European Union

Good Neighbors International

Beautiful Coffee NEPAL

MARKET SYSTEM ANALYSIS OF NEPALI COFFEE

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Coffee Value Chain Development Project

Good Neighbors International Nepal

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Good Neighbors International (GNI) Nepal is pleased to share the study report entitled “Market System Analysis of Nepali Coffee”. This report has been prepared under Coffee Value Chain Development Project (CVCDP) funded by the European Union (EU) and implemented in partnership with Beautiful Coffee Nepal. This report is expected to be useful in guiding all the stakeholders and market actors towards enhancement of trade competitiveness of Nepali coffee sub-sector.

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Acronyms

BeaCoN	Beautiful Coffee Nepal
CCU	Coffee Cooperative Union
CDC	Coffee Development Center
CLR	Coffee Leaf Rust
CPG	Coffee Producer Group
CRC	Coffee Research Center
CTEVT	Council for Technical Education and Vocational Training
CVCDP	Coffee Value Chain Development Project
DCPA	District Coffee Producers' Association
DOA	Department of Agriculture
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FC	Fresh Cherries
FGD	Focused Group Discussion
FNCCI	Federation of Nepali Chambers of Commerce and Industries
GATT	General Agreement on Tariffs and Trade
GB	Green beans
GDP	Gross Domestic Product
GNI	Good Neighbors International
ICO	International Coffee Organization
ITC	International Trade Center
KII	Key Informant Interview
LRP	Local Resource Person
MIS	Market Information System
MOAD	Ministry of Agriculture Development
MT	Metric Ton
NARC	Nepal Agriculture Research Council
NCF	Nepal Coffee Federation
NCPA	Nepal Coffee Producers' Association
NPR	Nepali Rupee
NTCDB	National Tea and Coffee Development Board
NTIS	Nepal Trade Integration Strategy
PCC	Primary Coffee Cooperative
PGS	Participatory Guarantee System
PMSA	Participatory Market System Analysis
SCA	Specialty Coffee Association
SCAA	Specialty Coffee Association of America
SCAE	Specialty Coffee Association of Europe
SCAJ	Specialty Coffee Association of Japan
USAID	United States Agency for International Development
USD	United States Dollar
WSB	White Stem Borer
WTO	World Trade Center

EXECUTIVE SUMMARY

Prelude

The prospect for “coffee in Nepal” derives from the fact it falls outside of the globally defined coffee belt around the equator. Coffee lovers around the world are increasingly getting fed up on the familiar aroma of the “coffee belt coffee” and are seeking coffee that thrives on the chilling Himalayan breeze, nurtured under fully organic production regime by innocent and poor farmers with "bare hands" and with utmost care.

Coffee farming in Nepal began in the late 1930s when Hira Giri brought a few coffee seeds from Burma (now Myanmar) and planted them in former Aanpchaur Village Development Committee(VDC) of Gulmi District. After that there has been no looking back despite occasional up and downs. Nepal now produces and exports coffee to more than 30 countries around the globe and the production and export volume is growing every year.

While under its implementation, a review assignment titled “Market System Analysis of Nepali Coffee” was awarded to Transcend Vision Nepal Pvt. Ltd on a competitive basis by the Coffee Value Chain Development Project (CVCDP) under the "EU Support to the Competitiveness of Quality Coffee in Nepal".

The specialist consultants deployed state-of-the-art methodology to carry out the study. Kaski, Syangja, Gulmi, Palpa, Lalitpur, and Nuwakot districts were visited to observe various value chain points, from cherry to green beans production and beyond. PMSA workshops were also organized in Kathmandu and Kaski districts. This data/information coupled with the participant observations constituted the primary basis for report preparation.

Salient features of the study

Under the "European Union’s support to the competitiveness of quality coffee in Nepal", Good Neighbors International Nepal (GNI Nepal) in partnership with Beautiful Coffee Nepal (BeaCoN) has been implementing a two-year comprehensive project for the development of value chain of Nepali coffee sector, mostly in western region of Nepal. The Coffee Value Chain Development Project (CVCDP) served 3,000 smallholder coffee farmers associated with 60 primary coffee cooperatives (PCCs) and a district level union of primary coffee cooperatives in Syangja, Kaski, Gulmi, and Palpa districts. CVCDP also integrated the institutions and market actors involved in production, processing and marketing of coffee in Nepal. At the national level, the CVCDP aimed at institutional strengthening of National Tea and Coffee Development Board (NTCDB) through the establishment of a comprehensive information management system.

The value chain accounts

First point of value chain starts at the production and distribution of coffee nursery saplings. On average, a market-ready coffee sapling was found to have cost the producer NRs. 29 out of which the producer/farmer received NRs.16 grants/support per sapling in the form of seeds, polythene for polypots and plastic sheets for sheds, transportation, etc. as observed in the four project districts. After 18 months, a sapling sold at a prevailing rate of NRs.15 per sapling with a net margin of NRs. 2 per sapling only which the producers/farmers complained about and demanded upward revision in the selling price (suggesting NRs.20 per sapling).

On the coffee producers' front, there are large estate establishments to petty growers having a few *Ropanies*[1] of plantations, to random backyard planters, perhaps experimenting for eventual expansion. Ripe cherries hauled to a pulping facility fetched NRs.88 to NRs. 92 per kg, against the minimum support price of NRs.83 per kg set by NTCDB. Most estate establishments had their own pulping facilities.

It is to be noted that, most areas under coffee farming in Nepal are remote, scattered and suffer from poor vehicular access. The harvested (picked) cherries need to be pulped within 24 hours lest these will start fermenting from within, thus, seriously affecting the quality of the green beans.

Share in value chain

For computing the value enhancement, the cost and revenue data at each operation level (fresh cherries, parchment coffee, green beans, roasted beans were collected and compiled. The conversion rates were – 23 kg parchment from 100 kg fresh cherries, 18 kg green beans from 23 kg parchment coffee, and 14.3 kg roasted beans from 18 kg green beans. Out of 35% at growers' level, 20% at PCC level involved in parchment making, 11% at CCU level involved in hulling and sorting, and 34% at traders' level involved in roasting. It is satisfying to note that the highest margin profits accrued to the growers who are also the poorest actors along the value chain.

Table 1: Share of cost and revenues/profits of various value chain actors on the final price of coffee equivalent to 100 kg fresh cherries

Actors	Product	Conversion equivalent (kg)	Price/kg	Associated cost /100 kg cherries equivalent (NRs.)	Revenue from proceeds (NRs.)	Value chain share (NRs.)	Value chain share (in %)
Farmer	Fresh cherries	100	85	4514	8500	3986	35
PCC	Parchment	23	570	10839	13110	2271	20
CCU	Green beans	18	900	15005	16200	1195	11
Traders	Roasted beans	14.3	1300	14770	18590	3820	34

[1] Ropani: Traditional land measurement unit in Nepal equivalent to 508.72 square meter

Table 2: Recommendation for overcoming constraints at different steps of Nepali coffee value chain

Value chain points	Constraints	Suggested short-term interventions	Suggested long term interventions
Production	Farmers do not have access to quality planting material	- Improvement of growing condition at nurseries - Use seeds from identified mother plants - Tracing seed sources - Upward revision of coffee sapling price - Encouraging private sectors to establish large scale nurseries and provide embedded services like technical support for lay-out, planting, etc.	- Develop of a certification system of nurseries - Develop and dissemination of varietal catalog of all coffee varieties in use - Research on varietal identification. - Importation of CLR resistant varieties.
	Poor farming practices characterized by inefficient surface irrigation, improper pruning. Inadequate nutrient and disease management practices.	- Appropriate combination of water, plant nutrients, mulching, shade crops and efficient labor - Drip irrigation for more efficient use of water - Cultivation in contour strip in slope areas, use of A-frames for lay out - Proper use of farm waste, processing waste etc. for making organic manure - Training/pruning and early identification and removal of borer infested plants - Encouraging large landholders and alternative income holders to participate in coffee farming	- Develop proper extension tools to create and disseminate knowledge and technology to farmers, processors and traders - Introduce/select and promote more productive and disease/pest resistant varieties
Processing	Inefficient processing machineries , manual pulping machine, rice hullers instead of coffee hullers	- Invest in efficient coffee hullers than cheaper rice hullers and grading machines - Dry processing in areas with acute water shortage - Train on machine operating skills and hiring skilled technicians - Establish pulping center with a long-term vision and availability of required facilities.	- Continue tax exemption in import of coffee processing machineries - Promote import of machineries from more credible suppliers

Value chain points	Constraints	Suggested short-term interventions	Suggested long term interventions
	- Processors lack knowledge in certain fields like: - Machine operation, repairing - Roasting operation - Cupping - Coffee lab techniques	- Organize exposure visits - Train more people on special coffee skills - Train on roasting and cupping techniques	- Incorporate special skills in CTEVT coffee technician training courses - Establish regional and national cupping labs
	Limited access to water, roads and other infrastructure	- Carrying out the primary processing at PCCs by establishing pulping center locally (also reduces the cost of transportation)	- Extend infrastructures like roads, water and electricity to coffee potential area. - Develop coffee zones/pockets and promote mechanization in coffee production. Prime Minister Agriculture Modernize project can play an important role.
Trade and Market Access	Low quality coffee in domestic market	- Organize interaction between suppliers, café owners, wholesalers and retailers - Provision of grading coffee based on quality	- Develop and strictly implement Nepali standard coffee logo. - Set minimum standard for coffee to be sold in domestic market to avoid use of broken beans in the ground coffee
	Poor Traceability	- Make provisions of compliance to maintain traceability by cooperatives - Traders should be required to exhibit the source and origin in their products	- Strict implementation of Nepal Coffee logo
	Failure to take advantage of trade agreements and preferential market access	- Better awareness about strict regulatory and administrative procedures to exporters	- Make provisions of more uniform and convenient schemes

Value chain points	Constraints	Suggested short-term interventions	Suggested long term interventions
	Unfair competition	- Value chain actors should specialize in one particular function - Creating an innovation platform for all the market actors - Encouraging new entrants to be included in the common coffee platform - Nepal Coffee Logo implementation guidelines to be implemented with strict monitoring system.	- Revise minimum support price for fresh cherries as needed based on the quality and international scenario. - Provision for coffee entrepreneurs to be registered with NTCDB should be implemented strictly - Create and maintain a Market Information System of Coffee
Organization and Institutional Development	Cooperatives lack motivation to solve immediate problems and to increase competitiveness of product	- Encouraging private sectors to enter into the market to increase the drive of competition. - Proper coordination between cooperatives and traders to avoid unhealthy competition which has resulted in astronomically increased price of Nepali Coffee. - Creating a village level innovative platform of stakeholders, cooperatives, farmers, private sectors etc. at local level that can jointly work for the promotion of coffee sector and also perform monitoring at local level	- Award and Reward for best entrepreneurs
	Poor record keeping, business planning and product development capacity of cooperatives	- Offer training courses on entrepreneurship skills - Record keeping should be made mandatory for farmers as well as processors regardless of whether they are part of ICS or not	Business Plan of CCU based on production plan of PCCs

Chapter 1: Background

This report has been produced after field study, consultation and secondary data review for the Market System Analysis of Nepali Coffee, initiated by Coffee Value Chain Development Project (CVCDP) implemented by Beautiful Coffee Nepal (BeaCoN) in partnership with Good Neighbors International (GNI) Nepal and with the financial support of European Union.

The study team assessed the market system, demand-supply situations, and identified current constraints and opportunities in Nepali coffee sector. This study has also assessed the current scenario of Nepali coffee sector, from both demand and supply sides, as well as analyzed the business intervention points, and proposed required improvements in policy measures, based on participatory market system analysis (PMSA).

In addition, this report also documents major lessons learnt and recommends programmatic, policy and strategic options for development of Nepali coffee enterprise as well as guide to similar other projects in the future. The study has also provided some inputs on how to develop a sustainable value chain of Nepali coffee, from farm to the final consumer, at different levels- local, regional and national. Similarly, assessment has been done towards tracing different ways to promote business development model and strategic opportunities for maintaining competitive price of Nepali coffee in domestic and international market.

1.1 Introduction

Agriculture is the largest and broadest sector in Nepal. Almost 66% of Nepal's population depends agriculture as the main source of food, income and employment. This sector, however, is growing at a slower pace than other sectors and its contribution to the Gross Domestic Product (GDP) about one-third. One of the major reasons could be low government investment in this sector (around 3% of total government's outlays) (Adhikari, 2015). In addition, Nepal's topographical variations and socio-economic characteristics provide both constraints and opportunities for the development of agriculture sector.

Limited arable lands in mid-hill region does not allow industrial scale farming, thus increasing the cost of production. Nepal's unique microclimates and soil quality provide opportunities for crop-diversification, including the cultivation of high value crops (Day, 2016). On the other hand, increasing rural to urban and international migration is creating acute shortages of agricultural labor. Therefore, in order to increase the resource productivity within the agricultural sector, proper identification and development of value chains is imperative. Moreover, high value

commodity such as coffee can play a significant role in income generation for smallholder farmers as well as contribute to the national economy.

1.2 Need for market system development

An entrepreneur produces a product that has to ultimately reach the final consumer for the purpose of consumption/production to derive utility/return. This long process from producer to consumer can be broken down into several mutually exclusive sequences of activities. For example, a producer may produce paddy and sell it. S/he may also choose to process paddy and convert it into rice at some cost, which will fetch more value than paddy. S/he may cook the rice and sell it in a readily edible form for even more return. There is always some degree of value chain activity and value addition (crude to sophisticated) involved; but how effectively and efficiently the value adding is done, is the prime concern. Each sequence in the chain has cost and value addition.

In the developing world, high value agriculture is growing because of rising incomes, urbanization and changing consumption behaviors. At the same time, global trade liberalization has opened up new vistas including export markets leading to increased foreign direct investments (FAO, n.d.). These changes pose challenges to small and poor farmers because high value agriculture often involves higher production costs and greater production and marketing risks. If these obstacles are not removed through close vertical linkages between farmers, processors, traders, retailers and buyers, there are chances that these small producers could be excluded from the supply chains. The increase in the production and consumption of these high value agriculture products has been accompanied by changes in food supply chains and changes in characteristics of products demanded (food safety, convenience and perceived qualities which are associated with price).

The numbers of supermarkets and hypermarkets have grown rapidly as a transition from traditional stores and wet markets. The food standards have moved from public to private. Value addition in the food-processing sector has grown significantly in emerging economies (Gulati et.al., 2006).

1.3 CVCDP as a leading initiative

Under the European Union's "Support to The Competitiveness of Quality Coffee in Nepal", Good Neighbors International Nepal (GNI Nepal) in partnership with Beautiful Coffee Nepal (BeaCoN) has been implementing a two-year long comprehensive project for the development of value chain of Nepali coffee in western region of Nepal. The Coffee Value Chain Development Project

(CVCDP) incorporates 3,000 smallholder coffee farmers associated with 60 Primary Coffee Cooperatives (PCCs) and a district level union of primary coffee cooperatives in Syangja, Kaski, Gulmi, and Palpa districts. CVCDP also integrates the institutions and market actors involved in production, processing and marketing of coffee in Nepal. At the national level, the CVCDP aims at institutional strengthening of National Tea and Coffee Development Board (NTCDB) through the establishment of a comprehensive information management system.

The comprehensive working modality of CVCDP is attributed to its integrated approach in promoting Nepali coffee sector in order to reduce poverty and stimulate trade-led economic growth through strengthening capacity and competitiveness of small scale coffee farmers in Western Nepal. The integrated approach includes value chain development interventions at farmer, cooperatives, markets, and policy levels.

At the farmer level, CVCDP intends to expand coffee cultivation and subsequently increase productivity per coffee bush and total production of fresh cherries. At the cooperatives level, CVCDP had aimed to reduce the cost of production, and increasing the quality of coffee by institutionalizing the cooperative models in coffee collection, processing and marketing. CVCDP has, in the next level, envisioned helping farmers to implement internal control system for organic certification. Proper certification, recognition and branding are prerequisites for enhancing the competence of Nepali coffee in international markets.

The CVCDP project has realized that poor and small-holders must overcome a "real access gap" of being able to cost effectively transport their produce, before being able to address the "market efficiency gap" that revolves around being competitive with better organized, better informed and better capitalized producers. Hence, unless these small holders are organized and placed in suitable value chains, they cannot be lifted out of poverty. Therefore, this study is conceived as a dire need for the actors involved in coffee value chain development for identifying bottlenecks at different levels of Nepali coffee value chain as well as devising the areas of possible interventions.

The purpose of this study is to carry out an *analysis of market system for Nepali coffee,* the findings from which could serve as guides to formulate better strategies for developing coffee sector in Nepal.

1.4 Objectives of the study

Major objective of the proposed study is to analyze the Nepali coffee market system for identifying current constraints and devise effective intervention models. Specific objectives of the study are as follows:

1. To determine current demand and supply of Nepali coffee in domestic and export markets
2. To probe into existing constraints and opportunities in each value chain level of Nepali coffee.
3. To identify and capture possible intervention/s (leveraging) points at different levels of value chain function of Nepali coffee.
4. To develop a well-defined list of business/market intervention models and strategies to maintain/enhance the current price of Nepali coffee in the markets.
5. To identify the consumption and import pattern existing in the domestic coffee market.
6. To assess actors' perception on quality parameters of Nepali coffee across the coffee value chain.
7. To assess the use and efficiency of Nepal coffee logo for marketing of Nepali coffee.

1.5 Scope of the study

Four districts in Western Nepal: Kaski, Syangja, Palpa, Gulmi, and two districts in Central Nepal: Nuwakot and Lalitpur were sampled for the study, hence the characteristics of coffee produced, and socio-cultural features of coffee farmers included in this study may differ from other parts of the country. Different districts have their own distinct practices and modality in coffee collection, processing and trading. Therefore, constraints inherent in value chains are specific to those modalities and practices of respective districts. The report has tried to analyze the common factors, constraints and opportunities throughout the coffee sector, as much as possible.

1.6 Limitations of the Study

Methodology used for the research was developed with consideration to time and resources provided by the proponent. Limitations in resources also restricted the extent of primary data collection (household data was not collected). Also it should not be assumed that a single study can offer solutions to the all the problems that exist in the entire Nepali coffee value chain. This study can serve as a reference for future studies, policy formulations and strategy developments related to coffee sector in Nepal.

Chapter 2: Study Methodology

Coffee is a global commodity and it involves a wide range of traders, processors, producers of various scales and regions along the value chain. In such a complex operating space having multiple actors, constraints to competitiveness may lie at any point within it. For the purpose of this study, we have employed the value chain approach to analyze the markets for Nepali coffee. Entire coffee industry has been analyzed from a market systems perspective and with a focus on the end markets.

The purpose of market system analysis is to undertake a systematic assessment of the current market system, its inputs, processes, actors and outcomes. Similarly, the analysis is also focused on value additions, product conversions, costs and returns at all different functional level of the value chain.

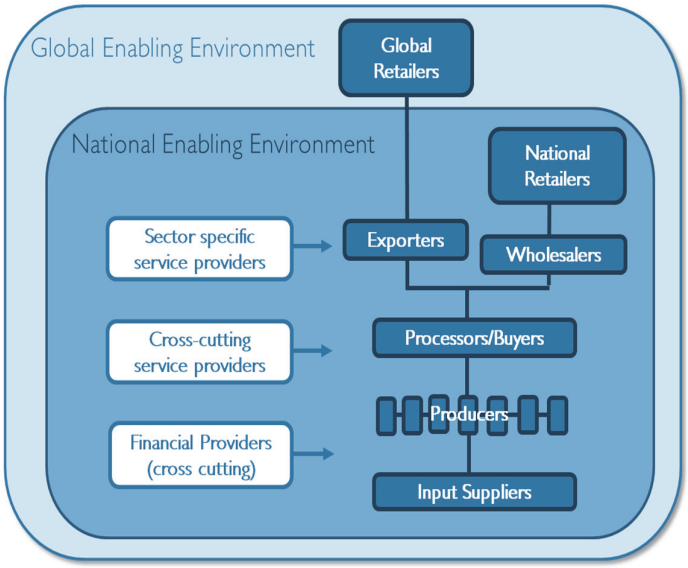
This study emphasizes various constraints at the farmer, processor, trader and exporter's levels. On the other hand, the study also identifies various opportunities and leveraging points for further improvement in the Nepali coffee value chain. The ultimate goal of the market system analysis is to aid stakeholders to take appropriate actions for developing sustainable, inclusive, resilient and competitive coffee market system in Nepal.

2.1 Approach to Analyzing the Market System

A Market System can be understood as a dynamic space, incorporating resources, roles, relationships, rules and results— in which private and public actors collaborate, coordinate and compete for the production, distribution and consumption of goods and services (USAID, 2006). The behavior and performance of these actors are influenced by other actors' decisions, by rules, incentives and the physical environment. Market systems are composed of vertically and horizontally linked firms and the relationships embedded in these linkages; end markets, input and support service markets; and the environment in which they operate, which may include socio-cultural, geographic and political factors, infrastructure and institutions (ibid). A systematic study of market dynamism, products, actors, rules and relationships between those actors, and study of the internal and external environments that directly affect that dynamism, comes under the framework of Market System Analysis (MSA), also generally understood as value chain analysis.

The larger purpose of the MSA is to contribute to market system development and the objective is to increase incentives to the value chain actors to improve productivity, performance, and trade, ultimately leading to better economic returns for poor producers. Market system analysis defines the interconnections in a market system using a framework of relationship, roles, rules, resources and results.

Following figure shows a generic value chain framework used in the market system analysis, and the factors and relationships affecting value chain competitiveness. The framework includes major actors and their interconnectedness in the market system of a specific product.



FACTORS AND RELATIONSHIPS AFFECTING VALUE CHAIN COMPETITIVENESS

Factors:

Business enabling environment
End markets
Supporting markets, including finance and other sector- and non sector-specific services and products
Inter-firm cooperation
Vertical linkages
Horizontal linkages
Firm-level upgrading (product and process upgrading)

Relationships:

Power dynamics between firms'
Access to **learning** and **innovation**
Distribution of **benefits**

Figure 1: Market system framework

The vertical and horizontal relationships between market actors are guided by a set of formal and informal rules and power distribution. Market system analysis carefully examines these relationships between market actors, and identifies significance of these relationships in the context of inputs, product quality, price, demand, supply, and overall well-being of the otherwise vulnerable actor

2.2 Criteria for defining the intervention space

One of the major objectives of this study is to identify intervention points in Nepali coffee value chain based on constraints and opportunities. A well-functioning market system should have the following three basic characteristics.

- ***Competitiveness***—actors in Nepali coffee sector are able to effectively innovate, upgrade and add value to their products to match market demand and maintain or grow market share.
- ***Inclusiveness***—delivering a sustainable flow of benefits to a range of actors, including poor farmers, women and marginalized, as well as to the society as a whole.
- ***Resilience***—actors in Nepali coffee sectors are able to address, absorb and overcome market shocks, policy environment, resource base or other aspect of the system.

Intervention space in Nepali coffee market system includes context, constraints, opportunities, and internal and external factors affecting it and actors at all levels of the value chain. Methodological goal is to identify the key factors that influence market system and to develop intervention models, wherever necessary, for increasing the competitiveness, inclusiveness and resilience of the Nepali coffee sector.

2.3 Data collection process and tools

Various data collection tools were used in the study. These tools are discussed below.

2.3.1 National Consultative Meeting

This study was launched after conducting a national consultative meeting at NTCBD where major institutional stakeholders of Nepali coffee sectors were informed about the study, who also provided important feedbacks in study approach and major issues in Nepali coffee sectors that needed to be covered by the study. The national consultative meeting was held in the presence of government agencies including Department of Agriculture (DoA), National Tea and Coffee Development Board (NTCDB), representative from the European Union and supporting partners such as Helvetas Nepal and CVCDP staffs from GNI Nepal and BeaCoN. Business membership organizations-Nepal Coffee Producers Association NCPA, Coffee Cooperative Unions, FNCCI, as well as coffee traders and exporters were also consulted in the course of this study.

2.3.2 Participatory Market System Analysis (PMSA) workshop

Markets are complex systems with diverse actors having different needs and viewpoints. Effective analysis of complex system can only be ensured through listening to these diverse actors and triangulating the facts. Participatory Market System Analysis (PMSA) is a participatory method for analyzing complex market systems. Therefore, PMSA workshop is one of the important methods used for this study.

First PMSA workshop was conducted on June 5, 2018 at Horticulture Research Center Pokhara. All major actors in coffee value chain from western region were in attendance. Similarly, second PMSA workshop was conducted on June 15, 2018 at International Club Lalitpur where all major stakeholders in coffee value chain at central region took part.

PMSA participants were, first, divided in a few heterogeneous groups each comprised of stakeholders and actors from different levels of the coffee value chain, namely: input suppliers, farmers, collectors, pulper operators, processors, traders, café owners and other supporting actors such as government agencies. These heterogeneous groups were tasked to create a value chain map within coffee sector by defining roles, functions and relationship of each actor presented in the group.

In the second session, homogeneous groups were formed so that each group comprised of stakeholders and actors from the same levels of coffee value chain, namely: input suppliers group, farmers group, and processor group, traders group and group of institutional supporters. These homogeneous groups conducted rigorous discussion to identify existing constraints as well as opportunities and space of interventions in their respective functions. All of the groups presented their views in the floor and provided a forum for an extensive discussion, verification and inputs from entire participants. Representative from CVCDP facilitated the groups and the study team did detailed note-keeping of the entire workshop.

Photograph 1: Group discussion during a PMSA workshop

The second PMSA was organized at International Club, Sanepa, Lalitpur on June 15, 2018 and it aimed to gain perspectives of big traders and hoteliers on existing situation, constraints and opportunities as the previous one had focused on coffee producers and processors. The PMSA saw fewer numbers of participants rendering it a consultative meeting. There were seven participants in this workshop compared to the twenty-five guests invited. Instead of dividing participants into groups, issues were identified and existing situations and possible solutions to problems were discussed.

2.3.3 Key Informant Interviews

Key informant interview (KII) is an effective method of information collection where specific subject matter experts are interviewed in an intensive way, covering all dimensions of the issues being investigated. The study team conducted a number of in-depth interviews with focal persons relating to one or more stages of coffee value chain as well as supporting organizations. Below is

the list of key informants interviewees and their roles in coffee value chain. Questionnaire and checklists used for KII are presented in Annex.

S.N	Name of Key Informants	Organization	Role in Coffee Value Chain
1.	Mr. Chandra Puri	Agriculture Development Officer, NTCDB Regional office Pokhara,	Enabler, supporter
2.	Mr. Sobhakhar Adhikari	Machhapuchchhre Coffee	Farmer, roaster, trader, café owner
3.	Mr. Bhojraj Poudel	Manager, Nirmal Pokhari Primary Coffee Cooperative, Kaski	Pulper, Collector, huller, exporter
4.	Mr. Khom Bahadur Gurung	Farmer	Production
5.	Mr. Indra Acharya	PCC, Annapurna 33	Nursery holder
6.	Mr. Phani Narayan Aryal	District Coffee Cooperative Union, Syangja	Collector, pulper, huller, roaster, trader
7.	Ms. Maya Tiwari	District Coffee Cooperative Union, Syangja	Collector, pulper, huller, roaster, trader
8.	Puspa Raj Poudel	Owner of one of the model farms in Kaski District, Pokhara 21	Farmer, pulper
9.	Mr. Bhaskar Gyawali	CCU, Gulmi	Collector, huller, roaster, trader
10.	Mr. Nil Kantha Gautam	CCU, Gulmi	Processor, Collector
11.	MNRs. Mana Bhattarai	PCC, Vodkua, Gulmi	Nursery Holder, large farmer
12.	Mr. Bal Bhadra Poudel	PCC, Barangdi, Palpa	Collector, pulper, huller, roaster, trader
13.	Mr. Sashi Badan Ghimire	CCU, Lalitpur	Collection, huller, trader
14.	Mr. Bal Bahadur KC	CCU, Lalitpur	Advisor
15.	Mr. Kumud Singh	Alpine Coffee	Owner

Photograph 2: Interview with key informants and farmers at CCU, Gulmi

2.3.4 Field observation and interview with farmers

In order to supplement and triangulate the data gathered from PMSA workshops and KIIs, and in order to get firsthand data on the ground reality of coffee producers, the study team conducted field observations and interviews with coffee farmers. Similarly, coffee processing units at DCCU and PCCs were also visited. Farmers and processing units associated with following coffee cooperatives were interviewed and their coffee orchards were observed.

- Nirmal Pokhari Primary Coffee Cooperative Kaski,
- DCCU Processing unit, Putalibazar, Syangja
- Primary Coffee Cooperative Karendada, Syangja,
- CCU Processing unit, Baletaksar, Gulmi
- Primary Coffee Cooperative Vodkuwa , Gulmi
- Primary Coffee Cooperative and processing unit, Barangdi, Palpa
- CCU processing unit, Chapagaun, Lalitpur

Photograph 3: Study team at coffee orchard, Nirmal Pokhari, Kaski

Smallholder farmers with traditional organic practices primarily do coffee farming in Nepal; therefore, group/cooperative model was developed in order to efficiently collect ripe coffee cherries, process them into various products, and for effective trade. However, private sector actors have initiated large-scale coffee farming in Nepal. In order to obtain information on this another dimension of Nepali coffee farming, the study team visited large-scale coffee farms and conducted thorough investigation and interviews.

2.3.5 Interview with Coffee Consumers

Coffee consumers lie at the last stage of coffee value chain, but carry highest importance than any other actor in the chain. All the efforts in coffee value chain - farming, processing, quality control and management - have an ultimate aim of offering the highest quality coffee to the consumers. Therefore, it was necessary to collect data on consumer perspectives, their preferences, knowledge, quality parameters and the price they are willing to pay for a cup of Nepali coffee. Study team interviewed 50 consumers at 20 coffee shops in Pokhara and Kathmandu. Similarly, random costumers at different grocery stores in Kathmandu valley were also interviewed.

2.3.6 Secondary data collection

This study is largely based on primary data, gathered directly from various actors at different levels of Nepali Coffee value chain. However, in order to observe wider scenario of Nepali coffee sector, historical data on production trends, exports and price of Nepali coffee in both domestic and international market have also been used. Similar historical data have been reviewed to identify gap in import and export of the coffee in relation to domestic consumption patterns. Data on import and export trend during the year 2009-2017 has been gleaned from Import/Export Data Bank of Trade and Export Promotion Center, government of Nepal. Whereas production related data was gleaned from multiple sources such as NTCBD, Ministry of Agriculture Development and National Agriculture Research Center (NARC).

One of the major limitations faced by the research team was inconsistency in coffee related data published by Planning Commission, Ministry of Commerce and Supplies and Nepal Tea and Coffee Development Board. For instance, Statistical Information on Nepali Agriculture (Ministry of Agricultual Development, 2017) mentions total Green beans production in fiscal year 2015/16 to be 532 m while coffee statistics of NTCDB mentions Green beans production for the same year to be 434 m (NTCDB, 2018).

Chapter 3: The Coffee Industry

3.1 Coffee as a global commodity

Coffee is one of the most traded agricultural commodities in the world. International prices of coffee are based on International Terminal Markets in New York (Arabica) and London (Robusta)(ITC, 2018). About 70 percent of coffee produced in the world comes from Latin America and Africa (ICO, 2018), rest of the 30 percent is produced in the Asia and Pacific regions. Brazil is the world's largest producer and exporter of coffee followed by Vietnam.

3.2 History of Nepali Coffee

Coffee sector at has a complex value chain process, from its origin at the farm to the cup. On the other hand, coffee-drinking culture is getting increasingly popular in Nepal among domestic consumers as well as among tourists and travelers. Although the very first coffee plant in Nepal was introduced in 1938, government of Nepal recognized it as a cash crop in late 1970s and distributed seeds to farmers in potentially coffee growing districts in Western Nepal. Commercialization of coffee production started in the mid-1980s after Nepal Coffee Company started collecting dry cherries from farmers and processed it for domestic consumption.

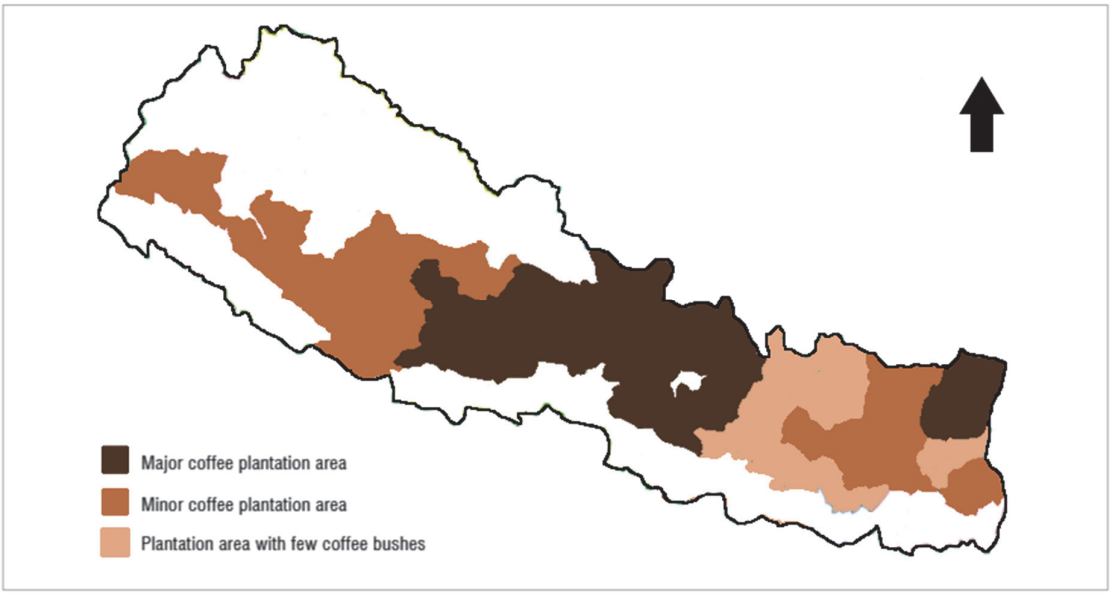


Figure 2: Coffee producing districts in Nepal (ITC, 2018)

Recognizing increasing domestic and international demand for Nepali coffee, Government of Nepal established Nepal Tea and Coffee Development Board, a national level entity in 1993 for promoting Nepali coffee sector through policy formulation, research, plantation expansion, and market facilitation. On the other hand, during late 1990s, coffee farmers began to organize the

collection and processing of coffee by establishing small cooperatives and local groups, which further helped in increasing coffee cultivation and overall production.

Nepali coffee sector gained special attention from domestic and international markets in 2000s after the private sector's involvement in processing, marketing, trading and exporting. In order to promote research and extension for increased production of fresh cherries, Government of Nepal established Coffee Research Program in Gulmi in 2013. Currently, coffee is grown in 41districts in 2,600 hectares of land by around 32,500 farmers. Kavre, Panchthar, Sindhupalchowk, Lalitpur, Nuwakot, Lamjung, Gulmi, Syangja, Kaksi, Palpa and Arghakhachi are top coffee producing districts having 65% of total plantation area and contributing 67% of total production.

3.3 Nepali coffee: From farm to cup

3.3.1 Plantation

Coffee belongs to Rubiaceae family, of which two major species – *Coffea Arabica* and *Coffea Canephora*- are commercially grown the world over. Nepal's topographical position, climatic variation – rainfall, temperature and humidity – as well as soil quality are highly suitable to grow *Arabica* species coffee at the altitude ranging from 800 to 1600 meters above the sea level. *Arabica* coffee is considered of higher quality and also gets higher price than *Robusta* coffee in the global market. *Arabica* coffee has three major varieties – *Bourbon, Typica* and *Yellow Caturra* – which are widely grown by Nepali farmers with some mix of locally crossed varieties. Majority of Nepali farmers apply organic practices in coffee farming, including land preparation, use of organic manure and organic pesticides.

Coffee saplings are normally grown in a nursery up to 18 months before they are transplanted to an orchard. It takes another 18 months for these plants to fruit cherries. Typically, a coffee plant becomes fully matured at the age of 5 and continues fruiting up to the age of 40 or even further if an orchard is properly managed with sufficient nutrient supply, plant pruning and pest control. Geography, organic and environment-friendly farming methods lend Nepali coffee special texture, earthiness, smell, taste, and after-taste.

Photograph 4: Well-maintained coffee plantation at Nirmal Pokhari, Kaski

3.3.2 Harvesting and Processing

Organically produced in remote mid-hills by small holder farmers, the coffee undergoes range of processes – pulping, fermentation, washing, drying, hulling, grading, roasting, and grinding – involving a series of actors – individual farmers, primary cooperatives, district cooperatives, private processor, traders, exporters and retailers.

In Nepal coffee is normally planted in orchards during the rainy season and harvested from October to February. Not all cherries on a plant ripen at the same time. Therefore, a farmer needs to harvest ripen cherries at different times. On average, a healthy and mature coffee plant yields 5-8 kilograms of fresh cherries in a harvesting season. A cross-section of a fresh coffee cherry is shown in following diagram:

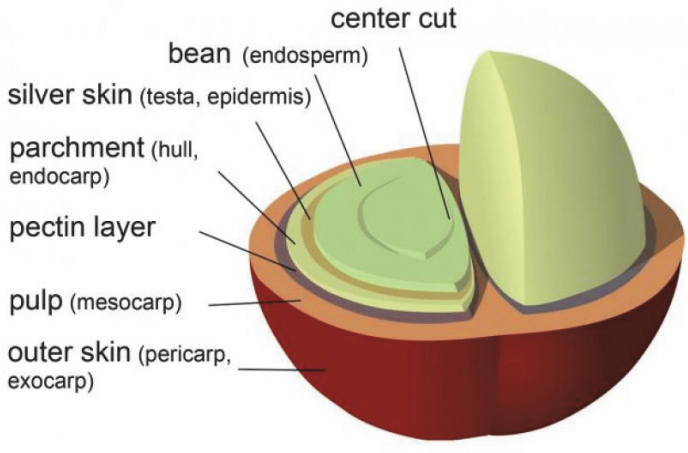


Figure 3: Cross-section diagram of fresh coffee cherry

Following steps are observed in coffee beans processing after harvesting:

1. Collection and Sorting: Farmers bring their fresh cherries to pulping center within 24 hours of harvesting. Cherries are soaked in water for primary sorting where floating cherries are discarded and submerged cherries are selected for further processing.
2. Pulping: Pulping is done to remove outer skin and pulp from a fresh cherries. To preserve the quality of coffee, it is required to complete the pulping process within 24 hours of harvesting lest the pulp inside begins fermenting thus affecting the quality of the final product.

Alternative processing

In Nepal, even a monkey did not spare the coffee cherries, eating as much as 300 gm of cherries in a day as evidenced in a coffee estate in Nuwakot. Monkeys can be nasty, but there is an animal locally called Bharse (Civet cat), a member of fox family, which is considered a natural fermenting agent. It is found to be used for chiuri and coffee. Bharse eats the coffee and chiuri pulps and releases the beans as dung, which when washed turns out to be a perfectly pulped beans. The use of this natural dynamics can be a topic for further research.

3. Fermentation: Pulping machine does not remove hard pectin layer. Therefore, pulped beans are stored in an airtight manner for 24-48 hours to let natural fermentation that will loosen the hard pectin layer.
4. Washing: Fermented beans are then hand-washed to remove the loosened pectin layer, which results in parchment.

Photograph 5: Dried coffee parchment at DCCU Gulmi

5. Drying: Wet parchment are first dried in shade and then sun-dried until the moisture level is between 11-13%. Dry parchment can be stored for a longer duration compared to other forms of coffee.

6. Hulling: Dry parchment is hulled using a huller to obtain green beans. The process is equivalent to removing paddy husk in order to get rice grain. Green beans of various sizes are graded (16, 14 and the rest) using a grading machine

Photograph 6: Green beans from DCCU Gulmi (Left);
Huller machine at Nirmal Pokhari PCC Kaski (Right)

7. Roasting and Grinding: Green beans are roasted to desirable levels – low roast, medium roast and dark roast – in a roaster machine resulting in different tastes. Roasted beans are ground into powdered coffee to which consumers apply different techniques and combinations according to their tastes and preferences.

Chapter 4: Global and National Trends

Nepal Trade Integration Strategy (NTIS) 2016, has listed coffee as one of the potential export commodities. Coffee sector in Nepal is seeing increased investment as increasing number of farmers, traders and café owners' are getting involved. And, also because Nepali coffee receives higher prices compared to other international coffees. At present, the average international price of Nepali Green beans stands at $ 8 per kg compared to $ 3.8 for other countries. Nepali coffee has received high price in international markets as it is specialty coffee and serves a niche market. However, there are concerns that the prices may fall if quality does not improve.

4.1 Global trends

Global trends in coffee shows that production increased in 2016/17 compared to 2010/11. In 2016/17 global coffee production stood at 9.46 million metric tons out of which 2.91 million metric tons is consumed domestically while 7.18 million metric tons is exported. Imports stand greater than exports at 7.6 million metric tons, around 2.55 million metric tons that is imported by countries are re-exported. The trend in consumption, exports, imports and re-exports are increasing worldwide.

Table 3: Global trends in coffee trade (ICO, 2018)

Year	Production (Million MT)	Domestic consumption (Million MT)	Exports (Million MT)	Imports (Million MT)	Re exports (Million MT)
2010/11	8.38	2.54	5.82	6.55	2.04
2011/12	8.88	2.64	6.27	6.71	2.13
2012/13	8.99	2.72	6.66	6.79	2.17
2013/14	9.14	2.76	6.63	6.96	2.18
2014/15	8.94	2.83	6.88	7.20	2.35
2015/16	9.13	2.90	6.87	7.28	2.43
2016/17	9.46	2.91	7.18	7.60	2.55

Brazil is the largest producer and exporter of coffee throughout the world followed by Vietnam, Columbia and Indonesia. Brazil makes up almost 30 percent of entire global coffee productions. In 2016, Brazil produced almost 3.06 million metric tons of coffee compared to 1.77 million metric tons produced by Vietnam. In 2016, Brazil exported around 2.06 million metric tons of coffee compared to 1.65 million metric tons by Vietnam. India exports more coffee than it produces. According to ICO database, India produced 0.35 million metric tons coffee in 2016 but exported 0.37 million metric tons. This is an example of entre-port trade between nations.

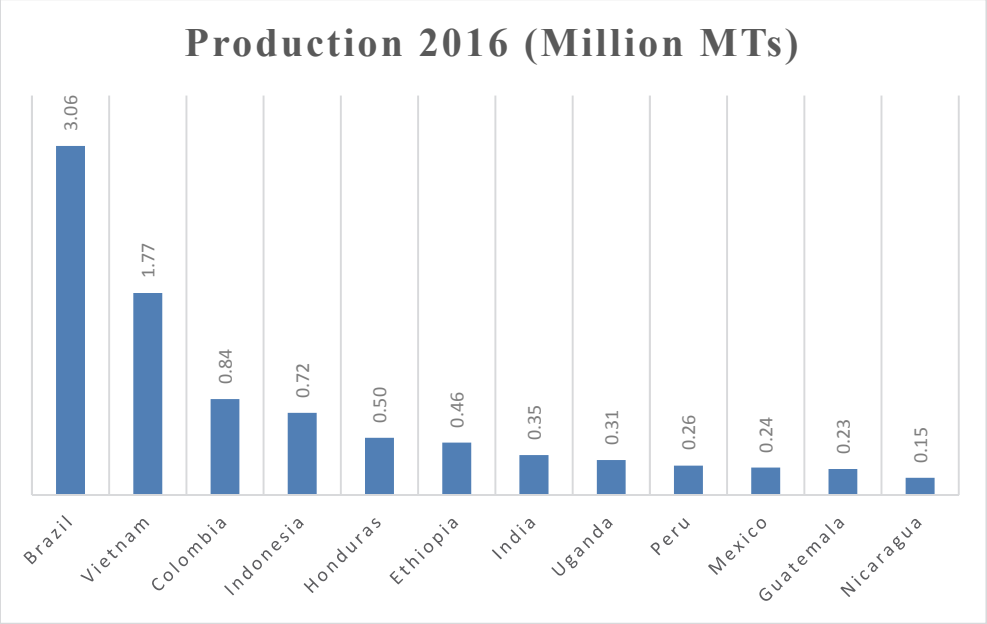


Figure 4: Major Coffee Producers of the World (ICO, 2018)

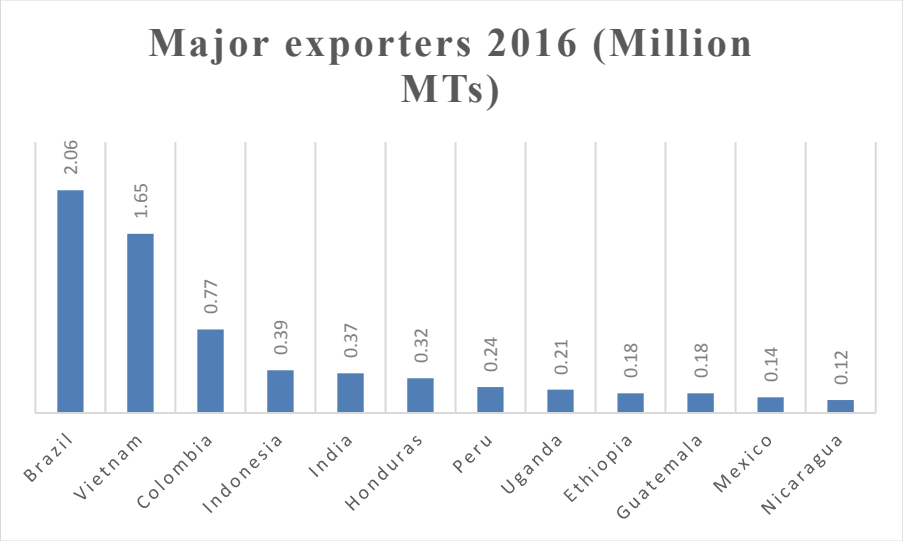


Figure 5: Major Coffee Exporters of the World (ICO, 2018)

Table 4: Nepal's Production Compared to other Countries

Green bean production – 2016	
Country	**Production (MTs)**
Brazil	3,019,051
Vietnam	1,460,800
Colombia	745,084
Indonesia	639,305
Ethiopia	469,091
Nepal	**532**
World	**9,221,534**

WHERE DOES NEPAL STAND?

USA, Germany, Italy and Japan are major coffee importers in the world (2013). 2013 data shows that the USA is a major importer (1.62 million metric tons) followed by Germany, Italy and Japan. The imports of these countries have increased in 2016. However, the ICO does not provide country-wise data of European Union countries for 2016.

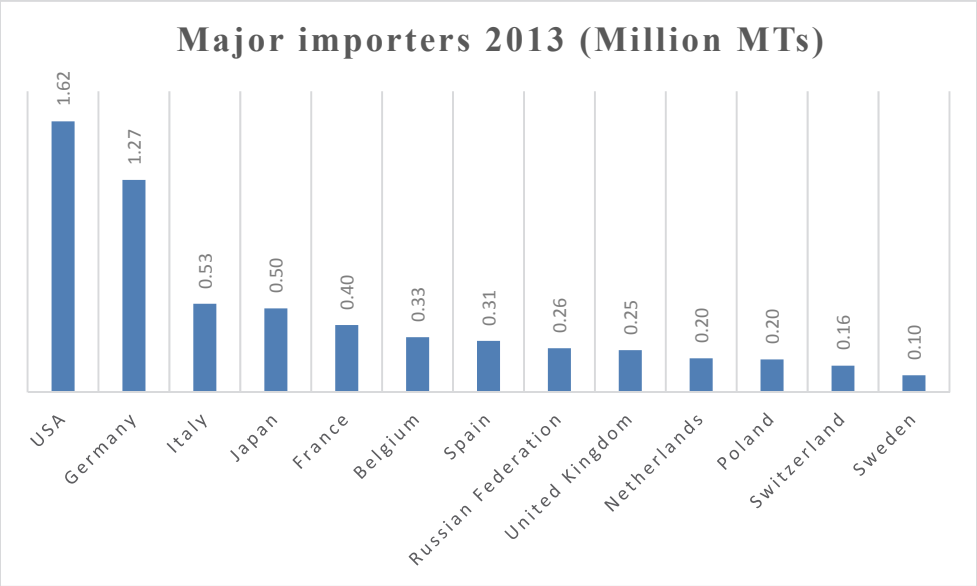


Figure 6: Major coffee importing countries (ICO, 2018)

The price paid to growers of various types of coffee decreased in 2016 compared to 2012. In 2017 prices increased. In 2017 the price of other mild types of coffee was highest at $ 3.78/kg compared to lowest price paid to Robusta at $1.88/kg.

Table 5: Prices paid to growers (USD/Kg) (ICO, 2018)

Calendar years	Columbian Mild	Other Mild	Brazilian Naturals	Robusta
2012	3.67	3.28	2.90	1.66
2013	2.51	2.56	2.30	1.60
2014	3.52	3.15	2.13	1.48
2015	2.63	3.15	1.93	1.34
2016	2.72	3.07	2.17	1.33
2017	2.77	3.78	2.59	1.88

The retail price of roasted coffee stood at $ 12.85/kg in 2016 compared to $ 15.41/kg in 2011. In 2011, roasted coffee sold at the highest prices in a decade and went down gradually since then. Overall, the prices of roasted beans are on the rise.

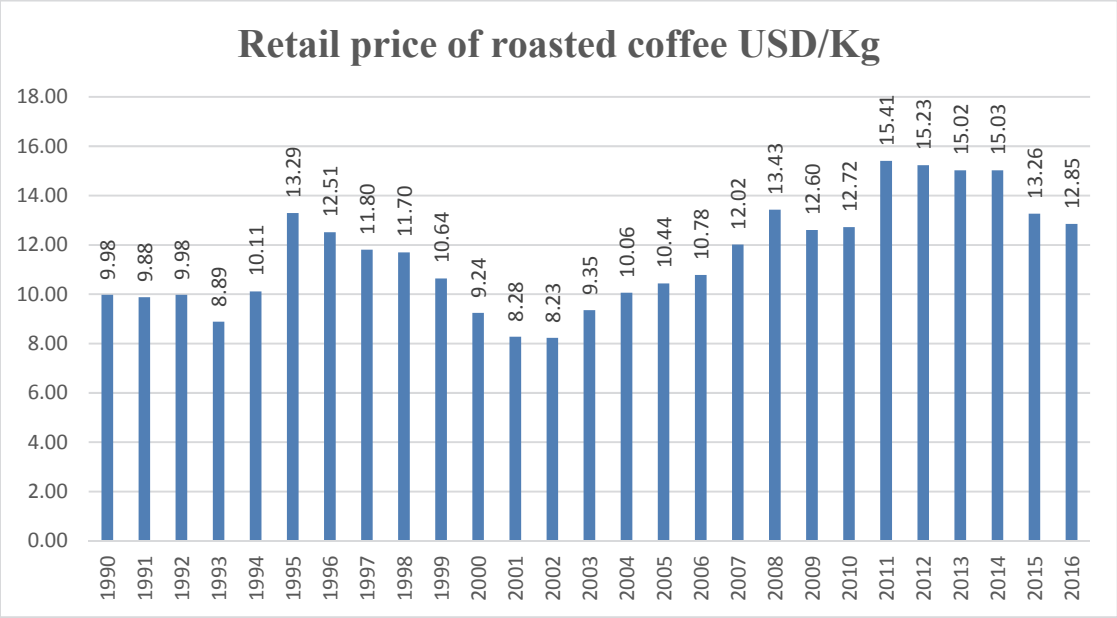


Figure 7: Retail price of roasted coffee USD/Kg (ICO, 2018)

Nepal has a very small share in the global coffee export market. Conventional coffee growing countries have dominated international coffee market throughout the last two decades. Similarly, India and China are emerging as mass-scale coffee producers and exporters and offer relatively cheap prices. Competing with these large coffee exporting countries is a significant challenge for Nepal due to a number of constraints in production side, lack of land, and low investment. Hence, rather than competing for mass export, Nepal can prioritize producing organic, high quality specialty coffee that abides by fair trade practices.

4.2 National trends

Although coffee is one of the most widely consumed beverage around the world, in Nepal it is gradually gaining popularity. At present there is a significant presence of Nepali filter coffee in Nepali market along with instant coffees from other countries. With increase in number of cafés and burgeoning coffee culture, number of people consuming coffee is increasing. Interaction with consumers and café owners in Kathmandu, Lalitpur and Pokhara pointed out that the number of people consuming coffee has significantly grown in the last five years. With the rise in coffee consumption, there also have been an increase in Nepali coffee brands and suppliers.

Although Nepali coffee has been receiving high price compared to coffee from other countries, there are increasing concerns that the prices may fall as quantity of production as well as quality is gradually declining. Section below provides an overview of the Nepali coffee sector.

4.2.1 Production

An estimated 0.17 million Ha of land is suitable for coffee farming in Nepal (Consultative workshop, Kathmandu). At present, coffee is farmed in almost 2618 Ha of land. Although being a relatively new crop, coffee is grown in 41 districts across the country. Syangja (310 ha) has the highest area under coffee production among the coffee farming districts followed by Panchthar (271 ha), Kavre (193 ha), Nuwakot (178 ha) and Gulmi (160). Syangja is also the highest producer of green beans at 41 metric tons (see ANNEX-1, table A2.).

The area under coffee plantation has increased by 9.95 percent from fiscal year 2014/15 to fiscal year 2015/16. Largest increase was observed in Bhojpur District. Average increase in plantation area was observed to be 17.15 percent. Green beans production increased by 14.76 percent in 2015/16 compared to 2014/15. Green beans production was observed to be decreasing in 10 districts while in other districts it was on the rise. The yield of Green beans increased by 15.79 percent and there has also been increase in number of coffee farmers by 1.23 percent.

Table 6: Summary of deviations in production parameters from 2014/15-2015/16

Parameters	Increase (districts)	Decreased or constant (districts)
Area	Syangja, Panchthar, Kavre, Nuwakot, Gulmi, Arghakhanchi, Lamjung, Sindhupalchok, Palpa, Parbat, Dhading, Baglung, Tanahu, Myagdii, Sanhuwasabha, Gorkha, Pyuthan, Khotang, Bhojpur, Other districts	Kaski, Lalitpur, Ilam, Rasuwa, Makwanpur
Green beans production (Mt)	Panchthar, Nuwakot, Lalitpur, Arghakhanchi, Lamjung, Palpa, Baglung Rasuwa, Tanahu, Makwanpur, Myagdii, Sankhuwasabha, Pyuthan, Khotang other districts	Syangja, Kavre, Gulmi, Kaski Sindhupalchok, Parbat, Dhading, Ilam, Gorkha, Bhojpur
Yield (kg/h)	Panchthar, Lalitpur, Lamjung, Palpa, Baglung, Rasuwa, Tanahu, Makwanpur, Myagdii, Sanhuwasabha, Pyuthan, Khotangother districts	Syangja, Kavre, Nuwakot, Gulmi, Kaski, Arghakhanchi, Sindhupalchok, Parbat, Dhading, Ilam, Gorkha, Bhojpur
Growers	Syangja, Panchthar, Kavre, Nuwakot, Gulmi, Kaski, Lalitpur, Arghakhanchi, Lamjung, Sindhupalchok, Palpa, Parbat, Dhading, Baglung, Tanahu, Gorkha, Pyuthan, Other districts	Ilam, Rasuwa, Makwanpur, Sanhuwasabha, Khotang, Bhojpur

Although coffee is a high value crop and it provides more income than other regular staple crops, farmers are still reluctant to grow coffee because it has a longer waiting period of three years compared to vegetables that grow in a few months. Lack of manpower, lack of quality seeds and saplings, problems of leaf rust and stem borer are some other factors that discourage farmers to grow coffee to the extent it is possible.

Table 7: Coffee plantation area, production and productivity (NTCDB, 2018)

Fiscal Years	Coffee plantation area (ha)	Production (MT)
1994/95	135.7	12.95
1995/96	220.3	29.20
1996/97	259	37.35
1997/98	272.2	55.90
1998/99	277.1	44.50
1999/00	314.3	72.40
2000/01	424	88.70
2001/02	596	139.20
2002/03	764	187.50
2003/04	925	217.50
2004/05	1078	250.00
2005/06	1285	391.00
2006/07*	1396	270.00
2007/08	1450	265.00
2008/09	1531	334.00
2009/10	1630	429.00
2010/11	1752	502.00
2011/12	1760	523.00
2012/13	1750	457.00
2013/14	1911	429.4
2014/15	2381	463.58
2015/16	2618	434.00
2016/17	2646	466.00
*After fiscal year 2005/06 production is calculated in terms of dry parchment not dry cherries		

There is an increasing trend in production as well as productivity of coffee in last 20 years. Years 2005/06 and 2011/12 were the years seeing highest level of production. Proper orchard management, shed management, moisture and nutrient management are some factors influencing productivity of a plant. It became apparent on field visits that white stem borers destroyed almost 10 to 20 percent of plants. Incidence of leaf rust were also found to be increasing. This disease was also responsible for wiping out entire coffee plantations in Sri Lanka (ITC, 2018). Experts suggested proper shed and moisture management and nursery management to prevent stem borer and leaf rust infestations. Experts and growers also pointed out the need of research on this area and identifying species of coffee that were more resistant to these infestations.

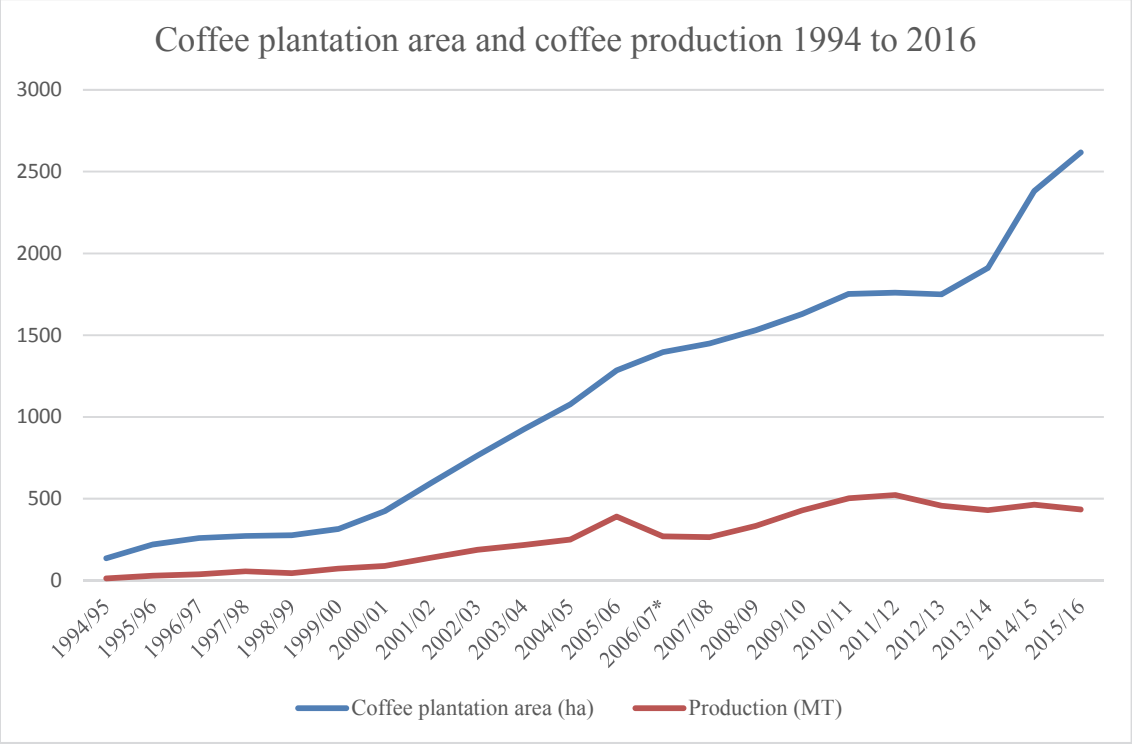


Figure 8: Coffee Plantation and Production Trend 1994-2016 (NTCDB, 2018)

Some experts pointed out that coffee was introduced in Nepal as a plant that could mitigate soil erosion in the slopes, needed less maintenance and also could provide an alternative livelihood to farmers. Similar mindset still persists amongst farmers. Field observation also showed that farmers lacked good practices in orchard management that in turn decreased production or produced low quality berries.

4.2.2 Export, Imports and Prices

Coffee exported and imported by Nepal can be categorized into the following types;

- Neither roasted nor decaffeinated (Green beans)
- Coffee
- Not roasted, decaffeinated
- Roasted and decaffeinated
- Roasted, not decaffeinated
- Instant coffee

Table 8: Exports and Imports of different Coffee Forms 2012-2017 (Ministry of Commerce and Supplies, 2018)

Product / year	2012/13		2013/14		2014/15		2015/16		2016/17	
	E	I	E	I	E	I	E	I	E	I
Neither roasted nor decaffeinated	82.22	3.13	38.36	17.46	44.32	63.86	58.03	59.40	31.59	70.75
Coffee	7.91	13.75	4.63	30.11	16.84	14.57	16.41	27.46	24.13	9.42
Not roasted, decaffeinated	1.05	16.60	12.69	16.60	43.38	17.57	8.86	30.94	35.96	98.20
Roasted and decaffeinated	1.92	3.53	3.68	6.42	12.90	4.27	3.73	8.79	1.29	11.07
Roasted, not decaffeinated	4.64	12.28	3.94	6.17	0.64	10.63	1.15	4.52	1.77	3.54
Instant coffee	-	23.92	-	14.44	-	73.08	-	19.63	-	41.80

E: Export in Metric Tons, I: Import in Metric Tons

Apart from instant coffee, Nepal imports as well as exports all other categories of coffee. However, if we look at data of the last 8 years (2009-2017), quantity of Green beans import is increasing whereas quantity of Green beans export is in decreasing trend. It is observed that in 2016 Nepal imported 9.42 MT coffee and 41.8 MT instant coffee. Although there has been an increase in domestic production of green beans, import of green beans is increasing rapidly. This could be due to the fact that while prices of Nepali Green beans stood at NRs. 1235.34 per Kg on exports, prices were significantly low at NRs. 289.52 for imported Green beans (2017). Almost 95.36 percent of green beans imported in Nepal in the last 8 years (2009-2017) were from India (Ministry of Commerce and Supplies, 2018). Nepali green beans are costly due to small-scale farming, organic practices, low productions, and lack of agricultural infrastructures, high labor costs and other factors that will be discussed later.

Figure 9: Green beans import-export trend by quantity 2009-2017

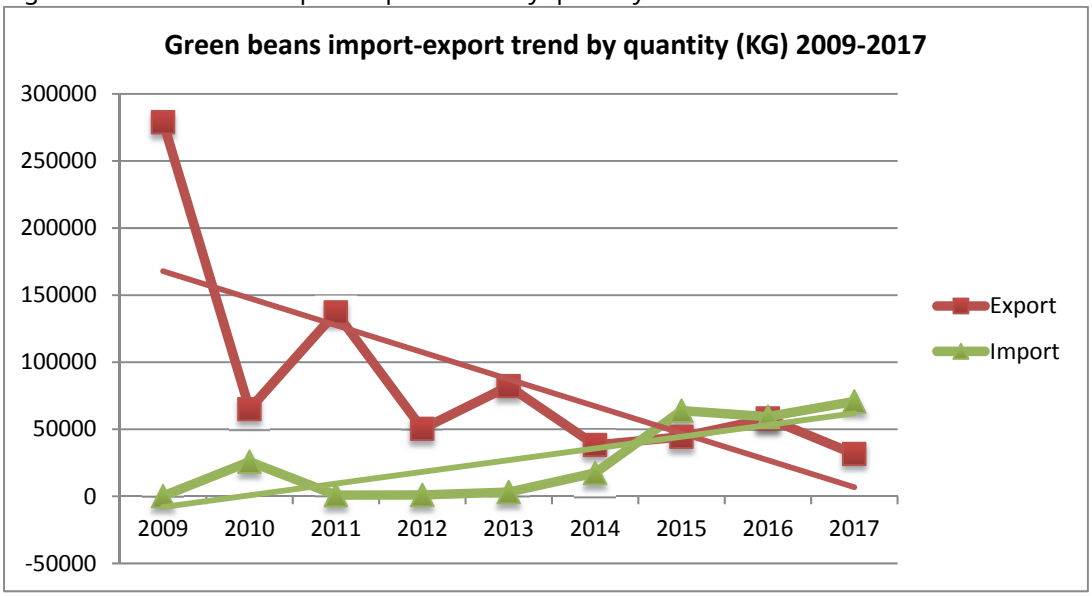
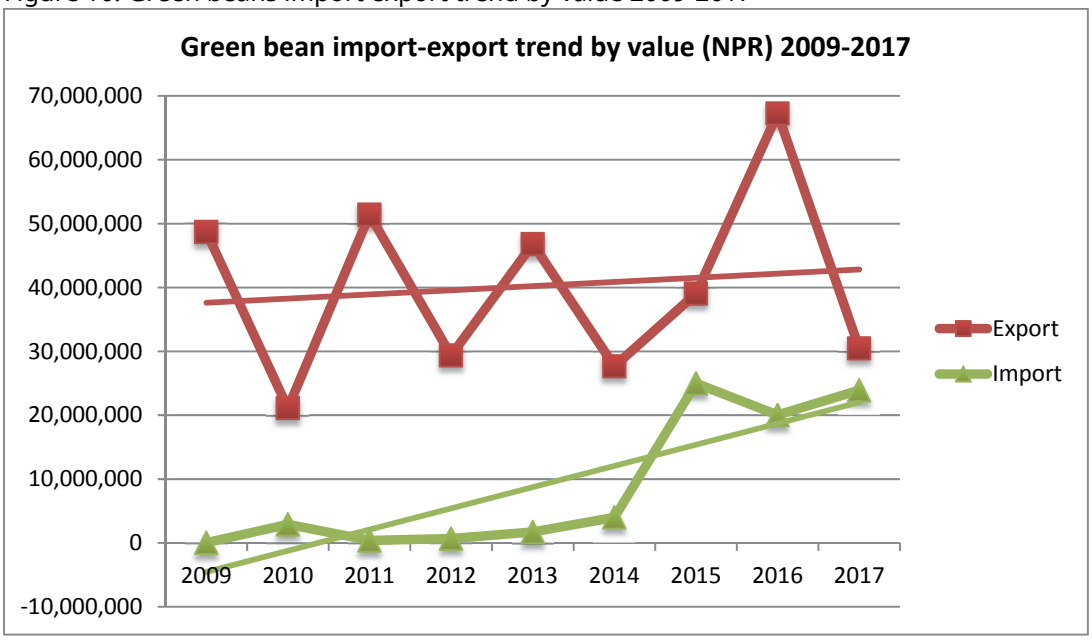
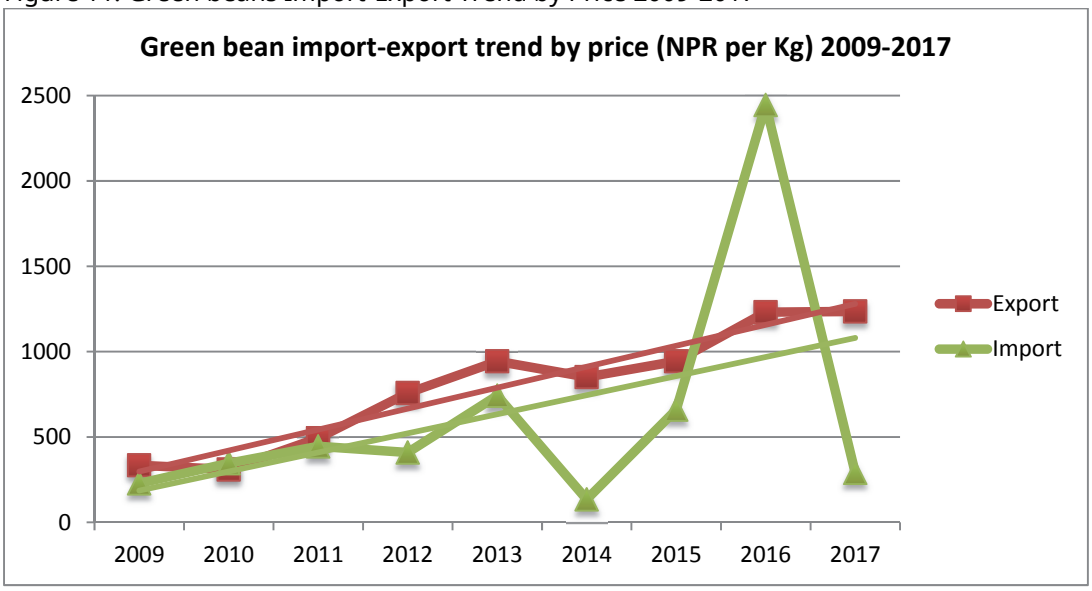


Figure 10: Green beans import export trend by value 2009-2017



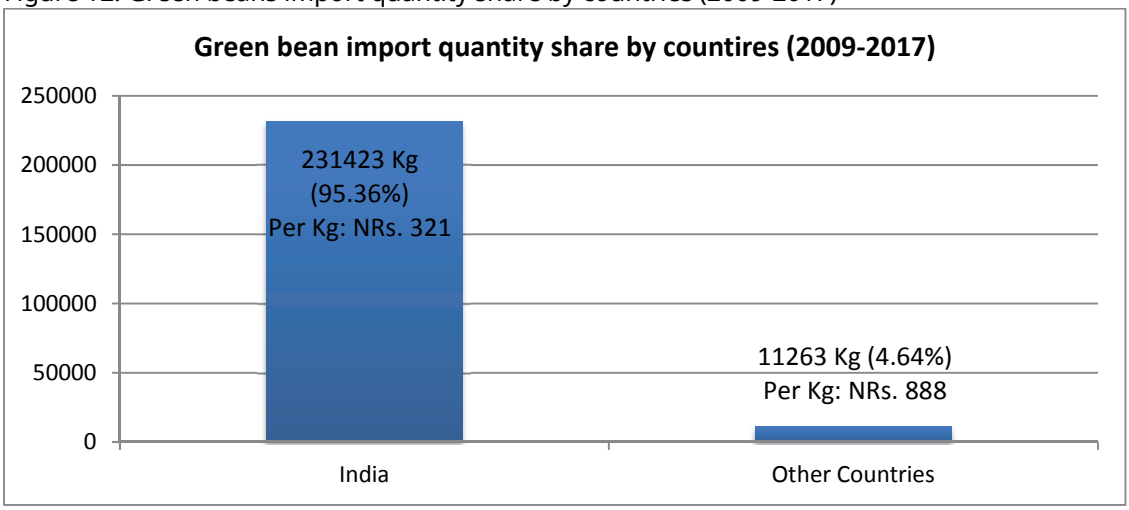
Over the last 8 years (2009-2017) price for green bean exports and imports are on an upward trend. Export price of Nepali Green beans per kg was 945 NPR which is higher than the price of imported Green beans in 2017. Whereas back in 2009 export price of Nepali Green beans was only 106 NPR higher than the price of imported Green beans. If we look at quantities, export of Nepali Green beans is in decreasing trend, while import of Green beans is in increasing trend. This is attributed to increasing domestic consumption as well as very cheap Green beans available in India.

Figure 11: Green beans Import-Export Trend by Price 2009-2017



Aggregated data of Green beans import in Nepal during 2009-2017 shows that India has the highest share (95.36%) in comparison to rest of the countries including Japan, China, Brazil, Indonesia and nine others from where Nepal imports only around 4.64% of the total amount of imports. Indian green beans are NRs. 567 per Kg cheaper than that from other countries on an average. However, if we compare India and China alone over the last 8 years, Chinese Green beans costs NRs. 112 per Kg, whereas Indian Green beans costs NRs. 321 per Kg. This again signifies that, in the future, it could be very challenging for Nepali coffee to compete with our neighboring countries who produce large scale green been in much lower price than we do.

Figure 12: Green beans import quantity share by countries (2009-2017)



Following figures present top 10 countries in terms of export of the last eight years (2009-17) in terms of quantity, value and price of Nepali green beans that have been exported to those countries. The highest amount was exported to India (226.89 MT) followed by Germany and South Korea; while Nepali green beans got the highest price in France (NRs. 3005/kg) followed by Qatar, the Philippines and Switzerland.

Figure 13: Top Countries by green beans export quantity 2009-2017

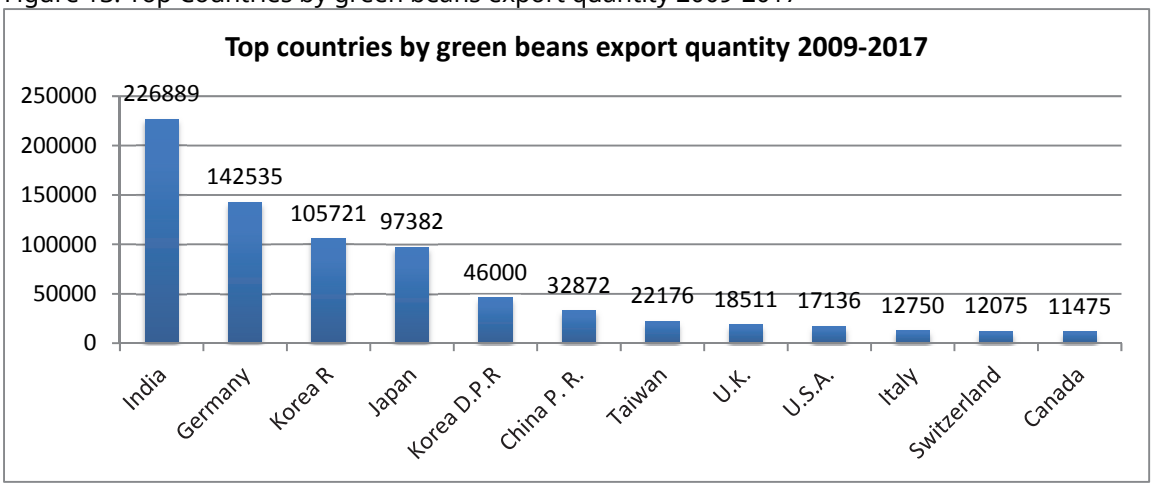


Figure 14: Top countries by green beans export value (NPR) 2009-2017

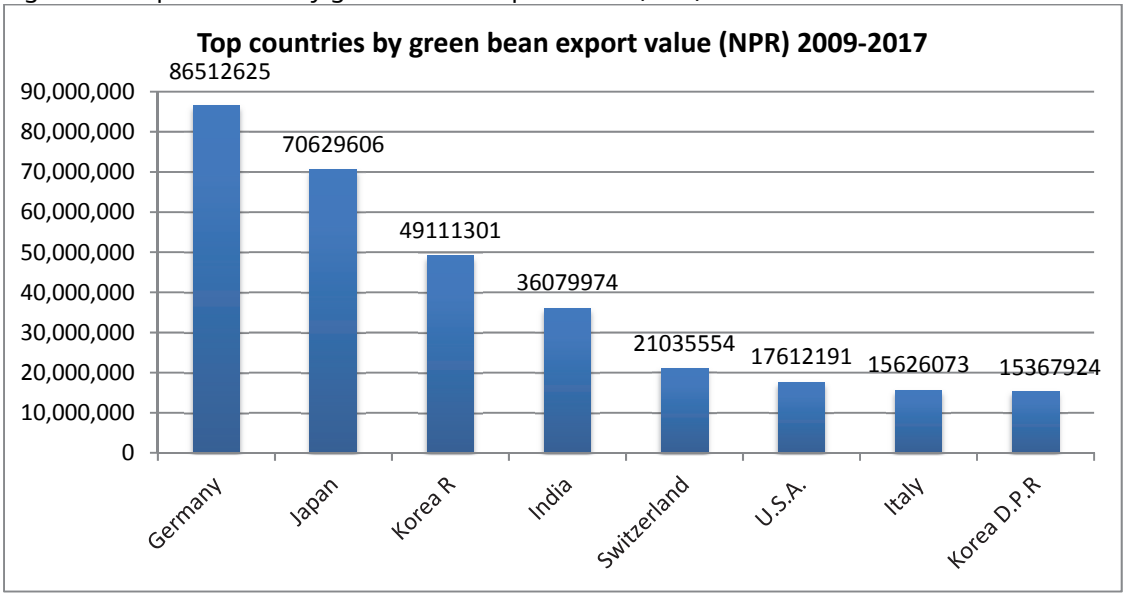


Figure 15: Top Countries by green beans export price (NPR per Kg) 2009-2017

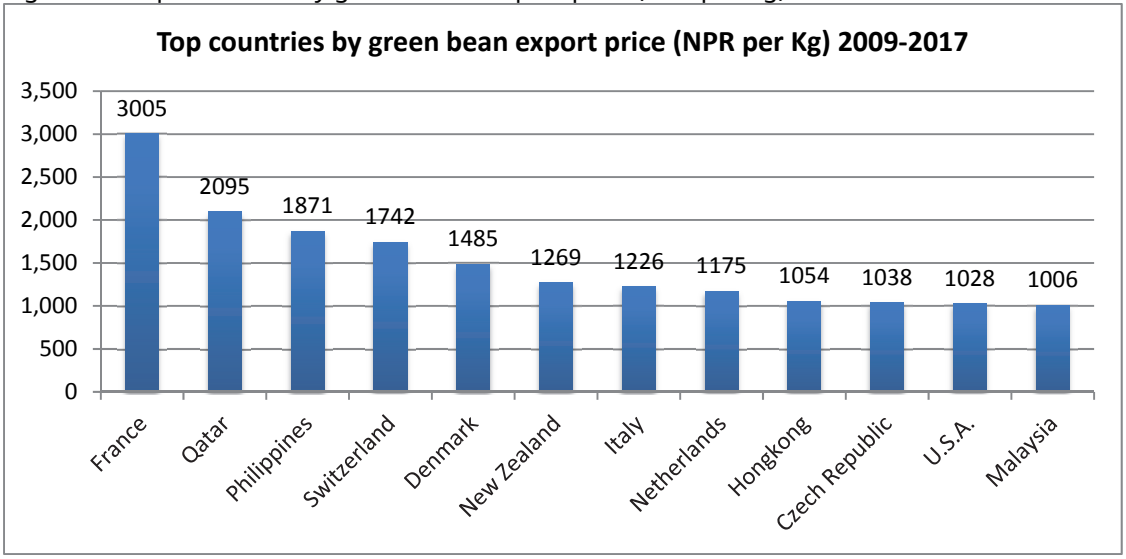


Table 9: Export-Import Quantity Gap (MT) of different categories of coffee 2012-2017

Product / year	2012/13	2013/14	2014/15	2015/16	2016/17
Neither roasted nor decaffeinated	79.09	20.90	-19.53	-1.38	-39.16
Coffee	-5.84	-25.48	2.27	-11.05	14.71
Not roasted, decaffeinated	-15.55	-3.91	25.81	-22.07	-62.25
Roasted and decaffeinated	-1.60	-2.74	8.63	-5.06	-9.78
Roasted, not decaffeinated	-7.64	-2.23	-9.99	-3.37	-1.77
Instant coffee	-23.92	-14.44	-73.08	-19.63	-41.08

Export trends show that Green beans has the highest rank on the basis of quantity exported and the value of export (quantity times price). However, price per kg of decaffeinated green beans were observed to be the highest. Nepal's trading data on decaffeinated Green beans has not been

verified by interaction with traders, as none of the traders during the study claimed to export decaffeinated green beans or roasted beans. In the last 8 years, Nepal has exported green beans to around 35 countries.

Table 10: Export trends summary for different categories of coffee 2009-2017

EXPORT (2009- 2017)					
Type	**Quantity rank**	**Value rank**	**Price rank**	**Price trend**	**Number of countries**
Neither roasted nor decaffeinated	1	1	4	Increasing	35
Coffee	2	3	5	Increasing	17
Decaffeinated, not roasted	3	2	1	Increasing	19
Roasted and Decaffeinated	4	4	2	Increasing	18
Roasted, not decaffeinated	5	5	3	Increasing	19

Imports trend shows that the import of Green beans has been increasing in last 8 years. The price of imported Green beans increasing. However, the price of imported Green beans is lower compared to roasted beans. Apart from green beans, Nepal is also a large importer of filter coffee and instant coffee. In 2016 Nepal imported almost 41.8 MT of instant coffee. Instant coffee is imported from six countries. The import of instant coffee from Malaysia is the largest at 21.35 MT. Instant coffee and tea are the major competitors of Nepali filter coffee. With expansion of coffee culture, it is likely that more Nepali consumers will prefer filter coffee compared to instant coffee.

Table 11: Import trends summary for different categories of coffee 2009-2017

IMPORT (2009-2017)					
Type	**Quantity rank**	**Value rank**	**Price rank**	**Price trend**	**Number of countries**
Neither roasted nor decaffeinated	1	2	4	Increasing	15
Coffee	2	1	3	Increasing	23
Decaffeinated, not roasted	3	5	5	Decreasing	14
Roasted and decaffeinated	5	4	1	Increasing	12
Roasted, not decaffeinated	4	3	2	Increasing	17

4.2.3 Domestic Consumption

The amount of coffee that does not leave Nepal is taken as a proxy measure for domestic consumption. This measure has been annually increasing. The domestic consumption was estimated by adding imports to production and subtracting exports. Also the coffee that has not been exported could be lying as stock processed or unprocessed. Based on these estimates, percentage of imported coffee is seem to be gradually increasing in Nepal. Majority of Nepali

people prefer instant coffee compared to filter coffee. Instant coffee is convenient to make and doesn't need any equipment such as coffee maker, filters and mocha pots at home. On the other hand, number of cafés making Nepali coffee was observed to be on the rise. Cafés where Nepali coffees are being sold, were found to have advertised local brands and encouraged customers to consume domestic coffee.

Table 12: Domestic coffee consumption in Nepal 2012-2016

Fiscal Years	Production (MT)	Domestic consumption (MT)	Imported %	Domestic production %
2012/13	457	408.54	17.92	82.08
2013/14	429.4	442.86	20.59	79.41
2014/15	463.58	456.39	40.31	59.69
2015/16	434	476.92	31.61	68.39
2016/17	466	564.25	41.61	58.39

On an average the price of an Americano at cafés ranged from NRs. 50 to NRs. 130, while the price of normal coffee (Nescafe) ranged from NRs. 30 to NRs. 50. Consumers were willing to pay almost NRs. 100 for a cup of Americano and thought the present price of a cup of Americano to be expensive. Americano costs over NRs. 100 at most café. Increasing café culture and consumption of coffee among youth shows that there is still demand for Nepali coffee in the domestic market. However, there were also some cafés those reported that the quality of Nepali coffee is not consistent hence the café preferred Indian coffee beans. Average price of roasted Nepali coffee bean is NRs.1200 per kg.

Chapter 5: Market System Analysis of Nepali Coffee

5.1 Market map

Markets are more than just the transactions between buyers and sellers. It is a dynamic space where market actors exchange goods, services, information within a set of rules and regulations. The interrelationships between the market actors, service providers, stakeholders and the governing rules determine how a market system works. The following coffee market map was drawn using a participatory method and it illustrates the Market Systems of Nepali Coffee.

The core market is the space where the commodity is produced, processed, traded and consumed. The interrelationship between markets actors, the functions they perform and value addition at each step have been demonstrated under the core market component. Various business services provided to the core market actors by service providers have been demonstrated under the Business Service Providers component and the roles of various stakeholders in the market system have been demonstrated under the Business Enabling Environment component.

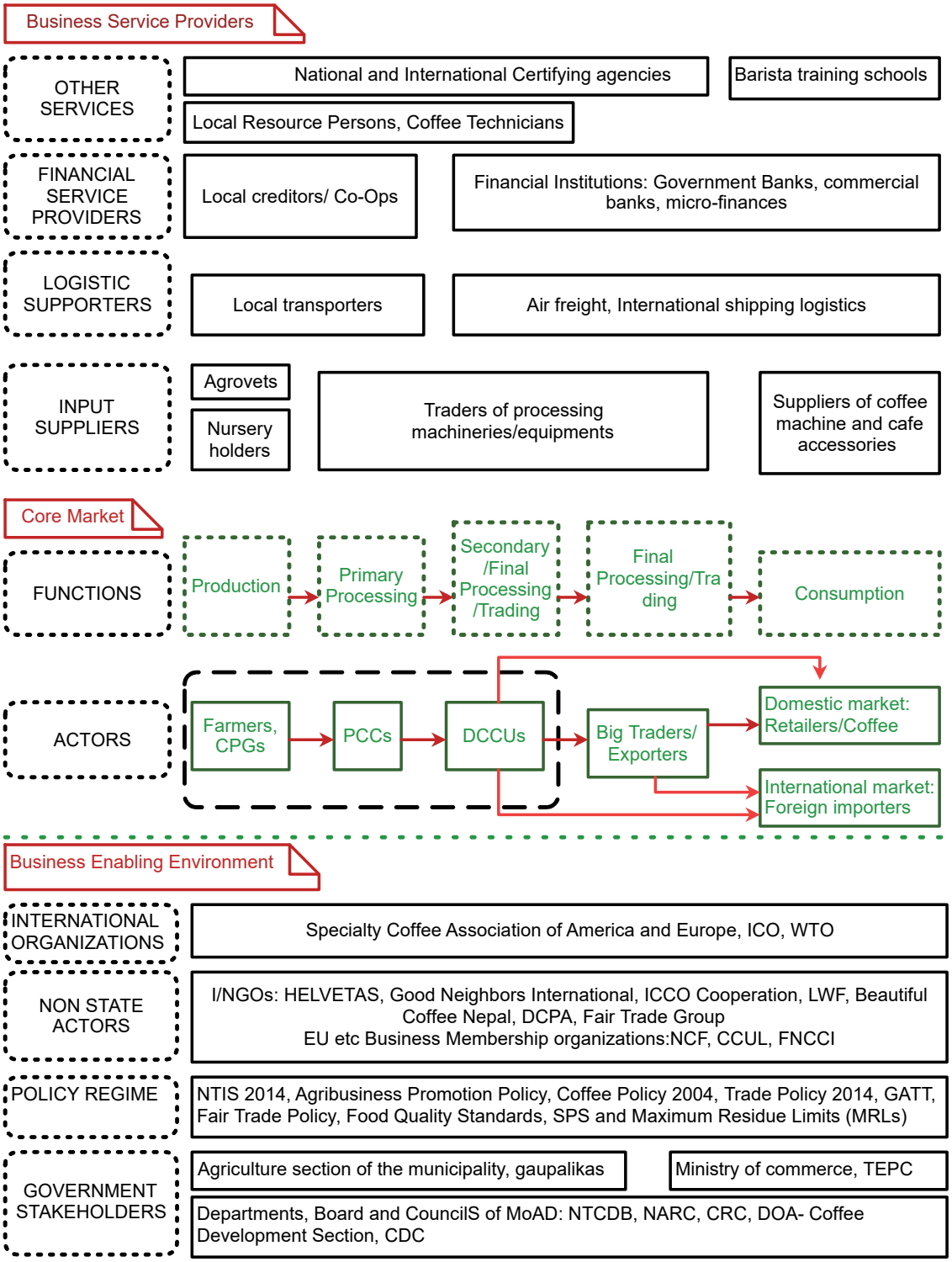


Figure 16: Market System Map of Nepali Coffee

5.1.1 The Core market

5.1.1.1 Growers

More than 32,000 smallholder farmers in 41 districts of Nepal are engaged in coffee farming in more than 2,000 ha of farmland. These farmers are growers and the primary actors in Nepali coffee value chain. Farmers, in major coffee growing districts, organized into Coffee Producer Groups (CPGs) either sell fresh cherries to the Coffee Cooperatives (PCCs) and individual collectors or perform primary processing in the own group.

Farmers buy a coffee sapling at NRs 15 from local nurseries and plant those during the rainy season. The imputed subsidy value is 49% of the total production cost which is estimated at NRs.29 per sapling. Since coffee plants need shade for optimum production, farmers also need to grow shade plants like: Jackfruit, Ipil-lipil, Badahar, silver oak etc. in their orchards, a year prior to plantation.

Observations at production farms visited showed a rather cursory attention given to the selection and maintenance of shade trees. As a result, incidences of over and under shading were found. A rather low Green beans output and infestation of white stem borer is attributed, among others, to this phenomenon. Coffee saplings are planted 2.5 m X 2.0 m apart (row to row and plant to plant). In a well-designed lay out, pits 0.5 m deep and 0.5 m in diameter are made 1 month prior to planting saplings. The topsoil and sub-soil are kept separately. The top-soil mixed with 5 kg of well decomposed compost and then it is used to fill up the pits and sub-soil is added on top. Saplings are planted at the center of the pits. Orchard is irrigated regularly during the dry season and weeding is also done on a regular basis.

Normally, it takes 3 years for a coffee plant to start bearing fruit. In the first three years, management practice involves manure application, irrigation and weeding. A coffee plant is top-stopped when it reaches a height of 5 ft. to facilitate fruit picking. Proper training and pruning are required for optimum production. Without this, the coffee plants grow up to a height of 15 ft., rendering cherry harvesting difficult and more labor intensive.

In the third year, farmers can have the first harvest. Coffee trees reach maturity in their fifth year. It is only in the fifth year, a coffee tree in a properly managed orchard starts to bear fruits properly and yields range from 5-8 kg on an average. Fruit picking starts in early autumn and lasts till the end of winter. Since coffee fruits do not ripen at the same time, they have to be picked carefully and at different intervals. Hand-picked fresh and ripe cherries are then transported to the pulping center within 24 hours where they are pulped immediately. Farmers are getting NRs 90 to 110

cash per kg of fresh cherries right away at pulping centers, while the minimum support price fixed by NTCDB price fixing committee is NRs. 78 and 83 per kilogram of fresh cherries.

On an average, small farmers cultivate coffee in around 1 Ropani of land, which theoretically has 100 plants. The normal spacing is 2 x 2 square meter without intercrops and 2 x 2.5 m with intercrops. Hence, a Ropani of well-managed coffee orchard provides an income of around NRS 45,000 to 70,000 per annum to a farmer starting from the third year and onward.

Besides this, farmers who have applied for group certification through Coffee Cooperative Union (CCU) must also confirm to the standards specified for organic certification of coffee and maintain a daily logbook recording all the farm activities in a given standard format. Since coffee producer farmers are also members of PCCs, they are bound to sell their products to PCCs. Farmers who sell their product to pulping centers operated by PCCs, do not breach this contract because of the additional support they get from the PCCs and CCUs.

5.1.1.2 Primary Coffee Cooperatives (PCC)

As of the recent data, there are about 124 PCCs operating in 41 coffee producing districts. The primary function of the PCCs is to collect the fresh cherries produced by the farmers and carry out the primary processing (pulping of fresh cherries) and supply the parchment coffee to the CCUs. PCCs get cash in advance before the pulping season from the CCUs against the estimated amount of fresh cherries to be bought. Farmers are provided with cash in hand after sorting and weighing the fresh cherries immediately. Pulping machines are allocated by the PCCs and profits are shared according to the agreement between the pulper operator and the PCCs. Usually, pulper operators get up to NRs 50 for a kilo of parchment they supply to the CCUs.

5.1.1.3 District Level Coffee Cooperative Union (CCU)

CCUs are district level union of the PCCs. They have defined roles in production, processing and trading of coffee. At the district level, they coordinate with the CPGs, PCC, and local stakeholders to facilitate the production, processing and marketing of coffee. At the national level, they coordinate with coffee promotion projects, donor agencies, national stakeholders, international and domestic market actors etc. for promotion and trading of Nepali coffee. There are 12 district level CCUs working in 12 large coffee producing districts namely Gorkha, Lamjung, Tanahu, Parbat, Kaski, Syangja, Palpa, Gulmi, Nuwakot, Lalitpur, Kavre, and Sindhupalchok.

DCCUs have the following roles:

- Provide technical support and services to CPGs for production of quality coffee
- Facilitate the internal control system and certification done by third parties
- Buy fresh cherries from the farmers at fixed prices and in a sustainable and transparent way

- Develop the institutional capacity of CPGs and PCCs so as to benefit the coffee producer farmers
- Ensure farmers get paid instantly in cash as soon as they deliver fresh cherries to the pulper operator by providing cash in advance to the pulper operator
- Ensure farmers get prices no less than minimum support price fixed by NTCDB for fresh cherries
- Ensure a production environment free from child labor and gender discrimination
- Carry out secondary processing (Hulling)of coffee
- Market and promote Nepali Coffee in sustainable manner
- Adopt fair trade principles in production and processing

5.1.1.4 Large Traders and Exporters

A substantial number of big traders and exporters trade in Nepali coffee, many of whom were the pioneers of coffee trade in Nepal and have been involved in promoting coffee farming and trade for a long time now. Some of the private companies also have large farms in some parts of the country. However, most of them specialize at wholesaling and export of Nepali coffee. Many traders have also facilitated the international certification processes and have been trading organic coffee too.

Despite the institutionalization of cooperatives model in trading of coffee during the last decade, these organized and individual traders continue to co-exist in the coffee market and the number is increasing. Very often, they work together with the cooperatives and operate on fair trade principles so as to provide reasonable benefits to the farmers.

Due to the perishable nature of roasted beans, traders export major part of coffee in the form of green beans and a small amount as roasted beans. Japan, Germany, Switzerland, U.S.A. and Korea are the major importers of Nepali coffee. Exporters claim to have exported green beans to big companies like Ataka, Nippon Coffee, Vol Café etc.

5.1.1.5 Domestic Consumers

An increasing number of coffee consumers, Cafés as well as coffee retailers in major cities have given rise to increased consumption of coffee in the country. Around 60% of the total coffee produced is now consumed in the domestic market. Despite the growing demand for coffee in the domestic market, traders continue to export coffee to international market because Nepali coffee enjoys premium price in international market thus bringing more returns.

CASE STORY 1: COFFEE BRINGS PROSPERITY

Machhapuchhre Organic Cafe is a coffee store/café at a busy street near lakeside. Even in a tourist lean season, the café is frequented by a good number of customers. Mr. Shovakar Adhikari, the proud owner of this café, says his product has got 4.5 stars and excellent reviews on TripAdvisor and that's what makes him confident that the coffee he roasts and brews is actually of high quality.

Shovakhar, his wife and two full time employees run the café, which is only a small part of his business. With annual sales of 15 to 20 tons of green beans, the company seems to be doing well now, but things were very different initially. After working for many years South Korea, he returned with a determination to start a coffee business. At that time, few farmers had been producing coffee in different areas and in small quantities. There were very few people who knew how to process coffee. Without any technical knowledge of the processing technology, it was obviously a big risk for him to start a coffee business but he decided to go for it.

A training program on hand roasting of coffee organized by Helvetas Nepal further provided an impetus to his venture. To start with, he bought coffee from farmers for NRs 14,000 and started roasting them at home in a small metal pot. He seldom got tired of trying new tricks and methods to get the roasting right. Despite a lot of hard work put into improving the roasting method, he was not able to reach the desired level of perfection.

The turning point in his business career came when he got a JICA funded opportunity to visit Japan to see the advances in coffee industry. This opportunity helped him to learn different aspects of coffee processing, and also helped him to transform his business. A small business that started with NRs. 14,000, now has an annual turnover of millions.

Many other entrepreneurs like him put their hard work in promoting coffee sector even during unfavorable times which has resulted in the growth of coffee sector to the level witnessed at present. Mr. Shovakar thinks individual traders like him are very important for the growth of the coffee sector. But, he also acknowledges the contribution of many cooperative leaders and their organizations in promoting coffee in Kaski District in the past. Having weathered the storms with them earlier, they are more like partners than competitors to him and he is always eager to work together with the cooperatives in future as well.

On the other hand, a substantial amount of coffee is imported every year to meet domestic demand. Instant coffee is one of the most popular variety of coffee in Nepal. A kilogram of roasted beans retails at around NRs 1,200 to 1,600. Coffee Cafes offer a cup of Americano at NRs 120 to 170.

5.1.1.6 International Consumers

Nepali coffee commands a premium price in the international market under the Himalayan Arabica Coffee brand. It has less caffeine, better taste and is organically produced. In the recent

times, due to decreased production, Nepali traders and cooperatives have not been able to supply enough Green beans to their international import partners which amply proves that there is room for large scale production.

Nepali coffee receives good reviews in the international market. There is no established mechanism to determine the demand for Nepali Coffee, but increasing number of organic product consumers and popularity of fair trade movement globally, allows us to fairly assume that demand for Nepali coffee will not decrease in the near future.

Nepali coffee exporters and traders, during the study, repeatedly claimed that the demand for Nepali coffee is exponentially larger than the current export. It is still a topic of discussion whether mass production to meet the demand helps to exploit the unmet demand or it hampers the industry by driving the prices down. However, export prices are sufficiently high and a slight decline with increased volume of production could benefit a larger number of Nepali coffee produce NRs. Alternatively, improving the quality of products might also help to maintain high prices.

5.1.2 Business Service Providers

5.1.2.1 Input suppliers

- **Nursery owners:** In each project district, there are a number of farmers assigned by the CCU to establish nurseries for growing coffee seedlings. CCUs provide training, technical support and quality seed to the nursery owners. CCUs in the project districts also provide necessary inputs like nets, plastic sheets, polybags and other infrastructures at subsidized prices. Nursery owners are obliged to provide quality coffee seedlings to the local farmers recommended by CCUs. The subsidy rate for nursery sapling producers is estimated to be over 60 percent. The sapling producers claim that their margins are quite low and hence have been demanding to increase selling prices of NRs.20 at the least.

- **Agro-vets:** Agro-vets have rather limited roles in coffee farming areas since coffee production is a low input technology and local resources utilizing sector. However, there are some inputs that are not locally available. For example, Copper Sulphate and lime for Bordeaux mixture. Sprayer pumps and secateurs, scissors for pruning are some other inputs that Agro-vets can supply to the farmers. They also supply input materials like polybags, nursery nets, plastic sheets, etc. to coffee nurseries.

- **Suppliers of processing machineries and equipment:** Coffee processors are supplied with processing machineries like: pulping machine, hullers and roasters and equipment like moisture meter by medium and large traders based in big cities.

- **Suppliers of coffee machines and café accessories:** In recent times, an increasing number of coffee machines and café accessories suppliers have cropped up in response to the increasing consumption of coffee in the domestic market. These suppliers trade in espresso machines, mocha pots, French press, coffee filters and coffee makers.

5.1.2.2 Financial Service providers

PCCs provide saving and credit services to member-farmers, although this is not their primary function. Financial services, however, are very important to CCUs and PCCs that need to invest frequently on assets, infrastructure and services. Processing of coffee is quite complex procedure requiring several equipment, machineries and technical manpower. Cost of infrastructure and machineries is therefore quite significant in the production cycle. As of to date, donor agencies and development programs have heavily funded many CCUs especially in the form of machinery and equipment support. However, CCUs must find a more sustainable way to fulfill their financial needs in future.

A number of micro-finance institutions and commercial banks have extended their services to rural areas. They can provide solutions to the financial needs of CCUs and PCCs. There are instances of CCUs in some districts taking out large loans from commercial banks but those were exceptions. In practice, it is very difficult for cooperatives to take out loans because most of the them do not have assets that can be used as collateral.

5.1.2.3 Logistic supporters

- **Local transporters:** At the local level, porters hired on a daily wage are the only option available. Local transporters are involved in transporting parchment and green beans to the regional and national markets. For many rural coffee growers inadequate transport infrastructures limit the access to market.

- **Airfreight and shipment logistics:** A fair amount of coffee reaches international market by air. However, medium and large transporters provide shipment logistic services for land routes such as ports in India.

5.1.2.4 Other services

- **Local Resource Persons (LRPs):** LRPs are leader-farmers from villages who are well-trained on various aspects of coffee production. Each CCU trains a number of local farmers and hires them to provide technical support to other farmers. They are also hired by various coffee development programs and stakeholders for providing extension services. Although many educated young girls are available and willing to work as LRPs, experience shows that investing in training them is not so productive because they tend to migrate to their husband's village in other location after getting married. Due to this problem, some villages lack experienced technicians.

5.1.3 Business enabling environment

5.1.3.1 Government stakeholders

Councils, boards and departments of the MOAD such as: NARC, NTCDB and DOA, Coffee and Tea Development Section have been providing research and extension service to the coffee sector. The Agriculture Section of municipalities and rural municipalities under the new local government structure are responsible for implementing coffee related programs at local level.

5.1.3.2 Development Partners

I/NGOs such as HELVETAS, Beautiful Coffee Nepal, Good Neighbors International Nepal, ICCO Cooperation etc. have been supporting local communities to promote community-led coffee development initiatives through their programs. European Union has also been funding these activities. Similarly, some other agencies like Lutheran World Federation, Save the Children are also implementing similar programs.

5.1.3.3 Policy Regime

National Trade Integration Strategy has prioritized coffee as a potential export commodity. National policies like Trade Policy, Coffee Policy, Agribusiness Promotion Policy, Coffee Quality Standard, etc. are instrumental in providing direction for future interventions.

5.2 Governance structure of organic coffee value chain

"Governance" refers to the nature of relationships between buyers and sellers, including the extent of their interactions with one another (AFE, 2014). A “Balanced Governance Structure” commonly occurs between market actors in the fair trade-based coffee value chain.

At the suppliers’ end, coffee producers organize into small groups, PCCs and then into CCUs which exist as the units of production and Green beans is the ready-to-sell product. At the consumers’

end, multiple buyers exist in the domestic as well as international market. It appears that Nepali coffee caters to the demand of a niche market; the group of coffee consumers who prefer organic coffee or exclusively, the Organic Himalayan Arabica Coffee. To ensure that consumers get the genuine product, there is information flow in both directions. The industry operates on fair trade principles.

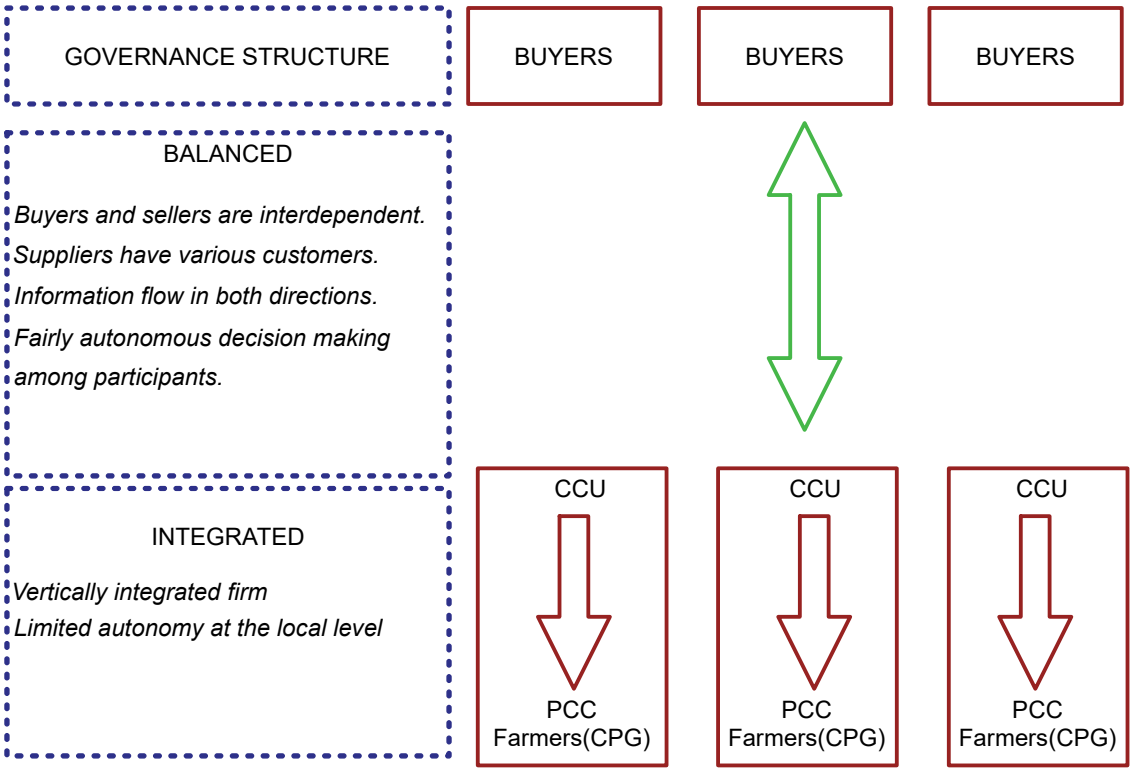


Figure 17: Governance structure of organic coffee value chain

Characteristics of a "**Balanced Governance Structure";**

- Buyers and sellers are interdependent
- Suppliers have various customers
- Massive information flow in both directions
- Both sides have capabilities that are hard to substitute
- Commitment to solve problems through negotiation rather than threats
- Fairly autonomous decision-making among participants
- Cooperation, not one single party dominates
- Direct trade, no involvement of middlemen

5.3 Share of Value Chain Actors on the Final Price

There are several steps involved in coffee processing before they reach the cup. Farmers produce fresh cherries and sell them, as-they-are to the pulping centers. Primary processing (pulping) is

carried out at the pulping centers, where the fresh cherries are transformed into parchment coffee. Hulling centers carry out the secondary processing (hulling) and sell green beans to traders. Traders either export the green beans to international importers or roast and sell them in the domestic market.

The following table uses cost of production/operation calculated on the basis of primary data collected during the field visit. Prices are also based on the collected data. ICO's conversion rates are adjusted to calculate the conversion equivalent.

Table 13: Share of cost and revenues/profits of various value chain actors on the final price of coffee equivalent to 100 kg fresh cherries

Actors	Product	Conversion equivalent (kg)	Price/ kg	Associated cost/ 100 kg cherries equivalent (NRs.)	Revenue from proceeds (NRs.)	Value chain share (NRs.)	Share in %
Farmer	Fresh cherries	100	85	4514	8500	3986	35
PCC	Parchment	23	570	10839	13110	2271	20
CCU	Green beans	18	900	15005	16200	1195	11
Traders	Roasted beans	14.3	1300	14770	18590	3820	34

This table shows that cost of production for 100 kg fresh cherries equivalent, varies along the chain and so does the price. Cost of production is comparable between the other actors except the farmers. At the farmers' end the cost of production is quite low. But compared to the costs revenue is relatively high.

In summary, farmers get the highest share (35 %) of the final price. Despite higher costs of production, traders (roasters) enjoy the second largest share at 34 %. PCCs and CCUs, who carry out the pulping and hulling, get 20 % and 11 % share of the final price respectively. This, however, indicates that if secondary processors have the capacity to conduct the final processing, they can significantly increase their share of the final price in the value chain. It also suggests that farmers get higher share at the cost of PCCs and CCUs who work for the welfare of its members. Although PCCs and CCUs have influential role in the value chain governance, they don't have monopoly over the price/revenue.

Chapter 6: Constraints to Competitiveness of Nepali Coffee

6.1 Production constraints

Despite a high demand for Nepali coffee, production stands at a meager 496 tons of green beans. The production and productivity follow a decreasing trend. A variety of factors linked with the production function are constraining the growth of coffee farming in Nepal.

6.1.1 Slow adoption rate

Adoption of coffee farming is very slow. Around 32,000 farmers in the mid hills cultivate coffee in 2646 ha of land. This is very small growth in many years compared to other commercial crops. Coffee unlike other high value crops takes relatively longer duration to get returns from investment. Additionally, coffee is a new crop for majority of farmers. In absence of proper knowledge on coffee cultivation, they are reluctant to choose this new enterprise by abandoning the cultivation of conventional crops like maize and wheat.

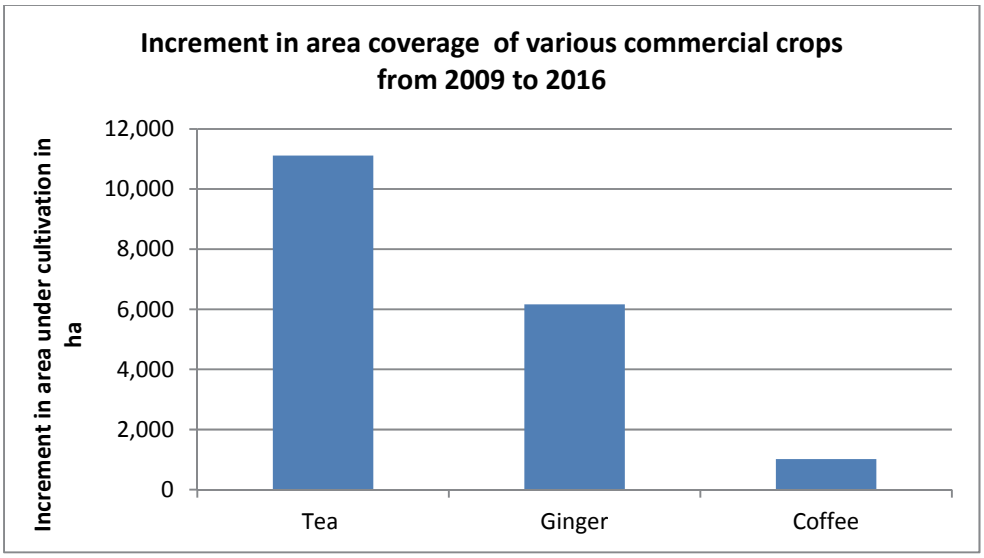


Figure 18: Increase in the area under cultivation of various commercial crops grown in Nepal (Source: Data from various sources; NTCDB, Ginger VCA report HVAP, 2009 to 2016)

6.1.2 Poor planting materials

The healthy and productivity of a coffee plant starts with the seed. So, quality planting material is vital to the sustainability of the coffee industry. The seriousness of this fact, however, has neither been realized by coffee entrepreneurs nor by stakeholders.

Currently, the supply of planting material is haphazard, unmonitored and unregulated. Under the current practice there is no way that a farmer can be sure about; which variety s/he is buying? Is it genetically pure? Does the nursery follow best practices for raising healthy, disease-free plants? What is the agronomic performance of the variety s/he is using?

According to international standards, a proper nursery should ensure the following:

1. Nursery Standards: The nursery follows best practices for raising healthy, disease-free plants.
2. Genetic Purity: The coffee variety has been identified using proper methods so farmers can be certain they are buying the correct variety.
3. Education: The nursery informs the farmers about the agronomic performance of different varieties available to farmers so they can make an informed choice.
4. Breeder's Rights: The nursery gives credit to breeders and ensures their rights are respected.

Production of planting materials is highly regulated through certification systems and monitored by the government in major coffee producing countries. Coffee nurseries in Kenya, for instance, are guided by Coffee General Regulation and Arrangements. The county government licenses coffee nurseries by providing "coffee nursery certificate" and authorizing the nursery holder to operate a coffee nursery. No person, other than the Kenya Agricultural Research and Livestock Organization or its authorized agents operating laboratories or tissue culture units under their supervision, is allowed to issue certified coffee seeds or seedlings for multiplication in any coffee nursery to any other grower or for export.

The provision also requires the person to be trained and registered with the authority in collaboration with the relevant county to establish or operate a coffee nursery.

Nepal should also learn the importance of maintaining nursery standards from similar policies around the world.

6.1.3 Poor Cultivation Practice

Layout and spacing

The recommended spacing for planting coffee plants, 2.5 m between plants and between rows was not found to be in practice at small as well as large farms. For slopes above 15 degrees, planting in contour strips is recommended which was not seen practiced in reality. It is important for minimizing soil erosion and managing irrigation. Contours can be simply designed by using A-frames.

Figure 19: 2Orchard layout using A-frames (World Agroforestry Center, 2018)

Irrigation

Shortage of water is a major problem in many coffee producing areas, which is also one of the major reasons for limited productivity. Further, coffee farmers have been using an inefficient irrigation system, where coffee plants are watered whenever there is an excess at the households. Irrigation using garden pipes was commonly observed, which is also labor intensive.

Twisting, unopened buds or dried flowers are typical damages caused by high water shortages resulting in yield loss of up to 50%. (NaanDanJain, 2009) Proper management of irrigation can thus reduce the yield loss to a large extent.

Organic manure and FYM

It is estimated that for every 6,000 kg of ripe coffee cherries (1 ton of green beans) removed from the plants, approximately 40 kg nitrogen (N), 22 kg phosphorus (P) and 53 kg potassium (K) must be replaced yearly. This requires that the coffee plants be supplied with a good amount of nutrients every year. It is estimated that 5 to 8 quintals of manure is required for supplying optimum amount of nutrients for 1 ropani of coffee orchard per year (Winston, 2005). Although coffee is cultivated in a livestock integrated farming system, seasonal crops like maize and wheat are often prioritized for application of FYM and organic manure.

Labor inefficiency

Given the size of the farm and the number of coffee plants in an average sized coffee orchard, the labor requirement of existing coffee farms should be easily available at farming households.

Though, farmers complained about the labor shortage in the areas visited. Migration of younger generation to the cities and abroad has also created a labour vacuum in the coffee growing areas.

Coffee farming is labour intensive and there are certain steps like cherry picking, pruning etc., for which labourers require certain set of skills. For instance, an average labourer should be able to pick 45-90 kg of cherries in a day, while the observed rate was 25-30 kg per day only. The problem needs to be addressed through various measures targeted at youths such as collateral free loan, training programs and orientation on coffee farming as well as training programs and equipment support for different coffee processing steps.

Disease and pest

Coffee White Stem borer is a devastating pest for coffee farming that has severely destroyed coffee plantations in many districts. A damage of 20 to 60% of the orchard was reported at various locations. Though, cooperatives and stakeholders have been assisting farmers to get rid of infested plants, effective technique to manage this pest has not been developed and the problem is increasing.

White stem borer is a beetle that lays eggs in the cracks and grooves of the bark. The eggs hatch into larvae which eats into the branch and the trees stop fruiting and, eventually die. The problem

Pick the cherries which have this color: Case from Rwanda

Sustainable Harvest is a company founded by David Griswold in 1997. The company pioneered forming direct relations with coffee farmers and creating a transparent supply chain. Rather than reaping profits, the company reinvested profits in agronomy training so that farmers could improve the quality of coffee and earn more in international markets. The company is supporting cooperatives in Rwanda. One of the initiatives taken by the company was to make farmers understand that coffee was different from corn. Farmers practiced "strip picking" cherries which caused inconsistency in taste of the roasted coffee. In order to change this practice, red colored silicon bracelets were given to farmers that said "Pick the ripe cherries which have this color" in English and local language, which was constant reminder to pick only scarlet hued ripe cherries and not the unripe ones. This initiative alone increased the quality of coffee substantially.

Source: Wallace, 2017

is more widespread at lower altitudes. It is very difficult to control the pest, especially in an organic environment since pesticides can't be used. Control measure employed so far are identify in early stages, and cutting down and burning the whole plant. Whereas, farmers who have only a few coffee plants do not bother to cut down and burn the infested plants which is further accelerating the spread of this pest.

Coffee leaf rust is another major problem in coffee cultivation. It is a disease caused by a fungus, Hemileiavastatrix, and is a major problem in coffee growing areas. This disease is more prevalent in Lalitpur, Syangja and Kaski districts. This disease is spreading rapidly since the spores of this fungi spread through air.

6.2 Constraints of processing

6.2.1 Processing machineries

Pulping, hulling and roasting are the three main steps in processing coffee. It is still difficult for processors to get high quality pulper, dryer, grader, huller and roasting machines that are more efficient. Most of the machineries that are imported come from India, China, Turkey and Italy. There is a very narrow range of choices because only few companies trade in coffee machineries. Alpine Coffee, a major supplier of coffee processing machineries claims that it is the one and only company that specializes in trade of coffee machineries. The supplier, however, said that the demand for these machines is still very low and buyers prefer to buy cheaper and less efficient machines rather than the more efficient and expensive ones. For instance, a proper coffee hulling machine costs twice the price of a rice huller/polisher used for hulling coffee in many places. Buyers still prefer to buy low priced rice hulling machine without considering the fact that more efficient machinery can save enough money to finance more expensive machinery.

Many CCUs and PCCs in the study area were using machines/machineries funded by various development programs and the Government of Nepal. Most of them are old technology and less efficient. Processors often complained about the processing losses due to low quality machineries. Pulping machines used in many cooperatives are manual and less efficient. In the mid-hills water shortage is a common problem. Pulping of cherries requires a lot of fresh water. Dry processing can be carried out in places where there is acute shortage of water. It is recommended that investments be made in more efficient and high capacity machines/machinery considering the fact that the industry is growing.

6.2.2 Technical knowledge

Coffee industry is one of the most dynamic industries and coffee processing involves complex technology. Since Nepali coffee is regarded as a specialty coffee in the international markets, it is imperative that we maintain quality standards through using the latest and relevant technology. To keep up with the expectations of niche market consumers, processors must conform to the various standards of high quality specialty coffee. For this, the industry needs manpower with a certain set of skills. There are some vital steps in coffee processing where there is a lack of technical manpower:

- Machine operators, repairers
- Roasting operators
- Q-graders

6.3 Constraints to trade and market access

6.3.1 Low quality coffee in the domestic markets

It was a trend in the past for traders and cooperatives to export high quality coffee to international market and send the low-grade to the domestic market. The trend has changed in the recent years due to the demand of high quality coffee but many cafes still complain about the quality of Nepali coffee they receive. Due to lack of enough supply, ground coffee available in the market is in many cases a mixture of broken low quality coffee. A café owner from Sinamangal and another one from Lazimpat shared about how they had to switch to an Indian Coffee brand due to the low quality of Nepali coffee they were supplied with earlier.

6.3.2 Segregation of private sector

It was observed that there is a very poor participation of private sectors in the national coffee platform. Although it is mandatory for all coffee entrepreneurs to be registered with the NTCDB, only 20 entrepreneurs have done so. Many private sector actors who were involved in trade and marketing since the early days of coffee were found to be actively participating in the national platform. But it was understood that there have been little efforts to include new entrants. Reformation of Nepal Coffee Producers' Association (NCPA) into Nepal Coffee Federation (NCF) and reorganization of NCF can be regarded as positive moves, when Central Coffee Cooperative union (CCCU) is being inactive, but ensuring the participation of new entrants should be prioritized for avoiding fragmentation of the coffee sector.

6.3.3 Unfair competition

The coffee market in Nepal has a fair presence of private sector traders. Some of them have been operating in coordination with cooperatives and some others independently. Although the existing market system promotes healthy competition most of the times, there are occasional instances of unfair competition between them. Some cooperatives complain about the traders offering higher prices to the farmers in order to have a strong foothold in the market. Although this trend benefits the farmer in the short run, it may disrupt the existing market system and hamper the coffee industry as a whole in the long run. One instance of such trend was found in Lalitpur District, where CCU Lalitpur had to offer higher prices to the farmer at one point of time to compete with the traders. Under the existing condition, farmers get a good share of the final price of coffee. Maintaining this price is very important for sustaining the industry which requires the cooperatives to invest in increasing competitiveness of the product. We found that competitive market has helped to promote innovations in some coffee producing areas. Healthy and fair competition should be ensured through policies.

6.3.4 Lack of a proper market information system

Several stakeholders are involved in the promotion of the coffee sector. Trade and Export Promotion Center (TEPC), Ministry of Commerce, NTCDB, Customs, CBS collect and share information on various aspects of the coffee market like: export-import volumes/values, production, productivity, etc. Besides, there are many other agencies working in this sector that have their own mechanism to manage coffee database. However, coordination is poor between these stakeholders in pooling the market information for the beneficiaries.

A major problem for new entrants in the coffee industry is the lack of a proper market information system that provides information of price, market centers and buyers, quality and quantity requirement of market, required technology, etc.

6.3.5 Poor Traceability

Traceability guarantees food safety and is integral to organic and fair-trade systems. In the absence of a proper mechanism for tracing the origin of products like coffee, it is not possible to sell specialty products in both domestic and international markets.

Currently, some cooperatives selling organic/fair trade coffee in the international market have been found to have maintained traceability up to PCC level, but for the rest of the coffee, there is no way a consumer can trace its origin.

An increasing number of traders now buy coffee from various locations but sell them under a common brand. As in case of Kaski District, a single trader claimed to have sold more coffee than the entire amount coffee produced in the district, while the PCC/CCU sell only a fraction of their coffee to that particular trader. This is an example of how coffee is becoming untraceable in the recent times.

6.3.6 Failure to take advantage of trade agreements and preferential market access

Nepal has signed 17 trade agreements and two transit agreements, which afford the country improved access to regional and global markets. In the coffee export sector, Nepal faces 0 % tariff under the bilateral trade agreement with India; under *Most Favored Nation* regimes in the EU and United States markets; and under the preferential tariff for least developed countries in Japan and the Republic of Korea. The benefits of these preferential market access provisions, however, has been utilized minimally. Although coffee export can be an important source of foreign exchange, the export only stands at 20 % of total coffee production.

6.4 Constraints related to organizational management

6.4.1 Lack of motivation

Institutionalization of cooperative model for production and trade of coffee started less than a decade ago. Before that, it was the traders who governed the coffee value chain. During that period, many farmers did not get fair prices or payments were delayed. The rise of cooperative-led trading of coffee was actually farmers' response against the monopoly of traders. Cooperatives have an influential role in the value chain governance now. The role of cooperatives, however, remains more focused on the marketing and pricing of coffee while the production part gets less priority. This might be one of the reasons why the sector hasn't seen much growth in a long time. The production and productivity hasn't increased much and adoption rate is very low.

Cooperatives still need support to grow, as institutionalization process started only a few years back. Cooperatives, however, should develop a subsidy graduation plan to be able to operate independently.

Niche markets such as fair trade and organic consumers favor the cooperative model. So, there is a big opportunity for cooperatives to occupy the specialty market. Although some cooperatives are motivated to develop new products; for instance, bird-friendly (as claimed by Jureli Coffee) and peaberry specialties targeted for these niche markets, the efforts are inadequate and short term.

6.4.2 Poor business development capacity

Besides some ICS implementing CCUs, cooperatives lack proper recordkeeping systems. This problem was also found at large farms visited. Without proper business plans and product development strategy, it is difficult for enterprises to respond to the needs of emerging markets. Cooperatives also do not seem to have proper plan to tap the growing domestic demands.

There is a mandatory provision for all PCCs/CPGs to have a proper production plan. CCUs make their business plans based on the production plans of PCCs/CPGs. This, however, has neither been practiced nor been monitored.

6.5 Policy constraints

6.5.1 Infrastructure for Coffee Cultivation Area

Coffee Policy 2003, which is supposed to be the guiding policy for the overall development of the Nepali coffee sector, emphasizes increasing coffee cultivation and priorities infrastructures development like road access, electricity, irrigation and communication. However, this has not yet translated into action. In Nepal, coffee is exclusively cultivated in the hilly areas, where it is difficult to extend infrastructure owing to the difficult terrain and undulated topography. A majority of the rural farmers will not be able to adopt coffee farming unless they do not have access to these infrastructures.

6.5.2 Land access for small holder farmers

The coffee sector development in Nepal can significantly contribute to poverty alleviation, only if the issues of small holder, resource-poor farmers are addressed. One of the key issues that are constraining small holder farmers from adopting coffee farming is unavailability of sufficient land. Farmers who only have a few *ropanies* of land will obviously be reluctant to allocate a big plot for coffee cultivation. Policies to provide public and private land on lease for coffee farming have only been "limited to paper".

6.5.3 Poor progress on the research front

NARC, Coffee Development Center, Coffee Research Center, NTCDB and its two regional offices have the institutional capacity to carry out technical research on the coffee sector. Despite the presence of a number of these institutions, coffee research has seen no progress in many years. Although the coffee policy emphasizes the development and dissemination of modern and improved technologies in coordination with the government and private sector through focus on

research, there is limited research in this area. There was a varietal trial carried out at NTCDB Regional Office, Pokhara, which was an orchard under the dense cover of Litchi trees.

6.5.4 Issues on the implementation of national logo in exportable Coffee items.

A collective trademark, Nepal Coffee was introduced some years ago through collaborative effort of TEPC, NCPA and NTCDB. NTCDB renews the logo under the COLLECTIVE MARK with the Department of Industry while NCPA grants the Nepal Coffee logo to products that are organic and meet other international quality standards. NCPA has also been authorized to register the trademark abroad. NTCDB is concerned about NCPA granting logo to exporters without abiding by government rules during registration of the trade mark abroad. NCPA on the other hand, blames NTCDB for not renewing the logo. This issue hindered the effective implementation of the logo in the past. A guideline to facilitate the branding process is about to be finalized soon which might resolve the issue.

Chapter 7: Recommendations

7.1 Focus on productivity enhancement

Right combination of water, plant nutrients, shed crops and efficient labor can eliminate all problems in productivity and also help to reduce white stem borer infestation currently plaguing Nepali coffee farms. To conserve water used in irrigation, mulching will be essential. Productivity will have to be at least 5 kg average fresh cherries per coffee bush and this should not be an impossibility. Productivity has been reported to be over 10 Kg per bush that is equivalent to gross income of around NRs. 45,000 per ropani half of which is production costs. This level of income generation achievement alone will be instrumental in reducing poverty.

7.2 Irrigation management

For water-scarce regions, installation or construction of appropriate size of rainwater collection tanks is recommended. Drip irrigation, the most efficient irrigation method has been successfully implemented on many coffee plantations around the world. It consumes minimal power (Marrouelli and Silva, as cited in Naandanjain, 2009). It is estimated that localized irrigation like drip systems have irrigation efficiency of 80 to 95 % compared to only 40 -75 % in surface irrigation method. Mulching practice conserves moisture in the soil. Some alternative water management practices like pit digging for ground water recharge may also be practiced for efficient use of water resource.

7.3 Provision of shade

Shade for coffee bush is essential. The choice of shade trees should have following requirements:

- Alternative income generation to complement the income from coffee;
- Non-competing root zones with coffee plants for nutrients but should rather be supplemented by leguminous shade trees;
- Light foliage permitting enough sunlight to reach coffee bushes that is needed for photosynthesis – without which there will be no fruiting. This includes optimum pruning of the shed trees. So, there is a need to strike a balance between shade and sun.
- Siris, a leguminous plant which can provide nitrogen to the coffee bush, jack fruit are recommended for shade trees. Pines (because it renders the soil to be acidic), Saal trees are not recommended. Wherever feasible, avocado and macadamia could be lucrative options. It is a deep-rooted tree, and its fruits are highly valued.

7.4 Fertilizer management

Traditionally, farmer made manure out of livestock litter, dung and cow urine chiefly. While many other degradable materials like farm wastes, coffee pulp, husk, straw, biogas slurry, etc. went unutilized. Nitrogen fixing shade plants like Ipil lipil and Faledo can be beneficial in stocking the soil with additional nitrogen. Each bush should receive about 7-8 kg of well-decomposed organic fertilizer per year.

7.5 Trained Work force

Coffee farmers/workers need a certain set of skills to carry out many operations like pruning and fruit picking. Training workers can solve the problem to some extent. Further, scientific layout of the orchard, introduction of efficient irrigation system and timely pruning can also reduce the amount of work/labor needed. Selection of uniformly ripening variety can reduce cost for picking fresh cherries. Trained and efficient workers are needed to handle all inter-cultural operations.

GOING AN EXTRA MILE

Khom Bahadur Gurung of Pokhara Lekhnath Metropolitan -33, had no idea about coffee farming until a nursery owner in his village asked him about how the villagers earn an income from this new crop. Maize, the family's primary crop brought in a very small income. Instantly, he decided to plant coffee in a small piece of land.

After getting trained on the basics by the PCC, he gained some ideas about farming coffee, but he went beyond what he learned to raise the plants. He had been told that coffee plants start to bear fruits only after the third year but to his own surprise and the villagers', those coffee plants flowered the very first year.

Despite having used the same planting material, 50% of his coffee plants heavily fruit and are better than in many other three-year-old orchards in the village. Mr. Gurung attributes much of his success to the hard work he put in on irrigation, weeding, fertilizing and taking care of the coffee plants.

He has now learnt that growing crops is like raising a child. They respond very well to the quality and amount of care given to them. Some technicians suggested him to thin his fruits to get sustained yield, but he is sure that if he continues to give the same amount of care to them the coffee bushes will certainly continue to give high yields. "I go to the orchard every day and observe each plant carefully. I remove the weeds, manure the plants whenever necessary, and water them. That's how I have set a new record in this village" says Mr. Gurung who is a retired British Gurkha. He says, "Going an extra mile in any endeavor is what I have learned while in the British Gurkha Army" and that is what he has put into practice.

7.6 Intercrops

Intercropping to enhance the profitability is recommended. Peas and beans as intercrops enhance soil nitrogen. Spice crops like ginger, turmeric are other productive alternatives. Chilly keeps away the animals and birds besides adding to the farm income. There will be a need to add more crop nutrients if intercrops are grown so that these crops do not share nutrients from the coffee bush.

7.7 Suitable varieties

7.7.1 Fruiting pattern

A coffee farmer located at a distance of over 5 km from the nearest road cannot afford to harvest two kilograms of cherries and transport it to the nearest pulping center. This will not be an economically acceptable proposition. For such a farmer, coffee varieties that ripen more uniformly and almost simultaneously are needed. Although experts suggest there is no such variety available at present. Choosing simultaneously maturing varieties might be an option.

Photograph 7: Berries maturing in tandem and maturing at different times

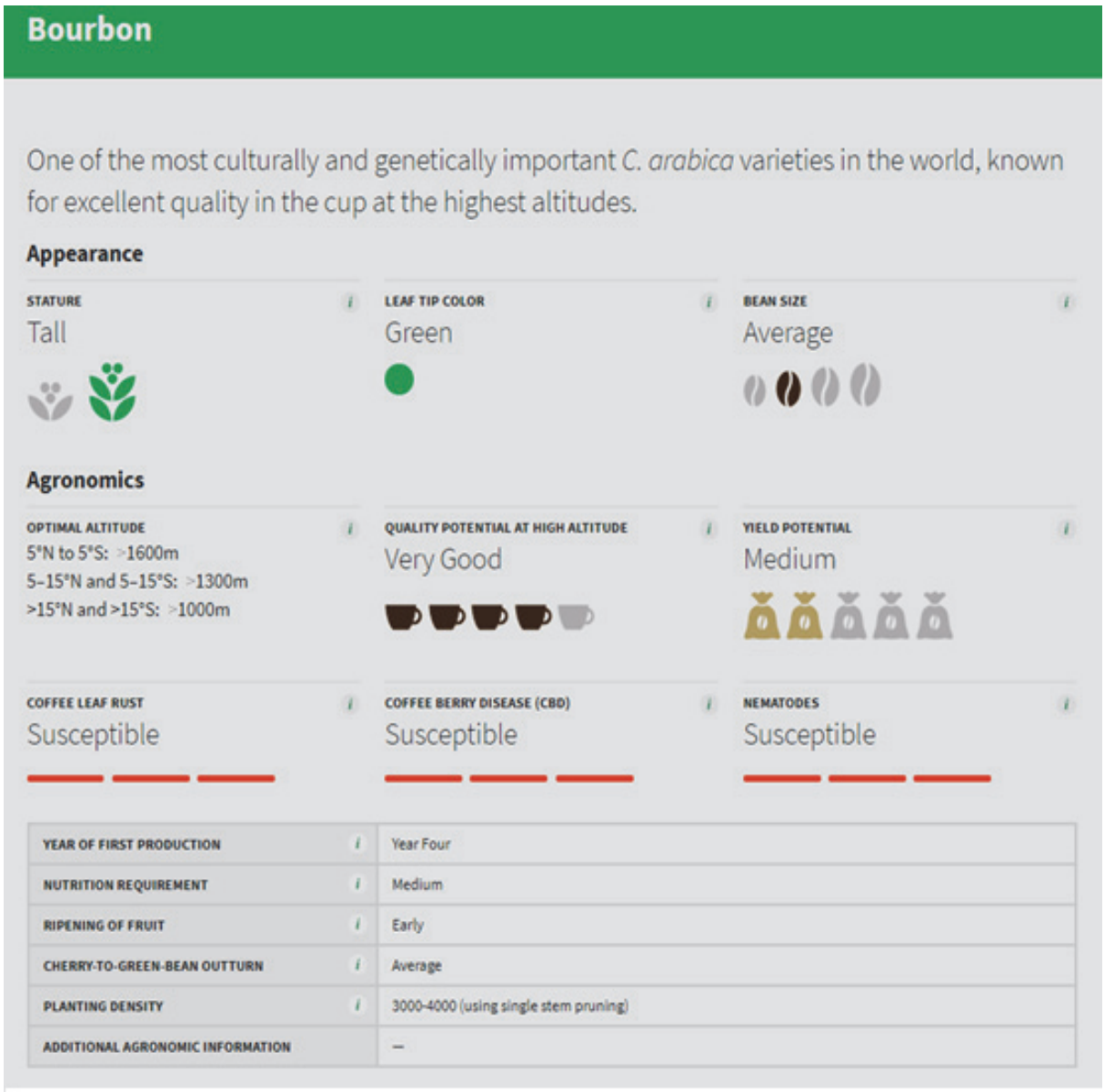


Figure 20: A typical catalogue of bourbon variety (World Coffee Research, 2017)

7.7.2 Developing varietal catalogue

It is also recommended that a varietal catalog be developed and disseminated. It should be a catalog with detailed list of all varieties currently in cultivation and new varieties being imported having description of their appearances like stature, leaf tip color, bean size and their agronomics like yield potential, quality potential, optimal environment for cultivation and susceptibility to pest and diseases.

7.8 Processing

Two processes are followed – wet and dry. In dry processing, cherries are dried under the sun or by mechanical means to reach a moisture level of 11 percent before hulling. The wet process on the other hand involves pulping, washing, fermenting and drying before hulling. Cherries have to be pulped within 24 hours of harvest – lest the pulp will begin to ferment inside, affecting the quality of the coffee beans. Both processes are equally efficient. Where water shortage is acute, the dry process will be the obvious choice.

7.8.1 Economic Use of By-products

Coffee processing results in pulp (from pulping) and husk (from hulling) as byproducts. Alpine Coffee Estate in Nuwakot district uses pulp as fuel for producing bio-gas. They reported an increase in bio-gas output by about 20 percent. The pulp can also be also used in confectioneries as useful additions in cakes, candies and chocolates. Husk can be used as litters for layer chickens and pulp can be simply composted for making manure.

7.8.2 Improvement in hulling

Hulling machines convert the parchment into green beans. Because of varied sizes, capacity and less skilled operation, output is sub-optimal-- evidenced by high percentage of broken beans. Although, the broken beans are also marketed, they command a price less than half of the whole beans.

An experiment was carried out in a controlled setting with 2,700 kg of hulled coffee a year ago. The result was 1,050 kg 16 grade whole beans (38.9%), 1,090 kg 14 grade green beans (40.4%), 385 kg broken beans (14.3%) and 175 kg husks and pea-berries (6.5%). The high percentage of broken bean was exclusively due to inefficient hullers. The maximum normal level of broken beans should have been about 5 percent.

Table 14: Different forms of green beans obtained in grading process

Size	16 sized	14 sized	Broken	Husk & pea berry	Total
Quantity (kg)	1050	1090	385	175	2700
Percent	38.9	40.4	14.3	6.5	100.0

Source: Gulmi Coffee Cooperative, 2018

7.9 Trade and market

7.9.1 Development of Market Information System

Market Information System is a process of systematic collection, analysis and dissemination of market information and it enables all market actors in efficient decision making. It is recommended that a Market Information System be established to collect, process and disseminate information on;

- Market centers and buyers
- Quality and quantity requirements of the markets
- Legal and policy provisions for marketing products
- Market actors and marketing channels
- Distribution channels and transportation
- Warehouse and storage facilities

7.9.2 Improving the domestic market of Nepali coffee

- Expand coffee shops to tourist trails
- Persuade government and donor offices and boarding schools to offer Nepali coffee
- Arrange Nepali coffee to be featured in food festivals
- Use logo and advertise the encouraging cupping test results achieved by Nepali coffee for increasing its consumption

7.10 Policy recommendations

7.10.1 Need for an Integrated Approach

The Coffee Policy 2003 envisages making coffee enterprise more sustainable and investment friendly. Nepali Coffee is in its infant stage and it is not possible to achieve this goal without channeling large investments into this sector. At present, a vast demand for Nepali coffee exists but production is limited. It would be crucial to direct investments to the production side; for increasing acreage, promoting wider adoption, farmers' training, improved farming technologies and research. This requires an integrated approach that looks at the coffee industry in a holistic manner.

Increased trade and export of coffee is only possible when production increases. Coffee sector stakeholders must focus on strengthening the coffee value chain by addressing constraints at various

levels through coordinated actions. For this, there should be a close coordination between coffee promotion programs of Ministry of Agriculture and Ministry of Trade and Commerce.

7.10.2 International Collaboration

Coffee is a globally traded commodity. Nepali coffee is exported to a limited number of countries and has not yet reached many potential countries where number of fair-trade and organic coffee consumers is increasing. This highlights the importance of inter-governmental trade cooperation aimed at exploring new markets and strengthening the existing ones. Technical support from international research institutions like World Coffee Research and specialty coffee associations like SCA and SCAJ might be helpful in strengthening the research capacity and technological advancement of the Nepali coffee sector.

7.10.3 Organic and fair-trade coffee for Specialty market is the roadway

World coffee market is dominated by a limited number of countries that produce coffee in quantities much larger and incomparable to that of Nepal. With India and China also planning to increase acreage, it will be impossible for Nepal to compete with them in the conventional coffee market.

However, trend shows that despite the decreasing export quantities, the price of Nepali coffee has seen a substantial increase in the last decade. This implies that we can focus on increasing or maintaining the quality of our coffee and selling good coffee to the specialty market. Coffee promotion program should, therefore, focus on supporting fair trade organic coffee production and trade.

7.10.4 Central Role of NTCDB

There are several advantages of having a separate body to promote a particular sector in agriculture. Presence of NTCDB, therefore, does not only indicate that coffee sector is high on the Nepal Government's priority but also highlights the importance of coffee in boosting the economic development of the country.

NTCDB should play a central role in promoting coffee sector as a whole and particularly in coordinating with various stakeholders to address the constraints at various levels. A proactive role of NTCDB in responding to the emerging issues and needs will be crucial for overall growth and sustainability of this sector.

Table 15: Recommendation for overcoming constraints at different steps of Nepali coffee value chain

Value chain points	Constraints	Suggested short term interventions	Suggested long term interventions
Production	Farmers do not have access to quality planting material from credible and genuine source	- Improvement of growing condition of nurseries - Use seeds from identified mother plants. - Tracing the seed source - Upward revision of the price fixed for coffee saplings - Encouraging private sectors to establish large scale nurseries and provide in-bed services like technical support for lay-out, planting etc.	- Development of certification system of nurseries - Development and dissemination of varietal catalog of all coffee varieties in use - Research on varietal identification. - Importation of CLR resistant varieties.
	Poor farming practices characterized by inefficient surface irrigation, improper pruning, training. Inadequate nutrient and disease management practice.	- Appropriate combination of water, plant nutrients, mulching, shade crops and efficient labor - Drip irrigation for more efficient use of water - Cultivation in contour strip in slope areas, use of A-frames for lay out - Proper use of farm waste, processing waste, etc. for making organic manure - Training/pruning and early identification and removal of borer infested plants - Encouraging large land holders and alternative income holders to participate in coffee farming	- Development of proper extension tools to create and disseminate knowledge and technology to farmers, processors and traders - Introduction/selection and promotion of more productive and disease/pest resistant varieties
Processing	Inefficient processing machineries, manual pulping machine, rice hullers instead of coffee hullers	- Investing in efficient coffee hullers than cheaper rice hullers and grading machines - Dry processing in areas with acute water shortage - Training on machine operating skills and hiring skilled technicians - Establish pulping center with a long-term vision and availability of required facilities.	- Continuation of tax exemption in import of coffee processing machineries - Promoting import of machineries from more credible suppliers

Value chain points	Constraints	Suggested short term interventions	Suggested long term interventions
	- Processors lack knowledge in certain fields like: - Machine operation, repairing - Roasting operation - Cupping - Coffee lab techniques	- Organizing exposure visits - Training more people on special coffee skills - Training on roasting and cupping techniques	- Incorporating special skills in CTEVT coffee technician training - Establishing regional and national cupping labs
	Limited access to water, roads and other infrastructure	- Carrying out the primary processing at PCCs by establishing pulping center locally (also reduces the cost of transportation)	- Extending infrastructures like roads, water and electricity to coffee potential area. - Developing coffee zones/pockets and promoting mechanization in coffee production. Prime Minister Agriculture Modernization project can play an important role.
Trade and Market Access	Lower quality coffee in domestic market	- Organize interaction between suppliers, café owners, wholesalers and retailers - Provision of grading coffee based on quality	- Development and strict implementation of Nepal standard coffee logo. - Setting minimum standard for coffee to be sold in domestic market to avoid use of broken beans in the ground coffee
	Poor Traceability	- Provision of compliance to maintain traceability by cooperatives - Traders should be required to exhibit the source and origin in their products	- Strict implementation of Nepal Coffee logo

Value chain points	Constraints	Suggested short term interventions	Suggested long term interventions
	Failure to take advantage of trade agreements and preferential market access	- Better awareness about the strict regulatory and administrative procedures to exporters	- Provision of more uniform and convenient schemes
	Unfair competition	- Value chain actors should specialize in one particular function - Creating an innovation platform for all the market actors - Encouraging new entrants to be included in the common coffee platform - Nepal Coffee Logo implementation guidelines to be implemented with strict monitoring system.	- Revising the minimum support price for fresh cherries as needed based on the quality and international scenario. - The provision for coffee entrepreneurs to be registered with NTCDB should be implemented strictly - Creating and maintaining a Market Information System of Coffee
Organization	Cooperatives lack motivation to solve immediate problems and to increase competitiveness of product	- Encouraging private sectors to enter into the market to increase the drive of competition. - Proper coordination between cooperatives and traders to avoid unhealthy competition which has resulted in astronomically increased price of Nepali Coffee. - Creating a village level innovative platform of stakeholders, cooperatives, farmers, private sectors etc. at local level that can jointly work for the promotion of coffee sector and also perform monitoring at local level	- Award and Reward to best entrepreneurs
	Poor record keeping, business planning and product development capacity of cooperatives	- Training on entrepreneurship skills - Record keeping should be made mandatory for farmers as well as processors regardless of whether they are part of ICS or not	Business Plan of CCU based on production plan of PCCs

Table 16: Sustainability matrix with intervention models

Interventions	How the recommended interventions contribute to		
	Competitiveness	Resilience	Inclusiveness
Improvement of growing condition of nurseries	Better plants supplied to the farmers leading to good quality coffee	Improves resilience of plants	Opportunity for households with less amount of land to be involved in nurseries
Tracing the seed source as well as collecting the seeds from identified mother plants.	Enhances the authenticity and credibility of nurseries and the product they supply		
Upward revision of price fixed for coffee saplings.	Ensures adequate incentives to the nursery enterprises to produce high quality saplings	Ensures the sustainability of coffee nursery enterprises	
Development and dissemination of varietal catalog of all coffee varieties in use	Helps to maintain genetic purity and thus the uniformity of product		Poor farmers have the opportunity to make informed choice
Appropriate combination of water, mulching, plant nutrients, shade crops and efficient labor	Increases productivity and quality		
Drip irrigation for more efficient use of water	Increases productivity and quality	- Conserves water - Conserves energy	Ensures participation of women (with possibility of automation)
Introduction/Selection and promotion of more productive and disease/pest resistant varieties	Increases productivity and quality	Shields the farmers from losses due to disease/pest	Ensures participation of female (as tougher tasks like spraying can be avoided)
Early identification and removal of borer infested plants	Reduces crop losses		

Interventions	How the recommended interventions contribute to		
	Competitiveness	Resilience	Inclusiveness
Cultivation in contour strip in slope areas, use of A-frames for lay out	- Increases productivity - Saves labor	- Conserves environment by reducing soil erosion - Saves water	Ensures participation of women
Investing in efficient coffee hullers and graders than cheaper rice hullers	Reduces losses and cost of production.	Saves energy	
Dry processing in areas with acute water shortage	Increased storage life	Saves water	Remote farmers have access to coffee market
Training on machine operating skills and hiring skilled technicians	Reduces losses Improves quality	Saves energy, resources	
Organizing exposure visits	Increases quality	Builds capacity of community	
Training on roasting and coffee cupping techniques	Increases quality	Builds capacity of community	
Carrying out the primary processing at PCCs by establishing pulping center locally (also reduces the cost of transportation)	Reduces losses Maintains quality	Conserves energy	Poor community have access to coffee market
Awareness program on quality of Nepali coffee	Ensures quality		
Organize interaction between suppliers, café owners, wholesalers and retailers	Facilitates market	Fosters fair trade Builds trust	
Provision of grading coffee based on quality	Ensures quality and consistency	Ensures sustainability of domestic market	

Interventions	How the recommended interventions contribute to		
	Competitiveness	Resilience	Inclusiveness
Value chain actors should specialize in one particular function	Ensures quality and consistency	Ensures sustainability of market	
Creating an innovation platform for all the market actors	Creates space for innovation		Enhances participation
Encouraging new entrants to be included in the common coffee platform	Maintains consistency		Enhances participation
Encouraging private sectors to enter into the market to enhance the drive of competition	Promotes innovation and competitiveness	Creates an environment of check and balance	
Providing incentives to Executives of Cooperatives	Promotes innovation and competitiveness		Enhances participation
Training on entrepreneurship skills	Enhances quality	Builds the capacity of communities	
Record keeping should be made mandatory for farmers as well as processors regardless of whether they are part of ICS or not		Builds capacity of communities	Strengthens communities

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ANNEXES

Annex I

Table A1. Global trends (ICO, 2018)

Year	Production (Million MT)	Domestic consumption (Million MT)	Exports (Million MT)	Imports (Million MT)	Re exports (Million MT)
1990/91	5.59	1.17	4.84	4.45	0.53
1991/92	6.07	1.22	4.56	4.28	0.59
1992/93	5.93	1.26	4.70	4.75	0.64
1993/94	5.44	1.27	4.51	4.63	0.66
1994/95	5.59	1.28	4.24	4.50	0.77
1995/96	5.22	1.36	4.07	4.34	0.69
1996/97	6.20	1.43	4.66	4.67	0.75
1997/98	5.98	1.47	4.82	4.86	0.85
1998/99	6.54	1.52	4.82	4.97	0.91
1999/00	7.89	1.55	5.17	5.13	0.92
2000/01	6.82	1.63	5.37	5.26	1.01
2001/02	6.49	1.71	5.45	5.34	1.12
2002/03	7.37	1.74	5.33	5.48	1.18
2003/04	6.31	1.80	5.18	5.60	1.28
2004/05	6.98	1.90	5.47	5.75	1.30
2005/06	6.68	2.01	5.25	5.78	1.44
2006/07	7.75	2.11	5.50	6.09	1.57
2007/08	7.37	2.23	5.78	6.28	1.72
2008/09	8.04	2.32	5.86	6.41	1.93
2009/10	7.67	2.41	5.77	6.27	1.91
2010/11	8.38	2.54	5.82	6.55	2.04
2011/12	8.88	2.64	6.27	6.71	2.13
2012/13	8.99	2.72	6.66	6.79	2.17
2013/14	9.14	2.76	6.63	6.96	2.18
2014/15	8.94	2.83	6.88	7.20	2.35
2015/16	9.13	2.90	6.87	7.28	2.43
2016/17	9.46	2.91	7.18	7.60	2.55
2017/18	9.58	2.94			

Table A.2 Major coffee production area, production, yield and growers

S.N.	Districts	2014/15				2015/16				% Increase from 2014/15 to 2015/16			
		Area (ha)	GB Prodn. (mt)	Yield (kg/ha)	Growers (No.)	Area (ha)	GB Prodn. (mt)	Yield (kg/ha)	Growers	Area (ha)	GB Prodn. (mt)	Yield (kg/ha)	Growers
1	Syangja	290	50.5	174	3,311	310	41	132	3313	6.90	-18.81	-24.05	0.06
2	Panchthar	250	12.5	50	712	271	21	77	900	8.40	68.00	54.98	26.40
3	Kavre	186	40	215	3,250	193	38	197	3261	3.76	-5.00	-8.45	0.34
4	Nuwakot	162	28.1	173	1,375	178	29	163	1379	9.88	3.20	-6.07	0.29
5	Gulmi	150	35.1	234	1,780	160	35	219	1789	6.67	-0.28	-6.52	0.51
6	Kaski	146	30.1	206	4,242	146	30	205	4248		-0.33	-0.33	0.14
7	Lalitpur	130	23.59	181	980	130	28	215	980		18.69	18.69	0.00
8	Arghakhanchi	126	28.75	228	1,652	131	29	221	1656	3.97	0.87	-2.98	0.24
9	Lamjung	126	18.4	146	1,333	131	25	191	1341	3.97	35.87	30.68	0.60
10	Sindhupalchok	117	30	256	1,572	128	19	148	1578	9.40	-36.67	-42.11	0.38
11	Palpa	115	27.3	237	2,271	119	30	252	2278	3.48	9.89	6.20	0.31
12	Parbat	85	18	212	1,913	92	16	174	1916	8.24	-11.11	-17.87	0.16
13	Dhading	69	18.25	264	726	71	15	211	728	2.90	-17.81	-20.12	0.28
14	Baglung	60	14.3	238	1,331	62	15	242	1338	3.33	4.90	1.51	0.53
15	Ilam	60	19.2	320	715	60	19	317	715		-1.04	-1.04	0.00
16	Rasuwa	44	7	159	362	44	12	273	362		71.43	71.43	0.00
17	Tanahu	31	2.37	77	612	38	9	237	621	22.58	279.75	209.79	1.47
18	Makwanpur	30	11	367	812	30	12	400	812		9.09	9.09	0.00
19	Myagdii	28	7	250	471	31	10	323	492	10.71	42.86	29.03	4.46
20	Sanhuwasabha	28	6	214	368	28	31	1107	368	0.00	416.67	416.67	0.00
21	Gorkha	25	5.5	320	734	33	5	152	741	32.00	-9.09	-31.13	0.95
22	Pyuthan	25	8	320	412	26	10	385	415	4.00	25.00	20.19	0.73
23	Khotang	17	4.6	271	278	21	5	238	278	23.53	8.70	-12.01	0.00
24	Bhojpur	11	3	273	162	15	2	133	162	36.36	-33.33	-51.11	0.00
	Other districts	70	15	214	812	170	46	271	910	142.86	206.67	32581	12.07
	TOTAL	2,381	463.56	5,599	32,186	2618	532	6483.15	32581	9.95	14.76	15.79	1.23

Source: Ministry of Agricultural Development, 2017

Table A 3. Annual cost of operation and revenues of a pulping center with a capacity to pulp 2 tons of fresh cherries

S.N.	Cost Headings	Unit cost	Quantity	Total Cost	Life	Total Cost per year
	Fixed costs					
1	Pulping Machine	35000	1	35000	4	8750
2	Processing Shed	60000	1	60000	15	4000
3	Sorting Container	2000	1	2000	5	400
4	Fermentation tank	15000	1	15000	5	3000
5	Water storage tank	12000	1	12000	8	1500
6	Drying facility	5000	1	5000	3	1667
7	Equipment (Moisture meter)	8000	1	8000	10	800
8	Storage facility	20000	1	20000	15	1333
9	Weighing machine	10000	1	10000	5	2000
	Operation Cost					
1	Fresh cherries	85	2000			170000
2	Water supply	800	5			4000
3	Electricity	1000	5			5000
4	Labor cost	1200	5			6000
5	Packaging materials	10	100			1000
	Total cost per year					209450
	Revenue					
1	Sales of parchment	570	444			253333
2	Sales of by product (pulp)	5	1000			5000
	Total revenue per year					258333
	Net profit					48883
	Cost of production per 23 kg parchment					10839.04
	Returns from 23 kg parchment					13110

Note: The calculations are based on the actual data collected from a pulping center in Nirmalpokhari, Kaski

Table A4. Annual cost of operation and revenues of a hulling center with a capacity to hull 3000 kg parchment

S.N.	Particulars	Unit Cost	Quantity	Total cost	Life	Cost per year
1	Hulling machine	300000	1	300000	15	20000
2	Grading machine	150000	1	150000	15	10000
3	Processing platform	60000	1	60000	10	6000
4	Weighing machine	10000	1	10000	5	2000
5	Storage facility	20000	1	20000	15	1333
6	Equipment (moisture meter)	8000	1	8000	10	800
	Operation Cost					
1	Parchment	570	3000			1710000
2	Packaging material	10	50			500
3	Electricity	1200	5			6000
4	Labor cost					45000
5	Transportation					24000
	Total cost per year					1825633
	Revenue					
1	Sales of Green beans(A grade)	900	2190			1971000
	Total revenue per year					1971000
	Net profit					145367
	Cost of production of 18 kg green beans					15005
	Revenue from sales of 18 kg green beans					16200

Note: Based on the data collected from Hulling centre in Nirmalpokhari, Kaski

Table A 5. Annual cost of operation and revenues of a roasting operator with a capacity to roast 200 kg of Green beans

S.N.	Cost Headings	Unit cost	Quantity	Total Cost	Life	Total Cost per year
	Fixed costs					
1	Roasting machine	800000	1	800000	10	80000
2	Processing platform	100000	1	100000	10	10000
3	Gas Cylinder with regulator	6000	1	6000	5	1200
4	Packaging machine	40000	1	40000	5	8000
	Operation Cost					
1	Green beans	850	2000	1700000		1700000
2	Electricity					3600
3	LPG	1500	1			1500
4	Labor cost	900	15	13500		13500
	Total cost per year					1817800
	Revenue					
1	Sales roasted beans	1300	1760			2288000
	Total revenue per year					2288000
	Net profit					470200
	Cost of production of 14.3 kg roasted beans					14770
	Revenue from sales of 14.3 kg roasted beans					18590

Note: Based on data collected from CCU Lalitpur

Table A 6. Variable production cost

Variable production cost per ropani							
Particulars	**Small**		**Medium**		**Large**		**Weighted av.**
Proportion	**0.8**		**0.15**		**0.05**		
Variable cost	**Qty.**	**Value**	**Qty.**	**Value**	**Qty.**	**Value**	
Planting material (NRs.)	83	1245	85	1275	85	1275	1251
Manure		600		700		800	625
Plant protection		300		275		250	294
Labor (days)							
Planting	3	900	3	963	3	875	908
Weeding	1	300	1	350	1	350	310
Irrigation	5	1500	5	1750	5	1750	1550
Mulching	1	300	1	300	1	350	303
Pruning	5	1500	5	1750	5	1500	1538
Picking	5	1500	5	1750	5	1750	1550
Transportation	3	900	3	1050	3	1050	930
Total labor cost		6900		7913		7625	7088
Others (5%)		107		113		116	108
Total cost (NRs.)		9152		10275		10066	9366
Output (cherries)	3	18675	3	19422	3	20916	18899
Net profit (NRs./rop)		9523		9147		10850	9533
Total cherries production from 1 ropani							208
Cost of production of 100 kg cherries							4514
Revenue from sales of 100 kg cherries							8500

ANNEX-2

Checklist for FGD with the coffee Farmers Groups

Name of the group: Address:

Number of participants: Contact details of the participants:

A. Value chain mapping of the coffee

Develop an aggregate value chain map as well as specific value chain map for coffee produced in the village

Activity	Actors/ Number	Quantity/ Number	Price	Service providers	Constraints
Input Supply					
• Seed					
• Fertilizer/micro-nutrients					
• Organic -Pesticides					
• Training					
• Loan/Credit					
• Other equipment					
Collection/collectors (PCC)					
Trading/Trader					
Processing/Packaging					
Retailing					
Wholesaling					
Exporters					
Consumption/Consumers					

B. Information on cropping system and farmers' involvement

1. What percentage of the farmers in your village has received training on coffee farming? From where do you get such trainings?
2. On an average, what proportion of the total land of a household is used for coffee farming? Is coffee farming increasing, decreasing or same, compared to the last three years?

3. What is the average annual production of coffee in this village? (cherries)
4. Do you get demands of coffee before production season? How the next level actors approach you? How selling price is determined? (negotiation)
5. Is there any coffee nursery in your village? How many farmers are engaged in such nursery business?
6. What is the average income from coffee farming for majority of the households in your village?
7. What innovative technologies that farmers apply for coffee farming? (Tools, pest control practices, fertility management, shading)
8. What are the major problems that you are facing for producing your coffee? What can be done (from the stakeholders including the project) for improving coffee farming in this village?

Opportunities	Major constraints	Strategies/actions needed to overcome the constraints

C. Processing/Value addition, grading, packaging and marketing

9. Do you also perform cleaning, grading and processing of the coffee? To which extent? What tools do you use?
10. Is there any processing/value addition facility for the coffee that you grow? What products are prepared after processing/value-addition and where/how are they sold? How do the farmers handle their produces if they do not get the buyer or in low price conditions?
11. How do farmers transport coffee to the collection center or the market? What is the post-harvest loss?
12. Where and how do you sell your product? Who fixes the price? Do you get the money instantly after you sell your product? Are you happy with the prices that you get for your produces?
13. What are the end markets for your product?
14. Can you sell your produces to the buyer that you want to sell or who offer you higher prices?
15. Do you get market and price information for the coffee? If yes, how do you get it?

16. Do you have quantity and price contractual agreements with the buyers for selling coffee? If yes, what kind of agreements that you have with them?
17. Do you also get input and credit supports from the buyers during production seasons? Does it compel you to supply the product to them in low price?
18. What do you do if you are offered low prices or no any demand for the coffee that you produce?
19. Do you have any idea what helps you get the higher prices for your coffee?
20. What are the major constraints that you are facing for marketing of your product?

D. Institutions and access to input market, and related services

21. How far are the agriculture service centers (ASCs) located from your place? Do you get any supports from ASCs? If yes, what kind of support services have you received so far?
22. Do you get any support services from the local municipality offices? If yes, what are those?
23. What institutions are working in your village for promotion of coffee farming? How are you linked to those institutions?
24. Is there any mechanism (Innovation Platform) that brings and engage public, private and community actors on board for discussions and working towards promotion of the coffee value chain?
25. How are farmers of one group/cooperative linked to other groups/cooperatives of the same or different villages? Is there any networking of the farmers of this village with other farmers? How do you get benefits from such networks?
26. How do you obtain the agricultural inputs for producing coffee? How many and how far are the agro-vets and other input suppliers located in/from your place? Are you able to get timely supply of the inputs from the existing agro-vets and input suppliers? Are you happy with the available services? What constraints have you faced in obtaining such services?
27. Do you have any access to the credit for farming activities? Have you taken any credit for coffee farming? If yes, then from where and what is the interest rate?
28. What kind of farm machineries that you have and lend/use for coffee farming?

E. Risk perceptions and mitigation strategies

29. What are the major risks associated with production and marketing of coffee?
30. How do you minimize those risks?

31. Have you heard about agricultural insurance? What is the percentage adoption of crop insurance for coffee farming in this area? If no, why farmers don't insure your crop?

F. Gender participation and alternative opportunities

32. In what activities female have more participation in coffee farming? Please provide information specific to the crop.
33. What kinds of supports are needed in improving coffee production and income generation?
34. What other opportunities/farming alternatives that you feel could be important for you for increasing your income?

ANNEX-3

Guideline for Participatory Market System Analysis Workshop

Objectives:

- To probe into existing constraints and opportunities in each function of value chain of Nepali coffee.
- To identify and capture the possible intervention (leveraging) points in different levels of value chain function of Nepali coffee.
- To develop a well-defined list of business/market intervention models and strategies to maintain the current price of Nepali coffee in the market.
- To assess actors' perception on quality parameters of Nepali coffee across the coffee value chain.

Expected Participants:

- Producer farmers, Nepali Coffee Producers Association (NCPA)
- Processors (local as well as commercial)
- Traders (small, medium and large)
- Primary Coffee Cooperatives (PCC)
- Service providers (input suppliers, financial service providers, organic certifiers)
- Stakeholders (NTCDB, National Coffee Research Program)
- HELVETAS, CoPP, AEC- FNCCI

Method:

- Formation of groups
- Group work on "Participatory market mapping" (heterogeneous group) and "Analysis of business development services" (homogeneous group).
- Presentation of group-work
- Reflection and summing up

Tools:

1. **Participatory market mapping:**

   Objective: to visualize product flows, business development services, and inputs along the market chain, from producers to processors to traders/exporters, from diverse points of view.

   Time: 1.5-hour activity comprising of group work and plenary

   Materials: flip charts and markers

Process: Participants are divided into 2-3 groups having members from each functional categories of the market chain and ask them to draw the market chain, as they know it. As the process advances, other questions are asked that provide additional details. These details are then added to the basic market chain initially drawn. At the end, each group explains its vision of the market chain in the plenary session. To get additional information on key topics, the facilitator will ask some of the following questions:

- What are the functions of each of the actors (participants) in the market chain? How do they relate to one another?
- Are relations good, average, or poor? Why?
- What are the characteristics of the product?
- How much does it cost to produce (in each link of the market chain)
- What are the buying and selling prices at each stage of the market chain?
- Are they stable during the year, or do they fluctuate?
- How efficient (yields by area planted, conversion factors, etc.) activities in the market chain?
- What is the distribution of the total income from the market chain between the actors?
- Which groups gain more and which less, and why?
- Who (in each link of the market chain) supports you?
- How do they support you?
- What services do they offer (in each link of the market chain)?
- What is the quality of the services offered?
- What is the form of payment at each stage of the market chain?
- What are the quality requirements?
- What is the buying frequency?
- Describe the relations between market chain actors
- Are they happy with the existing relationships?

2. Analysis of Business development services:

Objective: to make a simple list of business development services that exists along the market chain and to qualify their quality and identify gaps for future improvements.

Time: 1.5 hour

Materials: flip chart and markers

Process: Continuing with the same groups used for mapping, the groups should proceed to examine supply and demand of formal and informal business development services in each function of the market chain. The session will be facilitated by the study team members by asking some of the following questions. Results will be organized in a matrix (Table 1 and 2) and presented in a plenary.

Facilitation questions:

- Who supplies services to this link in the market chain? ·
- What services are supplied?
- What cost does this service have?
- How useful is this service?
- Does it solve your problem?
- What services are supplied to each link in the market chain (production, post-harvest, processing, marketing, business organization)?
- Who are the clients of the service?
- What portion of the service cost does the service client cover?
- What portion is covered by other sources (donor or government subsidy)?
- How effective is the service?
- Does it manage to solve the problems of the client?
- How much does it cost to supply the service?

Table 1. Matrix of the analysis of services received (by clients)

Service by link of the market chain	Supplier	Cost	Recipients' perspective	Comments
Production				
Processing				
Marketing				
Organization				

Table 2. Matrix of the analysis of services supplied

Service by link of the market chain	Clients	Cost	Suppliers' perspective	Comments
Production				
Processing				
Marketing				
Organization				

ANNEX-4

Checklist - Key Informant Interview

PCC, DCCU

- What are the functions PCCs and DCCUs do? In which level of coffee value chain do PCC and DCCUs lie? How PCC and DCCU are involved in this value chain of coffee (do you have single role or multiple roles in coffee value chain?)
- Please explain the current situation of coffee production in this area?
- How it is changing? A brief evolution story? Change in farming techniques, materials, processing techniques, policy and management? Change in farming size, farmers' involvement, productivity.
- What percentage of the farmers in your village has received training on coffee farming? From where do you get such trainings?
- What is the average annual production of coffee in this village? (your last year data/record/file)
- Do you get demands of coffee before production season? How the next level actors approach you? How selling price is determined?
- What is the current practice for pricing of coffee at farm-gate, cooperative-gate, processor-gate? Who determine the price? What are other factors associated with cost of value addition?
- Is there any coffee nursery in your village? How many farmers are engaged in such nursery business?
- How organic coffee farming is being practiced? What are the constraints and opportunities associated with existing organic certification for the farmers? What is your proposed solution from farmer's perspective?
- What policies and regulations from the government benefit your business? (registration, inspection, subsidies, incentives etc)
- What are the current policy obstacles?

Coffee Processor

- Please explain what is your position in coffee value chain? What function do you perform? Do you have multiple roles (for example as collector, as processor, as trader?)
- Which type of processing do you perform? (pulping, hulling etc?) Please explain the technical process. (raw material, process and output)

- What is your technical capacity in processing (kg/day?), is your unit occupied throughout the year, please explain the seasonality of your processing function.
- Is your processing function demand driven? Or supply driven? What determines how much to process and when?
- What is the current practice for pricing of your raw material? Who determine that? You or raw material supplier?
- What are the costs for value addition in your function? (operation, maintenance, labor, capital, raw material etc)
- How do you sell your products? Who determines the price, how? Have you organized in an association? What is the role of association in determining the price?
- What are the constraints, problems in your function? (supply side, technical aspects and demand side?) How do you think these problems can be sorted out?
- What policies and regulations from the government benefit your business? (registration, inspection, subsidies, incentives etc)
- What are the current policy obstacles? What are the current technical obstacles? What the current financial obstacles? And what do you suggest for overcoming those obstacles?

ANNEX-5

Some Glimpses of the Field Work