruits and vegetables for sale. However, there are some differences in the amount of time or labor that both men and women contribute towards producing a crop. With some crops, due to their nature, both men and women contribute equal amounts of labor every time the crop is grown. In other instances, labor inputs are required from both parties at the

⁴ Introduced vegetables refer to Western style vegetables such as broccoli, carrots, lettuce, tomatoes, celery, cauliflower, zucchini, etc.

introductory phase of the crop, say during the first and second rounds of production, but for the subsequent rounds, women provides the sole labor in producing a crop. In other instances,

Martin and Jagadish found that, in general, those smallholder farmers who are operating at subsistence level produce a range of crops at minimum cost. They have minimal capital (such as bush knives, grass knives, spades and knapsacks), farm communally owned land and use family labor. While some may have small-scale borrowings, those spoken to in this study used internally generated funds to meet variable costs (such as seeds and insecticides) and to purchase capital items (Martin and Jagadish 2006:9). They point out that in some parts of the Western Highlands and Jiwaka Provinces, farmers have moved well beyond the subsistence focus and were running highly successful commercial businesses. In these communities, farmers were using commercial labor, able to produce sufficient high quality produce that could easily be sold to various markets and farmers were able to undertake capital purchases. Bonney et al (2012) summarized key production characteristics in 3 provinces (Annex 5, Table 1).

Annex 5, Table 1: Profile of Fresh Produce Smallholders in 3 Provinces

	Western Highlands	Eastern Highlands	Central Provinces
Population	254,227	432,972	183,983
Pop density (per km ²)	59	39	6.2
Mean farmer age (yrs)	37.6	37.7	41.2
Education to Grade 9-12	25%	14%	28%
Mean household size	6.1	6.1	7.5
Av. no gardens	4.8	3.0	4.8
Av. size gardens (ha)	1.64	1.39	0.95
No. visits to gardens ^{NS}	4.6	6.4	3.6
Production (P) vs Marketing (M) roles by gender (M – F – Both)	P: 21% - 30% - 43% M: 19% - 47% - 27%	P: 19% - 19% - 59% M: 21% - 36% - 40%	P: 9% - 6% - 77% M: 4% - 33% - 52%
Production intentions for fresh produce (Expand – Stay Same – Reduce)	78% - 16% - 6%	90% - 10% - 0%	87% - 11% - 2%
Mean no. fruit & veg grown for sale	4.5	5.5	4.3
Mean no. selling outlets used for fresh produce	3.4	2.9	1.9
Methods of transporting fresh produce to market (PMV – Own – Other)	87% - 6% - 7%	90% - 0% - 10%	89% - 9% - 2%
Use of mobile phones for marketing information	62%	23%	32%
Access to collection depot nearby	59%	1%	19%
Membership of coop or marketing group	31%	21%	11%
At least one source off-farm income for h/hold ^{NS}	48%	43%	19%
Mean value fresh produce sales	K1,809 (US\$855)	K845 (US\$399)	K1,499 (US\$708)
Mean value other cash crop sales	K1,148 (US\$542)	K1,200 (US\$567)	K1,470 (US\$695)
Mean value livestock sales	K731 (US\$345)	K347 (US\$164)	K349 (US\$165)
Gross annual family income with no off-farm income	K10,788 (US\$5,097)	4,125 (US\$1,949)	K8,046 (US\$3,802)
Gross ann. family expenditure w no off-farm income	K10,389 (US\$4,909)	K6,266 (US\$2,961)	K12,937 (US\$6,111)

Source: Bonney et al. 2012:20.

Smallholder farmers encounter various constraints in producing fruits and vegetables for cash incomes. These include: poor communication between suppliers of agricultural inputs and smallholder farmers, inaccessibility of seeds/seedlings and other planting materials, lack of reliable and consistent supply of quality seeds, lack of appropriate farming equipment/machinery and other materials, lack of credit for expanding production by smallholders, (in some areas) shortage of land due to population pressure, lack of irrigation systems, and lack of technical training or farmer schools. Farmers also lack training in business and financial management skills as well as training in socio-cultural and livelihood strategies.

The inability of smallholder farmers to access quality seeds on a regular basis was identified as a major problem by several previous studies (Martin and Jagadish 2006; Bonney et al., 2012). Martin and Jagadish (2006:13), in particular, note that:

A number of farmers in different chains reported difficulty in accessing quality seed and/or in being able to purchase seed at the right time. While it is usually difficult for outside agencies to intervene successfully in chains with respect to the provision of information (particularly towards the market end of the chain), some intervention to improve the information flow between input suppliers and smallholders could be quite beneficial to improving chain performance and smallholders' returns.

In a recent study undertaken to assess the feasibility of a new wholesale fresh produce market in POM, Bonney et al. (2012) highlighted that smallholder farmers have devised their own techniques to save or collect seeds due to lack of consistent supply of reliable and quality planting materials including seeds. They go on to explain that smallholder farmers buy first generation hybrid (F1) seeds in small home gardener packets and then collect seed for a second year's production, though such mechanisms are unreliable and are likely to result in poor performance of the crop, including low yields and poor quality.

Production of fresh produce (for sale) is fragmented. There is no coordination among farmers, there is no single line of command directing farmers what to grow, the frequency for growing, how much to grow at any given time, how to grow, and when to harvest and manage the post-harvest process. Poor coordination among farmers and lack of proper planning results in oversupply of certain crops. Inevitably, oversupply leads to reduced prices for farmers, which results in their becoming discouraged and not ensuring consistency in the production of fresh vegetables. Apart from several specialized farming operations, such as the hydroponics, many smallholder farmers cultivate on average one hectare of land for vegetables and apply the shifting mode of production. As a result, smallholders are constrained from obtaining a critical mass of produce or even a critical mass for a single line of product.

Smallholder farmers face variable costs of production as they move towards producing bulk for distant markets or planning their production to get a certain volume on a regular basis. This is particularly true for the production of sweet potato (kaukau) for distant markets. Each task associated with producing, harvesting, packing and transporting kaukau (from the farm gate to the main road) is a cost to the farmer.

Access to credit is another major constraint for smallholder farmers. Financial institutions do not provide credit to smallholders largely because there is no acceptable form of collateral. Land, which the smallholder farmer owns, is non-tradable, as it is not formally registered with clear ownership titles and demarcation of boundaries.

Value-Addition through Processing and Quality Management

At present, almost all fresh produce is sold as fresh. Much effort is concentrated on enhancing the quality of a product. Enhancement refers to the various tasks (such as trimming, washing, sorting, grading, packaging, using recommended materials, etc) that are done in an effort to improve its overall freshness, quality, and presentation. Value addition, as per conventional thinking through processing is almost non-existent

along the supply chain of fresh produce. A main reason for this is:

Currently there are no industrial scale produce farms in PNG and this will not change within the medium term. This is because the vast majority of land in PNG (96%) is held under customary tenure and mobilising land remains a key constraint to potential investors, therefore any improvements in the efficiency of the fresh produce system must involve smallholders and producer groups. Even where ethnic groups are organised into land-owner cooperatives or companies, PNG's topography and land capability remain major impediments to large scale production. Hence PNG will remain reliant on smallholder production into the medium-term future so improvements in their coordination, capacity and supporting infrastructure will be necessary for food security (Bonney et al. 2012:8).

Post-harvest losses are high due to lack of cool chain practices along the supply chain. Product quality deteriorates at the farm site soon after harvest due to lack of cool storage facilities at the farm gate. The deterioration of product quality accelerates as the smallholder farmer struggles to pack his/her produce in whatever packaging material is available, including old biscuit or twisties cartons, and loads it onto a PMV that is carrying both passengers and cargo at the same time. The product continues to diminish in quality (and value) as it changes hands from one player to the next as it moves along the supply chain. By the time the product reaches the final consumer, it is sometimes considered as non-saleable. For example, it has been estimated that 30-50 percent of sweet potato production may be unsaleable upon arrival in POM due to rots and other physical damage (Chang et al. 2013:17). This is confirmed by the POM wholesale market feasibility study, where wastage levels of 20% or more are common (Bonney et al, 2012).

The observations made by Martin and Jagadish (2006:11-12) in their analysis of the fresh produce supply chain affirm the challenges smallholder farmers face in managing the quality of their produce in the absence of cool storage, while indicating that quality issues will be product- and chain-specific. Less perishable products targeted to lower-quality market segments in relatively short chains will be relatively well-placed to cope with difficult logistics. By contrast, perishable products targeted to higher-quality market segments in long chains that face strong logistics challenges will find it less easy to maintain the quality of the product and preserve its value on its journey from the producer to the market (Martin and Jagadish, 2006:11-12).

Transportation of Fresh Produce to Distant Markets

Individuals and businesses associated with the fresh produce supply chain utilize various modes of transport to move their produce to their clients. At times, the players undertake complex marketing routes to get their produce to their clients. The finding of an ACIAR research acknowledges the fragmented nature of the supply chain and notes that fresh produce was largely transported by farmers or small-scale middlemen from the highlands down to coastal markets. The produce is often poorly packed and transported in a public motor vehicle (PMV) or on the back of an open truck. It was frequently damaged by rough handling or high temperatures (Spriggs et al. 2013:11).

A recent analysis (Bonney et al. 2012) indicates that there are a total of eight trucking companies moving cargo along the Highlands Highway, though these trucking companies are dedicated to the resource projects. Most of these trucking companies have a policy of not carrying smallholder consignments because premature harvesting

and poor packaging and handling techniques mean that wastage of vegetables may be high and transporters will not accept liability. Those that are involved in transport do so on a 'no liability' basis. There is a significant potential for back-loading fresh produce from the Highlands to Lae, but because it is regarded as highly problematic and transporters want a quick turn-around for resource project work, companies are reluctant to become involved. However, some drivers unofficially become involved in back-loading on the return journeys to Lae, but this is discouraged by companies.

Many smaller collectors and adventurous farmers transport their vegetables via unofficial backloads in dry containers returning to Lae or in the many varieties of PMVs. Costs from Mt Hagen to Lae vary, but are around PGK20-30 per seat and cargo is charged the same as it occupies a seat (Bonney et al. 2012).

Air Niugini operates three dedicated, non-refrigerated freight flights per week out of Mt Hagen (Monday-Wednesday-Friday) for transporting perishable produce to POM. The total weekly shipment is between 10-12 tonnes and there are currently about four regular users of the service. Air Niugini apparently plans to upgrade the service in the near future to the Series 400 with the higher payload, which could increase potential weekly capacity to 25 tonnes. The standard freight charge is PGK5.45/Kg but volume discounting brings the price down to just under PGK3/Kg with signed volume agreements. Air Niugini prefers consignments in stackable boxes. The airline has a small shed area for storage, which is not designed for perishables, so produce shippers have to synchronize their transport with aircraft arrivals. However, because planes are sometimes late or even cancelled, there is a need for a dedicated cool/refrigerated storage facility close to the Mt Hagen airport.

Goroka does not have a scheduled freight service but planes are available for charter on demand. Despite the lack of a dedicated freight service, there are vegetables flown out of Goroka on passenger flights as luggage. However, the Goroka runway is too short for larger aircraft and, since it is within the town boundaries, extension of both the runway and other facilities such as a dedicated fresh produce staging facility are problematic.

Lae Port is the 'export' port for PNG, the main point of access for resource development projects in the northern half of the country and re-packing trans-shipment for the SW Pacific islands. Consequently, throughput has grown rapidly and is estimated to grow at 30% per annum for the next five years (Bonney et al. 2012). According to Bonney et al, major developments are in the pipeline for both the Lae and Port Moresby ports. These developments should assist in the movement of fresh produce.

Lack of data restricts an accurate assessment of the volumes of fresh produce shipped from the Highlands, via Lae, to Port Moresby. However, Bonney et al. (2012) indicate that Bismarck Maritime and Consort Express Lines Ltd each run twice weekly, fixed cross-over services capable of carrying 220 containers including about 40 x 20 foot 'reefer' or refrigerated containers. The total time it takes to send a shipment of fresh produce from Lae to Port Moresby is currently estimated to be between 5-8 days (Bonney et al. 2012). In the absence of any refrigeration or cool chain system while in transit, one can easily imagine the state of the produce once it arrives at the designated

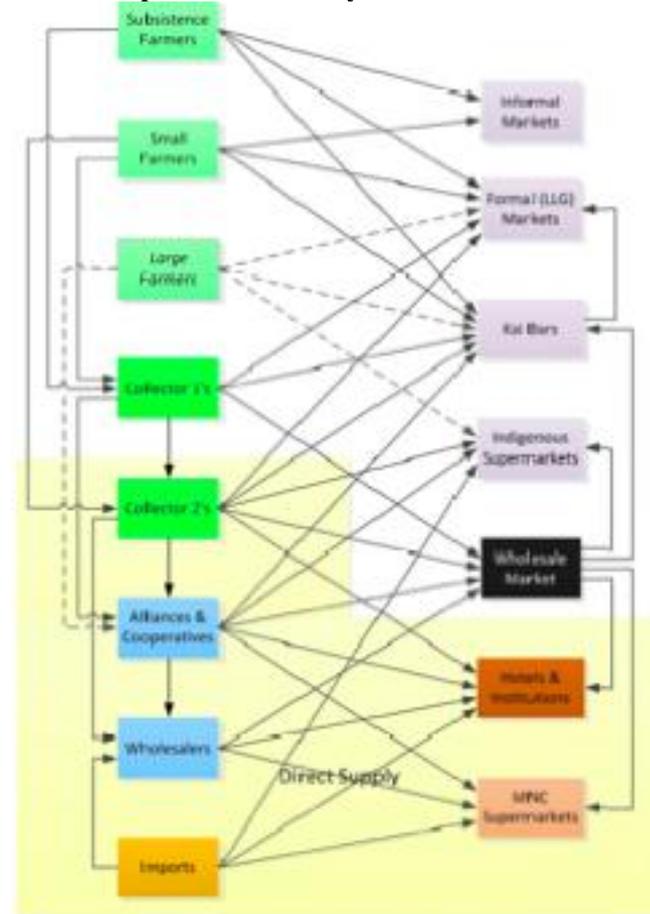
markets in Port Moresby.

Relationships and Information Flows

The supply relationships for fresh produce in PNG are complex. As stated by Bonney et al. (2012), just about every combination of relationship that can be imagined exists somewhere. However, the relationships established to create value cannot be sustained because the fresh produce market is characterized by a high level of fluidity and volatility. The relationships involved are transactional, short-term, with price-based incentives and no trust, commitment or coordination of supply. Bonney et al. further highlight that all parties regularly engage in opportunistic, exploitative behavior, that invites reciprocally and mutually reinforcing negative behavior. This behavior in the marketplace discourages smallholders to improve consistency of supply or the quality of their vegetables to markets outside their local area. Conventional practices demonstrate that value is created through developing, maintaining and utilizing various relationships along the supply chain. However, in the PNG fresh produce sector, value creation through relationships is limited because there are very few contractual relationships and relationship-based alliances. As analyzed by Bonney et al. (2012), innovations to solve problems or develop new products and create competitive advantage is problematic without such long-term, trusting, mutual interest, stable, open, and interdependent relationships. Thus, those players associated with the fresh produce subsector, either directly or indirectly, should take necessary steps to ensure that relevant relationships are facilitated, developed, executed and maintained. The complex nature of the relationships that currently exist in the fresh produce sector for the POM market is depicted in Annex 5, Figure 2.

Information flows are poor (Annex 5, Box 1). Most smallholder farmers do not know the requirements of a buyer. The buyers of fresh produce do not inform smallholder farmers of their requirements. In some instances, buyers communicate their requirements to their agent or middlemen, who then aggregate the produce and sell on to the buyer. However, there is no direct communication between the producer and the buyer. Many of the smallholder farmers

Annex 5, Figure 2: Fresh Produce Exchange Relationships in Port Moresby



Source: Bonney et al. 2012:30.

turn up with their produce at the doorsteps of a supermarket/hotel, hoping to sell their produce, only to be told that they already have sufficient stock or they refuse to buy due to poor quality. The Purchasing Supervisor of a major supermarket in Lae, during a recent interview (held on 21 January 2014), confirmed that farmers were turned away after they brought their produce to the doorstep of the supermarket because they could not buy the produce for reasons such as poor quality.

There is also poor communication between suppliers of agricultural inputs and smallholder farmers. Smallholders do not communicate their requirements to the supplier in terms of what types of seeds they want, how often they want them, which types of seeds they can afford, i.e., those in large containers (1kg) versus those in small packages (500g). Smallholders walk up to the supplier's showroom expecting to find their favorite seeds and once they realize that the seeds are not available, they just go home and wait till the next lot comes in. This waiting period is variable but could take up to a month. As a result, the farmer cannot consistently supply the market, and consistency in supply is a major issue

among the farmers in PNG. Rebecca None of the Fresh Produce Development Agency indicated during a farmers meeting (held on 24 January 2014) in Goroka that farmers continue to complain about lack of markets for fresh produce, however, the main problem among farmers is lack of consistent supply to the market(s). To ensure consistent supply of produce, there must be regular communication between farmers and suppliers of agricultural inputs. An aggregator of fresh produce in Mount Hagen indicated that farmers cannot source the seeds that they need on a timely basis.

Communication is also poor between transporters (shipping companies and airlines), smallholder farmers, and middlemen or wholesalers. Shipping companies do not know the requirements of a smallholder farmer in terms of how much space he/she requires, when the produce is expected to arrive at the port, and what type of container is required. Smallholder farmers arrive at the front gates of Consort Shipping and Bismarck Shipping with their produce. It takes a day or two before the produce is loaded onto a container, usually a dry container. In an interview (on the 22 January 2014) with the Lae Operations Manager at Consort Shipping, it was confirmed that there is lack of communication between the shipping company and smallholder farmers. Lack of communication between the airline companies and the users of freight service on updates on flight delays or cancelled flights contributes greatly to the post harvest losses of fresh produce.

Systemic Issues

Businesses and individuals along the fresh produce supply chain cannot prosper in the absence of reliable infrastructure such as roads, bridges, airstrips, and cool chains.

Annex 5, Box 1: The Cost of Communications Breakdowns

There can be interrelationships between the adequacy of information flows, poor logistics, and quality. Established marketers who have linked the requirements of the market back to their sources of supply will be able to hold back supply at its source if transport schedules are disrupted, which better preserves product quality. The same is not likely to apply to self-marketing farmers who are taking excess production to markets in Port Moresby 'on spec'. These farmers can arrive in Lae with their produce, unaware that the shipping schedule has been disrupted, and the consequent delay in shipping can destroy much of the value of their produce.

Source: Martin and Jagadish, 2006:13.

Smallholder farmers cannot engage meaningfully in business if they cannot access the market. Furthermore, the requirements of a buyer cannot be fully satisfied by a supplier of fresh produce due to lack of supporting infrastructure such as cool storage facilities.

Wholesalers, aggregators, farmers, retailers, transport and shipping companies consulted during the field visits indicated that the cost of doing business was high due to poor infrastructure. The Operations Manager of Consort Shipping in Lae, for example, indicated during a recent interview in January 2014 that it costs as much to truck a container 5km in the Lae area as it does to send a container 50km in Australia. Past studies (Martin and Jagadish 2006) also acknowledged the poor condition of the roads and have highlighted the consequences of these conditions for supply chain efficiency - increased wear-and-tear on vehicles and delays in getting product to market.

Insecurity along the Highlands Highway is also hindering operations for many businesses and individuals along the fresh produce supply chain. As highlighted by the Operations Manager of Consort Shipping in Lae, shippers will not send refrigerated trucks along the Highlands Highway because of poor road conditions and insecurity. It was also noted during the discussions with the Consort Shipping representatives that truckers group together in large convoys for security purposes as they move along the Highlands Highway, which may mean further delays in transporting goods to the port -- an issue that is especially critical for more perishable fresh produce. Bonney et al. (2012) confirm that trucking companies are reluctant to use reefer containers on the Highlands Highway because of the damage caused by the rough road and the high likelihood of theft.

Martin and Jagadish's analysis of the fresh produce marketing system in PNG also brought to light key supply chain issues, including systemic problems with logistics and infrastructure. Specifically, they note that:

poor logistics and infrastructure creates problems for the marketing of smallholder produce from the Highlands. However, the extent to which it does this will be product and chain specific. Less perishable products targeted to lower- quality market segments in relatively short chains will be better placed to cope with difficult logistics. By contrast, perishable products targeted to higher-quality market segments in long chains face much stronger logistics challenges. The extent to which logistics poses problems depends on where a product or chain sits between these two extremes.

Poor infrastructure can have two key impacts on supply chains. Firstly, it can reduce the effectiveness of a chain; that is, its ability to meet the needs of its customers through the provision of product of the required quality and quantity at a specified time. Secondly, it can increase costs in the chain, thereby reducing efficiency and returns to all participants along the chain. In more extreme situations, where there are no roads, it can even deny smallholders market access. ... Transport operators, marketers and farmers all commented on the impact of poor roads, which increased wear-and-tear on vehicles and caused delays in getting product to market. A shipping operator noted that outdated port infrastructure made it difficult to maintain shipping schedules, which can also cause unexpected delays in getting product to market. Unreliable airline schedules will have the same impact (Martin and Jagadish, 2006:10-11).

Annex 6 Summary Results of the Stakeholder Workshop

A Stakeholder Workshop was held in Port Moresby on April 15, 2014, to discuss the findings of the analytical report and to provide an opportunity for people directly engaged in the three agri-business sectors to articulate their own ideas as to what the key challenges and priorities are. Participants represented a very diverse array of

interested parties: farmers, exporters, women's organizations, cooperative associations, policy-makers, researchers, providers of extension and other services, aggregators, wholesalers, and catering services. The Workshop Agenda is in Attachment 1. The list of participants is in Attachment 2. The Workshop was facilitated by Deepak Adhikary (IFC).

A Summary of Report Findings

The key findings of the analytical report were presented at the outset of the workshop. To summarize, these were: (i) women are key to quality in all three agribusiness sectors, albeit in different ways, as women are largely responsible for time-critical and quality-relevant tasks in production and processing; (ii) labor dynamics affect outcomes in each of these supply chains, as much labor is allocated for "social" purposes, smallholders tend not to see their activity as a "business," and labor shortages exist, especially at critical production/processing times, and are especially apparent when the gender division of labor is explicitly taken into account; (iii) provision of services, including inputs, extension, training/capacity-building, and finance, is limited and poorly targeted, and gender-specific tasks and needs are insufficiently integrated into design and delivery of services; and (iv) systemic issues persist and to affect performance of all three supply chains, including poor or non-existent infrastructure, absence of storage and cold chain facilities, and pervasive insecurity and violence, including domestic violence, which disproportionately affect women and their ability to operate along these supply chains.

B Summary of Group Discussions

Stakeholders formed four groups, one for each of the three sectors and one covering broader cross-cutting issues, to discuss these findings in more detail, to outline the main causes and effects of the issues identified, and to indicate key solutions and responses to these issues, based on their own experience and perceptions of the main challenges and priorities in these areas. While many issues affect the performance of these supply chains, the aim of the Stakeholder Workshop was to focus on identifying gender-specific issues, where differences between men and women are relevant. Their findings and proposed responses are summarized below.

Coffee Group

The main issues identified by the group were:

- lack of technical knowledge, especially by women, of key production and processing tasks;
- coffee theft (which is a local issue, estimated by some to represent 10-15% of production) and insecurity;
- farmers not seeing their work as a business;
- differences in incentives for men and women affecting labor allocation in the sector;
- lack of control by women of coffee-related income; labor issues; and land tenure conflicts.

The key implications of these issues for the sector were identified as affecting the reputation of PNG coffee (low quality) and as reducing demand for PNG coffee. At the same time, poor quality coffee (an estimated 85% of PNG coffee is in the lowest [Y] Grade) contributed to lower incomes earned in the sector. Moreover, the critical work done by women in the sector is insufficiently appreciated and valued, and the persistent lack of female extension agents, and the lack of outreach of training to women, further limits women's potential to contribute effectively to raising both quality and quantity of coffee produced.

The principal solutions identified by stakeholders included:

- focus training and capacity-building on the key quality-enhancing tasks, with particular focus on women's tasks;
- expand the number and reach of female extension agents, including recruiting women agents from within communities (as this too contributes to greater security of women);
- set up a coffee college to train women extension agents;
- developing a women-friendly coffee curriculum;
- use new and emerging technologies (example: "digital green") to communicate knowledge and facilitate access (by women) to training opportunities;
- address coffee theft through measures within communities (where the problem lies), including fines and other sanctions for perpetrators and strengthening the role of village councils;
- improve incentives for women to allocate their labor to the sector, including through direct payment systems (where women are supported in opening bank accounts and accessing financial services), and PV training involving sensitization of men to women's contribution and to changing cultural norms;
- work with certification agencies (largely beyond PNG) to strengthen attention to gender dimensions in verifying "social" or other co-benefits of certification, including labor dynamics and greater equity in sharing of benefits;
- shorten the supply chain to the extent possible by maximizing the opportunities for women to sell cherry directly to exporters, a measure that would simultaneously contribute to greater quality of the final product;
- link the provision of key infrastructure (notably targeting of where roads are needed) directly to where the opportunities for direct sale of cherry are greatest;
- explore new models for delivery of quality inputs in a timely and efficient manner, through agribusiness-dealer approaches, which would bring retail outlets for inputs closer to farmers.

Stakeholders emphasized the importance of cultural and behavioral shifts that need to occur in the coffee sector, and in farming more generally. They noted that the lack of a savings culture, the persistence of farming as a subsistence activity, and the absence of financial literacy, management capacity, as well as persistent patriarchal attitudes toward women and their contribution to the economy, could all be addressed through personal viability (PV) training, which has become an integral part of much of the outreach and extension work undertaken in PNG. It was pointed out that an impact assessment of PV training should be carried out, before any systematic expansion of such training were to be undertaken, while noting that it would be important for both men and women to attend such training together, so as to maximize their access to

knowledge and to strengthen spousal communication in these areas. Consideration should be given to strengthening the savings culture by facilitating women's greater access to bank accounts and financial services, developing electronic and other payment systems through which coffee buyers could provide equal (or proportionate) payments to husbands and wives for the work they do in the sector. Measures of this kind could in turn contribute to addressing the lack of incentive women currently have to contribute their labor effectively to coffee, over and above the other (domestic and food production) tasks for which they are responsible.

Stakeholders considered it equally important to build associated infrastructure, notably roads and transport services, where there is a need to build the business case for the benefits that would result from building such infrastructure. While it was critical to emphasize the need to improve the quality of red cherry that can be sold, it was pointed out that if there is no road that will enable the farmer to sell her cherry directly to the exporter (a much more certain way of ending up with better quality coffee than fermentation and drying by the smallholder), then no amount of improving production and picking practices will lead to better quality. It was pointed out that women who sell cherry directly to the exporter earn 33% more than those who do not, which, in turn, helps to shorten the supply chain considerably, to the benefit of women. This reflects a more general finding from the workshop, namely that the shorter the supply chain, the easier it is for women to contribute effectively. Investment in road and transport infrastructure needs to be undertaken in a manner that is directly aligned with investment in improved production and processing, if the full benefits of improving the quality of coffee are to be realized. Workshop participants also argued that strengthening the business case for coffee, including women's greater involvement as coffee exporters, was an important avenue to pursue.

Based on the workshop discussions, and the participatory methodology developed by the workshop facilitator, illustrative problem and objective trees for the coffee sector, which are intended to underpin greater World Bank Group (WBG) operational engagement in this, and the other, sectors, are presented in Charts 1-3 below.⁵

Cocoa Group

The main issues identified by the group were:

- low yields, in part due to CPB;
- low quality, in part due to poor block management, and inadequate processing (drying and fermenting) facilities;
- lack of business orientation among farmers (the "farming" vs. "foraging" mind set);
- persistent labor constraints, especially in the light of CPB, including different incentives facing men and women (as well as youth) in the sector, in view of male (household head) control over associated income;

⁵ These problem and objective trees for the coffee sector were prepared by Rahmad Saykib, Operations Officer, IFC. The authors of this report gratefully acknowledge this valuable contribution to the articulation of key issues in the coffee sector.

- weak market access, including through lack of transport, and poor understanding of market requirements (quality and quantities needed), leading to unreliability of supply; and
- lack of inputs.

The main causes of low yields were cocoa pod borer (CPB), low quality planting material, inadequate labor input, and poor extension services. Women face multiple claims on their time, they have lower incentives than men (because they lack control over resulting income), and they are not targeted for provision of extension and other services. The key drivers of low quality are poor pre- and post-harvest techniques, deficient drying and fermenting facilities, and lack of training and participation, including women's insufficient involvement in decision-making within the household.

The principal solutions identified by the group were:

- raise yields by improving the functioning and economic viability of nurseries and bud gardens, while focusing on developing CPB-resistant strains and improving the overall quality of plant material;
- focus specifically on developing women's technical skills and capacities to work in nurseries and bud gardens, as this is a high-potential area for greater women's involvement, where women are perceived as being more "meticulous" and therefore in a good position to contribute directly to better quality plant material in the sector, while, at the same time, working in nurseries and bud gardens could provide a career path for women toward training and employment as extension agents in the sector;
- improve quality through better training in production and processing techniques, where participants advocated for the establishment of farmer field schools in cocoa growing areas: moreover, in cocoa, as in other sectors, the emphasis was on whole-family training, and developing the concept of the "lead couple" (not "lead farmer") in delivering training;
- tackle the need to change the mind-set, both with respect to business practices and gender attitudes, through community sensitization, strengthening the "lead couple" model through the farmer field schools; and
- expand skills in the areas of book-keeping, management, financial literacy, and personal viability (PV), while focusing on the critical need for cocoa itself to be economically viable if it is to be seen as a business.

Changing mind-sets required changing community norms, not just individual behaviors.

Other points raised by the cocoa group included: the importance of seeing the totality of farming activities, and not just be limited to cocoa cultivation, as farmers operate in wider systems that they need to manage (including food and other crops), and cocoa cultivation needs to fit within these wider farming management systems; it is important not to tell farmers what to do, but to allow farmers to express their own ideas and needs; while it is true that coping with CPB requires much more intensive management, including 2 -3 times as much labor inputs, this is for a limited time, and, once CPB is under control, a more normal pattern of labor allocation can be resumed. It was argued that extension should not be a matter of "visiting" farmers, but of staying with them, and mentoring them as they seek to improve production and incomes.

Fresh Produce Group

The main issues raised by the fresh produce group were:

- low farm level productivity;
- high post-harvest losses, in large part because of the absence of cool chain and adequate storage facilities;
- limited access to good seeds and inputs;
- poor handling, including lack of appropriate packaging materials;
- lack of credit and financial services;
- poor irrigation;
- lack of transport infrastructure, including lack of transport opportunities specifically geared to the transport of fresh produce, and associated issues of accessibility, affordability, and reliability of transport services; and
- weak market linkages, including poor information flows along the supply chains, leading to high losses, poor coordination with transport services, inconsistency in quality and quantity, poor or non-existent relationships between producers and buyers (supermarkets and others).

Other issues raised included socio-cultural factors where men are the decision-makers in matters relating to income and expenses, and lack of appropriate knowledge and skills in post-harvest management. As in other sectors, the lack of female extension agents, coupled with male reluctance to women traveling or being absent for training, mean that outreach to, and skill-building of, women is very limited. Moreover, lack of access to finance, and insufficient knowledge of financial issues, further limits women's capacity to develop or grow their farming in the sector. The potential of the fresh produce sector, including as a source of exports to other countries in the region, was emphasized by the group.

The principal solutions outlined by the fresh produce group were:

- establish seed production, storage, and distribution facilities, in key provincial and regional centers, enabling NARI, FPDA, and others to produce seeds locally, to buy seeds in bulk, and to distribute to farmers at all district and LLG levels;
- establish cool storage facilities at key provincial and central locations, which would be managed by a private sector company, and which would provide appropriate support services to farmers;
- enable the private sector entity responsible for managing the cool storage facilities to provide all fresh produce transportation requirements to farmers, thus enabling farmers, especially women, to sell their produce at the farmgate, which has the added advantage of shortening the supply chain, from the farmer's perspective, considerably: this entity would coordinate all transportation needs, including land, air, and sea transportation, and ensure distribution of fresh produce to buyers and markets;
- facilitate marketing through the transport/cold storage private company, so that (women) farmers can concentrate on production tasks;

- target training and extension to women farmers, along the lines of what was discussed for other sectors, including expanding the number and reach of female extension agents;
- tackle socio-cultural barriers through PV training, and "whole family" approaches, where husbands and wives participate jointly in training and sensitization activities: this training would include capacity-building in business skills, financial literacy and management;
- enable women to open their own bank accounts and to receive payment from buyers (the cool chain/transport/marketing company) directly, along the lines of what is the current practice, mentioned during group discussions, of CPL.

Some participants expressed concern that opening bank accounts separately for women might also provoke more "family and sexual violence" (FSV), not less conflict, and it was noted that efforts in this area require continuous supervision and monitoring, and that support to men and women is required to facilitate these processes. The role of women aggregators in the fresh produce sector, some of whom were present at the workshop, was recognized as a pioneering change, which gave both men and women to see the value of the contribution women can make to improved performance in this sector.

Cross-Cutting Issues Group

The main issues raised by this group were:

- poor public finance management and expenditure prioritization, with insufficient attention given to transport infrastructure development and maintenance;
- lack of accountability;
- socio-cultural issues, including land rights and conflict over land;
- prevailing beliefs and negative attitudes toward women;
- pervasive insecurity and violence affecting communities, and especially women, throughout PNG;
- lack of information and key services, both in the agribusiness supply chains and elsewhere.

The impacts of these cross-cutting issues are felt throughout these supply chains:

- poor access to markets;
- high production and transportation costs;
- law and order issues;
- insufficient health and education services, leading to lower literacy and skill levels and generally poor health outcomes;
- inconsistent and poor quality produce, notably in the fresh produce sector, including high levels of waste, owing in part to lack of high-value market facilities, such as cool chain and storage, in turn leading to lower value products in markets and diminution of PNG's reputation in regional and global markets;
- lack of business development facilities, including gender bias in extension services, inappropriate training and skill development, and limited outreach;

- poor communications and information services throughout the supply chains, leading to insufficient knowledge of market dynamics and requirements, poor coordination with transport and other services, leading in turn to lower productivity and persistence of subsistence-focused, as opposed to business-oriented, farming.

The principal solutions identified by the group were:

- strengthen both the reach and content of training, focusing on personal viability (PV) training, involving both men and women, and facilitating broader "family business planning;"
- tackle insecurity and violence, with particular focus on ensuring that communities and local-level government agencies take ownership of this issue, and implement locally-appropriate solutions, including strengthening village courts, building community level government (LLC), and providing sufficient manpower and resources (policing) commensurate with the need in the communities concerned;
- develop new models of land use combining both food and cash crop activities, and which look at the whole farming system, not just crop-specific issues;
- mobilize communications technology and other information services (phone services, internet) to facilitate electronic banking services and access to finance, to improve information flows (market conditions, prices, transport schedules) along these supply chains, and to build the knowledge, skills, and capacities of farmers, with focus on " whole family" and PV training;
- improve market infrastructure and access, especially in fresh produce markets throughout the country, working in partnership with key activities, such as the UN Safe Cities initiative: key measures to consider include provision of banking and financial access services within market spaces; providing toilet and other facilities for women inside markets; substantially strengthening market security through adequate policing and provision of security services; facilitating greater women's participation in market management, oversight and decision-making;
- generate and use new data and baselines on production, processing, and marketing in all three sectors, including farmer profiling, to provide a basis for making the business case for, and to help to prioritize, investment in key supporting infrastructure in these sectors, including transport, cold chain, and storage facilities.

Other ideas mentioned by this group included use of freight subsidies to support transportation of product to market, though opinions differ as to the usefulness and feasibility of this kind of measure; strengthening accountability of public and private service providers through report cards, community engagement, social audits, and improving district- and local-level planning processes. Tackling socio-cultural issues would require social mapping of communities, greater engagement with men, stronger focus on the family (and not the individual) as the center of attention, as with the "lead couple" model proposed by the cocoa sector, and focusing especially on training and sensitization of landowners on issues of land use planning at the local/village level. There is clearly an important need to reach out to PNG's youth, notably to encourage and enable youth to remain on (or come back to) the land, and to take over farming responsibilities from the older generation.

C Summing Up by Tania Lozansky, IFC

Tania Lozansky, Head of Advisory Services for Asia for IFC, was invited to provide an overall summing up of the workshop. She did so around six key words:

Amazing: the meeting included a very diverse range of stakeholders who were strongly committed and fully engaged throughout the day, which is very rare.

Daunting: it is easy to feel that the challenges and issues raised are complex and overwhelming, and that things cannot change, but ...

Inspiring: the stories people have told during the day show that people are always trying new things and that there's always a solution.

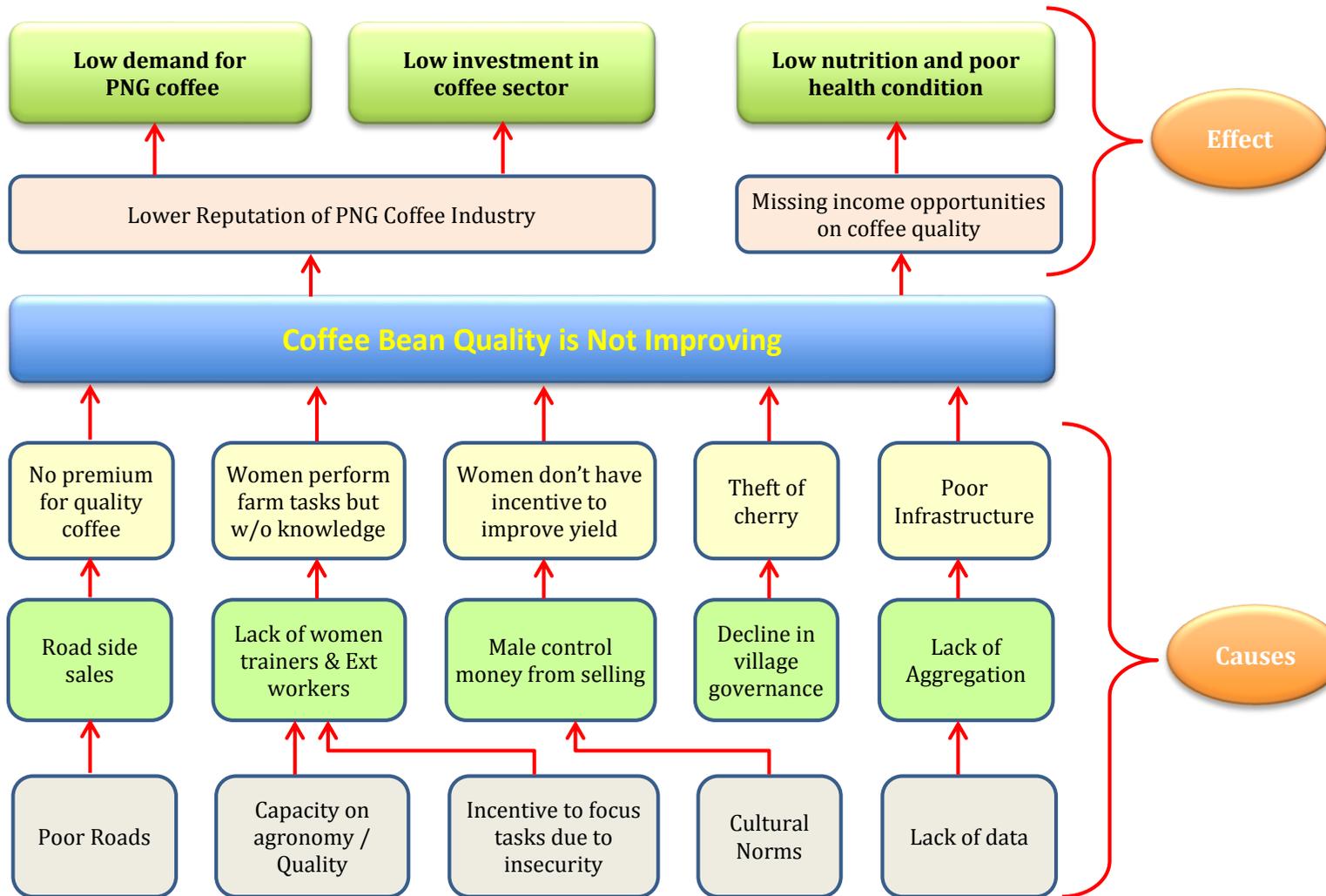
Learning: a key lesson of the day is that we must learn from experience and try new things.

Together: for the World Bank and IFC, which are both engaged in addressing gender issues in PNG, collaboration enables us to focus on both private and public sector dimensions, and to identify cross-cutting solutions and new ideas.

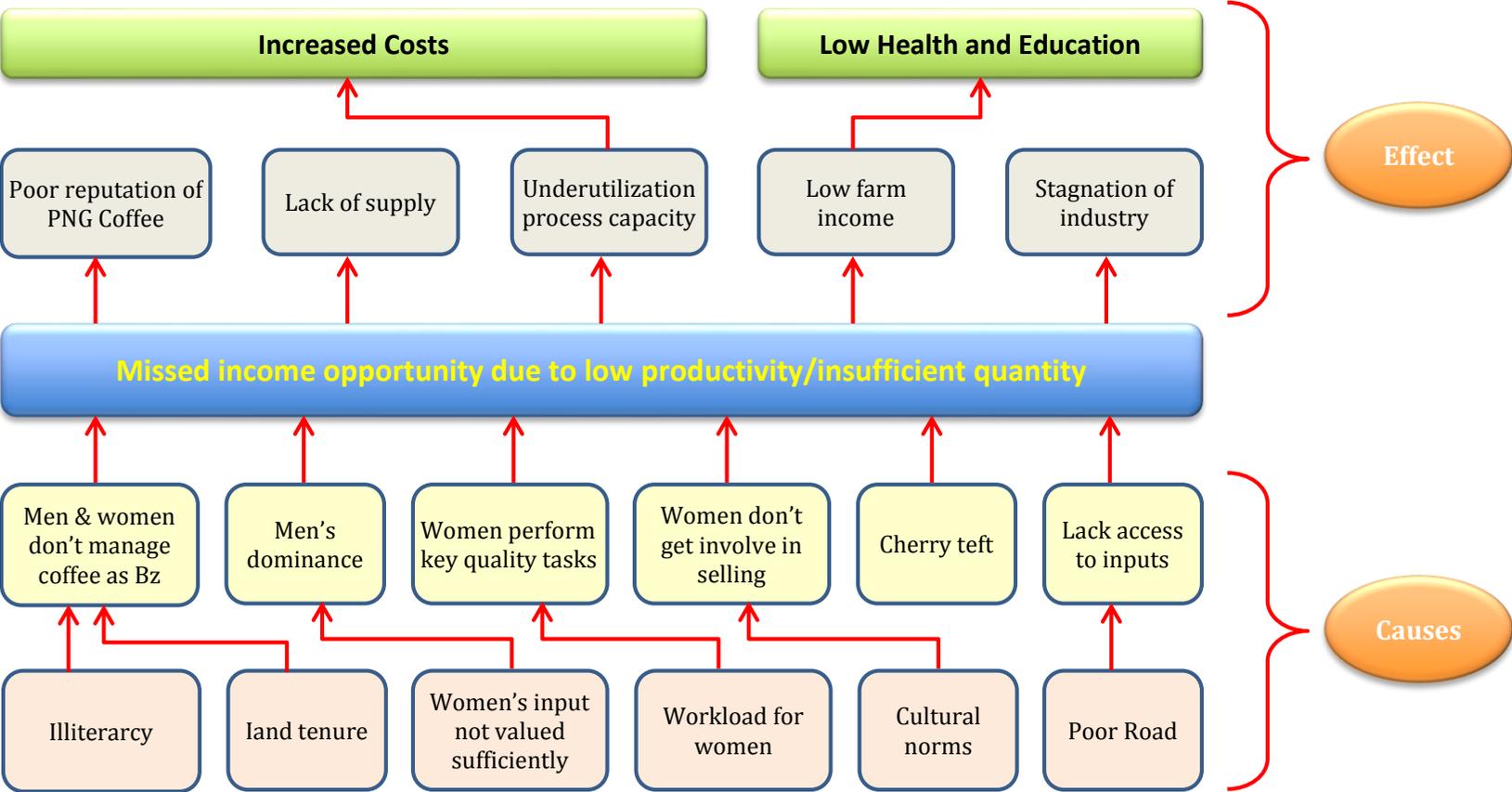
Opportunity: PNG's economic potential is enormous: "everything grows in PNG." Women's empowerment is part of the answer, in the 3 sectors and beyond, though this, and the broader sectoral issues, all need to be addressed.

Annex 6 Chart 1: Coffee Sector Illustrative Problem Tree 1

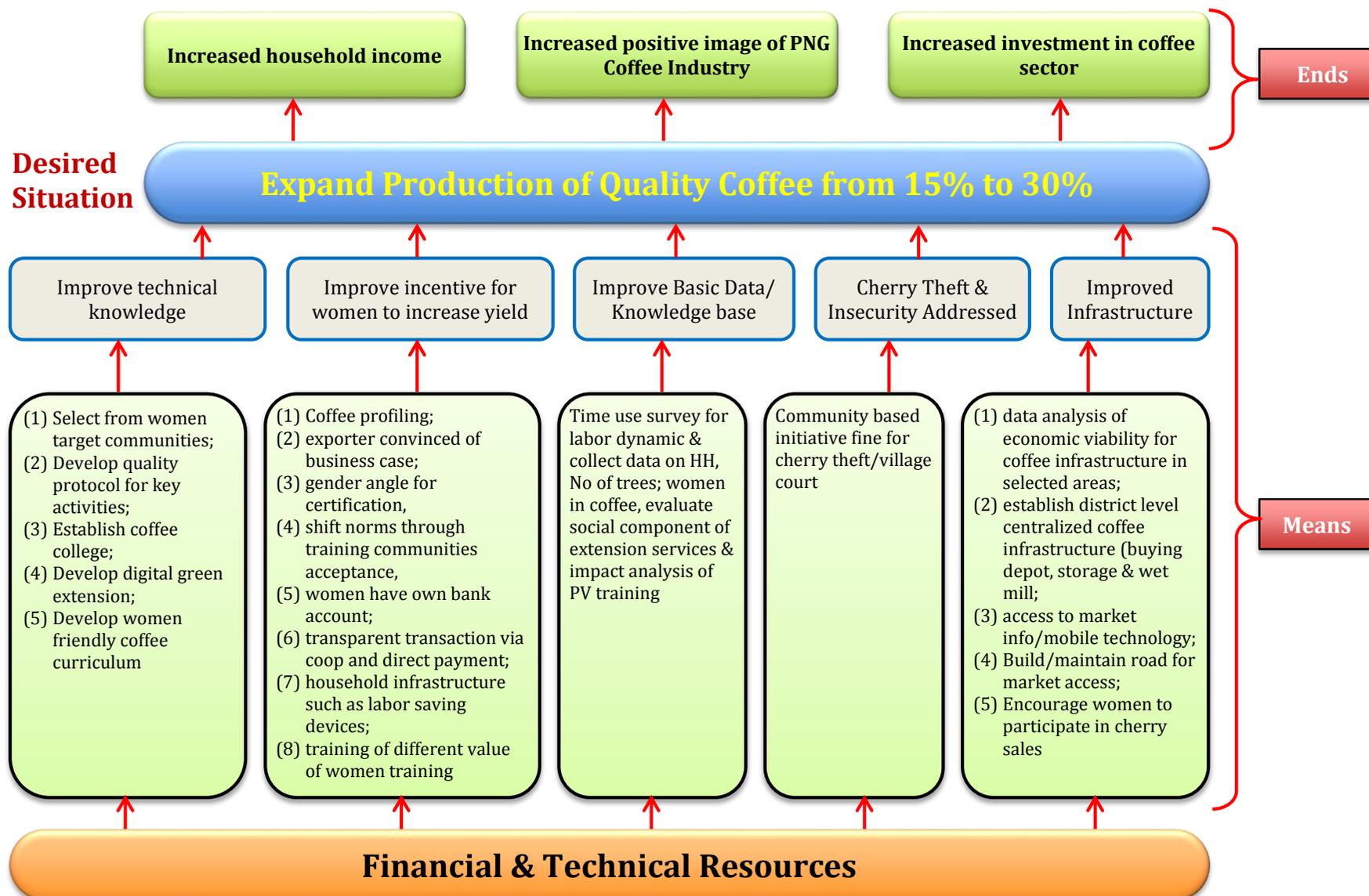
These sector problem and objective trees were prepared by Rahmad Syakib, Operations Officer, IFC, based on the workshop discussions.



Annex 6 Chart 2: Coffee Sector Illustrative Problem Tree 2



Annex 6 Chart 3: Coffee Sector Illustrative Objective Tree



Stakeholder Workshop on Gender Equality Analysis Along the Agri-Business Supply Chains in Papua New Guinea	
Port Moresby, April 15, 2014	
9:00 - 9:45	<p>Welcome</p> <ul style="list-style-type: none"> • <i>Carolyn Blacklock, Resident Representative</i> <p>Introduction and Setting Ground Rules</p> <ul style="list-style-type: none"> • <i>Deepak Adhikary, Amy Luinstra, Anuja Utz, World Bank Group</i>
9:45 - 10:45	<p>Gender perspectives on the agribusiness sector in Papua New Guinea</p> <ul style="list-style-type: none"> • <i>Presentation, Mark Blackden and Maxie Dominic, World Bank Group</i> • <i>Discussion</i>
10:45 – 11:00	Coffee Break
11:00 - 12:30	<p>Group Work (Coffee, Cocoa, and Fresh Produce) <i>Each group will work on the following key questions:</i></p> <ol style="list-style-type: none"> 1. <i>What are the main problems that are being encountered in this sector?</i> 2. <i>Where are the particular gender challenges?</i>
12:30 - 1:45	LUNCH
	Plenary report out on group work
1:45 - 3:45	<p>Group Work Continues:</p> <ol style="list-style-type: none"> 3. <i>Now that we know what the challenges are, what can be done to address them?</i>
3:45 – 4:15	Coffee Break
4:15 - 5:30	<p>Plenary discussion</p> <ul style="list-style-type: none"> • <i>Groups report back</i> • <i>Discuss cross-cutting issues and next steps</i>
5:30 – 5:45	<p>Closing remarks</p> <ul style="list-style-type: none"> • <i>Tania Lozansky, Senior Manager</i>
6:00 - 8:00	<i>Evening Cocktail</i>

April 15th, 2014
Port Moresby, Papua New Guinea

Name/Title	Institution	Location	Contact Information
PNG Government/Statutory Organizations			
Ms. Daisy Lepon Project Coordinator DRM	Dept. of Agriculture & Livestock PO Box 2033, POM	POM	PH: 3211190 FX: 3214568 C: 72043667/ Email: ds.lepon@gmail.com or daisylepon@yahoo.com.au
Mr. Paul Barker Executive Director	Institute of National Affairs PO Box 1530, POM	POM	PH: 3211044 E: paul.barker@cimcpng.org
Ms. Lovelyn Ungere	CIMC PNG	POM	PH: 3211044 C: 71810894 E: lovely.ungere@cimcpng.com
Ms. Lumbe Silai Principal Financial Analyst	Department of Treasury	POM	E: lumbe_silai@treasury.gov.pg
Mr. Joe Itaki Assistant Secretary	Gender and Development Branch, Dept. for Community Development	POM	C: 76821041 E: jitaki@dfcd.gov.pg or joeitaki01@gmail.com
Mr. Jethro Apinas Project Coordinator	WB - PPAP	POM	coordinator.pcu@ppap.gov.pg
Mr. Clement Victor Senior Project Officer	WB - PPAP	POM	c/- coordinator.pcu@ppap.gov.pg
Coffee Subsector			
Mrs. Sallyn Lomutopa President	PNG Women in Coffee c/- Coffee Industry Corporation PO Box 137, Goroka, EHP	GKA	C: 70836794 c/- Cathy Pianga cathy.pianga@gmail.com
Ms. Cathy Pianga	PNG Women in Coffee c/- Coffee Industry Corporation Goroka, EHP	HGN	C: 71286583 E: cathy.pianga@gmail.com
Mr. Michael Toliman	NECNASI Coffee Coop	LAE	via CIC Office in Lae PH: 4725044

	Name/Title	Institution	Location	Contact Information
	Manager			E: michael.toliman@global.net.pg
	Dr. Mark Kenny	Coffee Industry Corporation Goroka, EHP	GKA	C: 73630890 E: mkenny@cic.org.pg or dr.markkenny@gmail.com
	Mr. David Freyne Project Manager	WB PPAP, Coffee Component	GKA	ppap@cic.org.pg
Cocoa Subsector				
	Mr. David Peate Managing director	Paradise Foods Ltd. Boroko, NCD	POM	david.peate@paradisefoods.com.pg
	James Maora	PNG CCI, POM Rep.	POM	C: 72926833 E: jasmaora@gmail.com
	Mrs. Laniete Aua Cooperative Leader	East New Britain Youth & Women in Agriculture c/- NARI Rabaul, ENBP	RAB	C: 73810080 c/- Kiteni Kurika E: kiteni.kurika@nari.org.pg
	Mr. Martin Powell, Component 2 Coordinator	WB – PPAP, Cocoa Component	RAB	c2c@ppap.cocoaboard.org.pg
	Dr. Eremas Tade Acting CEO	PNG Cocoa Coconut Institute Ltd.	RAB	71721557 E: c/- Jacinta Palacham palachamj1902@gmail.com
	Dr. Josephine Saul Maora Principal Scientist	PNG Cocoa Coconut Institute Ltd.	RAB	C: 71872654 josephinesaul@yahoo.com.au
	Mrs. Kiteni Kurika Manager	East New Britain Youth & Women in Agriculture c/- NARI Rabaul, ENBP	RAB	C: 71504303 E: kiteni.kurika@nari.org.pg
	Mr. Arul Thomas	OUTSPAN PNG Ltd.	RAB	PH: 982 3176 E: arul.thomas@olamnet.com
Fresh Produce Subsector				
	Mr. Mark Worinu	Fresh Produce Development Company PO Box 958, Goroka, EHP	GKA	PH: 5323248 E: worinu@yahoo.com
	Mr. Noel Kuman	Fresh Produce Development Company Goroka, EHP	GKA	E: noel.kuman@gmail.com
	Rachael Jubal	FDAP Contact Farmer	GKA	C: 72900570 Sent via Fax

	Name/Title	Institution	Location	Contact Information
	Ms. Serah Kakulai FPDA Extension Officer	Fresh Produce Development Company Rabaul ENB	RAB	PH: 9829886 C: 71845348 E: sarah.kakulai@gmail.com or nadia_services@yahoo.com
	Ms. Agnes Merep Gal Vegetable Farmer	FPDA Contact Farmer	HGN	C: 72013104 c/- Maino Wingi at FPDA E: wingimaino@gmail.com
	Mrs. Cathy David Role Model Vegetables Farmer (Jiwaka)	FPDA Contact Farmer	HGN	C: 72013104 c/- Maino Wingi at FPDA E: wingimaino@gmail.com
	Mrs. Maino Wingi Seed Potato Farmer (Tambul)	FPDA Contact Farmer	HGN	PH: 5422411 C: 71657967 E: wingimaino@gmail.com
	Andrew Aveling	FPDA Farmer	HGN	PH: 5422411 C: 71657967 E: wingimaino@gmail.com
Private Sector/NGOs				
	John Gethin Jones	NCS Holdings Ltd	POM	C: 71004854 E: john.gethin-jones@ncs.com.pg
	Mr. Chris Quirk Manager, Rice Development Manager	Trukai Industries Ltd. Mataram Street, Lae	LAE	C: 70311785 E: cquirk@rrapl.com
	Mr. Hemphrey Saese	Trukai Industries Ltd.	LAE	C: 73864607 E: hsaese@trukai.rrpl.com
	Ms. Theresa Arek Director	AMRUQA	RAB	C: 73913216 E: tarek.png@live.com
	Ms. Rosemary Miria	CPL Group POM, NCD	POM	C: 70683808 E: rmiria@cpl.com.pg
	Ms. Anna Padarath	CARE International Goroka, EHP	GKA	PH: 5322766 C: 71965916 E: Anna.Padarath@careint.org
Training in Livelihood – Strategies/Social Skills				
	Sarah Rumints Rapa	Personal Viability Trainer	HGN	PH: 5421633 C: 7150 5733
PNG Donor Partners				
	Ms. Emily Flowers	Australian High Comm.	POM	C: 71286629 E: Emily.flowers@dfat.gov.au
	Mr. Stephen Hills	Australian High Comm.	POM	C: 72001816 E: stephen.hill@dfat.gov.au
Women's Groups				
	Ms. Maria Linibi President	PNG Women in Agriculture c/- NARI	LAE	PH: 4784000 C: 72765001 E: maria.linibi@nari.org.pg

	Name/Title	Institution	Location	Contact Information
	Ms. Lesley Bennet	Women in Mining Program Chamber of Mines and Petroleum	POM	PH: 3212988 C: 71964367 E: wim@pngchamberminpet.com.pg
Public Sector Agencies/Agriculture Research				
	Dr. Sergie Bang Director	National Agricultural Research Institute	LAE	PH: 4784000 E: sergie.bang@nari.org.pg C: 71773843
WB/IFC Staff and Projects				
	Ms. Carolyn Blacklock Resident Representative	IFC	POM	PH: 3217111 E: cblacklock@ifc.org
	Mr. Gavin Murray Regional Director	IFC	SYD	E: gmurray@ifc.org
	Ms. Anuja Utz Senior Operations Officer	WB	SYD	PH: +61 -2 9235 6415 E: autz@worldbank.org
	Ms. Amy Luinstra Senior Operations Officer	IFC	SYD	PH: +61 -2 9235 6574 E: aluinstra@ifc.org
	Deepak Adhikary Principal Operations Officer	IFC	DC	PH: +1 (202) 458-7520 E-mail: dadhikary@ifc.org
	Mr. Liam Grealish Project Manager	IFC Sustainable Business Advisory	POM	PH: 3217111 E: lgrealish@ifc.org
	Mr. Allan Oliver Operations Officer	WB Sustainable Development	POM	PH: 3217111 E: aoliver1@worldbank.org
	Mrs. Nicole Jenner Project Officer	WB	SYD	PH: +61 02 92356557 E: nicolejenner@worldbank.org
	Ms. Dodi Doiwa Operations Analyst	WB	POM	PH: 3217111 E: ddoiwa@worldbank.org
	Ms. Serah Sipani Associate Operations Officer	IFC Investment Climate	POM	PH: 3217111 E: ssipnai@ifc.org
	Ms. Margaret Ali Team Assistant	WB	POM	PH: 3217111 E: mali3@worldbank.org
	Mr. Charles Lor Senior Results Management Specialist	IFC	Hong Kong	PH: + 852- -2509-8516 E:clor@ifc.org
	Mr. Wahyuni Baso Program Assistant	IFC	Jakarta	PH: +62-21-2994-8053 E:abaso@ifc.org

	Name/Title	Institution	Location	Contact Information
	Mrs. Judith Ugava Taunao Senior. Social and Community Development Specialist.	WB	POM	PH: 3217111
	Mr. Deane Woruba Consultant	WB	POM	PH: 3217111
	Ms. Summerville Kave Team Assistant	WB	POM	PH: 3217111 E: skave@worldbank.org
	Mr. Jeffrey Mavu Team Assistant	IFC	POM	PH: 3217111 E: jmavu@fc.org
	Mr. Roy Murray Prior, Consultant	IFC	North Queensla nd	PH: +61 2 427 212 079 E: roy@agribizrde.com
	Mr. Ayyamani Jagadish, Consultant	IFC	Kuala Lumpur	E: ayyamani.jagadish@gmail.com
	Ms. Maxie Dominic, Consultant	WB/IFC	POM	C: 71508775 E: makambo020368@gmail.com
	Mr. Mark Blackden, Consultant	WB/IFC	USA	PH: (1) 703-981-7993 E: mblackden@comcast.net

Annex 7 Task Terms of Reference

THE WORLD BANK GROUP *TERMS OF REFERENCE* GENDER EQUALITY ANALYSIS AND RESPONSE FOR THE AGRIBUSINESS SECTOR IN PAPUA NEW GUINEA

1. PROJECT BACKGROUND AND OBJECTIVES

The World Bank Group's mission is to help reduce poverty. This is delivered through a combination of investment and advisory services. The World Bank's Pacific program has been scaling up over the past three years, and its catalytic and convening role is in increasing demand. The International Finance Corporation (IFC) is a member of the World Bank Group, and the largest global development institution focused exclusively on the private sector in developing countries. IFC pursues its mission of reducing poverty and improving people's lives by providing financing to help businesses employ more people and supply essential services, by mobilizing capital from others, and by delivering advisory services to ensure sustainable development.

The World Bank and International Finance Corporation, known together as the World Bank Group (WBG) are undertaking a joint program to empower Pacific women. The joint WBG Program on *Gender Empowerment in the Pacific* includes parallel and joint activities to help improve equality for women in the Pacific. The objectives of this program are to:

- Promote women's migration to formal sector employment;
- Improve women's access to public services and financial services;
- Enhance women's security and safety, in private and public spaces; and
- Increase the number of women in positions of leadership in business and society.

The program is now in its pre-implementation phase and seeks to establish the baseline and analytical diagnostics needed to design effective advisory services to enhance gender empowerment in the Pacific.

The World Bank's World Development Report 2012: *Gender Equality and Development* and its companion report *Toward Gender Equality in East Asia and the Pacific* emphasizes how reducing gender inequalities in economic opportunities can improve economic outcomes. The 2013 IFC Jobs Study and the forthcoming IFC WINVEST: *Investing in Women: The Business Rationale* also makes the business case for gender diversity for firms, society, and the economy.

The overall goal of this study is to assist the WBG in achieving greater impact for women from its current activities in agribusiness and the associated supply chains in PNG and to provide clear recommendations on additional interventions aimed at improving outcomes for women in agribusiness supply chains. Agribusiness and related supply chains include crop production, agricultural extension services, seed supply, agrichemicals, farm machinery, distribution, transport, processing, marketing, and retail sales and food services. The study will focus on the supply chains for coffee, cocoa, and horticultural products,⁶ with the objective of:

- Understanding the constraints and opportunities that these sectors present for women's employment, income, and agency in PNG;

⁶ These have been chosen as organized supply chains exist for these three commodities. There is also a wealth of knowledge that has been accumulated on the supply chains for these products and on gender aspects by the World Bank and the IFC. Working on these products will also provide a useful entry point for follow-up activities.

- Identifying private sector behaviors and practices that contribute to gender inequality in economic opportunities and employment these sectors and their associated supply chains;
- Proposing rapid, medium, and long term policy recommendations that can be effective in improving women’s employment and economic opportunities, and identify opportunities for additional gender audits that can be conducted in private sector companies in PNG; and
- Proposing methods/interventions to ensure that women’s employment and economic opportunities contributes to their improved safety.

2. CURRENT AGRIBUSINESS INTERVENTIONS OF THE WORLD BANK GROUP IN PNG

The World Bank’s Productive Partnerships in Agriculture Project (PPAP) for Papua New Guinea aims to improve the livelihoods of smallholder cocoa and coffee producers through the improvement of the performance and the sustainability of value chains in cocoa-and coffee-producing areas. There are three components to the project.

- The first component is institutional strengthening and industry coordination. The objective of this component is to improve the performance of sector institutions and to enhance industry coordination in the coffee and cocoa sectors. Existing stakeholder platforms for industry coordination will be consolidated to address short- and long-term issues such as sector governance, skills development in the industry, improvement in extension services, industry strategy on threats to quality and quality promotion, information within the industry, market development and crop diversification.
- The second is productive partnerships. The objective of this component is to increase the integration of smallholder producers in performing and remunerative value chains by developing and implementing productive alliances between smallholders and the private sector aiming at improving market linkages in the project areas.
- The third is market access infrastructure. The objective of this component is to improve market access for smallholder cocoa and coffee growers in the areas targeted in the project.

To date, 25 partnerships (between smallholder farmers and lead partners including exporters, processors, knowledge, and service providers) have been approved and about 18,000 farmers are directly benefiting from the project in six provinces of PNG.

The International Finance Corporation aims to provide Investment and Advisory Services in the Agribusiness Sector in PNG. Taking an investment led approach, IFCs Agribusiness-PNG project aims to enable 4,500 lead firm-linked coffee and cocoa farmers, including 1485 women farmers, to graduate into more productive and sustainable enterprises through the adoption of better farming practices, application of higher quality inputs, such as seed and tools, as well as increased use of market information in managing farm operations.

An important part of this project will be working directly with investment clients to pilot gender equality-based training and incentivizing women’s engagement along their supply chain with the aim of increasing the productivity of small holder farms through improved production practices of female farmers

IFC is also scaling up its investment activities in agribusiness-related supply chain and downstream activities with a strong pipeline of potential investments in the coffee, cocoa, fresh produce and poultry sectors.

3. SCOPE OF WORK

This work requires a three-pronged approach:

1. Gender equality analysis of agribusiness and related supply chains in PNG related to coffee, cocoa, and horticultural products, with proposals for rapid response interventions;
2. Gender equality program design workshop to discuss the findings and proposed rapid response interventions with various stakeholders; and
3. A report outlining recommendations for medium- and long-term interventions to effect reform.

•

1. Gender equality analysis and rapid response interventions

The analysis will identify the opportunities and challenges for enhancing the contribution of women and increasing their access to income and employment along different segments of the supply chain for coffee, cocoa, and horticultural products in PNG.

- a. It is important to undertake a literature and documentary review on gender aspects in the supply chains for coffee, cocoa, and horticultural products, leveraging existing research to draw together the relevant information relating to:
 - Education and training;
 - Customary land tenure;
 - Participation in extension services;
 - Access to finance, property/collateral;
 - Access to resources (e.g., water/energy/telecommunications/equipment/seeds);
 - Access to services (health and education);
 - Access to grants/incentives/services/innovative technology (government, NGOs);
 - Involvement in representative bodies (private, cooperatives, public);
 - Private sector behaviors and practices in employment, with suppliers, and with customers;
 - Infrastructure, transport and logistics;
 - Certification schemes and lead buyer relevant commitment and policies, particularly in coffee and cocoa; and
 - Caregiving commitments.
- b. The Consultant should analyze:
 - What is the role of women in the coffee, cocoa, and horticultural products' supply chains? What is their income and from which crops do women derive more income?
 - What is the degree of control over their income?
 - How do they expend their income?
 - For which of the identified crops do women provide the majority of labor inputs?
 - What are the potential incentives to increasing women's integration into their supply chains?
 - Once women's roles in the supply chain are mapped, key informant and focus group discussions could help identify opportunities and challenges.
- c. The Consultant should also explore how gender equality issues arising from major legislative barriers, cultural considerations, patrilineal customary land

tenure and access to finance undermine agribusiness sub-sectors and supply chains' access to skills through poor recruitment, retention and attendance; limit productivity, create workplace tension, undermine worker-management relations and reduce innovation in agribusiness; negatively affect relations between agribusinesses and local communities; and reduce market access and sales for processors, retailers and service companies.

- d. The Consultant should identify any underlying social constraints which may impede women's access to employment or income. For example, does the security situation restrict free movement of women and hence limit their participation in certain segments of the supply chain? Possible impacts could include, among other things, gender and sexual based violence, reduced voice and agency and limited safety in public places, such as markets. Once identified, harms should be assessed as to their impact on agribusiness growth and job creation for women, and the expected impacts if these types of social constraints were removed.

Rapid response interventions: While undertaking this work, the Consultant should identify and suggest rapid response interventions that can help to increase women's involvement or remove/reduce constraints and social threats. Interventions could include awareness workshops, facilitating linkages, presenting recommended policy changes to public and private sector stakeholders, such as major retailers, processing/commodity firms, education/training etc. Rapid response interventions should be coordinated with the IFC gender specialists conducting the gender audits and related actions. These interventions would be discussed at the workshop (see point 3) and should be such that they could be taken forward either as part of existing WBG projects or as a complement to these projects. Further opportunities for gender audits of private sector companies should also be identified so that the rapid response interventions can be coordinated with the IFC gender specialists conducting the gender audits and related actions in PNG.

2. Joint gender equality program design workshop

Based on the work undertaken in point 1. above, the Consultant will contribute to facilitating a World Bank Group program design workshop prior to finalizing the report by acting as a resource person. The workshop will provide a platform to discuss the findings, especially the proposed rapid response interventions that have been identified by the consultancy team.

3. Report with medium- to long-term recommendations

The Consultant will analyze the supply chains in coffee, cocoa, and horticultural products in PNG, by role, income, and control over income. How can women's involvement be increased at each step? What are the opportunities and the kinds of constraints that need to be removed in order to affect this?

The Consultant should consolidate the findings from the various data sources and the above-mentioned activities and develop a final report with a set of medium- to long-term recommendations; these may also consist of follow-up activities to the rapid response interventions that will have been identified. The report should identify key performance indicators to track progress towards gender equality and women's economic empowerment in PNG. It should recommend areas where further work by the WBG or other organizations might be considered. In addition, the Consultant should prepare a one page brief that provides a succinct summary of main findings and the actions that are needed, and prepare an Op-Ed for media distribution. The findings of this work will help to position the World Bank Group to undertake key strategic interventions in order to enable increased female

participation in the coffee, cocoa, and horticultural products supply chains in PNG. They would also be used for advocacy purposes.

4. DELIVERABLES/SPECIFIC OUTPUTS EXPECTED FROM CONSULTANT

The overall assignment is expected to last 80 working days with the possibility of extension for 10 days subject to approval from the Project Leader. The specific breakdown of deliverables (per days) will be discussed with the Project Leader.

- In consultation with WBG project/country teams, global specialists, and results measurement team, the Consultant will be responsible for the outputs outlined in Section C. above.
- As part of this process, the Consultant will need to should undertake desk and field research, and utilize existing literature and various resources supplied in meetings with small holders, provincial women's groups, businesses (management, HR, operational and production line staff), commodity traders, and key stakeholders in the agribusiness supply chain, government agencies and civil society organizations and donors.

In terms of desk/field work, the Consultant should:

- Gather primary/secondary data and sources relating to policies, constraints, opportunities etc. *The bulk of the work regarding identifying opportunities and constraints would need to be done in the six provinces where the PPAP is active and additional provinces where IFC is active*
- Identify appropriate women and women's representatives in various layers of the supply chain with whom to conduct interviews/focus group discussions in order to establish functions and roles of women, the positive opportunities the sector presents, and perceived constraints to greater input and meaningful involvement of women. This might include women employees within both large and small commercial companies, cooperative members, or as landowners who might be leasing their land to large commercial companies or may be growing produce on small land holdings to sell on contract to larger commercial companies/exporters.
- Interview men among the different categories of workers, landowners, and growers in order to capture the perspective of both genders.

Schedule of Deliverables:

- An inception report, detailing the review of the literature and project documents, and outlining the proposed methodology for the assignment (end November 2013);
- A draft report following completion of fieldwork, with proposed rapid results interventions (end January 2014);
- A joint workshop and workshop report (end February 2014); and
- A final report with medium- to long-term recommendations and an Op-Ed (April 17 2014).

The Consultant will be required to undertake domestic/international travel within the region on work relating to the assignment. IFC/WB will facilitate travel and accommodation reservations for the Consultant. Any amendments to travel schedules must be submitted to the Project Leader in writing.

Acceptance of Deliverables: All specified contract deliverables will be sent in soft copy to the Project Leader as named in the Letter of Appointment.

5. SPECIFIC INPUTS TO BE PRESENTED BY THE CLIENT

Available literature, project documents, and cases on gender and development from the WBG. Access to WBG clients will be facilitated by WBG managers and staff.

6. SPECIAL TERMS & CONDITIONS/SPECIFIC CRITERIA

The Consultant should be a gender specialist who has knowledge of the key commodities in PNG or a senior professional with comprehensive expertise in supply chain analysis needed for coffee, cocoa, and horticultural products, working with a gender specialist with experience in designing/applying methodology(ies) to establish the business case for women's economic empowerment, and in providing advisory services to corporate clients. The Consultant should be able to interact confidently with clients at the policy level and with senior counterparts in national governments and/or other organizations.

Minimum Requirements

- Master's degree in economics, business, agribusiness, sociology, anthropology, gender, or in another relevant discipline
- Demonstrated experience/knowledge of supply chain analysis, with particular reference to gender issues, preferably in agribusiness for commodities relevant to the PNG context. Examples of past work must be presented.
- Work experience in an emerging market environment is strongly preferred, and experience in PNG and the Pacific region is desirable
- Proven ability to conceptualize, design and implement qualitative, anthropological field research and to produce critical analysis
- Proven ability to conceptualize, design and implement client engagements and to produce complex analytical reports for clients
- Demonstrated track record of accomplishments related to gender equity, women's economic empowerment, and gender mainstreaming
- Track record in demonstrating initiative, monitoring issues and tasks, meeting deadlines and in setting priorities
- Strong ability to communicate ideas clearly and confidently, articulate issues, recommend solutions, and facilitate workshops
- Ability to work effectively under time pressure with high capacity to produce quality work
- Excellent communication skills in English
- Willingness to travel regularly within PNG and the Pacific region.