



Australian Government

Australian Centre for  
International Agricultural Research

**SMALLHOLDER COFFEE PRODUCTION IN  
PAPUA NEW GUINEA – EXTENSION OFFICER  
TRAINING GUIDE**

**UNIT 2: KNOWING YOUR FARMERS**

---

**MODULE 2:  
WHAT FACTORS AFFECT SMALLHOLDER  
COFFEE PRODUCTION?**



Curry G, Tilden G, and Aroga L (2023)  
*Smallholder coffee production in Papua New Guinea: A training package for extension officers and farmers*, ACIAR Monograph No. 220,  
Australian Centre for International Agricultural  
Research, Canberra.

ACIAR Monograph Series No. 220 (MN220)  
© Australian Centre for International Agricultural  
Research 2023

This work is copyright. Apart from any use as  
permitted under the *Copyright Act 1968*, no  
part may be reproduced by any process without  
prior written permission from ACIAR, GPO Box  
1571, Canberra ACT 2601, [aciarc@aciarc.gov.au](mailto:aciarc@aciarc.gov.au)



**Australian Government**

**Australian Centre for  
International Agricultural Research**

**SMALLHOLDER COFFEE PRODUCTION IN  
PAPUA NEW GUINEA – EXTENSION OFFICER  
TRAINING GUIDE**

**UNIT 2: KNOWING YOUR FARMERS**

---

# **MODULE 2:**

**WHAT FACTORS AFFECT SMALLHOLDER  
COFFEE PRODUCTION?**



## The Smallholder Coffee Production in Papua New Guinea Training Program

The training program contains modules prepared in partnership with the Australian Centre for International Agricultural Research (ACIAR) and by CARE-International.

The structures of the Extension Officer Training Program and the Farmer Training Program are shown in the table below.

Some modules also contain references to additional training that learners are encouraged to complete as part of their training.

## ACIAR Resource

Monograph MN220 Smallholder Coffee Production in Papua New Guinea: a training package for extension officers and farmers. This package contains the modules for both the extension officer training guide and the farmer training guide. The ACIAR monograph is available online from [www.aciar.gov.au](http://www.aciar.gov.au)

Hard copies of the ACIAR training package may be available by contacting ACIAR or the Coffee Industry Corporation (CIC)

## CARE Resources

Organisational Strengthening Training  
CARE Family Money Management Training

The CARE modules are available online from <https://pngcdwstandard.com/resources-for-use-by-cdws-working-with-wards-communities-groups-and-smes>

Hard copies of the CARE modules may be available by contacting the CIC or CARE-International.

## Extension Officer Training Program

Title	Module reference
Introduction to smallholder coffee production in Papua New Guinea	ACIAR Smallholder Coffee Production in Papua New Guinea Training Package
<b>Extension Principles</b>	
Introduction to the Coffee Extension Officer and Farmer Training Guides	ACIAR Extension Officer Training Guide Unit 1 Module 1
The extension officer - roles and effectiveness	ACIAR Extension Officer Training Guide Unit 1 Module 2
<b>Knowing Your Farmers</b>	
Getting to know our coffee smallholders	ACIAR Extension Officer Training Guide Unit 2 Module 1
What factors affect smallholder coffee production?	ACIAR Extension Officer Training Guide Unit 2 Module 2
Strongim grup: course facilitator guide	CARE Organisational Strengthening Training

## Farmer Training Program

Title	Module reference
<b>Becoming a Coffee Farmer</b>	
Knowing your coffee tree	ACIAR Farmer Training Guide Unit 1 Module 1
Coffee nursery development	ACIAR Farmer Training Guide Unit 1 Module 2
Establishing a new coffee garden	ACIAR Farmer Training Guide Unit 1 Module 3
<b>Managing Your Coffee Garden</b>	
Weed control	ACIAR Farmer Training Guide Unit 2 Module 1
Maintenance pruning and rehabilitation	ACIAR Farmer Training Guide Unit 2 Module 2
Shade management	ACIAR Farmer Training Guide Unit 2 Module 3
Drainage	ACIAR Farmer Training Guide Unit 2 Module 4
Pest and disease management	ACIAR Farmer Training Guide Unit 2 Module 5
Coffee berry borer management	ACIAR Farmer Training Guide Unit 2 Module 6
Soil fertility and nutrient maintenance	ACIAR Farmer Training Guide Unit 2 Module 7
Intercropping in your coffee garden	ACIAR Farmer Training Guide Unit 2 Module 8
<b>Harvesting and Processing Coffee</b>	
Coffee harvesting and processing	ACIAR Farmer Training Guide Unit 3 Module 1
Coffee grading systems and pricing	ACIAR Farmer Training Guide Unit 3 Module 2
Establishing a mini wet factory	ACIAR Farmer Training Guide Unit 3 Module 3
<b>Coffee Marketing</b>	
Understanding the domestic coffee market	ACIAR Farmer Training Guide Unit 4 Module 1
Kamapim ol prairiti	CARE Organisational Strengthening Training
Kamapim ol eksen plen	CARE Organisational Strengthening Training
Setim gutpela kastom bilong ronim grup	CARE Organisational Strengthening Training
Wok bilong meneja na memba na lida	CARE Organisational Strengthening Training
Coffee certification	ACIAR Farmer Training Guide Unit 4 Module 2
Fairtrade certification	ACIAR Farmer Training Guide Unit 4 Module 3
Family money management	CARE Family Money Management Training

# CONTENTS

---

<b>CONTRIBUTING AUTHORS</b>	<b>3</b>
<b>ACKNOWLEDGEMENTS</b>	<b>3</b>
<b>INTRODUCTION</b>	<b>4</b>
Aim	4
Learning outcomes	4
Lesson plan	4
Teaching aids	5
Preliminary activity	5

## MODULE TOPICS

---

<b>2.1 SMALLHOLDER CONSTRAINTS ON COFFEE PRODUCTION</b>	<b>6</b>
What are the top constraints on coffee production for smallholders?	6
<b>2.2 FARM INPUTS</b>	<b>8</b>
Farm input shortages	8
Why is there a shortage of farm inputs?	10
<b>2.3 LABOUR CONSTRAINTS</b>	<b>11</b>
Household demographics	11
The division of household labour	11
Labour shortages	12
Returns to labour and the opportunity cost of labour	14
Exercise 1. Labour and time demands on male and female coffee smallholders	17

<b>2.4</b>	<b>ACCESS TO LAND, MARKETS AND OTHER SERVICES</b>	<b>19</b>
	Land access	19
	Planting stock	19
	Road access and transport	19
	Selling cherry or parchment	20
	Income diversification	21
	Labour	22
	Services and assets	22
	Income availability	23
<b>2.5</b>	<b>COFFEE TREE STOCK – AGE, DIVERSITY AND ACCESSIBILITY</b>	<b>25</b>
	Age of coffee trees	25
	Quality of planting material	25
	Diversity of planting material	26
	Access to planting material	27
<b>2.6</b>	<b>TECHNICAL KNOWLEDGE</b>	<b>28</b>
	Lack of technical knowledge in coffee production	28
	Why do smallholders lack technical knowledge?	32
	Barriers to the adoption of new technologies	33
	What is the best approach to delivering technical knowledge to smallholders?	33
<b>2.7</b>	<b>OTHER CONSTRAINTS</b>	<b>34</b>
	Coffee prices	34
	Land access and tenure disputes	34
	Poor rural infrastructure	35
	Law and order	35
	Grower groups and certification	36
	Environmental factors	37
	Exercise 2. Identifying an individual smallholder's constraints	38
	Exercise 3. Constraints on coffee work discussion activity	40
	Exercise 4. Coffee constraints matching activity	43
<b>2.8</b>	<b>KEY MESSAGES FOR THE EXTENSION OFFICER</b>	<b>45</b>
<b>2.9</b>	<b>QUIZ</b>	<b>46</b>
<b>2.10</b>	<b>SOURCES OF FURTHER INFORMATION</b>	<b>53</b>
	<b>APPENDIX 1. Sight cards for Exercise 3</b>	<b>55</b>

## Recommendations for additional training

In addition to this extension officer training module, it is recommended that trainee extension officers also complete the CARE-CIC or Family Farm Teams Program to develop a collaborative approach to training. These training programs can be found at:

### **CARE-CIC Training Manuals**

<https://pngcdwstandard.com/resources-for-use-by-cdws-working-with-wards-communities-groups-and-smes/>

### **Family Farm Teams Program**

*The PNG Family Farm Teams Manual*

[www.aciar.gov.au/publication/books-and-manuals/png-family-farm-teams-manual](http://www.aciar.gov.au/publication/books-and-manuals/png-family-farm-teams-manual)

*Building gender equity through a Family Farm Teams approach*

[www.aciar.gov.au/publication/books-and-manuals/building-gender-equity-through-family-teams-approach](http://www.aciar.gov.au/publication/books-and-manuals/building-gender-equity-through-family-teams-approach)

*The farmer-to-farmer adult learning manual*

[www.aciar.gov.au/publication/books-and-manuals/farmer-farmer-adult-learning-manual](http://www.aciar.gov.au/publication/books-and-manuals/farmer-farmer-adult-learning-manual)

*Business Training for Family Teams – A Facilitator’s Manual*

[www.canberra.edu.au/research/faculty-research-centres/csc/archive/family-farm-teams-program/family-farm-teams-resources/PAU-Business-Skills-Facilitators-Manual.pdf](http://www.canberra.edu.au/research/faculty-research-centres/csc/archive/family-farm-teams-program/family-farm-teams-resources/PAU-Business-Skills-Facilitators-Manual.pdf)



## CONTRIBUTING AUTHORS

---

Gina Koczberski, George Curry, Geraldine Tilden, Leo Aroga,  
Tim Sharp and Matilda Hamago

## ACKNOWLEDGEMENTS

---

This module is part of a series of modules developed specifically as a resource for extension officers for training smallholder farmer groups and the training of junior extension officers. The knowledge of the following contributors has been invaluable in the development and writing of this module:

### **Coffee Industry Corporation Ltd**

Emma Kiup, Simon Gesip and Reuben Sengere

### **Curtin University**

Sarah Mandich and Stephanie Harris

### **CARE International in PNG**

Anna Bryan, Charles Iha and Trudie Iha

Chris Gard

### **Commonwealth Scientific and Industrial Research Organisation**

Mike Webb

### **Australian Centre for International Agricultural Research**

The development of this module was supported by the following ACIAR-funded projects:

Improving livelihoods of smallholder families through increased productivity of coffee-based farming systems in the highlands of Papua New Guinea (ASEM/2008/036)

Improving Livelihoods of Smallholder Coffee Communities in Papua New Guinea (ASEM/2016/100)



# INTRODUCTION

---

## Aim of Module:

The aim of this module is to improve extension officers' knowledge of the main constraints affecting smallholder coffee production.

Smallholders produce the majority of PNG's coffee yet they face major constraints on production. These include lack of secure and regular access to: farm inputs including labour; land; markets; extension; and other services. Poor rural infrastructure and law and order problems compound these constraints. Before extension officers can provide technical and financial management support to farmers it is important that they are aware of the main factors affecting smallholder production.

## LEARNING OUTCOMES:

By the end of this module trainee extension officers will understand:

- ✓ The main constraints on coffee production faced by smallholder farmers
- ✓ Labour and other farm input constraints
- ✓ The differences in constraints between farmers in accessible areas and those in remote areas
- ✓ Why many coffee gardens have ageing and poor yielding tree stock
- ✓ The deficiencies in farmer technical knowledge and how this effects productivity with particular emphasis on management of pests and diseases and coffee garden nutrition
- ✓ The impediments to farmers posed by low coffee prices, poor rural infrastructure, law and order problems, insecurity of land tenure and lack of sustainable support from government and industry

## LESSON PLAN:

The module has four parts:

Section 2.1	The top constraints on smallholder coffee production
Sections 2.2 and 2.3	Farm input and labour constraints
Sections 2.4 to 2.6	Accessibility constraints - to markets, technical knowledge, quality planting material and other services
Section 2.7	Other constraints – coffee prices, land access, rural infrastructure, law and order, industry partnerships, and environmental factors

## TIME REQUIRED TO COMPLETE THIS MODULE: 3 DAYS

## TEACHING AIDS:

- Butchers' paper and marker pens (or white board and white board marker pens)
- Pens and paper
- For Exercise 3, the sight cards are located in Appendix 1 of this module. Photocopy a set for each group of 3-4 participants
- For Exercise 4, make copies of the boxes for the matching activity (one set for each group)

## PRELIMINARY ACTIVITY:

### Quiz

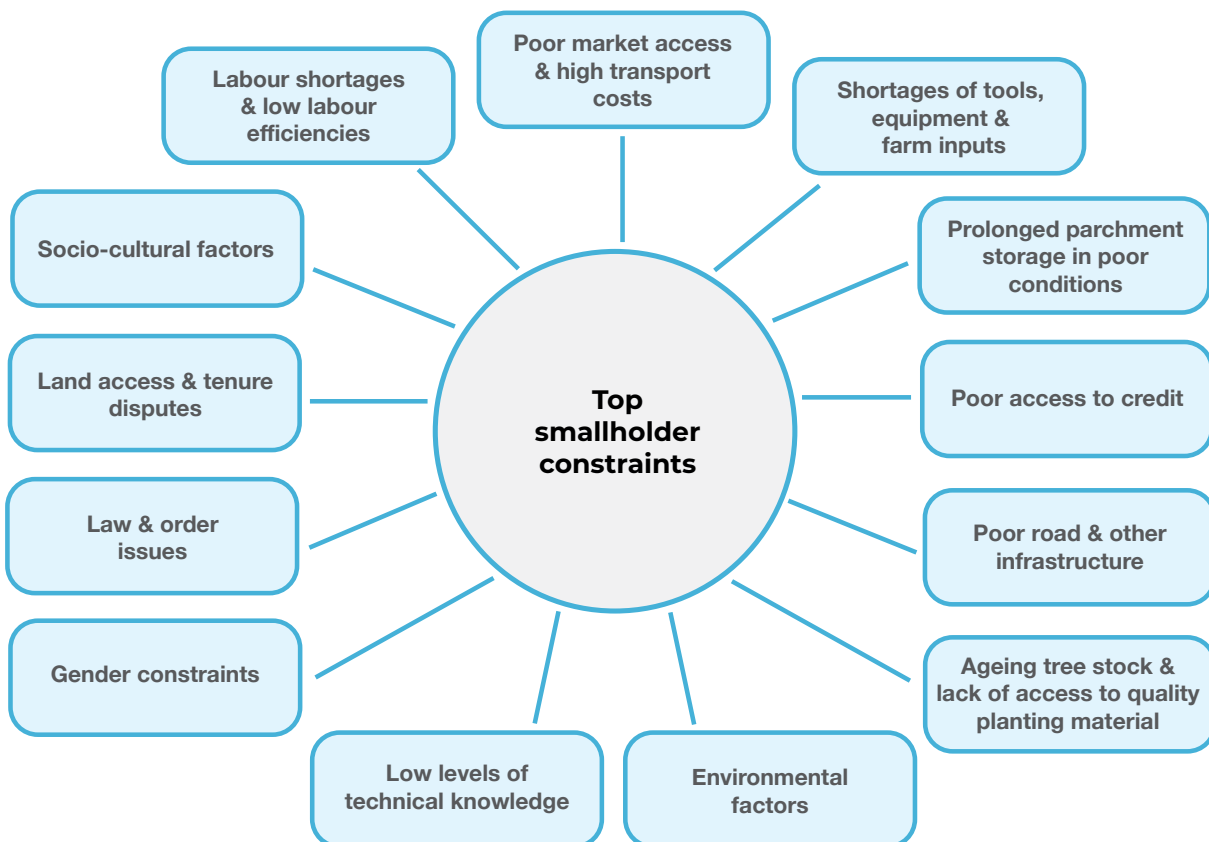
Before beginning the module topics, have the trainee extension officers complete the quiz at the end of this module. The quiz will then be repeated on completion of the module topics.

## 2.1 SMALLHOLDER CONSTRAINTS ON COFFEE PRODUCTION

Coffee is a primary source of household income for smallholders in many highlands communities. However, production and incomes are well below potential levels, and have been for many decades. Smallholders produce 85% of PNG's coffee yet they face multiple and interacting constraints on improving their coffee production and each of these will be discussed in this module.

### What are the top constraints on coffee production for smallholders?

Every coffee smallholder will have differing constraints on coffee production and the impact of each will depend on their individual circumstances. These constraints include such things as ease of access to markets, access to labour, farm inputs, extension and other services, household demographics and relationships, and land tenure. The most common smallholder constraints are shown in the following figure.



The top constraints on smallholder coffee farmers.

As discussed in the previous module, Extension Officer Guide Unit 2 Module 1 'Getting to know our coffee smallholders', smallholder farmers practise a low input system of production for a multitude of reasons. Their capacity to fully engage in coffee production and improve productivity is restricted by the constraints shown in the diagram above. It is, therefore, in the interests of the extension officer to develop a good working relationship with their smallholders so that they can establish a clear understanding of each smallholder's circumstances. This will then enable them to provide extension advice customised for each individual smallholder.

## 2.2 FARM INPUTS

---

Many smallholders, particularly in remote areas, lack the farm inputs, tools and equipment required to produce coffee efficiently. This results in very inefficient use of labour, and potentially poor returns to labour.

### Farm input shortages

- Fertiliser and inputs required for pest and disease control are unaffordable for many smallholders, particularly those in remote areas
- Improved access to basic equipment that many farmers lack would improve production efficiency. They include:
  - Pruning saw
  - Pruning secateurs
  - Wheelbarrow
  - Bucket
  - Canvas for drying parchment
  - Hand pulper
- Often in remote areas, smallholders have no alternative but to produce parchment using very laborious methods such as stone pulpers
- Poor storage conditions for parchment at the household and village level results in faster deterioration of parchment after processing, reducing quality, and therefore price

### PULPING CHERRY USING A STONE VERSUS A HAND PULPER

Some farmers in remote areas do not have access to a hand pulper so have to use a stone to pulp their cherry:

- Pulping cherry with a stone takes 12 times as long as when pulping using a hand pulper
- Very few people can use stone pulpers for 6 hours straight, so typically, coffee harvested in one day is pulped over 2-3 days thereby adversely affecting coffee quality
- Under-harvesting is common in remote areas due to a lack of pulpers. If using a stone to pulp cherry, harvesting rates are determined by the farmer's pulping capacity which is extremely low when using stones
- When the only option is a stone to pulp cherry, farmers tend to harvest coffee which is easily accessible and tolerate high levels of under-harvesting, especially of their more distant coffee gardens (Note: this has negative implications for the control of coffee berry borer)
- Pulping cherry with a stone is therefore a bottleneck in the production system in many remote areas
- Some farmers in remote areas hire pulpers during the coffee season, adding to already high costs of production (mainly transport costs)



Using a stone to pulp coffee cherry takes 12 times as long as when using a hand pulper.



Using a hand pulper is a much faster method of pulping cherry.

## Why is there a shortage of farm inputs?

### Credit

- Credit could be used to purchase farm inputs like secateurs to prune coffee or to buy canvases for drying coffee
- Coffee quality, efficiency of labour and incomes would be improved if farmers could purchase technologies like hand pulpers using credit
- However, past coffee industry credit programs have had very poor records of repayment and loans are seen as grants by many beneficiaries

### Household expenses

- Smallholder farmers have many household expenses. This limits their ability to purchase farm inputs
- Farmers have difficulties in repaying loans because of the myriad of other household expenses and demands on their income

### Partnerships

- Farm inputs are sometimes obtainable through farmer-industry partnerships
- Through these partnerships farmers can access credit in the form of farm inputs like pruning saws, secateurs and pulpers rather than as a cash loan
- At present, there are few existing farmer-industry partnerships, but they are an avenue that farmer groups could explore with potential industry partners

Increasing smallholder productivity requires equipment and other inputs. In some instances these items can only be obtained if farmers have access to credit. Credit in the form of farm inputs would be the preferred option and could be obtainable through sustainable farmer-industry partnerships.



## 2.3 LABOUR CONSTRAINTS

Smallholders rely heavily on family labour for harvesting and coffee maintenance. Very little labour is recruited from outside the family for coffee production.

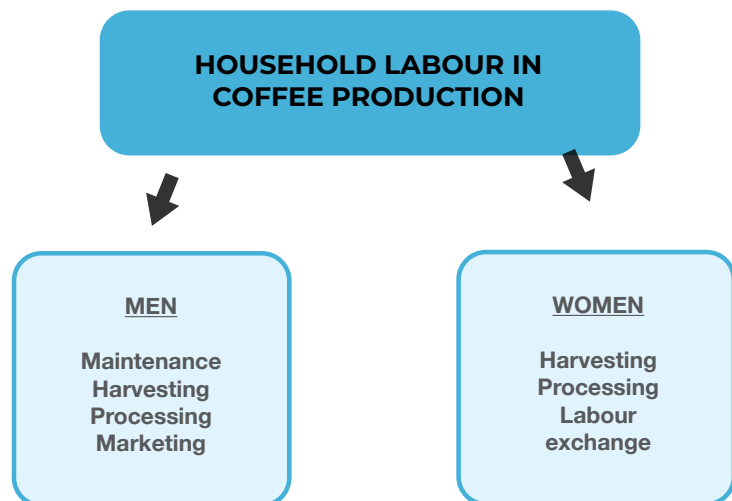
### Household demographics

The supply of family labour is dependent on household demographics. This includes the number of adults and children, their age, gender, marital status, education levels and residential status.

### The division of household labour

There is a distinct gender division of labour within households:

- Men are largely responsible for coffee maintenance (e.g. drain maintenance, fencing and pruning) and marketing
- Women contribute significantly to harvesting and processing
- Women participate in reciprocal labour exchange by providing harvesting labour to other families through social and kinship networks
- Women, in general, receive lower returns for their labour and have greater overall work burdens than men
- Women have greater responsibility for subsistence production but also provide labour (often unpaid) on what are generally considered male-owned coffee gardens in their household



## Labour shortages

Access to labour is one of the major constraints on coffee production in both remote and accessible areas. Labour shortages lead to under-harvesting – this is likely to be a key reason for low productivity.

Labour supply constraints result mainly from:

1. Absolute shortages of household and extended family labour
2. Underutilisation of household labour (the reluctance of some family members to provide labour)
3. Competing demands on labour
4. Limited use of labour mobilisation strategies like the use of hired labour

### Absolute shortages of household labour

Household labour shortages can be either short or long-term and tend to be experienced by the following types of households:

- Households that have large coffee holdings relative to household size
- Life cycle stage of the household. Households headed by the elderly, widows or women with few adult offspring to assist with harvesting and maintenance can experience labour shortages
- Newly married families or household heads with a long-term illness, face similar problems when they have no adult offspring to provide labour for coffee production
- In remote areas, many young people are absent, attending schools elsewhere or working away from the village
- In accessible areas, most families are involved in commodity crop production and other income-earning activities so there is a reluctance to ask for labour assistance from other households
- Reciprocal labour exchange is not as common as in the past because there is a reluctance for villagers, especially young adults, to provide unpaid labour to relatives

### Underutilisation of household labour

Conflicts within families can result in family members working less cooperatively as they are discouraged from or resent providing labour in coffee production. This can have a significant negative impact on the quality and quantity of smallholder production:

- The distribution of coffee income and payment for coffee work can be sources of conflict within families:
  - Women and young men often feel that the distribution of coffee income by the male household head is unfair and they are being inadequately remunerated for their labour input in coffee
  - The result is that some women and young men are unwilling to commit labour to coffee
- Another disincentive for other household members, particularly women, to commit labour to coffee is when there is unwise and frivolous use of the coffee income by the male household head

- Women, especially in accessible areas, direct their labour to activities, such as garden food production, where returns on their labour are higher or more secure. They have greater control over their own labour, production decisions and the income generated

### Competing demands on labour

Coffee farmers do not just grow coffee, they have a complex and diverse livelihood system:

- Competing demands on labour largely reflect livelihood and socio-cultural priorities
- Smallholders commit a large amount of labour and time to subsistence production, community activities and leisure such as socialising with relatives. They may also be involved in other income generating activities
- Other livelihood activities are so highly valued that few are willing to reduce these activities to commit more time and labour to coffee production. Commitment to a diversity of livelihood activities is an important pathway to status and prestige



Coffee farming-livelihood system of smallholders.

### Limited use of hired labour

Although smallholders recognise that a lack of access to labour is a major constraint on coffee production few households employ hired labour:

- Previously a cooked meal of garden food was accepted as a form of compensation for labour received. Now, labour is costly as labourers expect cash payment for their work
- Also, labourers want a cooked meal at the end of the day which includes store foods such as lamb flaps or rice and tinned fish
- Some labourers are uncertain they will be paid by smallholders creating a disincentive to seek work in coffee production
- At times of low prices it is not feasible for coffee farmers to engage labour at commercial rates
- Even when prices are high, most people are busy harvesting and processing their own coffee, and labour can be hard to find

### Returns to labour and the opportunity cost of labour

- Return to labour is the return or income a farmer receives from their labour input in coffee production
- A low level of farm inputs, tools and equipment results in the very inefficient use of labour and, therefore, potentially relatively low returns to labour
- In remote locations, high transport costs significantly reduce returns to labour
- By spending time doing coffee work, farmers are unable to use that time for other activities. This is called the opportunity cost of labour. For example, farmers may perceive that they can earn more from an hour spent on fresh food work than they can in an hour spent on coffee work
- Farmers in many accessible locations are investing their labour in high value food crops because the perceived opportunity cost of labour in coffee is higher. This can mean that farmers, especially women farmers, will be less motivated to invest labour in coffee production
- Having a range of alternative income sources like high value food crops increases the opportunity cost of coffee labour
- If good quality coffee parchment could be produced more efficiently, the labour efficiencies and improved quality would increase returns to labour. This would thereby reduce the opportunity cost of labour in coffee relative to other livelihood pursuits, such as fresh vegetable and fruit production, and make coffee production more attractive to farmers



For some remote farmers it is necessary to transport their coffee by air, significantly reducing returns to labour (Source: Susan May Inu).

### OPPORTUNITY COST OF LABOUR IN COFFEE: THE CASE FOR A DEMUCILAGER

- In areas with good access to markets, coffee smallholders are allocating labour to fresh vegetable and fruit production because the returns to labour are greater than when the same amount of labour is allocated to coffee
- This has negative implications for the coffee industry as the opportunity cost of labour in coffee is increased and fewer farmers will want to allocate time to coffee. Coffee gardens and coffee quality could deteriorate further
- Demucilagers (sometimes called ecopulpers) can be used to process coffee, one of the most labour intensive tasks in coffee production. This is an automated system whereby the pulp and mucilage are removed in one step saving a lot of time and labour
- Demucilagers avoid the need for fermentation which is required when using a conventional handpulper
- These machines have the potential to dramatically improve returns to labour in coffee through increased productivity and better quality parchment
- Although the initial cost may seem high, if the demucilager is purchased by a farmer group its cost can be quickly recouped



Using a hand pulper to pulp cherry. Fermentation, another very labour intensive step, is then required to remove the mucilage.



Using a demucilager to pulp cherry and remove the mucilage in one step.

In summary, labour shortages are a major constraint in coffee production. Some of the reasons households have a shortage of labour may be because: there is an absolute shortage of household labour; there may be underutilisation of household labour; or a reluctance to hire labour. In the majority of instances it is because competition from a diversity of livelihood activities prevents the deployment of enough labour into coffee to maintain adequate production. Increasing the efficiency of coffee production would increase returns to labour and make coffee production a more attractive livelihood option for smallholders.

**Objective:**

To differentiate how male and female coffee farmers allocate their time in coffee, as well to other enterprise and livelihood activities.

**You will need:**

Butchers' paper and marker pens (or pen and paper) for each group.

## EXERCISE 1

### Labour and time demands on male and female coffee smallholders

**Step 1:** Divide the participants into an even number of groups with 3 to 4 extension officers in each group.

**Step 2:** Have half of the groups list time demands on women and the other half, the time demands on men during both the coffee season and off-season.

**Step 3:** Rank the top 3 activities for each livelihood

**Step 4: OPTIONAL:** If there are many participants they could be divided further into groups looking at time allocation activities for men and women in remote vs. accessible areas.

Men - labour/time allocation				
Livelihood/activity	Coffee season		Off season	
	Activities	Rank	Activities	Rank
Coffee				
Gardening				
<ul style="list-style-type: none"> <li>• Subsistence</li> <li>• Marketing</li> </ul>				
Foraging and hunting				
Domestic				
Church, cultural and community				
Leisure				
Other (e.g. tradestore, piggery, meat chicken business)				

Women - labour/time allocation				
Livelihood/activity	Coffee season		Off season	
	Activities	Rank	Activities	Rank
<b>Coffee</b>				
<b>Gardening</b> <ul style="list-style-type: none"> <li>• Subsistence</li> <li>• Marketing</li> </ul>				
<b>Foraging and hunting</b>				
<b>Domestic</b>				
<b>Church, cultural and community</b>				
<b>Leisure</b>				
<b>Other</b> (e.g. tradestore, piggery, meat chicken business)				



## 2.4 ACCESS TO LAND, MARKETS AND OTHER SERVICES

Access to land, markets and services has a marked influence on smallholder coffee production. There is an obvious divide between those that reside close to markets and those living in remote areas.

### Land access

- In areas close to markets the average area of coffee per household is declining as land pressures grow. This occurs as more coffee gardens are subdivided amongst sons, and as coffee gardens are converted to other land uses
- At remote locations there are less land pressures enabling the expansion of coffee. However, many coffee gardens are located a long distance from the house (often more than a 30-minute walk)

### Planting stock

- There is greater diversity of coffee planting material in accessible locations compared with remote locations. In remote areas there is much greater reliance on a single coffee variety thereby limiting genetic diversity
- Limited genetic diversity can mean greater susceptibility to pests and pathogens or other environmental threats to coffee production

### Road access and transport

- Poor road infrastructure and long distances makes access to town very difficult for farmers located in remote areas. At many remote locations there is no road access to town
- A major hurdle for coffee producers throughout most of the highlands, but particularly in remote locations, is the transport of parchment coffee to market
- In some remote areas where there is no direct road access, the main way coffee farmers cart their coffee to buyers in town is by foot over very mountainous terrain and over very long distances
- In many districts, airstrips are unusable because they have not been maintained and airfreight charges are often so high that airfreighting is not a viable option for bringing parchment to market. Farmers have no option but to carry coffee on their backs to the nearest road. Even then they are still confronted with long distances by road and therefore high transport charges
- Having to spend long periods of time transporting coffee over long distances or hiring carriers to transport the coffee reduces returns to labour. This creates a disincentive for smallholders to increase production
- Poor road access also means there are fewer coffee buyers visiting remote areas and provision of private and government extension services is more difficult

- Law and order problems also deter coffee buyers from travelling to remote areas as they must carry large amounts of cash to purchase coffee. Instead, they are confined to major towns and district centres



To transport their coffee to markets, growers in remote locations often need to carry their coffee long distances over steep terrain  
(Source: Joeri Kalwij, NGHCE).



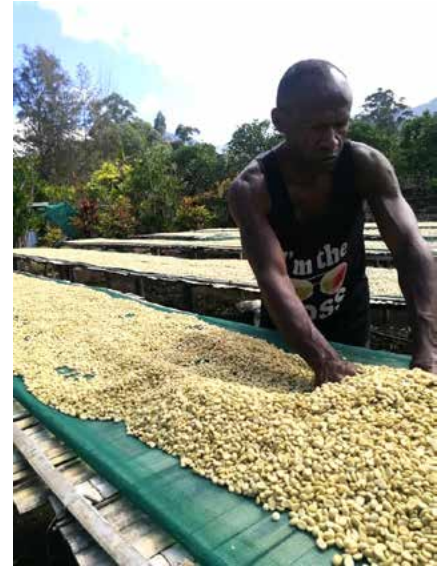
Remote farmers carry parchment coffee uphill from a deep gorge.

## Selling cherry or parchment

- Farmers in accessible areas have the choice to sell coffee cherry prior to processing. Not only do farmers receive a price premium for their cherry but it saves them expending a lot of labour in processing cherry into parchment. The saved labour can be redirected to other livelihood activities or to coffee garden maintenance
- Although men commonly control income from parchment sales, women in accessible areas have the opportunity to receive some coffee income from selling small amounts of cherry
- Some growers still prefer to produce and sell parchment even where they can sell their coffee as cherry, because parchment can be stored and sold when funds are needed or when prices rise
- Smallholders in remote locations are restricted to selling their coffee as parchment. The cost of transporting cherry is high and it must be processed quickly so only growers with good market access can sell their coffee as cherry
- Because of poor market access and high transport costs from remote locations, many growers store parchment coffee for extended periods as they are often faced with long delays in getting their coffee to market. Parchment quality can be adversely affected by long storage periods in sub-optimal conditions like in houses made from bush materials



Smallholders close to markets have the option to sell fresh coffee cherry  
(Source: Susan May Inu).



In remote areas smallholders have no option but to process their coffee and sell it as parchment  
(Source: Pr Albert Ukaiya).

## Income diversification

- In accessible areas, good income from fresh food production and marketing is leading some men and women to shift their labour from coffee to vegetable production where they receive higher returns to labour
- Some women become heavily involved in fresh food marketing because they have more control over the income from garden food production
- Most vegetables require good transport infrastructure and careful handling and storage, making them unsuitable as an alternative or additional crop for many smallholder coffee producers in remote locations
- There can be an enormous difference in the quantities of produce sold and income earned between remote and accessible locations
- In locations with good market access and near town, the broader range of income sources reflect not only better roads and access to commercial centres, but also the income opportunities associated with the larger flow of cash
- In remote areas, both men and women rely heavily on coffee as their main source of income because there are few alternative income sources that will generate the same level of income as coffee
- While women generally find it difficult to access land for coffee they are able to cultivate cash crops, such as pineapples, independently of their husbands. This is because like subsistence gardening, land access is short-term and part of the same framework of access rights governing access to land for subsistence food crops



Smallholders at accessible locations are diversifying their incomes by growing high value food crops for marketing (Source: Susan May Inu).

## Labour

As discussed in the previous section, coffee farmers can face labour shortages. This occurs in both remote and accessible areas but for different reasons:

- In remote areas, many young people are absent, attending schools elsewhere or working away from the village, creating shortages of labour
- In accessible areas, because of the greater returns to labour from vegetables there is a shift of labour from coffee to food gardening for marketing
- With most families involved in commodity crop production and other income-earning activities in accessible areas there is a reluctance to ask for labour assistance in coffee production from other households

## Services and assets

- The much lower overall cash incomes and low incomes in the non-flush periods at remote locations has implications for nutritional status, educational opportunities, farm inputs, labour productivity and smallholders' capacity to innovate
- There are very large disparities in educational outcomes along gender lines and between accessible and remote locations. This has implications for the ability of smallholders to understand and adopt the management practices necessary for producing high quality coffee
- Extension and other services provided by the government and private sector are more available in accessible areas near town. These contribute towards a better quality of life for smallholders in accessible areas than those in remote locations
- Access to banking services in remote areas is limited. Along with lower incomes this reduces the savings capacity of smallholders in remote areas
- With increasing urbanisation in accessible areas there has been a growing number of coffee buyers, leading to improved market access
- The more diverse and higher incomes in accessible locations are reflected in the better quality housing and higher ownership rates of farm inputs and general household assets

## Income availability

- Not only do market crops provide higher returns to land and labour, but also a more continuous stream of income
- This is a major advantage for women marketing vegetables and fruits in accessible areas because the income is not as strongly seasonal as coffee. Women can stagger vegetable production to ensure a regular and reasonably good income throughout the year
- Conversely, seasonality can be an important feature of coffee production. Producing and building reserves of parchment before sale is like saving money in the bank
- Small amounts of cash available in a continuous supply are often used for daily consumption. Storing coffee parchment is a way for many households to get access to a comparatively large amount of cash at one time which can then be used to pay for items such as a solar system or pig, or to meet larger expenses like school fees, bride prices or mortuary payments

Factors dividing accessible and remote locations	
Accessible locations	Remote locations
Land pressures close to urban centres. Average area of coffee per household is declining.	Generally, greater access to land enabling expansion of coffee.
Coffee gardens easily accessible (unless household has coffee gardens in other localities).	Many coffee gardens located long distances from the house (> 30 minute walk).
Growing number of buyers with increased urbanisation.	Poorer access to coffee buyers.
More support from the government and private sector.	Less support from the government and private sector due to inaccessibility.
Poor road infrastructure but accessible by road over shorter distances.	Poor road infrastructure and long distances. In many locations there is no road access.
Transport costs not a significant burden.	High transport costs.
Have a choice to sell coffee cherry for a premium price.	Coffee sales restricted to parchment
Parchment coffee stored for shorter periods and transported over shorter distances.	Transport difficulties – coffee often stored for long periods affecting parchment quality.
Earn income from coffee as well as marketing of high value food crops.	Little opportunity to market fresh produce. Income restricted to coffee.
Shift of labour from coffee to food gardening for marketing (greater returns to labour).	Few alternative income opportunities.

## Factors dividing accessible and remote locations

Accessible locations	Remote locations
Land is accessible for food gardening as it is short-term like that for subsistence gardening.	Land for coffee is long-term and inaccessible for women.
Women heavily involved in food marketing and have greater control of their income.	Little opportunity for women to earn market income
Higher cash incomes - improved household nutrition, educational opportunities (particularly for females) and farm inputs. Higher levels of farm inputs mean greater labour productivity.	Lower cash incomes – less access to nutritious foods, educational opportunities (particularly for females) and farm inputs. Lower labour productivity and capacity to innovate.
Diverse and higher incomes - better quality housing and greater ownership of household assets.	Limited income sources. Poorer quality housing and lower ownership of household assets.
Alternative income sources provide a constant stream of income.	Income from coffee is seasonal
Access to bank accounts; capacity to save. Mobile phone ownership for phone banking.	Limited access to banking and lower incomes - reduced savings capacity.
Continuous small amounts of income is often used for daily consumption.	Storage of parchment is like saving money in the bank.



In remote locations coffee gardens are often located a long distance from the house (Source: Susan May Inu).

## 2.5 COFFEE TREE STOCK – AGE, DIVERSITY AND ACCESSIBILITY

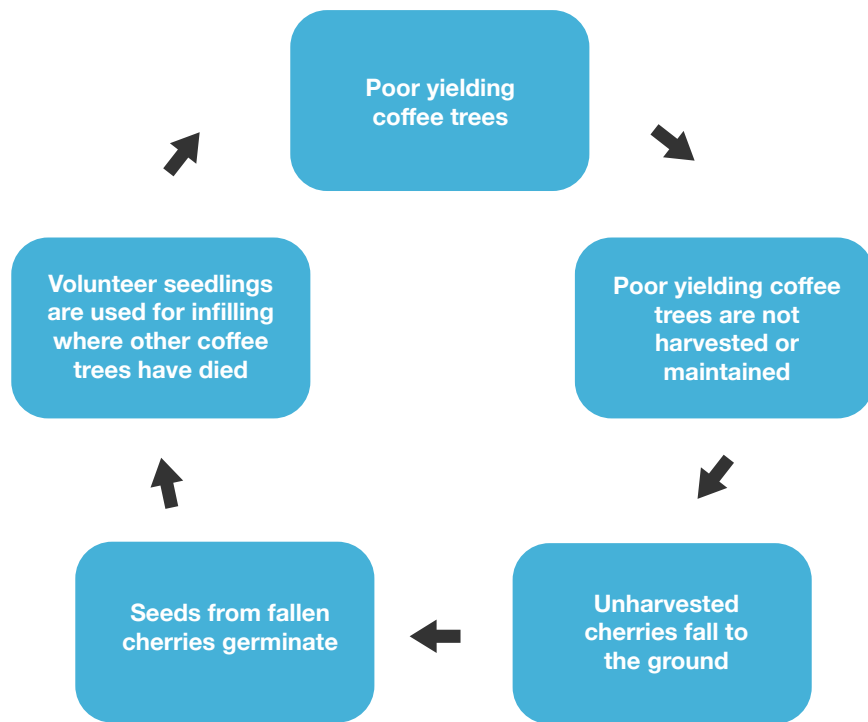
One factor contributing to low coffee yields of smallholders is the relatively old and ageing coffee tree stock. Replanting of old coffee trees has been very limited for several reasons including: land shortages; replanting is a huge task; farmers are left without income until the new trees start producing; and farmers lack access to quality planting material.

### Age of coffee trees

- Many coffee gardens were planted prior to 1990 so the trees are more than 30 years old
- In accessible locations, the limited planting of new coffee trees in the last decade is because of two inter-related factors:
  1. Rising land pressures
  2. The difficulty of accessing land to plant permanent crops like coffee which tie up land for long periods
- Coffee farmers in remote areas have limited access to quality planting material
- Replanting coffee trees is a huge task. The old trees have to be removed and replaced with new trees either grown by the farmer or purchased from a nursery
- If replanting, farmers are without income for several years until the new trees begin to yield sufficient cherry
- Replanting also opens up potential competing claims to land

### Quality of planting material

- The senescence of the stock of coffee trees is compounded by the use of poor quality planting material for infilling where old coffee trees have died:
  - Many farmers complain that their coffee trees do not yield well. Often this is because farmers use poor quality volunteer seedlings obtained from under their worst performing trees in their coffee gardens
  - The poor producing trees are often not harvested nor maintained (no grass slashing) and coffee seedlings sprout under them from unharvested beans that have fallen to the ground. The best trees are more likely to be fully harvested and better maintained, and typically there are no volunteer seedlings under them
  - Through time a coffee garden can be transformed from a potentially high yielding coffee garden to a low yielding one



The vicious cycle resulting in underperforming coffee gardens.

## Diversity of planting material

- There is greater diversity of coffee planting material in accessible areas with roughly similar proportions of the tall coffee varieties Typica, Arusha and Bourbon, commonly grown by smallholders
- In contrast, in remote locations there is a much greater reliance on a single coffee variety. As discussed previously, this has implications for the level of susceptibility of coffee trees to environmental threats
- In plantation production, dwarf coffee varieties are more commonly grown as they are higher yielding. These varieties, which are planted at a higher density per hectare, have not proven popular amongst smallholders:
  - They require much higher levels of management input than the taller varieties
  - The high labour demands make these varieties inappropriate for smallholders following a low input production strategy, particularly with regards to labour inputs
  - The dwarf varieties are susceptible to dieback and the high planting density and cherries in tight clusters make them more difficult to harvest (more time consuming)
  - Coffee garden sanitation is more difficult in densely planted coffee gardens, making it harder, for example, to collect fallen cherries infested with CBB



## Access to planting material

- In areas located nearer to services there is better access to new planting material while this is much less so for farmers in remote locations
- For all farmers there is poor access to affordable quality seedlings. The seedlings are expensive and so is the cost to transport them

Many coffee gardens require replanting due to the low productivity of ageing tree stock. Easy access to quality seedlings of a diversity of varieties at a reasonable price may be an incentive for farmers to replant their coffee gardens and in turn improve coffee yields and quality.

## 2.6 TECHNICAL KNOWLEDGE

Having sound technical knowledge of efficient coffee production is essential for growing high quality coffee cherry and processing it into quality parchment which will command better prices and improve returns to labour. It is also important for farmers to have an understanding of the principles of sustainability in order to continue to produce high quality coffee over the long-term.

### Lack of technical knowledge in coffee production

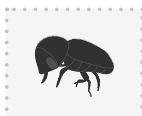
A major constraint on smallholders is a lack of technical knowledge on coffee production including in coffee husbandry, post-harvest processing and marketing, and financial management:

- There are many labour inefficiencies in smallholder coffee production, and general maintenance in many smallholder coffee gardens is poor
- Farmers' knowledge of shade, pest and disease, and soil fertility management is low resulting in low yields, often of poor quality cherry
- Inappropriate harvesting, processing and storage techniques used by farmers are the main factors reducing coffee quality and therefore price
- Many farmers have little market knowledge and poor financial literacy skills

### Coffee pests and diseases

Pests and diseases are a major problem for coffee growers but particularly so for smallholder farmers practising a low input system of production:

- Smallholders tolerate relatively high rates of losses to pests and diseases, which is a characteristic of their production system
- While farmers know that pests and diseases contribute to crop losses, they have very limited knowledge of coffee pests and diseases, and the appropriate control methods
- The environmental conditions in the area or in a particular coffee garden will influence the incidence of many pests and diseases
- Farmers have a very poor understanding of the relationships between shade levels and the incidences of pests and diseases, particularly green scale, pink disease and coffee leaf rust. The large knowledge gap on the effects of shade on pest and disease levels is a substantial barrier to improving production
- Although there are many benefits to farmers associated with selling certified coffee there are also restrictions placed on the methods that can be used to control pests and diseases (e.g. some pesticides or herbicides may be prohibited). Such restrictions increase labour requirements to control pests and diseases
- The coffee berry borer arrived in PNG in 2017. Its presence has placed an added burden on already highly constrained smallholder coffee farmers and is a major threat to the coffee industry





## CBB AND ITS CHALLENGES FOR SMALLHOLDERS

### Coffee berry borer

- Is the most serious pest of coffee production in the world
- In PNG, it was discovered in Banz, Jiwaka, in February 2017 and has since spread to many coffee growing provinces
- Spends most of its life cycle in the berry so it is difficult to control
- While eradication has not been possible the aim now is to keep pest numbers low
- Smallholder farmers have limited capacity to control CBB with their best method being good coffee garden hygiene

### Hygiene recommendations

- Frequent harvesting (fortnightly harvesting is best)
- Complete berry removal/stripping at final harvest (all berries: green, red and over-ripe)
- Floating of berries (those infested with CBB will float)
- Destroying infested berries to kill CBB



### Farmer constraints on control

- Highly labour intensive
  - May be price sensitive
  - Dropped berries may be left and become a source of infestation for the next crop
  - Neighbouring areas of unmanaged coffee trees can lead to reinfestation
- Damage caused by pigs in coffee gardens is another significant problem affecting coffee production in some communities
  - In some areas, coffee gardens are not fenced and are at risk of damage by feral and domesticated pigs. Pigs will forage freely in coffee gardens often blocking drains and damaging the coffee trees and roots



Pig owners are sometimes motivated to tether their pigs if farmers kill or harm the pigs when they are found damaging their coffee gardens. Farmers are usually reluctant to seek compensation from pig owners, as they are often family members. Disharmony in the extended family can result from a court action against a relative



Pigs damaging a coffee garden.

### Coffee garden nutrition

Poor coffee garden nutrition is compounded by poor coffee garden maintenance and failure to recycle some of the nutrients exported in cherry.

#### Nutrient status in coffee gardens

- Many smallholder coffee (and food) gardens are low in essential plant nutrients, especially nitrogen, phosphorus and potassium. Often, there are also deficiencies in both zinc and boron
- As with any agricultural crop, the selling of cherry or parchment coffee represents an export of nutrients from the coffee garden
- These nutrient deficiencies contribute to the low productivity of smallholder coffee gardens

#### Preventable nutrient losses

- Despite nutrient deficiencies in coffee gardens, many farmers lose large quantities of potentially recyclable nutrients during processing of cherry to parchment. The pulp contains high levels of nutrients, especially nitrogen and potassium
- Many farmers leave the pulp at the pulper while others dispose of it in waterways. Both of these management options result in a waste of valuable nutrients



Many farmers leave the pulp containing valuable nutrients at the pulper.

- As discussed previously, there are many advantages in selling coffee as cherry. However, because of the recognised value of pulp as a nutrient source, selling cherry rather than parchment will contribute further to nutrient losses from the coffee garden
- Poor control of erosion and waterlogging affect the supply and availability of nutrients in many coffee gardens

#### **Nutrient maintenance strategies**

- Most smallholders are unaware of the management strategies that can be used to help maintain nutrient levels. These include: effective use of the waste remaining from processing; growing legumes to cover the soil to improve the soil's nitrogen content; and the appropriate construction and maintenance of drains to minimise erosion
- Intercropping coffee trees with fertilised vegetables is an effective means of delivering nutrients to coffee trees. This is particularly useful in areas experiencing land pressures and where nutrient depletion risks are greater. As discussed previously, intercropping can also contribute to income diversification, particularly women's income
- Effective use of waste materials such as coffee pulp can reduce the financial burden of purchasing mineral fertilisers for use on vegetables in accessible villages or to retain nutrients in food or coffee gardens in remote villages
- Well managed shade trees can provide many nutritional benefits to coffee trees, however, due to a lack of technical knowledge many farmers are unaware of how to implement good shade management strategies

### Harvesting, processing and storage

In each step of the process from harvesting to the production of parchment coffee, there is the potential for quality to decline. Many farmers are not aware of, or have insufficient labour to implement, practices that will produce premium grade coffee.

- Incorrect harvesting techniques may result in cherry of variable ripeness which has implications for pulping and quality
- Delayed pulping and the processing of cherry harvested on different days leads to uneven fermentation rates, thereby reducing quality
- The incorrect assessment of the completion of fermentation reduces the quality of parchment
- Most smallholders produce Y grade coffee which is in high demand. However, because of poor coffee processing techniques the parchment often has a high number of defects (>70/kg). This results in smallholders receiving considerably lower prices for their parchment compared to what they would receive for good quality Y grade (<70 defects/kg) parchment
- Many farmers are also unaware that problems with quality arise from long-term and unsuitable storage of parchment

### Marketing and financial literacy

- The level of marketing knowledge amongst smallholders tends to be low. In addition, few growers are certified under any sustainability certification schemes. Farmers could receive higher prices for their coffee if they had sufficient knowledge of the marketing process
- Some smallholders sell small-volumes of coffee via undocumented roadside transactions. These forms of marketing offer no appropriate price incentives to raise coffee quality
- Many smallholders have poor financial literacy skills and so are unable to effectively manage income and expenses
- Minimal financial reinvestment in smallholder coffee gardens also contributes to low smallholder productivity

## Why do smallholders lack technical knowledge?

The reasons farmers have limited technical knowledge are:

- The low input smallholder production system is characterised by a low rate of uptake of new technologies and other extension inputs
- Smallholders have had limited access to regular extension advice and training due to under-resourcing of extension services. This restricts the flow of new technologies and information to assist smallholders to increase their production and productivity
- Extension delivery has been insufficient and spread too thin to have any significant impact on coffee farmers' levels of technical knowledge
- Some of the advice and new technologies promoted among farmers have not always been appropriate and so smallholders have been reluctant to adopt them

- Few partnerships exist between farmers and chain leaders (i.e. processors, exporters and the few remaining successful plantations). Chain leaders can collaborate with farmer groups to raise production, upgrade productivity and consistently supply quality coffee
- Many chain leader-smallholder relationships that have been established in the past through grower groups have not been sustainable, particularly in remote areas

## Barriers to the adoption of new technologies

- In most communities in PNG, importance is placed on the community (not the individual), collective land ownership and mixed cropping systems
- Gender and generational relationships are also very important determinants of social organisation and production
- Farmers may only partially adopt or reject new technologies as they may feel that their traditional ways of life and farming systems are under threat from new technologies and innovations

## What is the best approach to delivering technical knowledge to smallholders?

- It is important that there is a ‘whole farm system’ approach to extension training that considers environmental, social, gender and income within broader livelihood strategies, including food production for home consumption and sale
- Coffee production is one of several livelihood strategies in which families are involved, so extension has to consider the interactions of coffee production strategies with other livelihood strategies – what happens in one affects the other
- Extension must be tailored to the low input system of production practised by the vast majority of smallholder coffee farmers
- Extension should be provided for all coffee farmers, including women
- It is important that extension services are delivered in remote areas as farmers at these locations are likely to act on extension advice and invest more labour in coffee production as they have few alternative income sources that provide an equivalent or higher income than coffee. Methods to enhance parchment quality are particularly important in remote areas
- Farmers in accessible areas require the delivery of extension services that reduce the opportunity cost of labour in coffee in order to make coffee production more attractive to farmers

Improving smallholder technical knowledge in coffee production requires intensive provision of extension services that are appropriate to the smallholder system of production. Building strong, sustainable relationships with all stakeholders in the coffee industry will be the key to facilitating dissemination and practice of good coffee production techniques.

## 2.7 OTHER CONSTRAINTS

---

### Coffee prices

Coffee prices have a major influence on the amount of labour and other inputs farmers will allocate to coffee:

- Coffee farmers are price sensitive so when prices are low, they are less motivated to produce coffee
- When coffee prices are high smallholders are motivated to spend more time maintaining their coffee gardens, but when prices are low, they neglect their coffee gardens sometimes even abandoning them
- Farmers will sometimes store parchment waiting for coffee prices to rise. The quality of parchment will deteriorate if it is stored for more than three months, particularly if the storage conditions are sub-optimal
- The current pricing system and unregulated coffee buyers failing to adhere to quality standards create disincentives for farmers to produce quality coffee as they feel they are not receiving a fair price

### Land access and tenure disputes

A growing population in PNG is leading to constraints on access to land for coffee production:

- Coffee gardens are being subdivided among sons so individual land holdings are decreasing in size
- Some land is unsuitable for growing coffee (or for other farming enterprises) so access to good farmland for growing coffee is declining
- Being a long-term commodity crop, cultural norms constrain women's access to land for coffee production
- When households grow short-term food crops there is flexibility to share a portion of land with other households. Perennial crops like coffee, however, lock up land for long periods preventing the sharing of land. In some instances there are ongoing land disputes with the original customary landowners who want to reclaim land planted to coffee
- As the demand for land grows, some landowners are reclaiming their customary land which in the past was allowed to be used by relatives under traditional exchange agreements
- Some farmers who purchased land in the past to grow coffee are now having their land tenure challenged by the customary landowners
- Farming coffee on land with insecure tenure can undermine productivity and deter investment in the coffee garden



## Poor rural infrastructure

- Village infrastructure in many coffee growing areas in the highlands is generally poor with most communities lacking basic infrastructure such as electricity, reticulated water and drivable roads
- Many communities also lack other government services such as schools, health clinics and agricultural extension services
- As shown in the past, during the plantation era, good infrastructure, particularly road infrastructure, has a positive impact on coffee production. Having easy access to markets provides a major incentive for smallholders to increase coffee production

## Law and order

### General law and order problems

Coffee farmers may experience direct losses from theft or indirect costs associated with keeping themselves and their coffee secure:

- Coffee growers often become victims of robberies on roads when transporting their coffee to markets
- As mentioned previously, coffee buyers tend to carry large amounts of cash, and law and order problems deter them from travelling too far from town

### Theft of cherry and parchment

- Farmers located in areas with easy access to coffee markets are often targets for thieves. Cherry can be stolen and quickly sold, particularly if there are many buyers available in the community
- The amount of coffee theft often reflects coffee prices: higher prices, more theft
- Theft can lead to poor harvesting because farmers may harvest cherry that is not fully ripened in the fear that it may be stolen before they next harvest
- Stealing occurs when farmers are absent from the village or attending church services. It also occurs during the cherry ripening period when coffee gardens are not visited for several days
- Parchment is also a target for thieves in some areas
- Coffee theft is very disheartening for farmers and creates a disincentive to produce coffee
- Theft is not such a problem in less accessible areas or if farmers belong to a grower group or cooperative

### Tribal conflict

Smallholder coffee production can be negatively impacted by tribal conflicts:

- Some of the consequences of conflict have been tribes driving their enemies off their land, cutting down coffee trees and uprooting newly planted coffee seedlings
- Often the incentive is to destroy the properties of rival clansmen which includes destroying coffee trees
- During tribal conflicts, abandoned coffee gardens can remain unproductive and the bush can take over
- It can sometimes take years for peace to be brokered through mediation. This makes it risky for displaced farmers to return to their coffee gardens to work them during the mediation period

### Grower groups and certification

- The productivity of farmers participating in grower groups or cooperatives has been shown to be better than that of independent farmers
- Smallholders participating in cooperatives have benefited from receiving support from chain leaders and their partners. This has improved farmers' coffee productivity and quality
- As part of a cooperative, many growers become certified. Being certified means the coffee meets all guidelines set by coffee growers, most based on sustainability, and is verified by a certification organisation
- Being certified gives farmers an incentive to produce good quality coffee as they can earn premium prices on the coffee they sell
- Not only can certification bring financial rewards but it also strengthens social networks and improves livelihoods
- Despite being members of grower groups, farmers' productivity can still be undermined by the same constraints experienced by independent farmers, although to a lesser degree. These include such things as labour shortages, pests and diseases, lack of farm inputs and technical knowledge, and land scarcity
- Many farmer cooperatives and industry partnerships have been forged but have suffered challenges relating to poor group leadership. A lack of sustainable cooperatives and partnerships has limited smallholders' capacity to improve coffee productivity and quality

For the coffee industry to improve yields and coffee quality, smallholders require improved rural infrastructure, secure access to land, markets, inputs and services. Sustainable farmer-industry partnerships have the potential to provide farmers with what is required to increase efficiencies and produce good quality coffee which attracts a better price.

## Environmental factors

- Many environmental factors impact coffee tree health and yield. These factors include things such as sunlight, climate, the slope of the coffee garden, soil fertility, pests and diseases, in particular CBB, pest predators and pollinators
- Over time, climate change will also impact coffee production. Some coffee growing areas may become unsuitable for coffee



Coffee beans destroyed by CBB (Source: Donna Chambers).

**Objective:**

To identify constraints that may be applicable to an individual smallholder's circumstances and brainstorm strategies that may help overcome some of these constraints.

**You will need:**

Butchers' paper and marker pens (or pens and paper)

## EXERCISE 2

### Identifying an individual smallholder's production constraints

**Step 1:** Divide into groups of 3-4 participants.

**Step 2:** Allocate to each group one of the smallholder descriptions below.

**Step 3:** Identify the constraints that may be affecting each smallholder's coffee production.

**Step 4:** Brainstorm ideas on how an extension officer may help the individual smallholder deal with the constraints, in an effort to improve their coffee productivity and income.

**Smallholder 1**

Jacob and Diane live in Marawaka, EHP. They have two primary school aged children and two teenage children living away for schooling. Jacob's elderly father lives with them. They have other extended family living in the village. Diane grows most of their food with some help from Jacob. Supplementary food is purchased from the market in the village. Other supplies and services are flown in as there is no road access.

The family has two coffee gardens with a total of 1500 coffee trees from which they earn income mainly for school fees. They have some basic equipment and access to a hand pulper which they share with other family members who grow coffee nearby. Coffee parchment is flown out or carried for a couple of days to the nearest road then transported by vehicle to dry processors.

**Smallholder 2**

Solomon and Teresa live in Jamba Village in Bena district, EHP, 10 km drive from Goroka. They have one child at high school and two married children who live nearby on the same land with their families. Extended family live in the same village but there has been some conflict within the extended family regarding access to land.

Solomon and Teresa's single coffee garden has 800 coffee trees and they have removed many coffee shade trees in order to intercrop with vegetables for household consumption as well as for marketing in Goroka.

SMALLHOLDER NO.	
Constraints	Strategies to overcome or lessen the impact of constraints
Family demographics	
Farm inputs	
Labour	
Land access	
Market access	
Planting material	
Technical knowledge	
Other constraints	



**Objective:**

To identify the different constraints farmers may face depending on their location and gender

**You will need:**

Photocopies of the sight cards located in Appendix 1 (one set for each group of 3 to 4 extension officers)

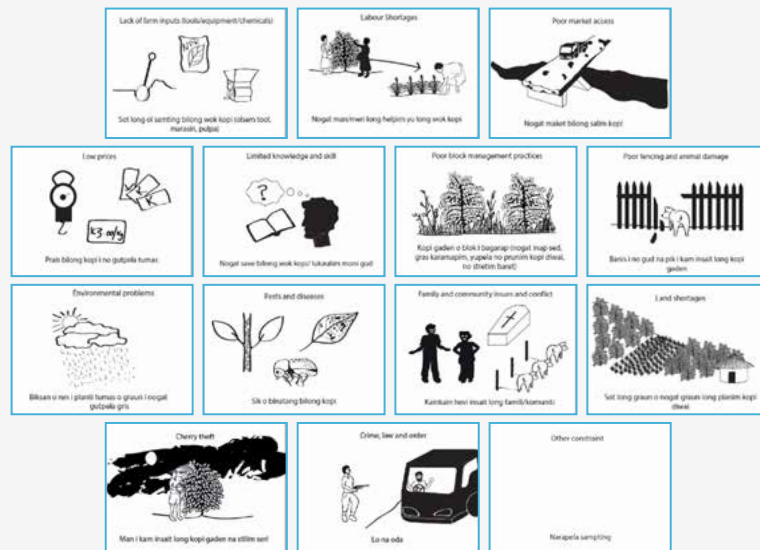
# EXERCISE 3

## Constraints on coffee work discussion activity

In this activity, participants will think about how different types of constraints or challenges impact different kinds of coffee farmers.

The activity uses two piles of cards: 1) Constraint cards; and 2) Farmer cards. These cards can be found in Appendix 1 at the back of the module and can be photocopied and then cut out from the photocopy. Participants will work in groups of 3 to 4 people. Each group will need a set of cards.

There are 14 'Constraint cards'. Each card shows a different challenge commonly faced by coffee smallholders.



There are 4 'Farmer cards'. These cards represent 1) men, 2) women, 3) farmers living in accessible locations, and 4) farmers living in remote locations.

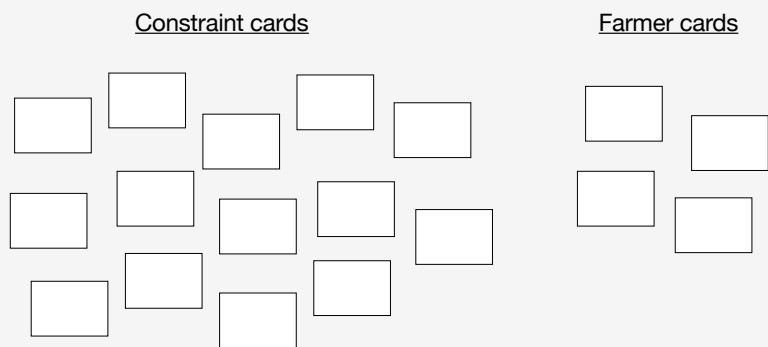


**The activity:**

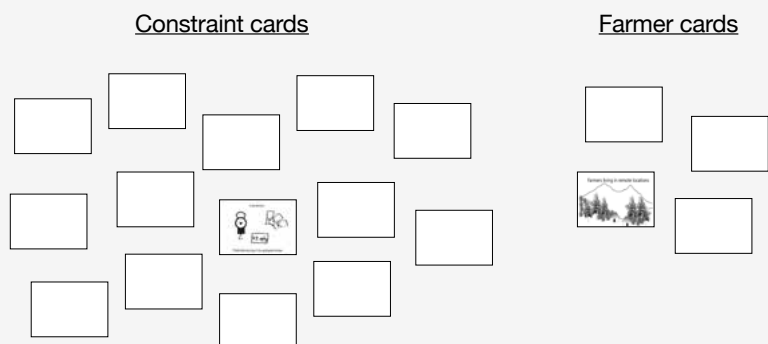
Throughout the activity keep the 'Constraint cards' and 'Farmer cards' in separate piles.

Shuffle the 'Constraint cards' then place the cards face-down on the ground or on a table (as shown).

Shuffle the 'Farmer cards' then place the cards face-down on the ground or on a table in a separate pile (as shown).



The first person in the group turns over one card from each pile (as shown). They then need to describe to their group how the type of farmer shown on the 'Farmer card' experiences the challenge shown on the 'Constraint card'. In the example below, the participant turned over the "Low prices" Constraint card, and the "Farmers living in remote locations" Farmer card. The participant, in this case, needs to tell the group how low prices impact coffee farmers living in remote areas.



The participant may, for example, talk about how it is very expensive to pay for airfreight of coffee and that after paying for transport they earn very little money. The participant could also say that some farmers then decide to carry their coffee by foot, but this is very hard work, takes a long time and means they are unable to do other work on those days. They might also say that farmers in remote rural areas are often more dependent on coffee for income than farmers in accessible locations, and so have no choice but to do this hard work even when prices are low.

Once the participant has finished, other group members may also offer other ideas. Participants should think about what they have learned from the training. They should also think about their own experiences, and conversations they have had with farmers.

Once the discussion is finished, the cards are re-shuffled and turned face-down again. It is now the next participant's turn. Like the first participant, they will turn over one card from each pile and tell the group how the issue shown on the 'Constraint card' impacts the farmers shown on the 'Farmer card'.

Continue until each participant has had at least two turns.



**Idea!** – the 'Constraint cards' used in this activity are a good tool for extension officers to use when working with farmers.

*The cards can help farming families to think through the biggest challenges they face with their coffee work. Maybe ask them to identify the 3 biggest challenges they face (picking the 3 cards) (note: there is also an "Other constraint" card that farmers can choose). You can then ask the farmers to talk in detail about their challenges. What challenges do women in coffee farming households face? Do men experience these challenges in the same way. These cards could be used with individual families or within larger groups. Understanding the challenges faced by farmers helps extension officers to understand why the coffee farms look the way they do and can also help extension officers to think about what types of training or resources might assist the farmers.*

*Can you think of any other games or activities you could play with these cards?*

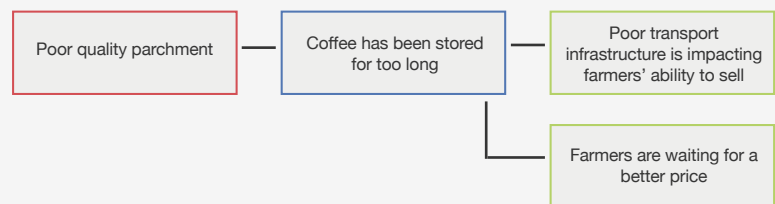




## EXERCISE 4

### Coffee constraints matching activity

Below are coffee production issues (the red boxes) that extension officers will encounter in their work with smallholder farmers. What might be causing these issues? There are both immediate causes (the blue boxes), and underlying causes (the green boxes). For example, for the issue of “poor quality parchment”, the immediate cause might be that the “coffee has been stored for too long”, the underlying explanation for this may be that “poor transport infrastructure is impacting farmers’ ability to sell” or that “farmers are waiting for a better price”.



#### The activity:

Draw lines to connect the coffee production issues (red) with the immediate causes (blue) of the issue and the underlying explanations (green). Some of the issues have more than one immediate cause and more than one underlying explanation.

Note: The explanations shown here are not the only explanations for these coffee production issues. There are also many other issues that may arise which have an immediate cause and underlying explanation. Think about what these may be and insert them in additional boxes.

Share your answers with someone else. Do you have the same explanations? Discuss

#### Objective:

To identify what is causing problems with coffee production

#### You will need:

A copy of the activity sheet below for each group of participants

### Exercise 4 activity sheet

Coffee production issue      Immediate cause      Underlying explanation

Coffee seedlings provided by CIC not planted out	Farmer does not own secateurs	No access to credit
Poor coffee tree health	No labour available	Male & female head of household are elderly
Coffee trees have low yields	Female head of household does not want to help	Female head of household is upset that husband does not share coffee income fairly
Coffee trees are unpruned	Coffee price is low	Female head of household is more interested in selling fresh food at the market
Coffee trees are not fully harvested	Farmer has lost interest due to lots of CBB-infested beans	Low returns to labour
High levels of pests and diseases in coffee	Coffee trees are too old	Farmer does not know how to control CBB
Poor quality parchment	Farmer does not have land available	Farmer does not have access to new planting material
	Pig damage	Farmer does not want to replant because they will lose income for several years
	Poor soil health	Disputes over use of customary land
	Poor knowledge of pests & diseases	Female farmer is not permitted to plant on husband's land
	Farmer tolerates high crop losses	Coffee garden is unfenced
	Coffee is not pruned or weeded	Coffee pulp is left at the pulper
	Coffee has been stored for too long	Limited extension services
		Farmers are busy with lots of other activities
		Poor transport infrastructure is impacting farmers' ability to sell
		Farmers are waiting for a better price

## 2.8 KEY MESSAGES FOR THE EXTENSION OFFICER

---

What are the key messages for the extension officer?

- To understand how coffee productivity can be improved, extension officers must first understand that coffee smallholders face multiple and interacting constraints on coffee production
- The top constraints include poor or insecure access to: land, markets, labour, farm inputs, extension and other services
- Although farmers practise a low input system of production their capacity to fully engage in coffee production and improve productivity is confounded by these constraints
- Labour shortages are a major constraint on coffee production and this may be due to an absolute shortage of household labour, underutilisation of household labour, competition from a diversity of livelihood activities or a reluctance to hire labour
- Access to markets and services influences farmers' commitment to coffee production as it affects access to land, technologies, labour and other inputs, and transport costs
- Smallholders, particularly women, with good market access are diversifying their incomes and directing their labour away from coffee, mainly into fresh fruit and vegetable production. These crops provide: good returns to labour, short-term access to land often not accessible for long-term commodity crops like coffee, and an independent income for women
- Many smallholder coffee gardens require replanting due to ageing tree stock, however, replanting has not occurred because it is a huge task, farmers are without income while the new trees are maturing, and farmers have limited access to quality planting material
- Smallholders are constrained by a lack of technical knowledge in coffee production. To improve coffee productivity, extension services must be directed towards both men and women smallholders practising the low input production system, taking into account the multitude of livelihood activities in which they engage
- Low coffee prices, limited access to secure land, poor rural infrastructure, and law and order issues all compound the already numerous constraints faced by smallholders
- Forging sustainable farmer-industry partnerships could ease many of the constraints faced by smallholders and improve coffee quality, productivity and incomes

## 2.9 QUIZ

---

Place a '✓' in the correct box.

1. Why is it important for an extension officer to be aware of the constraints faced by individual smallholders? So that they can:

- A Lobby the government for assistance for the coffee industry
- B Customise advice appropriate for a farmer's individual circumstances
- C Create a list of smallholder constraints as a guide for all extension officers
- D Avoid talking about these constraints with the smallholder as it may cause friction in their relationship

2. A lack of farm inputs is a major limitation to coffee production and productivity. Why do so many smallholders lack the necessary farm inputs for growing coffee?

- A Farmers have many household expenses and are unable to access credit to purchase inputs
- B They would prefer to spend their money on buai and market food than farm inputs
- C Few belong to farmer-industry partnerships which may enable them to access farm inputs at no cost
- D All of the available inputs are used in food production

3. The most common constraint on smallholder coffee production in PNG is:

- A Lack of farm inputs
- B Shortage of labour
- C Poor market access
- D Family conflict

4. The reasons for shortages of labour include:

- A Absolute shortages of labour
- B Underutilisation of household labour
- C Competing demands on labour
- D Limited use of hired labour
- E All the above

5. Why are smallholders unwilling to commit more time and labour to coffee production?
- A They are too lazy
  - B Not enough money can be made from coffee production
  - C They would prefer to direct all of their labour into vegetable production
  - D Smallholders' diverse livelihood activities are so highly valued that few are willing to reduce these activities to commit more time and labour to coffee production
6. Which of the following is an acknowledged constraint that divides smallholder coffee growers in accessible and remote areas?
- A There is more conflict over land in remote areas than accessible areas
  - B Farmers in remote areas have fewer income-earning opportunities than those in accessible areas
  - C Extension and other services are more beneficial to farmers in accessible areas
  - D Coffee trees in accessible areas tend to be older and less productive than those in remote areas
7. What are the main reasons for some coffee growers in accessible areas shifting their labour from coffee to fresh fruit and vegetable production?
- A Better fresh food supply for their families and for cultural events; other family members are more likely to help with vegetable production
  - B Coffee gardens are too large; greater food consumption in accessible areas
  - C Land shortages; good transport infrastructure; an independent form of income for women
  - D To control coffee berry borer; coffee theft; better availability of new technologies in fruit and vegetable production
8. Why are many smallholders reluctant to adopt new technologies?
- A Smallholders think they are too expensive
  - B They are too technical and farmers worry they may not understand how to apply them
  - C Farmers cannot access them
  - D They threaten traditional ways of life and farming systems
  - E All the above

9. In light of the many constraints faced by smallholders, what is the best approach to be taken by extension officers when delivering advice?
- A Extension must consider all aspects of smallholder livelihoods, not just coffee production
  - B Extension must be tailored to increasing yields of coffee
  - C Extension should focus on returns to labour
  - D Extension should focus on the environment and long-term sustainability of smallholders' coffee gardens
10. What factors motivate farmers to allocate more labour to coffee?
- A Theft; high coffee prices
  - B Land pressures; improved road infrastructure
  - C Good availability of labour; high coffee prices
  - D Cultural obligations; land pressures
  - E None of the above
11. What has the greatest potential to improve smallholder productivity, produce better quality coffee and provide better prices for growers?
- A The formation of farmer-industry partnerships
  - B Allocating more labour to coffee production
  - C Greater security of land tenure
  - D The application of fertilisers and other chemical inputs
12. Which of the following is a benefit of belonging to a farmer-industry partnership?
- A Better access to labour for coffee production
  - B Improved access to roadside coffee buyers
  - C Ability to obtain credit in the form of farm inputs such as pruning saws and hand pulpers
  - D Better access to CIC extension officers
13. Low coffee yields can be attributed in part to old and ageing tree stock. The main reason why coffee farmers in remote areas have not replanted is they:
- A Feel their old trees are adequate but just require fertiliser which they cannot afford
  - B May jeopardise their land tenure security if they replant their coffee gardens with new coffee seedlings
  - C Are too busy with alternative income-earning activities
  - D Have limited access to affordable quality planting material

14. It is a well-known fact that women make a significant contribution to coffee production, particularly in harvesting and processing. Why is it that many are reluctant or unwilling to commit labour to coffee?

- A They are too busy with domestic and cultural activities
- B They feel the distribution of coffee income by the male household head is unfair and they are not adequately remunerated for their labour input in coffee
- C They are too heavily involved in household food production
- D The potential to earn a good income from coffee is too low

15. True or false.

	True	False
a. Farmers are price sensitive and allocate more labour to coffee when prices are high. .....	<input type="checkbox"/>	<input type="checkbox"/>
b. Households with large coffee holdings can always earn a greater income from coffee than those with small coffee holdings. .....	<input type="checkbox"/>	<input type="checkbox"/>
c. The division of labour within households is based primarily on gender. .....	<input type="checkbox"/>	<input type="checkbox"/>
d. Unlike coffee which is strongly seasonal, vegetable production for marketing can be year-round. This means that smallholders growing vegetables for the market will have greater potential to meet regular expenses like store food purchases and mobile phone credit because cash is available continually. .....	<input type="checkbox"/>	<input type="checkbox"/>
e. Land for food crops is short-term and inaccessible for women. .....	<input type="checkbox"/>	<input type="checkbox"/>
f. In addition to saving labour in processing, sales of fresh coffee cherry attract a price premium. .....	<input type="checkbox"/>	<input type="checkbox"/>
g. Improved efficiencies in production and better coffee prices for farmers could be achieved if strong partnerships are forged between coffee farmers and industry. .....	<input type="checkbox"/>	<input type="checkbox"/>

## Answers to quiz questions

### Multiple choice

1. **Why is it important for an extension officer to be aware of the constraints faced by individual smallholders? So that they can:**

**Answer = b.** Customise advice appropriate for a farmer's individual circumstances

**Section 2.1.** It is in the interests of the extension officer to develop a good working relationship with their smallholders so that they can establish a clear understanding of each smallholder's circumstances. This will then enable them to provide valuable extension advice customised for each individual smallholder.

2. **A lack of farm inputs is a major limitation to coffee production and productivity. Why do so many smallholders lack the necessary farm inputs for growing coffee?**

**Answer = a.** Farmers have many household expenses and are unable to access credit to purchase inputs

**Section 2.2.** Increasing smallholder productivity requires equipment and other inputs. In some instances, these items can only be obtained if farmers have access to credit. Credit in the form of farm inputs would be the preferred option and could be obtainable through sustainable farmer-industry partnerships.

3. **The most common constraint on smallholder coffee production in PNG is:**

**Answer = b.** Shortage of labour

**Section 2.3.** Access to labour is one of the major constraints on coffee production in both remote and accessible areas. Very little labour is recruited from outside the family.

4. **The reasons for shortages of labour include:**

**Answer = e.** All the above

**Section 2.3.**

5. **Why are smallholders unwilling to commit more time and labour to coffee production?**

**Answer = d.** Smallholders' diverse livelihood activities are so highly valued that few are willing to reduce these activities to commit more time and labour to coffee production

**Section 2.3.** Coffee farmers do not just grow coffee, they have a complex and diverse livelihood system. Smallholders commit a large amount of labour and time to subsistence production, community activities and leisure, such as socialising with relatives. They may also be involved in other income generating activities.



**6. Which of the following is an acknowledged constraint that divides smallholder coffee growers in accessible and remote areas?**

**Answer = b.** Farmers in remote areas have fewer income-earning opportunities than those in accessible areas

**Section 2.4.** In locations with good market access and near town, the broader range of income sources reflects not only better roads and access to commercial centres, but also the income opportunities associated with the larger flow of cash.

**7. What are the main reasons for some coffee growers in accessible areas shifting their labour from coffee to fresh fruit and vegetable production?**

**Answer = c.** Land shortages; good transport infrastructure; an independent form of income for women

**Section 2.4.**

**8. Why are many smallholders reluctant to adopt new technologies?**

**Answer = e.** All the above

**Section 2.6.**

**9. In light of the many constraints faced by smallholders, what is the best approach to be taken by extension officers when delivering advice?**

**Answer = a.** Extension must consider all aspects of smallholder livelihoods, not just coffee production

**Section 2.6.** It is important that there is a 'whole farm system' approach to extension training that considers environmental, social, gender and income within broader livelihood strategies, including food production for home consumption and sale.

**10. What factors motivate farmers to allocate more labour to coffee?**

**Answer = c.** Good availability of labour; high coffee prices

**Section 2.7.** When coffee prices are high smallholders are motivated to spend more time maintaining their coffee gardens, but when prices are low, they neglect their coffee gardens sometimes even abandoning them. Farmers may consider hiring labour if prices are high.

**11. What has the greatest potential to improve smallholder productivity, produce better quality coffee and provide better prices for growers?**

**Answer = a.** The formation of farmer-industry partnerships

**Section 2.7.** Sustainable farmer-industry partnerships have the potential to provide farmers with what is required to increase efficiencies and produce good quality coffee which attracts a better price.

**12. Which of the following is a benefit of belonging to a farmer-industry partnership?**

**Answer = c.** Ability to obtain credit in the form of farm inputs such as pruning saws and hand pulpers

**Section 2.2.** Through farmer-industry partnerships farmers can access credit in the form of farm inputs like pruning saws, secateurs and pulpers rather than as a cash loan.

- 13. Low coffee yields can be attributed in part to old and ageing tree stock. The main reason why coffee farmers in remote areas have not replanted is they:**

**Answer = d.** Have limited access to affordable quality planting material

**Section 2.5.**

- 14. It is a well-known fact that women make a significant contribution to coffee production, particularly in harvesting and processing. Why is it that many are reluctant or unwilling to commit labour to coffee?**

**Answer = b.** They feel the distribution of coffee income by the male household head is unfair and they are not adequately remunerated for their labour input in coffee

**Section 2.3.** Women often feel that the distribution of coffee income by the male household head is unfair, and they are being inadequately remunerated for their labour input in coffee. There is often a disincentive for women to commit labour to coffee because they feel there is unwise and frivolous use of the coffee income by the male household head. Women, especially in accessible areas, direct their labour to activities, such as garden food production, where returns on their labour are higher or more secure. They have greater control over their own labour, production decisions and the income generated.

- 15. True or false**

- a. Farmers are price sensitive and allocate more labour to coffee when prices are high.**

**Answer = TRUE**

- b. Households with large coffee holdings can always earn a greater income from coffee than those with small coffee holdings.**

**Answer = FALSE**

- c. The division of labour within households is based primarily on gender**

**Answer = TRUE**

- d. Unlike coffee, which is strongly seasonal, vegetable production for marketing can be year-round. This means that smallholders growing vegetables for the market will have greater potential for savings because cash is continually available.**

**Answer = FALSE**

- e. Land for food crops is short-term and inaccessible for women.**

**Answer = FALSE**

- f. In addition to saving labour in processing, sales of fresh coffee cherry attract a price premium.**

**Answer = TRUE**

- g. Improved efficiencies in production and better coffee prices for farmers could be achieved if strong partnerships are forged between coffee farmers and industry.**

**Answer = TRUE**

## 2.10 SOURCES OF FURTHER INFORMATION

- Aba, L. A., Aipi, B., & Irau, T. (2012). Supply response of coffee in Papua New Guinea. Working Paper BPNGWP2012/01. Port Moresby: Bank of Papua New Guinea.
- Allen, B., Bourke, R. M., & McGregor, A. (2009). Cash income from agriculture: Coffee. In Bourke, R.M. and Harwood, T. (Eds.), *Food and Agriculture in Papua New Guinea* (pp. 306-314). Canberra: ANU E-Press.
- Batt, P.J. and Murray-Prior, R. (2011). Quality and Ethical Sourcing among Smallholder Coffee Producers in Papua New Guinea, *The 12th International Conference of the Society for Global Business & Economic Development*, Jul 21 2011, pp. 1488-1496. Singapore: Society for Global Business & Economic Development (SGBED). Available at: <http://hdl.handle.net/20.500.11937/25122>
- CARE-CIC Training Manuals: <https://pngcdwstandard.com/resources-for-use-by-cdws-working-with-wards-communities-groups-and-smes/>
- Collett, G.N. (2009). *Report Working Paper No. 3 Coffee Sub Sector* (PNG). Prepared for PNG Department of Agriculture and Livestock by URS Australia Pty Ltd, Adelaide.
- Curry, G.N., Koczberski, G., Inu, S.M., Hamago, M., Kiup, E., Aranka, J., Bekio, J., Apis, B. and Togonave, P. (2021) Socio-economic constraints on smallholder coffee production in the Papua New Guinea highlands: the case of labour. *PNG Coffee Journal Special Issue* 15(1): 14-22.
- Curry, G.N., Koczberski, G., Omuru, E. and Nailina, R.S. (2007). *Farming or Foraging? Household Labour and Livelihood Strategies amongst Smallholder Cocoa Growers in Papua New Guinea*. Black Swan Press, Perth. Available at: <https://espace.curtin.edu.au/handle/20.500.11937/30583>
- Curry, G.N., Nake, S., Koczberski, G., Oswald, M., Rafflegeau, S., Lummani, J., Peter, E. and Nailina, R. (2021) Disruptive innovation in agriculture: Socio-cultural factors in technology adoption in the developing world. *Rural Studies* 88: 422-431.
- Curry, G.N., Webb, M., Koczberski, G., Pakatul, J., Inu, S.M., Kiup, E., Hamago, M.R., Aroga, L., Kenny, M., Kukhang, T., Tilden, G. and Ryan, S. (2017). *Improving Livelihoods of Smallholder Families through Increased Productivity of Coffee-based Farming Systems in the Highlands of PNG*. Project Final Report FR2017-08 for ACIAR project ASEM/2008/036. ISBN: 978-1-86320-028-8. Available at: <https://espace.curtin.edu.au/handle/20.500.11937/54174> or <https://www.aciar.gov.au/project/asem-2008-036>

Kalwij, J. (2021). A reflection on the Papua New Guinea coffee industry: facing reality. *PNG Coffee Journal* Special Issue 15(1): 49-53.

Inu, S.M. (2015) *The influence of socio-economic factors in farm investment decisions and labour mobilisation in smallholder coffee production in Eastern Highlands Province, Papua New Guinea*. Thesis (M.Phil.)--Curtin University. Available at: <https://espace.curtin.edu.au/handle/20.500.11937/1938>

Murray-Prior, R. and Batt, P. J. (2007). Emerging possibilities and constraints to Papua New Guinean smallholder coffee producers entering the speciality coffee market, in Batt, P. J. and Cadilhon, J. (ed), *Proceedings of the International Symposium on Fresh Produce Supply Chain Management*, Dec 6-10 2006, pp. 373-389. Chiang Mai, Thailand: Food and Agriculture Organization of the United Nations. Available at: <https://espace.curtin.edu.au/handle/20.500.11937/26408>

Sengere, R.W. (2016) *The rise, fall and revival of the Papua New Guinea coffee industry*. PhD Thesis, Curtin University, Perth. Available at: <https://espace.curtin.edu.au/handle/20.500.11937/54142>

### **Family Farm Teams Program**

*The PNG Family Farm Teams Manual* [www.aciar.gov.au/publication/books-and-manuals/png-family-farm-teams-manual](http://www.aciar.gov.au/publication/books-and-manuals/png-family-farm-teams-manual)


*Building gender equity through a Family Farm Teams approach* [www.aciar.gov.au/publication/books-and-manuals/building-gender-equity-through-family-teams-approach](http://www.aciar.gov.au/publication/books-and-manuals/building-gender-equity-through-family-teams-approach)

*The farmer-to-farmer adult learning manual* [www.aciar.gov.au/publication/books-and-manuals/farmer-farmer-adult-learningmanual](http://www.aciar.gov.au/publication/books-and-manuals/farmer-farmer-adult-learningmanual)

# APPENDIX 1: SIGHT CARDS FOR EXERCISE 3


## Constraint cards

Lack of farm inputs (tools/equipment/chemicals)




Sot long ol samting bilong wok kopi (olsem tool, marasin, pulpa)

Labour Shortages




Nogat man/meri long helpim yu long wok kopi

Poor market access




Nogat maket bilong salim kopi

Low prices




Prais bilong kopi i no gutpela tumas

Limited knowledge and skill



Nogat save bilong wok kopi/ lukautim moni gud

Poor block management practices



Kopi gaden o blok i bagarap (nogat inap sed, gras karamapim, yupela no prunim kopi diwai, no stretim baret)

### Poor fencing and animal damage



Banis i no gud na pik i kam insait long kopi gaden

### Environmental problems



Biksan o ren i planti tumas o graun i nogat gutpela gris

### Pests and diseases



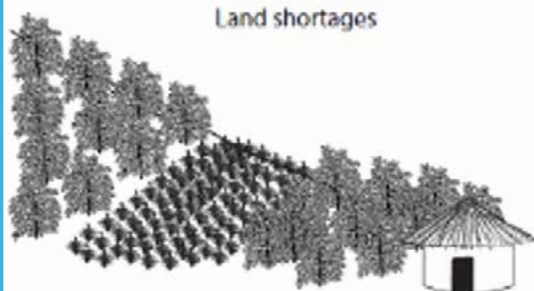
Sik o binatang bilong kopi

### Family and community issues and conflict



Kainkain hevi insait long famili/komuniti

### Land shortages

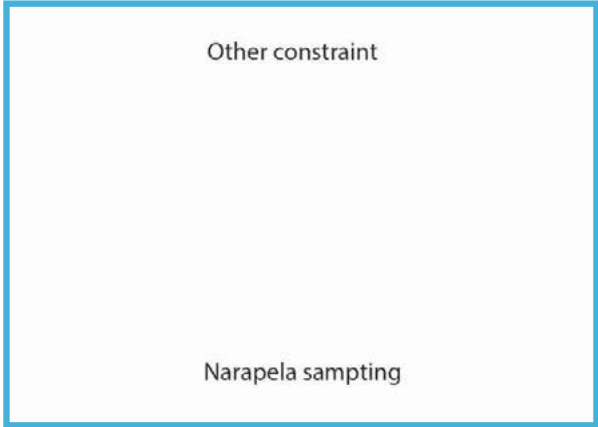
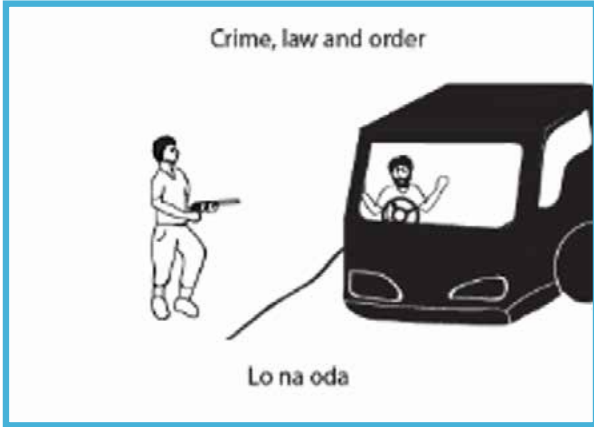


Sot long graun o nogat graun long planim kopi diwai

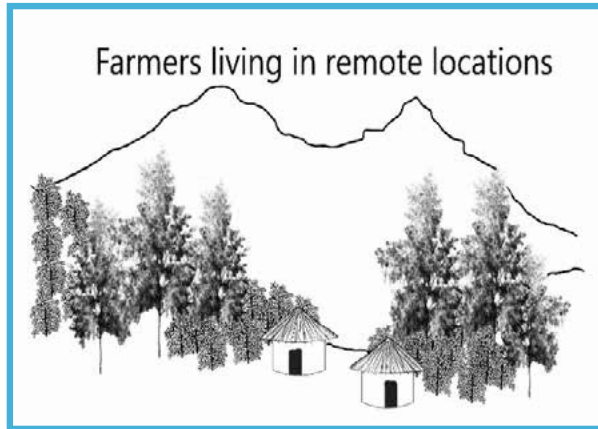
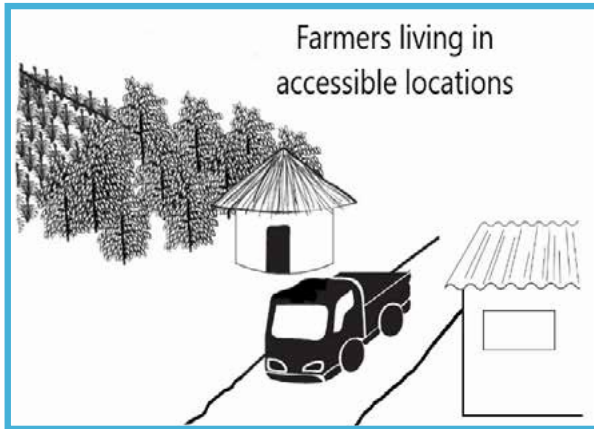
### Cherry theft



Man i kam insait long kopi gaden na stilim seri



Farmer cards





Australian Centre  
for International  
Agricultural Research

**Australian  
Aid** 

