Going to Market Without a Map

Go-To-Market Strategies for Dried Food Products in Nepal

Gustav Lautmann & Arvid Stider

Thesis for the Degree of Master of Science in Industrial Engineering and Management
Division of Production Management, Department of Industrial and Mechanical Sciences
Faculty of Engineering LTH, Lund University
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Preface

This thesis was created in collaboration with an ongoing project called *SolarFood: Developing inclusive business model (BM) concepts for solar food drying in the Himalaya region* (Project ID: 2768326; Grant ID: 352437). The project is led by Ruralis – Institute for Rural and Regional Research in Norway, and partnered by Lund University, Jigme Namgyel Engineering College at Royal University of Bhutan (JNEC), Gedu College of Business Studies at Royal University of Bhutan (GCBS), School of Management at Kathmandu University (KUSOM) and Department of Mechanical Engineering at Kathmandu University (KUDME). The SolarFood project is financed by NFR Forskerprosjekt.

The research for this thesis has been based at the School of Management at Kathmandu University, located in Balkumari, Lalitpur, Nepal.

Unless otherwise specified, all figures, tables, maps, and photographs in this thesis are created and edited by the authors. Consent was taken for any and all photographs included in the paper.

Abstract

Solar drying technologies give smallholder farmers in low- to middle-income countries (LMIC) a low-cost way to reduce post-harvest losses and add value to agricultural produce. Yet bringing solar-dried products to market remains poorly understood, particularly in fragmented food systems where structural conditions shape market entry in ways that standard frameworks do not account for. This thesis develops an analytical framework for mapping food systems, identifying viable market segments, and designing go-to-market strategies in LMIC contexts, applied to Nepal's food system for dried fruits, vegetables, and spices. The study draws on existing literature and twenty semi-structured interviews with producers, intermediaries, retailers, and institutional actors across Nepal.

The mapping revealed a longer and more complex intermediary chain than previously documented. Eight candidate segments were filtered against structural feasibility, leaving five: international trekkers, non-trekking tourists, festival consumers, urban premium consumers, and school canteens. Four structural constraints shaped go-to-market strategy design across all segments: fragmentation and coordination failure, weak institutional enforcement, geographic and infrastructural barriers, and uneven organisational capability. Under these conditions, producers must take on coordination functions that the system cannot provide, build credibility through signals such as certification and packaging, focus efforts geographically, and sequence market entry according to what their capacity can support. The thesis contributes by testing and extending existing frameworks in an LMIC agricultural context and producing five segment-specific go-to-market strategies.

Keywords: *Go-To-Market Strategy, Food Systems, Agricultural Value Chain, Market Segmentation, Transaction Cost Economics, Diffusion of Innovations, Solar Drying, Post-Harvest Losses, Nepal, Low-to-Middle Income Countries, Smallholder Farmers, Market Access, Development*

Acknowledgments

This thesis marks the end of our five years at the Industrial Engineering and Management programme at Lund University, a journey that brought us from the small lecture halls of LTH to conducting fieldwork in the vast mountain valleys of Nepal. This is a journey we are incredibly grateful for, and as such, would like to extend our deepest gratitude toward everyone who have supported us during the project.

First, we would like to thank our supervisor, Assoc. Prof. Ola Alexanderson. Your belief in our idea is what took us to Nepal in the first place, and your guidance helped us immensely at times when we felt lost in the project. Thank you for believing in us and supporting us throughout the whole journey, home and abroad. We would also like to thank our examiner, Assoc. Prof. Izabelle Bäckström.

To Assoc. Prof. Henrik Davidsson and Prof. Bivek Baral - we thank you for meeting us in Lund back in September 2025 and so enthusiastically inviting us to write our thesis in collaboration with SolarFood. Without you this thesis would not have been possible. We would also like to thank Research Professor Pia Piroschka Otte and Isabelle Hugøy from Ruralis for your guidance and assistance throughout the project. A special thank you to Pia for welcoming us to the Ruralis office in Trondheim back in October.

There is an almost endless list of people in Nepal that we would like to thank as well. A special thank you goes to Assoc. Prof. Roshee Lamichhane and Mr. Dolendra Poudel at KUSOM, whose generosity and hospitality made us feel at home from the very first day. Thank you for guiding us through both the academic and the human sides of this work, and for sharing your knowledge of Nepali culture and history in ways that no textbook could. Also a special thank you to Dolendra, who took us on adventures into the mountains outside of Pokhara, including to the village of Quibang, which fittingly is where the photograph on the front page of this thesis was taken. It remains

one of our strongest and most cherished memories from Nepal.

We would also like to thank our friends at the Kathmandu University Department of Mechanical Engineering, who joined us in the field as interpreters around Banepa and Dhulikhel. Your warmth and local knowledge were invaluable and it was a privilege to get to know you.

To our interviewees, thank you for offering your time and your knowledge. This thesis exists because of your willingness to engage with two confused Swedes showing up with questions about your food system.

Our fieldwork in Nepal would never have been possible without the financial support we received from scholarships. We therefore want to extend our deepest gratitude to the SIDA-funded Minor Field Study (MFS) program, as well as Carl Erik Levin's Foundation.

Our time in Nepal would also never have been the same without the wonderful people we met along the way. A heartfelt thank you to the Pilachhen Community, whose warmth and generosity gave us a home away from home in Nepal. You invited us to weddings, historical tours of Lalitpur, Holi celebrations, dinners, and futsal games, and showed us a side of the incredible Newari culture that we could never have found on our own. We will carry those memories for a lifetime.

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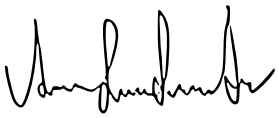
Lastly, we would like to thank each other. For showing up on the hard days, for keeping each other sane across interviews, bus rides and late nights, and for still being friends on the other side of arguing like an old married couple. We are incredibly grateful that we did it together.

Gustav Lautmann
Lund, June 2026



Arvid Stider
Lund, June 2026

Executive Summary

Title	Going to Market Without a Map: Go-To-Market Strategies for Dried Food Products in Nepal
Authors	Gustav Lautmann and Arvid Stider
Supervisor	Assoc. Prof. Ola Alexanderson
Background	In low-to-middle income countries, smallholder farmers face persistent structural challenges: fragmented production, significant post-harvest losses, and weak market linkages that limit their ability to capture value from their produce. Solar drying offers a low-cost, renewable method for extending shelf life and reducing losses, yet the conditions under which such products can successfully reach and sustain market demand remain poorly understood. Nepal exemplifies these dynamics. Despite growing urban demand for processed and preserved food products, the infrastructure connecting rural producers to viable markets remains underdeveloped, and the logistical, institutional, and socioeconomic variables shaping Nepal's food system add layers of complexity that conventional go-to-market frameworks are not designed to address. Understanding how market pathways can be identified and navigated in such contexts is therefore both a practical necessity and an underexplored research topic.

Purpose

The purpose of this study is to identify how GTM strategies can be designed within food systems in LMIC contexts. To achieve this, the study develops an analytical framework for identifying and evaluating market pathways in smallholder food system contexts, examining not only which pathways exist but what contextual variables shape their viability.

Research Questions

RQ1: How can food systems be mapped to inform GTM strategies in LMIC contexts?
RQ2: Which market segments show the highest potential for dried food products in the studied LMIC context?
RQ3: How do contextual variables influence the design of GTM strategies for food products in LMIC contexts?

Method

The study adopts a qualitative, exploratory approach using a single-case study design. Primary data was collected through semi-structured expert interviews with representatives from international organisations, government bodies, and private sector actors, supplemented by structured interviews with farmers, intermediaries, and retailers conducted during a field study in Nepal. This was complemented by an extensive literature review spanning food systems theory, value chain analysis, market segmentation, and GTM strategy. Data was analysed thematically across five domains: the food value chain, production, market channels, consumer demand, and quality and regulation.

Delimitations The study is geographically restricted to Nepal and categorically restricted to fruits and vegetables. Meat, dairy, grains, and other food categories are excluded. International export markets are not explored. The field study was conducted across selected regions assumed to be broadly representative, though findings should be applied with care in contexts with substantially different local conditions. The study is conducted within a 20-week timeframe. While created in collaboration with the SolarFood project, the study is not linked to any specific drying technology and is intended to be applicable across solar drying solutions more broadly.

Conclusions Five market segments show commercial potential for solar-dried products in Nepal: international trekkers, non-trekking tourists, festival consumers, urban premium consumers, and school canteens. Entry should be sequenced in that earlier segments build the capability needed for later ones. The key structural insight is that GTM strategy in fragmented LMIC food systems must be sequential, relationship-based, and geographically concentrated, shaped both by segment attractiveness and more by what the surrounding system makes possible.

Keywords *Go-To-Market Strategy, Food Systems, Agricultural Value Chain, Market Segmentation, Transaction Cost Economics, Diffusion of Innovations, Solar Drying, Post-Harvest Losses, Nepal, Low-to-Middle Income Countries, Smallholder Farmers, Market Access, Development*

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Abbreviations

Abbreviation	Full Term
3PL	Third Party Logistics
ADB	Asian Development Bank
AVC	Agrifood Value Chain
CIRAD	The French Agricultural Research Centre for International Development
DFTQC	Department of Food Technology and Quality Control
EU	European Union
FAO	Food and Agriculture Organisation
FNCCI	Federation of Nepalese Chambers of Commerce and Industry
GDP	Gross Domestic Product
GTM	Go-To-Market
JTBD	Jobs to Be Done
KUSOM	School of Management, Kathmandu University
LMIC	Low- and Middle-Income Country
MoALD	Government of Nepal, Ministry of Agricultural Development
NPR	Nepali Rupee

STP	Segmentation-Targeting-Positioning
TCE	Transaction Cost Economics
WFP	World Food Programme

Definitions

Term	Definition
Food loss	Reduction in the quantity or quality of food along the supply chain from harvest up to, but not including, the retail level.
Food waste	Food discarded or removed from the supply chain at the retail and consumption stages.
GTM Strategy	A plan for reaching the right customers, in the right market, through the right channels, with the right products and value proposition.
Post-harvest losses	Measurable quantitative and qualitative food loss between harvest and consumption, including spillage, spoilage, and market rejection.
Smallholder farmer	A farmer operating on limited land with low capital inputs and primarily family-based labour.
Solar-dried product	A food product whose moisture has been reduced through solar energy, either directly or via an enclosed drying system, to extend shelf life.
Value	The amount of money that can be received for something.

1 Introduction

This introductory chapter begins by giving a brief background into the thesis project. Building on this, it then narrows down the problem statement and introduces the purpose of the study together with three central research questions. The chapter subsequently describes the scope and limitations of the report, while also clarifying the expected deliverables. Finally, it presents the thesis disposition, providing an overview of the contents of the following chapters.

1.1 Context

Agriculture has long been the backbone of Nepal's economy and is the primary source of livelihood for nearly two-thirds of its population (FAO, EU and CIRAD, 2022). Even so, the sector operates under a vast set of structural constraints that limit the economic opportunities available to farmers. Agricultural productivity remains low, infrastructure is inadequate, and farmers' poor access to markets is further compounded by fragmented value chains. This has left producers with limited bargaining power and few routes to profitable markets (MoALD, 2015; FAO, EU and CIRAD, 2022).

Within this environment, post-harvest losses illustrate how these constraints compound each other. Farmers unable to access reliable markets must sell perishable products immediately and cheaply, meaning that even when preservation technologies exist, the absence of viable market pathways limits their value (Bhattarai, 2018; Pokhrel & Thapa, 2007). A substantial share of Nepal's fruits and vegetables, estimated between 20 and 50%, spoils before reaching the market, not primarily because farmers lack tools, but because the market infrastructure to absorb products does not reliably exist (Bhattarai,

2018).

It was against this backdrop that the SolarFood project emerged. The initiative was established to explore how improved food preservation technologies could help reduce post-harvest losses and create new income opportunities for smallholder farmers, particularly women-led cooperatives, in Nepal and Bhutan. At its centre is the development of a low-cost solar dryer designed to convert perishable agricultural produce into stable, shelf-life-extended products while protecting food from contamination during the drying process. The technology makes improved food preservation accessible to more farmers, supports decentralised forms of production, and increases resilience against the volatility that characterises smallholder agriculture in the region (Andreasson & Lundevaller, 2025).

Much of the work within SolarFood has focused on the upstream side of this challenge: developing and refining the solar-drying technology and ensuring it can be adopted and operated by smallholder farmers. That work has made substantial progress. However, the downstream side remains open. If farmers can now produce solar-dried products, who will buy them, through which channels, and what contextual variables do they need to consider? These are not questions unique to Nepal. Research from low-and-middle-income country (LMIC) contexts in general shows that new technologies in the agricultural sector have mixed results around enhancing profitability for smallholder farmers and small- and medium-sized enterprises (SMEs) due to barriers such as weak supply chains and market constraints (FAO & IPA, 2023). The technology's success, in Nepal as elsewhere, hinges on whether viable market pathways exist to connect farmers to buyers.

1.2 Problem Statement

Technological innovations aimed at improving agricultural productivity in LMICs often face significant challenges when transitioning from technical development to widespread adoption (Curry et al., 2021). Although many solutions demonstrate technical feasibility and potential socio-economic benefits, their impact ultimately depends on whether

they can be integrated into functioning market systems. Fragmented value chains, limited market transparency, and weak coordination between actors frequently create uncertainty for how new products should reach end consumers. As a result, promising innovations risk being underutilised if viable pathways to the market are not clearly understood (Marion et al., 2024).

Small-scale solar-drying technologies illustrate this challenge. These solutions present a major opportunity for smallholder farmers in LMICs. By improving the preservation of agricultural produce, these technologies have the potential to decrease nutrient degradation from traditional sun-drying practices (Ndawula et al., 2003), reduce post-harvest losses, and generate more stable income streams during off-season periods or times of low demand (Udomkun et al., 2020). However, these benefits are contingent on solar-dried products actually reaching end consumers.

There are numerous potential pathways through which solar-dried food could reach the market. Yet, if the structure and dynamics of these markets remain poorly understood, significant uncertainty arises regarding how new solar-drying solutions can be adopted and used. This uncertainty is generally evident in LMICs (World Bank, 2008). There, farmers tend to have limited insight into, or influence over, the channels, processes and systems through which their products move from farm to fork (Pokhrel & Thapa, 2007).

To address this challenge, it is therefore of paramount importance to establish a systematic understanding of how market pathways can be identified within LMIC food systems. This involves identifying potential use cases for food products, mapping relevant actors in the food system, and analysing the interaction process between producers, intermediaries, and consumers. Only by understanding the dynamics between potential customer segments, use cases, and the contextual variables surrounding them can context-specific go-to-market (GTM) strategies for solar-drying solutions be developed.

1.3 Purpose & Research Questions

The purpose of this study is to identify how GTM strategies can be designed within food systems in LMIC contexts.

To achieve this, the study develops an integrated analytical framework for mapping food systems, identifying viable market segments, and designing GTM strategies that account for the contextual variables shaping market entry in LMIC contexts.

The target audience for this thesis includes researchers, development practitioners, and other stakeholders interested in the commercialisation of food products in LMIC contexts.

To support this purpose, the following research questions are addressed:

RQ1: *How can food systems be mapped to inform GTM strategies in LMIC contexts?*

RQ2: *Which market segments show the highest commercial potential for dried food products in the studied LMIC context?*

RQ3: *How do contextual variables influence the design of GTM strategies for dried food products in LMIC contexts?*

1.4 Scope and Delimitations

The study is geographically restricted to Nepal and categorically restricted to fruits and vegetables for RQ1, and to dried fruits, vegetables, and spices for RQ2 and RQ3. Meat, dairy, grains, and other food categories are excluded from analysis. The potential of dried products in international export markets is not explored. Low-to-middle income countries are defined as countries with a Gross National Income per capita below $13,935 per year (World Bank, 2026b).

The field study was limited to Pokhara and Kathmandu Valley, and therefore views the food system from the perspective of these regions. Care should therefore be taken before generalising the findings to regions where local conditions differ substantially. The study was

conducted within a 20-week timeframe, which necessitates a breadth-over-depth approach. The study therefore does not provide exhaustive detail within each analytical domain, but instead enables a system-level understanding of how interrelated factors shape GTM strategies in LMIC contexts.

All interviewees have been anonymised in accordance with standard research ethics practice. Producers, intermediaries, and sellers are referred to by generic descriptors, while institutional actors are identified by their organisation or role, without attribution to named individuals, as detailed in Table 2.2.

Even though the study was conducted in collaboration with the Solar-Food project, it is not explicitly linked to the solar dryer technology developed by the project and is as such intended to be applicable for different food drying technologies.

1.5 Expected Contributions

The thesis expects to deliver theoretical and empirical contributions that focus on food systems, consumer segmentation, and GTM strategies in LMICs. It focuses on Nepal as a case study and simultaneously addresses gaps in the literature while aiming to provide insights to practitioners, policymakers, and researchers. These contributions will be accessible through a report and a summary article highlighting key findings. The expected contributions are listed below.

1.5.1 Theoretical Contributions

1. **Expansion of Theoretical Validity in LMIC contexts**
   Existing theory on market structure, value chains, and GTM strategies have been developed in high-income countries where markets are structured, data-driven, and institutions are formalised. This thesis tests the validity of these theories in the LMIC context and aims to identify which tenets of theory are applicable and which are not. Specifically, it adds the Nepali context that has been under-represented in GTM strategy re-

search.

2. **Modification of GTM Theories for LMIC contexts**
   This thesis aims to adapt and refine GTM frameworks to better account for the unique challenges of LMICs. By doing so, the thesis aspires to expand existing theories by accounting for contextual variables that were not captured by traditional theories.

1.5.2 Empirical Contributions

1. **A detailed analysis of Nepal's food system**
   The thesis seeks to provide a unique description of how food systems and value chains are organised in Nepal by focusing on actors, flows, and market pathways.

2. **GTM strategies within the Nepalese food market**
   Practically, the thesis aims to deliver GTM strategies for dried products grounded in empirical fieldwork in Nepal. These are meant to be actionable recommendations for the SolarFood project. The GTM strategies will include a description of key segments in Nepal's market, the factors driving their behaviour, and how contextual variables can be considered in agricultural business strategies in Nepal.

1.6 Thesis Disposition

1.6.1 Chapter 1: Introduction

This introductory chapter begins by giving a brief background into the thesis project. Building on this, it then narrows down the problem statement and introduces the purpose of the study together with three central research questions. The chapter subsequently describes the scope and limitations of the report, while also clarifying the expected deliverables. Finally, it presents the thesis disposition, providing an overview of the contents of the following chapters.

1.6.2 Chapter 2: Methodology

This chapter presents the methodological basis of the thesis. First, it describes the theoretical research strategy and then the practical research design. Lastly, the chapter will disclose how AI tools have been used throughout the research process and assess the methodology through the criteria of validity, reliability, generalisability and objectivity.

1.6.3 Chapter 3: Theory

This chapter presents the theoretical basis for the analysis. It begins by introducing systems thinking, food systems, and value chain theory, which provides the structural vocabulary for mapping how products, actors, and relationships are organised. This is followed by a discussion of transaction cost economics and its extension to LMIC contexts. The chapter then turns to market segmentation and adoption logic, drawing on segmentation theory, the Jobs to Be Done framework and diffusion of innovations theory to identify which market segments are viable and under which conditions new products spread through them. Finally, the chapter introduces the Interaction Model, which frames GTM strategy as a process of configuring and aligning relationships in a network of interdependent actors. Together, these theoretical building blocks form an integrated framework for analysing the conditions under which new food products can reach markets in LMIC contexts.

1.6.4 Chapter 4: Background

This chapter provides a short contextual overview of the study. It begins by introducing Nepal's geography and climate, before tracing the country's modern political history and its effects on institutional development and modernisation. The chapter then describes the socioeconomic and agricultural conditions that characterise Nepal today. It subsequently introduces solar-drying as a food preservation method, comparing traditional open sun drying with improved solar-drying technologies. Finally, the chapter concludes by introducing

the SolarFood project, describing the origins and learnings of its first phase and the market integration objectives of the current phase.

1.6.5 Chapter 5: Nepal's Food System

The following chapter builds on Chapter 4 and turns towards the food system itself. It examines the structural conditions shaping Nepal's food system, drawing on both international literature on AVC transformation in LMICs and context-specific studies on Nepal. It covers the value chain from producers through intermediaries to retail, the national enabling environment, and consumer demand and behaviour. The chapter provides the systemic foundation on which the empirical and analytical chapters build.

1.6.6 Chapter 6: The Industry and its Actors

This chapter examines Nepal's food system from the perspective of its actors. Drawing on semi-structured interviews with producers, cooperatives, traders, retailers, development actors, and public institutions, it covers how the food value chain, market channels, consumer demand, and regulatory environment function in practice.

1.6.7 Chapter 7: Analysis

The following analysis chapter draws on the literature review in Chapter 5 and the empirical findings in Chapter 6, interpreted through the theoretical framework established in Chapter 3. It is structured around the three research questions, beginning with a map of Nepal's food system before turning to market segmentation, the interaction model, and, finally, the design of GTM strategies under the contextual conditions identified in the field.

1.6.8 Chapter 8: Discussion

This chapter begins by reflecting on the key findings from the analysis before connecting them back to the theoretical frameworks and existing literature, examining where the findings confirm, extend or challenge what the theories anticipated.

1.6.9 Chapter 9: Conclusion

This chapter brings the thesis to a close. It begins by directly answering the three research questions before assessing to what extent the study fulfilled its stated purpose. It then presents the theoretical and empirical contributions of the thesis, reflects on the methodology, and closes with suggestions for future research.

2 Method

This chapter presents the methodological basis of the thesis. First, it describes the theoretical research strategy and then the practical research design. Lastly, the chapter will disclose how AI tools have been used throughout the research process and assess the methodology through the criteria of validity, reliability, generalisability and objectivity.

2.1 Research Strategy

A research project can generally take either a quantitative or qualitative approach, depending on the nature of the research problem (Denscombe, 2010). Quantitative research is based on numerical data and statistical analysis and is often suitable for large-scale studies where variables can be clearly defined and measured. In contrast, qualitative research focuses on understanding phenomena within their context and is particularly appropriate when studying complex real-world situations (Höst et al., 2006).

Research can also be classified according to its purpose. Höst et al. (2006) distinguish between descriptive, exploratory, explanatory, and problem-solving research. Descriptive studies aim to document how phenomena function, while exploratory studies seek to understand underlying structures and relationships in situations where knowledge is limited. Explanatory research focuses on causal relationships, and problem-solving research aims to develop practical solutions.

2.1.1 Chosen Strategy

Since this thesis aims to explore the structure of food systems and identify relevant market segments in an LMIC context, a qualitative approach was deemed suitable. The relatively small scale of the project and the focus on understanding complex, context-dependent phenomena support the use of qualitative rather than quantitative research.

The thesis is mainly exploratory but has descriptive elements as well. RQ1 and RQ2 aim to map the structure of the food system and identify relevant market pathways and segments. These parts of the study include descriptive elements, as they seek to illustrate how the system functions, while also exploring less apparent relationships and patterns. RQ3 is purely exploratory, focusing on investigating how contextual elements factor in when designing GTM strategies in LMICs.

2.2 Research Design

2.2.1 Different Approaches

The research design of a project can take many forms according to Höst et al. (2006). Denscombe (2010) mentions that the most common designs are experiments, surveys, case studies, action research, and mixed methods, and they are described in Table 2.1.

Table 2.1: Link between research strategies and purpose of research (Denscombe, 2010).

Research Strategy	**Purpose of Research**
Surveys	Compile and measure the current situation of the studied phenomena, with an emphasis on breadth rather than depth.

Research Strategy	Purpose of Research
Case study	Develop an in-depth understanding of complex relationships between factors as they interact within a specific social context.
Experiments	Identify causal relationships and observe the influence of specific factors under controlled conditions.
Action research	Present solutions or best-practice guidelines in response to a practical problem.
Mixed methods	Provide a more comprehensive analysis by integrating elements from qualitative and quantitative research.

Different research designs can also be combined within a single study to address different aspects of a research problem which is then called *combined research design* (Denscombe, 2010). Denscombe also mentions that one rationale for combining methods is *triangulation*, where different data sources are used to examine the same phenomenon, thereby strengthening the credibility of the findings. Combined designs can also follow *sequential logic* according to Saunders et al. (2009), where one phase of the study informs the next, allowing earlier findings to shape subsequent data collection and analysis. However, combining research designs introduces trade-offs according to Denscombe (2010). It increases the complexity and requires more careful coordination between phases, and are often more time-consuming. As a result, the scope of the study must typically be limited to remain feasible within the available time-frame.

2.2.2 Chosen Design

The research design used in this thesis takes the form of a *case study* supported by a combination of different data collection methods, including interviews, literature reviews, and observations. The case

study follows a sequential structure, where the first phase focuses on understanding the structure of the LMIC food system and its market pathways (RQ1). The findings of this phase form the basis for identifying relevant market segments (RQ2). Together, these two phases provide the foundation for the final phase, which explores how contextual variables affect the GTM strategy (RQ3).

This design was chosen to enable an in-depth understanding of the food system while allowing the identification of patterns and relationships across different data sources. Although a case study provides a strong foundation for analysing complex real-world phenomena, it risks lacking generalisability. By incorporating multiple sources of data, this study is meant to capture a wider range of perspectives and validate the findings between different actors and types of data (Yin, 2018). This is particularly important in the context of LMIC food systems, where structured data is often limited and must be complemented by expert insights and observations.

2.2.3 Case Study

Using the terms in Yin (2018), the thesis consists of a single-case design with three embedded subunits. The case is GTM strategies for agricultural products in LMICs, whilst the Nepalese food system, the market pathways for fruits, vegetables, and spices in the Kathmandu Valley and Pokhara, and the commercialisation of dried food products in the context of the SolarFood project form the embedded sub-units of the single-case study. The case is bounded by the geography of Nepal, the duration of fieldwork, and the analytical focus on contextual variables, market pathways, consumer segments, and their respective value-chain implications. These boundaries are meant to support analytical clarity while allowing for sufficient depth of investigation (Yin, 2018; Denscombe, 2010).

Within the case, multiple stakeholder perspectives are included in semi-structured interviews, such as international organisations, governmental bodies, farmers, retailers, consumers, institutional procurers, and other value-chain actors, with additional stakeholders identified in an initial data collection round. The key stakeholders and key

consumer segments that had emerged were corroborated in a second literature review and further examined in another iteration of semi-structured interviews.

2.3 Data Collection

In line with the case study methodology, the data collection consisted of two core parts; a literature review followed by a field study. The field study had two data collection methods: semi-structured interviews and observations.

2.3.1 Literature Review

The literature review provides the theoretical foundation for the thesis and supports the formulation of the research methodology, theoretical frameworks, and conclusion. Its purpose is to identify relevant theories, concepts, and findings from existing literature related to market pathways, end-consumers, value chains, and GTM strategies for food products in LMIC contexts as well as the case study country. In line with Höst et al. (2006), the literature review follows a process of identify, evaluate, and analyse.

An initial wide search was conducted to gain an overview of relevant articles on the LMIC context, contextual elements in Nepal, and identify central theoretical perspectives. This search also included backward searches through reference lists of relevant articles and theses, targeted searches in academic databases like Scopus, Web of Science, LUBsearch, or Google Scholar, and recommendations from supervisors. The authors favoured peer-review literature with many citations and scientifically sound methodologies, however, these were sometimes scarce in the context of Nepal. Government documents, industry and company reports, or documents from international organisations were thus included to supplement the scientific literature if they were deemed credible and relevant.

An iterative approach was chosen as it was consistent with the recommendations of Höst et al. (2006) and Yin (2018), who note that

literature reviews in exploratory and case-based research often evolve alongside the study rather than being completed entirely in advance.

2.3.2 Field Study

The field study interviews were conducted in two rounds: first with smaller actors and then with larger, more representative actors. The observations were conducted throughout and in various forms, documented in written form.

2.3.2.1 Semi-Structured Interviews

Interviews are commonly used data gathering methods for qualitative case study research and can be divided into three categories: Structured, Semi-structured, and Open-ended (Höst et al., 2006). In structured interviews, participants need to adhere to a strict list of predetermined questions. Open-ended interviews are instead constructed to give the interviewee greater freedom over the discussion by focusing on broad topics. Semi-structured interviews fall somewhere in the middle and allow for greater adaptability to how the interview unfolds in what order and which phrasing questions have. The authors opted for semi-structured interviews as it lends itself to the exploratory depth needed to fully answer the research questions, and because it allows for comparability of responses (Denscombe, 2010).

Different interview guides were developed for different groups of actors, such as farmers, retailers, intermediaries, and institutional actors. These guides combined:

- Predominantly qualitative open-ended questions,
- Selected quantitative elements, including some Likert-scale questions (1–7),
- And actor-specific questions tailored to the role of the interviewee in the food system.

As highlighted by Denscombe (2010), Likert scales are widely used in small-scale research to collect quantitative data. They allow re-

spondents to express varying levels of agreement or disagreement with specific statements, making it possible to systematically compare attitudes and perceptions. In this study, they were measured on a 1-7 scale. The interview guides are available in Appendix.

As seen in Table 2.2 below, a total of 20 interviews were conducted with key stakeholders in the food system, including producers, intermediaries, sellers, regulatory actors, market development actors, and institutional buyers.

Table 2.2: Overview of Interviews

Organisation	**Respondent**	**Date**	**Duration**	**Location**
Producers				
Farming Cooperative A	Cooperative Manager	2026-02-17	43 min	Pandeli
Farming Cooperative B*	Cooperative Secretary	2026-02-18	45 min	Quibang
Farming Cooperative C*	Unnamed Farmer	2026-02-25	34 min	Kathmandu Valley
Individual Farm A*	Unnamed Farmer	2026-02-27	39 min	Kathmandu Valley
Individual Farm B*	Unnamed Farmer	2026-02-27	41 min	Kathmandu Valley
Intermediaries				
Packaging Company A*	Manager	2026-02-25	40 min	Kathmandu Valley
Wholesaler Market A*	Market Representative	2026-02-25	36 min	Kathmandu Valley
Sellers				

Organisation	Respondent	Date	Duration	Location
Store A	Salesperson	2026-02-19	32 min	Pokhara
Store B*	Store Owner	2026-02-25	28 min	Kathmandu Valley
Store C*	Store Manager	2026-02-26	30 min	Kathmandu Valley
Store D*	Store Owner	2026-02-27	31 min	Kathmandu Valley
Store E	Store Owner	2026-03-18	42 min	Pokhara
Enabling and Regulatory Environment				
MoALD	Undersecretary	2026-03-26	66 min	Online
Market Development Actors				
FNCCI Agriculture Enterprise Center	Representative	2026-03-12	79 min	Kathmandu
FAO Nepal	Value Chain Specialist & Agricultural Economist	2026-03-13	77 min	Kathmandu
Asian Development Bank Nepal	ADB Officials	2026-03-23	75 min	Kathmandu
World Bank Group Nepal	Agriculture Team	2026-03-23	94 min	Kathmandu
Helvetas Nepal	Business Development Coordinator	2026-03-27	72 min	Online
Institutional Buyers				

Organisation	Respondent	Date	Duration	Location
World Food Programme Nepal	School Meals Programme Manager	2026-03-13	68 min	Kathmandu
BigMart	Purchasing Officer	2026-04-02	78 min	Kathmandu

* Interview conducted in Nepali

The semi-structured interviews were divided into two rounds. First, an exploratory round to map initial conditions, trends, problems, and opportunities within the food system. The second interview round was then conducted, informed by the learnings of the first round, to acquire a more representative and authoritative picture of the state of the food system. In both rounds, non-probability sampling techniques were employed, as the objective was not statistical representativeness but to gather relevant and information-rich perspectives in line with the research purpose (Denscombe, 2010).

The first round consisted of interviews with smaller stakeholders, including smallholder producers, intermediaries, and sellers. These interviewees were selected primarily through convenience sampling as statistical or probability sampling methods were not feasible in the context. In addition, snowball sampling was used to identify additional relevant participants through recommendations from initial interviewees or local contacts (Denscombe, 2010). This approach enabled efficient access to a broader network of actors and supported the identification of key themes, actors, and relationships that informed the subsequent stage of the study. The combination of convenience and snowball sampling in this phase was suitable given the exploratory nature of the research, where breadth of perspectives and rapid access to the field were prioritised.

The second round consisted of interviews with stakeholders that possessed aggregated knowledge of the Nepali food system. This included

regulatory actors, market development actors, and institutional buyers. In this phase, purposive sampling was applied, where the sample is hand-picked due to its relevance to the issue or the theory being investigated, or because the sample possesses privileged knowledge or experience about the relevant topic, to ensure that specific perspectives and forms of knowledge were included (Denscombe, 2010). Here, the actors were selected based on their ability to provide broader system-level insights, validate findings from the first round, and contribute more authoritative accounts of market structures and dynamics. Snowball sampling was also used in this phase to facilitate access to high-level actors who are otherwise difficult to reach. The use of purposive sampling in combination with snowball sampling allowed the study to balance depth with credibility, particularly in a context where time and resources limited the possibility of broader sampling strategies.

The general sampling approach reflects the broad scope of the study, which requires the inclusion and reconciliation of multiple perspectives across the food system. Non-probability sampling is therefore appropriate, as it enables the selection of participants based on relevance and knowledge rather than representativeness (Denscombe, 2010). Due to time and resource constraints, it was not feasible to obtain a statistically representative sample of all actors within the food system. Instead, purposive sampling was used to target actors with broader and more aggregated knowledge of different parts of the system, such as institutional stakeholders and market-level actors (Denscombe, 2010).

The core set of questions remained consistent across interviews within the same interview round but differed between the different interview rounds. The questions in the first round were closely tied to the individual actors' situations, while the interviews in the second round included questions tailored to the specific actor, and more general questions aimed gaining insights from a broader perspective of the food system. In line with the nature of semi-structured interviews, both rounds allowed for follow-up questions where necessary.

2.3.2.2 Observations

Due to the case study taking place in a real-world setting of the case, the opportunity for direct observations was great (Yin, 2018). These observations were informal in nature and carried out in many different contexts.

Several observations were made in connection with interviews, e.g., farming practices, customer behaviour, or food quality. Informal conversations with the interviewees and visual observations both contributed to interesting insights otherwise left out of the interviews. In addition, study visits to smaller stores, street vendors, and retail stores in key locations were made in conjunction with visits to larger wholesale markets. These visits included visual observations, photographic documentation, and informal discussions with wholesalers and personnel with a greater overview, e.g, Chief Information Officers.

Finally, many insightful observations were also made while travelling to and from field study sites, taking note of e.g. transport infrastructure conditions. Other observations were also made outside of study hours and in conversations with private citizens. Through these informal conversations, the writers could clarify the question marks of the interviews and test their hypotheses on the food system against locals with native experience of the food system and its actors.

2.4 Data Analysis

The data analysis in this study is qualitative in nature, reflecting the exploratory purpose of the research and the primarily qualitative character of the data collected. The analysis draws on interview transcripts, observational notes, and secondary sources, and follows an iterative process in which data collection and analysis proceeded in parallel rather than sequentially.

Interview data was analysed thematically. Responses were reviewed and coded against a set of themes derived from both the theoretical framework and the research questions, covering food system structure, market actors and flows, consumer demand and contextual variables

shaping market access. Codes were then grouped into clusters, allowing patterns, convergences, and tensions across interviewees and actor groups to be identified. Expert interviews formed the primary evidential base, while structured interviews with farmers, intermediaries, and retailers served a supporting role, illustrating the patterns that surfaced through the expert interviews, rather than acting as an independent analytical layer.

Throughout the process, findings were triangulated across data sources. Where interview data converged with secondary literature or observational evidence, confidence in the finding was strengthened. Where divergences appeared, these were noted and explored rather than resolved by defaulting to one source. As Denscombe (2010) notes, traceability is essential in qualitative analysis. All conclusions presented in this thesis can be traced to the data on which they are based.

2.5 Generative AI

Throughout the research process, *ChatGPT*, *Claude* and *NotebookLM* have been used in several ways. Initially, all models aided with brainstorming thesis ideas, refining research questions, and searching for relevant literature. They were also used to summarise large and sometimes complex packages of information, and helped in drafting and updating interview guides. Importantly, they were beneficial to write and debug the *LaTeX* code used for tables and document design in Overleaf. The tools have also been used in parts to improve the clarity and rhythm of written text, with the purpose of enhancing the reading experience and ensuring the usage of correct English language.

Additionally, the AI tool *Klang* was used to transcribe interview recordings. While written notes were also taken during the interviews, audio recordings acted as a backup to ensure a thorough and accurate account of the interviews. This was deemed especially important when there was a language barrier between the authors, translators, and interviewees, to avoid the risk of information being lost in translation and to improve the overall reliability of the data collection.

None of the aforementioned AI tools have been used for analysis, interpretation of findings, or drawing conclusions. All analytical reasoning, argumentation, and conclusions presented in this thesis are the authors' own.

2.6 Evaluation

The trustworthiness of the study is assessed through the criteria of validity, reliability, generalisability, and objectivity, as defined by (Denscombe, 2010). Although originally rooted in quantitative traditions, Denscombe (2010) argues that these concepts remain applicable to qualitative and case-based research, provided that they are interpreted in relation to context, purpose, and methodological constraints.

2.6.1 Validity

Validity concerns whether the study captures the phenomena it intends to investigate (Denscombe, 2010). In this study, validity is primarily assessed through the alignment between research questions, research design, and data collection methods, as well as through the triangulation of interviews, observations, and secondary data sources (Saunders et al., 2009; Denscombe, 2010).

2.6.2 Reliability

Reliability refers to the consistency and transparency of the research process (Denscombe, 2010). Given the exploratory and qualitative nature of the study, reliability is assessed primarily through the use of documented procedures, semi-structured interview guides, and transparent reporting of data collection and analysis (Denscombe, 2010).

2.6.3 Generalisability

Generalisability concerns the extent to which findings can inform understanding beyond the specific case studied (Denscombe, 2010). Following case study methodology, this study seeks analytical rather than statistical generalisation, where findings are linked to broader theoretical concepts and may provide insights relevant to similar contexts (Yin, 2018).

2.6.4 Objectivity

Objectivity refers to the extent to which findings reflect the phenomenon under study rather than the biases of the researchers (Denscombe, 2010). As complete objectivity is difficult to achieve in qualitative research, the study instead emphasises reflexivity, meaning the researcher's critical reflection of how their own background, assumptions, and position can influence the research process and interpretation of the findings (Denscombe, 2010), transparency, and the inclusion of multiple stakeholder perspectives to strengthen the credibility of interpretations (Saunders et al., 2009).

3 Theoretical Framework

This chapter presents the theoretical basis for the analysis. It begins by introducing systems thinking, food systems, and value chain theory, which provides the structural vocabulary for mapping how products, actors, and relationships are organised. This is followed by a discussion of transaction cost economics and its extension to LMIC contexts. The chapter then turns to market segmentation and adoption logic, drawing on segmentation theory, the Jobs to Be Done framework and diffusion of innovations theory to identify which market segments are viable and under which conditions new products spread through them. Finally, the chapter introduces the Interaction Model, which frames GTM strategy as a process of configuring and aligning relationships in a network of interdependent actors. Together, these theoretical building blocks form an integrated framework for analysing the conditions under which new food products can reach markets in LMIC contexts.

3.1 Food Systems and Value Chains

3.1.1 Systems Thinking

A system can be defined as "*an interconnected set of elements that is coherently organised in a way that achieves something*" (Meadows, 2009). This definition highlights that every system consists of three fundamental components: elements, interconnections, and a function or purpose (Arnold & Wade, 2015) . Elements represent the individual parts of the system, interconnections describe how these parts relate and interact, and the function reflects the overall outcome that the system is organised to produce (Meadows, 2009).

Systems are rarely isolated; instead, they are typically made up of

multiple subsystems that are embedded within a larger whole. These subsystems perform specific functions while contributing to the overall purpose of the broader system (Meadows, 2009). In this thesis, value chains will be viewed as subsystems within the broader food system, allowing for analysis at different levels while maintaining a coherent system perspective.

This thesis uses systems thinking as its analytical lens, focusing on how relationships between components shape outcomes rather than analysing parts in isolation. As Meadows (2009) argues, the behaviour of the system is mainly determined by the interactions between elements rather than by the elements themselves. Although systems thinking enables a holistic understanding of complex environments, it remains an abstract framework that does not specify the components of particular systems. Systems thinking therefore needs to be tailored to the specific system at hand. This leads to the concept of the food system.

3.1.2 Food Systems

A food system, as defined by the Food and Agriculture Organisation (FAO), encompasses "*the entire range of actors and their interlinked value-adding activities involved in the production, aggregation, processing, distribution, consumption and disposal of food products,*" as well as the wider economic, social, and natural environments in which these activities are embedded (FAO, 2018).

The complexity of the food system calls for a holistic mode of analysis in which outcomes are understood as the result of interconnected relationships and feedback effects, rather than as the product of isolated subsystems such as individual value chains or markets. Although approaches with a narrower scope can address specific constraints in depth, they often overlook how other parts of the system, such as infrastructure, market access, institutions, and consumption patterns, influence overall performance (FAO, 2018). In contrast, the FAO argues that a food systems approach enables the identification of interlinked root causes underlying system outcomes by explicitly considering these interactions FAO (2018).

The food systems approach proposed by the FAO has practical implications for how system performance is understood and addressed. In particular, it distinguishes between three interrelated perspectives: how to measure performance, how to analyse performance, and how to improve performance (FAO, 2018).

First, measuring performance requires a holistic assessment of economic, social, and environmental outcomes. The assessment should identify synergies and trade-offs, and ensure that improvements in one area do not undermine overall system performance (FAO, 2018).

Second, analysis of performance involves identifying the interlinked root causes of system outcomes. This requires a deep understanding of how the structure of the system affects stakeholder behaviour and, in turn, how this conduct leads to a general performance that alters the structure of the system over time. The FAO outlines three key steps in this analysis:

- The first is to analyse *linkages* within the system, and how the social and natural context interacts with the core system.

- The second is to analyse *governance mechanisms*, particularly the power relations and incentive structures that influence how actors behave and interact.

- The third is to identify *root causes* of underperformance and areas with the greatest potential for improvement, including *binding constraints* and *leverage points* that may not be immediately visible (FAO, 2018).

Third, improving performance within the FAO framework focuses on transforming the system itself. This includes changing behaviours by addressing structural factors that influence incentives and capacities, developing coordinated strategies across stakeholders, and facilitating feedback mechanisms that enable self-sustained improvements over time (FAO, 2018).

Even though the thesis is not centred on transforming systems, it includes four perspectives in the analysis: (1) identifying contextual variables and what synergies and trade-offs they lead to in the food

system; (2) identifying binding constraints and potential leverage points; (3) examining linkages between actors across product flow stages and their broader context; (4) analysing governance structures, including power relations and incentives. These dimensions are further considered across different stages of business maturity, as both constraints and opportunities evolve over time.

This provides a foundation for understanding how food flows are structured, how different actors interact, and where challenges and opportunities emerge, and relates most to RQ1 and RQ3. At the same time, the broad scope of the food system requires a more focused unit of analysis. This leads to the concept of value chains, introduced in the following section.

3.1.3 Value Chains

The value chain, shown in Figure 3.1, was introduced by Michael E. Porter in the 1980s and provides a way to decompose the steps between production and distribution into a sequence of value-adding activities that impact the competitive position of organisations. Porter (1985) distinguishes between primary activities such as outbound logistics and marketing and sales, and support activities such as infrastructure, technology development, and procurement. Moreover, he argues that support activities improve the effectiveness and efficiency of the primary activities. The company's ability to manage the linkages between all activities in its value chain is then reflected in the profit margin. Importantly, rather than treating value creation as a single outcome, Porter's concept makes it possible to identify where value is generated in the process, how activities are linked, and how different value chain designs affect overall performance.

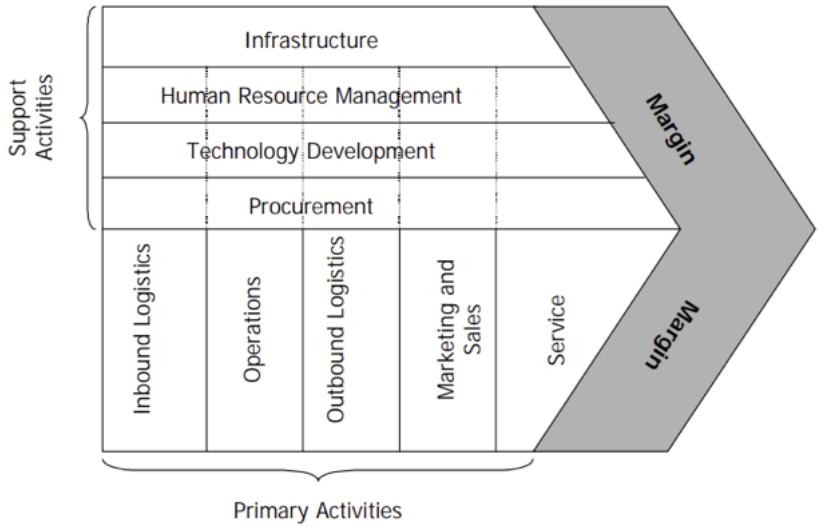


Figure 3.1: The value chain (Porter, 1985).

Building on this, Kaplinsky & Morris (2001) argue that the value chain concept has expanded beyond the individual firm to include multiple actors performing different functions along the chain. Indeed, it is rather unusual for a single company to perform everything from product design to delivery to the end-consumer by itself. Instead, organisations are often elements within a greater value system as shown in Figure 3.2. In this view, value chains are not only sequences of activities, but structures in which value can be distributed unevenly depending on how functions are organised and governed.

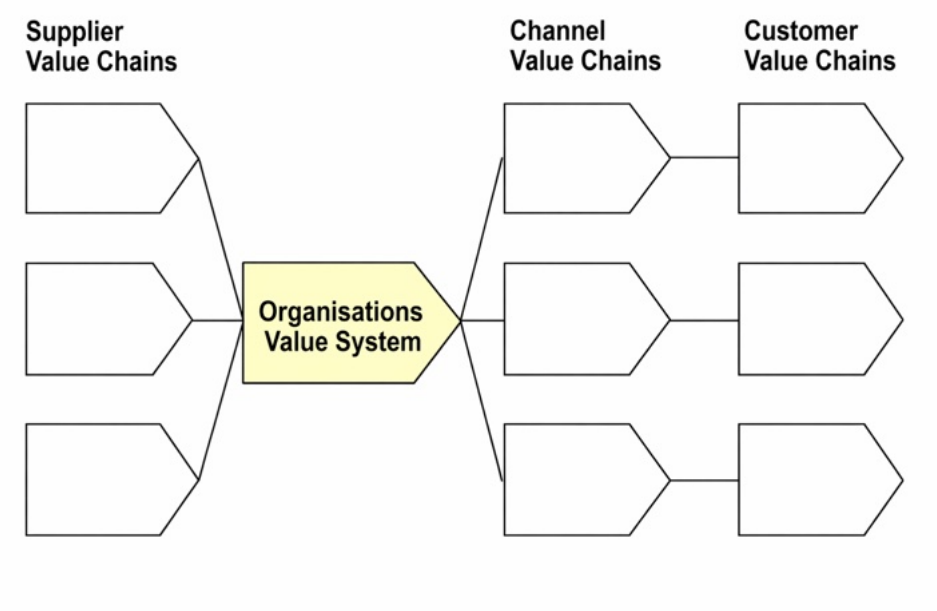


Figure 3.2: The value system (Kaplinsky & Morris, 2001).

In this study, a value chain approach for the food system is applied. The value chain is used as an analytical tool to map the flow of food products between actors and to identify functions performed at different stages. This allows for a structured examination of where value is created and captured, as well as how responsibilities are distributed across actors.

3.1.4 Agricultural Value Chains

Value chains are inherently affected by the industry and environment in which they operated. With this backdrop, the FAO has created a sustainable value chain framework for the food sector that depicts the core value chain, the extended value chain, and the enabling environment as interlinked layers (Figure 3.3).

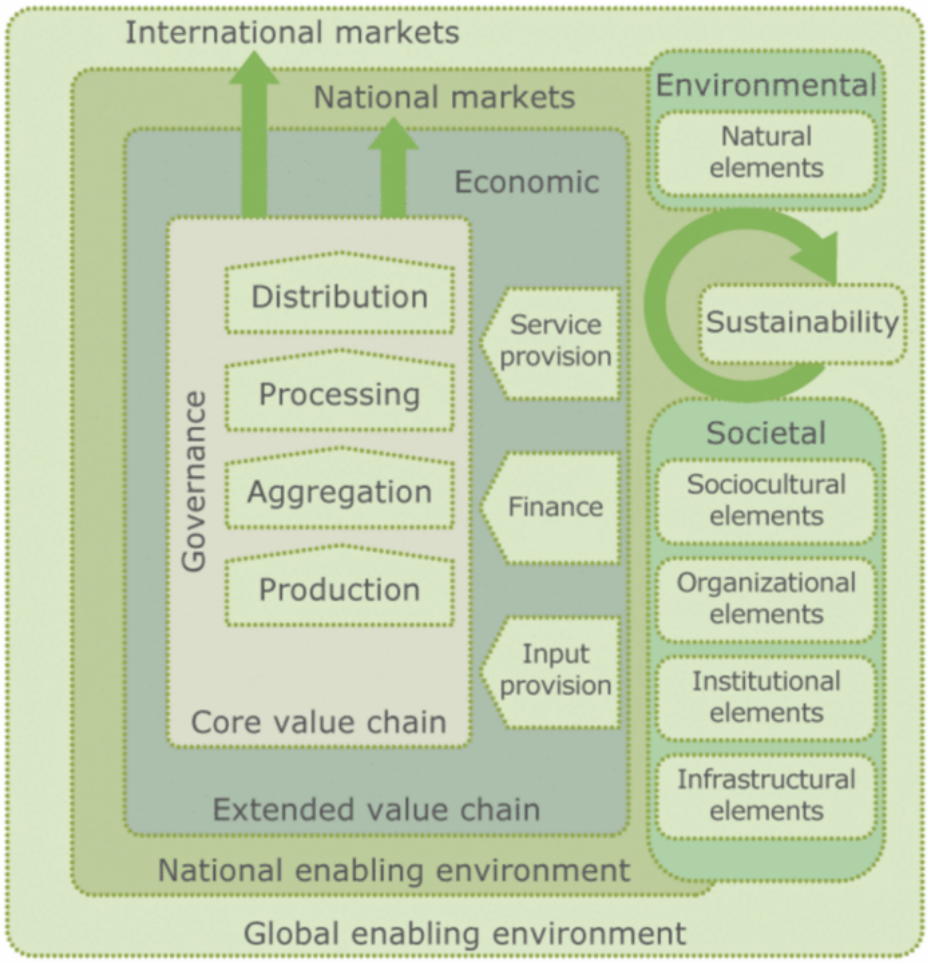


Figure 3.3: FAO's value chain framework based on systems thinking (FAO, 2014).

Agrifood value chains (AVCs) describe the sequence of actors and activities through which food moves from production to consumption, including the intermediaries that facilitate this flow. In LMIC contexts, these chains vary significantly in structure, scale, and level of development, which in turn shapes how value is created, distributed, and accessed between actors (Bernard & Giraud-Héraud, 2024). In this thesis, the AVC framework developed by Bernard & Giraud-Héraud (2024) is used to analyse how differences in value chain maturity,

structure, and functional organisation shape feasible market pathways and GTM strategies.

3.1.5 Functional levels of the Agrifood Value Chain

To operationalise this analysis, AVCs have been decomposed into seven functional levels by Bernard & Giraud-Héraud (2024):

- **Input markets**: Supply of production inputs such as seeds, fertilisers, and equipment. Although important for the value chain, this will not be included in the analytical framework in this thesis.
- **Production**: Producers can dispose of their produce by either consume it themselves; sell it directly to consumers; or sell it to an aggregator.
- **Aggregation**: Rural traders or primary cooperatives often purchase from farmers and sell to larger wholesalers.
- **Wholesaling**: Wholesalers purchase products from aggregators and distribute them to processors or retailers, depending on the level of transformation required before reaching consumers. In some cases, wholesalers also source products from outside the region or country, while in others, this function is performed by processors.
- **Processing**: Transformation into consumable or higher-value products that are sold to retailers.
- **Retailing**: Retailers interact directly with final consumers and range from large outlets, such as supermarkets, to small shops or market stalls. These may differ in formality depending on the context and in some cases, they also perform a final stage of product transformation.
- **Consumption**: End use by consumers.

The structure and organisation of these functional levels vary considerably depending on how developed the value chain is (Barrett et al., 2022). Understanding where a given AVC sits on this spectrum, and what that implies for coordination, intermediation, and market access, requires a framework for assessing chain maturity, which is introduced in the following section.

3.1.6 Stages of Transformation

Agricultural value chains can be characterised by their stage of transformation, reflecting increasing levels of market integration and institutional development. Barrett et al. (2022) distinguish between traditional, transitional, and modern AVCs along a set of structural parameters, as presented in Table 3.1. This framework is used in the analysis to categorise the stage of transformation of the food system in the case country.

Table 3.1: The three stages of transformation of AVCs (Barrett et al., 2022)

	Traditional AVC	**Transitional AVC**	**Modern AVC**
Retail	Home enterprise	SMEs, wet markets	Supermarkets
Food service	None (home cooking)	Street vendors, independent restaurants	Fast-food chains
Processing	None (home-processing)	SMEs such as small mills	Large processors and food manufacturers
Wholesale	Brokers based in rural villages	Wholesalers based in urban markets	Off-market distribution companies

	Traditional AVC	Transitional AVC	Modern AVC
Logistics	Own logistics by brokers	SMEs in third-party logistics (3PLs)	Large 3PL companies and freight forwarders
Supply chain length	Short, local	Long, rural–urban	Long, rural–urban, international
Exchange arrangements	No contracts, no standards	No contracts, public standards, some vertical integration	Emerging contracts, private standards, vertical integration
Technology	Labour-intensive	Labour-intensive	Capital-intensive
Foreign direct investment	None	Emerging	Significant

Traditional AVCs are characterised by short local chains with limited intermediation. Production is predominantly small-scale, and food is often consumed locally or traded through spot markets with minimal processing. In some cases, farmers sell directly to end-consumers, while in others transactions are mediated by local traders. In such settings, remoteness may result in a limited number of intermediaries, leading to a concentrated midstream segment where traders can exert market power and influence the prices received by producers and paid by consumers (Bernard & Giraud-Héraud, 2024). Coordination is largely dependent on informal mechanisms, and infrastructure constraints limit both geographic reach and product processing (Barrett et al.,

2022; Bernard & Giraud-Héraud, 2024).

Transitional AVCs emerge with increasing urbanisation and improved transport infrastructure. These chains become longer and more geographically dispersed which enables linkages between rural production areas with urban consumption centres. Multiple intermediary levels develop, including aggregation, wholesaling, and processing, leading to a rapid expansion of post-harvest activities. Coordination becomes more complex, with a mix of spot market transactions and emerging forms of vertical coordination, such as contracting (Barrett et al., 2022; Bernard & Giraud-Héraud, 2024).

Modern AVCs are characterised by consolidation and formalisation. Fewer but larger actors operate across the chain, often linked through contracts or vertical integration. Supply chains span national and international markets, supported by advanced logistics and processing capabilities. Product differentiation, private standards, and capital-intensive technologies become central, and value creation is increasingly concentrated in downstream segments such as processing, retail, and food services (Barrett et al., 2022; Bernard & Giraud-Héraud, 2024).

This progression reflects a shift from fragmented, local systems to coordinated, capital-intensive structures. Importantly, it does not imply a linear or uniform transition, as multiple stages may coexist within the same food system. Nevertheless, the categorisation provides a useful analytical framework for assessing value chain maturity and understanding how structural differences shape market opportunities. The structure and maturity of AVCs are closely linked to transaction costs: fragmented and informal chains are associated with high costs of searching, negotiating, and enforcing exchanges, while more developed chains reduce some of these costs through coordination mechanisms but introduce others related to standards, contracts, and compliance (Barrett et al., 2022). These dynamics are examined in the following section.

3.2 Transaction Cost Economics

The modern concept of transaction cost economics (TCE) was first developed by Oliver Williamson in 1989, offering a framework for understanding why economic actors organise exchange in the way they do. TCE puts focus on the individual transaction rather than treating the firm or the market as the unit of analysis. Williamson argues that while neoclassical economists assume frictionless exchange, friction is in itself inescapable. As such, understanding its sources and consequences is fundamental to acquiring a deeper understanding of how markets and organisations actually function (Williamson, 1989).

The central insight is that transaction costs are not uniform, they vary with the nature of the exchange. A key aspect is *asset specificity*, defined as the degree to which an investment loses value if redirected to an alternative use (Williamson, 1989). A farmer who builds a relationship with a specific buyer, or invests in equipment tailored to a particular product, cannot easily redeploy that investment elsewhere. Where asset specificity is low and alternatives are readily available, simple market transactions suffice. If one party defects, another can be found cheaply. Where specificity is high, parties become mutually dependent and more structured forms of coordination become necessary to manage that risk (Williamson, 1989). This creates a spectrum from pure spot-market exchange to full vertical integration, and where an actor lands on that spectrum is shaped by the transaction costs they face.

Figure 3.4: The market-hierarchy spectrum. Adapted from Williamson (1989).

3.2.1 Transaction Cost Economics and Market Access in LMIC Contexts

Williamson's framework was developed in and for contexts with functioning institutional infrastructure. Applying it to LMIC food systems therefore requires extending it to account for conditions it was not designed to address. Chamberlin & Jayne (2013) show that in smallholder agricultural markets in LMIC contexts, transaction costs do not only raise the price of exchange, they can also block it altogether. This shifts the question from which governance structure fits best to whether organised exchange is viable at all, and helps explain why coordination failures in fragmented food systems tend to persist even when actors recognise them.

A key extension concerns channel specificity. Chamberlin & Jayne (2013) show that transaction costs are not uniform in a given geographical area. Instead, they vary by product, by actor, and by marketing channel. This means that analysing market access requires looking at specific channels rather than making general claims about a market as a whole. In the context of food value chains in LMICs, it suggests, contrary to previous literature, that the fruitful questions should not be asked at the system level but rather in the specific linkages where coordination becomes difficult or breaks down (Chamberlin & Jayne, 2013). Identifying where those linkages break down, however, is only half the problem. The other half is knowing which ones are worth addressing and for whom. That requires a different set of tools that help distinguish between markets, map who is buying and why, and assess where demand is realistic rather than assumed.

3.3 Market Segmentation and Adoption Logic

A GTM strategy can be understood as a plan for *"reaching the right customers, in the right markets, through the right channels, with the right products and value proposition"* (Friedman, 2002). However, designing a GTM strategy first requires understanding both how

markets can be meaningfully segmented and how new products spread through them.

3.3.1 Market Segmentation and Targeting

Market segmentation as a theoretical concept and marketing strategy originates with Smith (1956), who argued that rather than trying to fit all customers into a single product offer, a firm may be better served by recognising that different groups of buyers have different needs, ultimately designing its approach around that difference. Smith further argued that precision in serving specific groups tends to outperform breadth.

Wedel & Kamakura (2000) build on this foundation by identifying six criteria that a viable market segment must satisfy:

1. It must be identifiable
2. It must be substantial enough to be worth targeting
3. It must be accessible through available distribution or communication channels
4. It must be stable over time
5. It must be responsive to differentiated marketing efforts
6. It must be actionable given the resources of the firm

These criteria matter not just as a checklist, but also as a filter as they separate segments that exist in theory from segments that can actually be reached (Wedel & Kamakura, 2000).

The practical application of segmentation is captured in the Segmentation-Targeting-Positioning (STP) framework developed by Kotler & Keller (2012). The framework structures the process in a sequential way: First, divide the market into distinct groups based on shared characteristics or needs, then select which groups represent viable targets, then lastly define a positioning that communicates why the product

is relevant to the target. The framework is widely used because it follows a logical flow and clear sequence of decisions. Its limitation, however, is that it assumes a market where consumer preferences are sufficiently articulated to be observed and that targeting can be done through channels that already exist (Kotler & Keller, 2012).

It is in this risk that the *Jobs to Be Done* (JTBD) framework developed by Christensen et al. (2016) becomes a useful complement. Rather than starting from the perspective of consumer characteristics, JTBD asks what a person is trying to do in a given situation and what they need to get there. Instead of asking who the customer is, the question becomes about what problem they need solved. In markets where stated preferences are unreliable and incomplete, and where product categories are unfamiliar, this reframing becomes particularly useful.

3.3.2 Innovation Diffusion and Adoption

The concept of diffusion of innovations, developed by Rogers (2003), describes how new products and practices spread through a population over time. At its centre, the model draws upon theories adopted from sociology, management, and communication theory, explaining how adoption is not simply a rational economic problem, but is also shaped by how information flows through networks, how individuals perceive and evaluate novelty, and by how the behaviour of early adopters influences those who follow. Rogers categorises adopters into five categories; *Innovators*, *Early Adopters*, *Early Majority*, *Late Majority*, and *Laggards*.

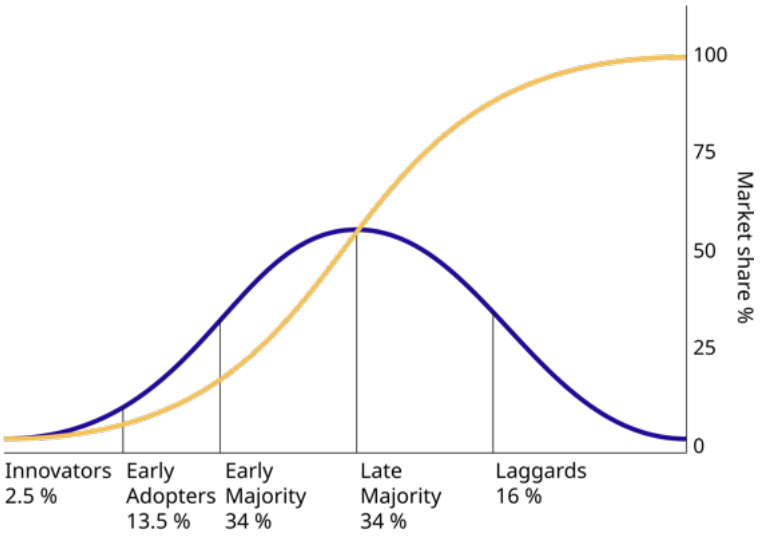


Figure 3.5: Diffusion of Innovations (Rogers, 1962).

As depicted in Figure 3.5, Rogers furthermore shows that the adoption rate follows an S-shaped curve, with slow initial uptake, a period of acceleration, and an eventual plateau. The gradient of that curve is shaped by five perceived attributes of the innovation itself:

1. **Relative Advantage** - Whether it offers a clear relative advantage over existing alternatives
2. **Compatibility** - Whether it is compatible with existing practices and values
3. **Complexity** - How complex it is to understand and use
4. **Trialability** - Whether it can be tried on a small scale before full commitment
5. **Observability** - Whether its benefits are visible to others

These attributes matter because they determine how much uncertainty a potential adopter faces. An innovation that is clearly better, easy

to try, and observable in use diffuses faster than one that requires behavioural change, significant investment or trust in benefits that cannot yet be seen (Rogers, 1962).

3.3.2.1 Diffusion in Low-Resource Agricultural Markets

Rogers' model was developed primarily in the context of high-income countries with high-tech markets and developed industries, where the main variables shaping adoption are the attributes of the innovation and the characteristics of individual adopters. In LMIC contexts, this picture becomes incomplete. Falck-Zepeda (2026) extends the diffusion framework into agricultural LMIC contexts and shows that adoption is also shaped by the enabling environment in which it takes place. This includes institutional factors such as access to credit services, governance factors such as regulations and policy support, and social factors such as networks, community norms, and trust. Where these enabling conditions are weak or absent, even innovations with a clear relative advantage can fail to diffuse, not because adopters are unwilling but because the infrastructure required does not exist yet.

This has one primary implications to the agricultural LMIC context, that adoption decisions in smallholder agricultural systems are rarely only individual. They are shaped by cooperative structures, by the relationship between producers and intermediaries, and by what Falck-Zepeda (2026) call the *innovation system*, i.e. the network of public and private actors whose coordination determines whether a technology reaches farmers at all.

For GTM strategy design, this means that segment selection cannot precede an assessment of whether the structural conditions for reaching that segment are in place. This constraint has direct implications for how market entry should and could be sequenced, something which the following section will address directly.

3.4 Network Organisation and Strategy

3.4.1 The Interaction Model

The Interaction Model, as depicted in Figure 3.6, was developed by the Industrial Marketing and Purchasing (IMP) Group and built on the observation that markets are not made up of passive buyers responding to sellers' offers. Instead, both buyers and sellers are active participants, each engaged in search, negotiation, and adaptation. Relationships between them are frequently long-term and close, involving a complex pattern of exchange at both organisation and individual levels (Håkansson, 1982; Ford, 1995).

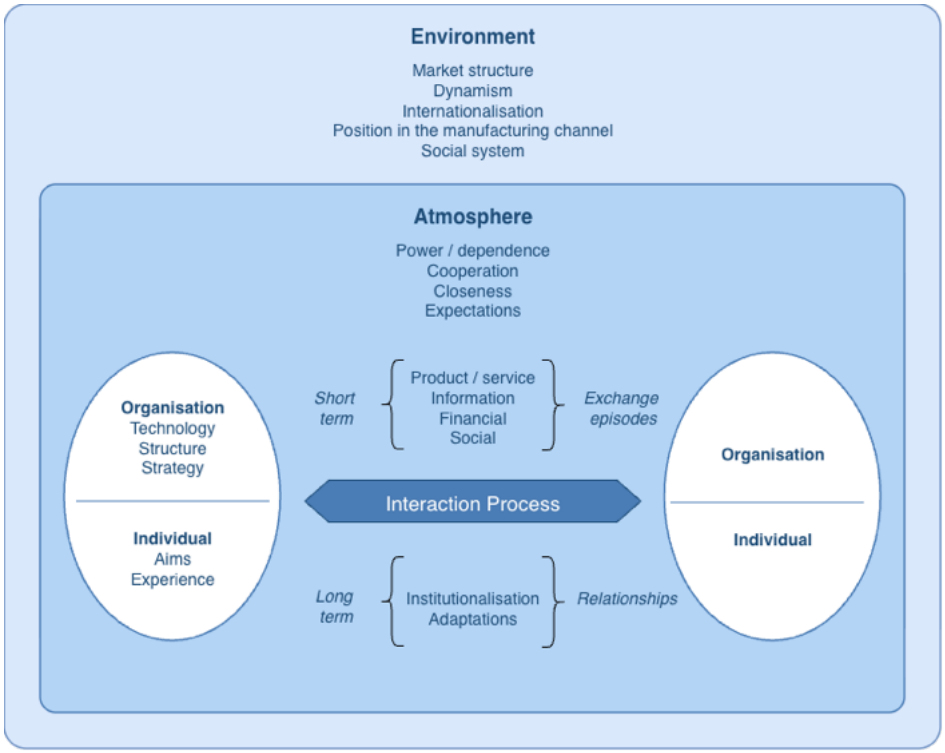


Figure 3.6: The Interaction Model. Adapted from Håkansson (1982).

At the centre of the model is the interaction process, which Håkansson (1982) analyses at two levels. In the short term, relationships consist of discrete exchange episodes involving four interconnected flows:

product or service exchange, information exchange, financial exchange and social exchange. Each of these flows shapes and is shaped by the others. Social exchange, in particular, plays a critical role in reducing uncertainty between parties, building the mutual trust on which longer-term commitments depend and maintaining the relationship in periods between transactions. Over time, repeated episodes give rise to longer-term relationship patterns, institutionalisation and adaptations, through which expectations become stabilised and roles become routine between parties.

This whole interaction process takes place within a broader *environment* characterised by market structure, dynamism (how prone something is to change over time), degree of internationalisation, position in the manufacturing channel, and the wider social system. Cutting across both the environment and the interaction process is what Håkansson terms the *atmosphere* - the relational climate shaped by power-dependence structures, levels of conflict or cooperation, the degree of closeness or distance between parties, and companies' mutual expectations. The atmosphere is, however, not simply a background condition. It also mediates how each exchange plays out and is itself continuously modified by the accumulation of episodes over time.

A key implication of the model is that markets are not static structures, but rather continuously constructed and reconstructed through interaction. This shifts the analytical focus from linear value chains to networks of relationships, where actors adapt to one another over time. As a consequence, value creation and exchange depend not only on the efficiency of product flows but equally on the alignment of informational, financial, and social dimensions across actors.

In the context of this thesis, the Interaction Model therefore serves as an analytical lens for understanding how GTM strategies must be designed around, and not merely imposed upon, existing patterns of interaction in the value chain. Rather than treating market entry as a firm-level decision about targeting and positioning, the model frames it as a question of how to configure and create alignment in a network of interactions between actors with varying degrees of trust, power, and access to information.

The model's main limitation within this context is that it was developed in industrial B2B settings with relatively formal and structured relationships. Applying it to loosely structured smallholder agricultural systems therefore requires extending it beyond its original industrial context, particularly to account for informal governance, fragmented networks, and significant power asymmetries between actors. Nevertheless, precisely because the Interaction Model puts focus on relational and structural dimensions that other frameworks tend to overlook, it offers a useful starting point for GTM strategy design.

3.5 GTM Strategy Composition

Having established the structural conditions under which a GTM strategy must be designed in an LMIC context, what remains is to define what one concretely consists of. According to Friedman (2002) a GTM strategy can be decomposed into five interdependent components:

1. **Target segment** – who the product is intended for, and why that group constitutes a viable market
2. **Value proposition** – what the product offers that existing alternatives do not, and why that difference matters to the segment
3. **Channel strategy** – through which actors and pathways the product reaches the end consumer
4. **Pricing model** – at what price point the product can be offered, given both production costs and segment willingness to pay
5. **Communication approach** – how awareness, trust, and demand are built within the target segment

Together, these five components constitute the GTM strategy in the context of this thesis.

3.6 Integrated Framework

The theory section has thus far shown how a food system can be explored, understood, and described within the LMIC context, how the potential of different consumers within can be assessed, and how to analyse flows and interactions between actors within their environment. In this section, the authors have integrated these theories into two frameworks that give a clearer picture of how the theories connect and how they will be applied together in the analysis.

3.6.1 Integrated Value Chain Model

When combining the concepts of TCE from Williamson (1989) with the stages of transformation of AVCs, clear relationships emerge between value chain maturity and governance structures. Traditional AVCs align more closely with the market end of the market–hierarchy spectrum, where transactions are dominated by spot markets. In contrast, modern AVCs exhibit characteristics closer to hierarchical governance, where vertical integration and formal coordination mechanisms become more prevalent. Transitional AVCs occupy a position somewhere in between these on the spectrum.

This alignment also implies that the nature of transaction costs varies across the stages of transformation. In traditional AVCs, transaction costs primarily arise in inter-firm exchanges, such as between farmers and buyers, where information asymmetries and intermediary dependencies prevail. In these contexts, managing relationships between actors becomes central to reducing transaction costs and increasing market power. In contrast, modern AVCs are more likely to experience intra-firm transaction costs that arise between functional interfaces in vertically integrated organisations, such as between production and marketing. Here, efficiency gains depend more on internal coordination and organisational design than on external relationship management. In practice, however, most AVCs exhibit hybrid characteristics, where both inter- and intra-firm transaction costs coexist.

Building on this, the thesis develops an integrated value chain model

that combines the value chain model of Porter (1985) with the Sustainable Food Value Chain framework proposed by FAO (2014), incorporating insights from TCE. In this model, Porter's primary activities are redefined as the core value chain functions (production, aggregation, processing, distribution, and retail), while elements of the extended value chain, such as input provision, finance, and service provision, are incorporated into support activities. In addition, the framework acknowledges the role of the enabling environment, and includes environmental, sociocultural, institutional, infrastructural, economic, and organisational elements as circumstances that affect AVCs in all stages of transformation.

Finally, these elements are synthesised into a broader conceptual model that provides an overview for the analysis rather than a step-by-step analytical procedure. The market-hierarchy spectrum is combined with the stages of transformation to illustrate how governance structures, transaction costs, and value chain maturity evolve together. The Integrated Value Chain Model (Figure 3.6.1) makes these relationships visible in a single view, and serves as a reference point for understanding how the component frameworks connect before each is applied individually in the analysis.

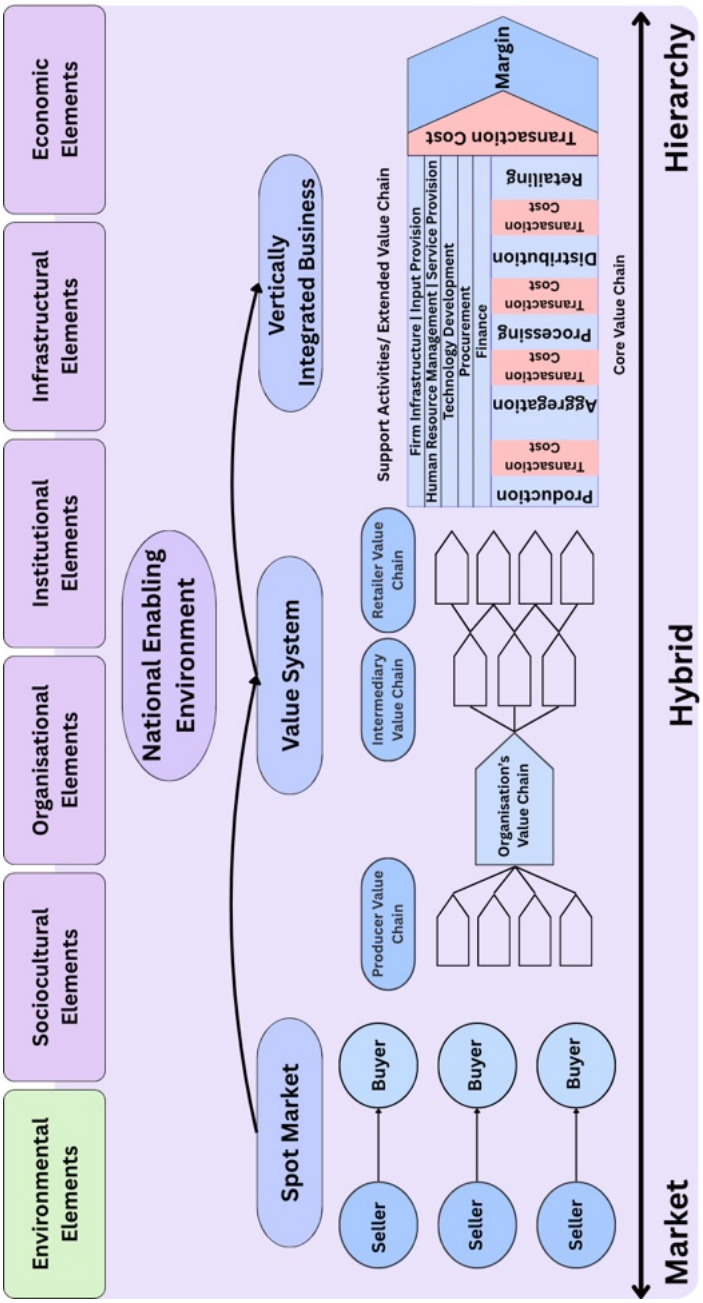


Figure 3.7: The Integrated Value Chain Model illustrates how value chain governance, structure, and transaction costs co-evolve across stages of transformation.

3.7 Integrated Market Entry Framework

The *Integrated Value Chain Framework* presented above establishes where the system sits structurally; how are actors organised, where does coordination break down, and what governance configurations are available given the transaction costs involved?

This provides the analytical foundation for the second integrated framework, but it does not yet answer the strategic questions that follow from it; which consumer groups are worth targeting within this system, do the conditions for reaching them actually exist, and how should a GTM strategy be designed given the relational dynamics at play?

The following section integrates these questions into a sequential framework that moves from segment identification through adoption feasibility to interaction design, as illustrated in Figure 3.8 below.

The first layer, *segment identification*, draws on STP, Wedel and Kamakura's viability criteria, and the JTBD framework to map which consumer groups exist in the market and whether they constitute viable targets.

The second layer, *adoption feasibility*, filters those candidates against structural reality. Rogers' diffusion framework and Falck-Zepeda's LMIC extension ask not only who might want the product, but who can realistically be reached given the conditions established by the value chain analysis.

The third layer, *interaction design*, asks how a GTM strategy must be configured to reach the segments that survive the first two filters. Drawing on the Interaction Model, the output is not a generic strategy but a set of segment-specific strategies structured around the five GTM components introduced in the preceding section.

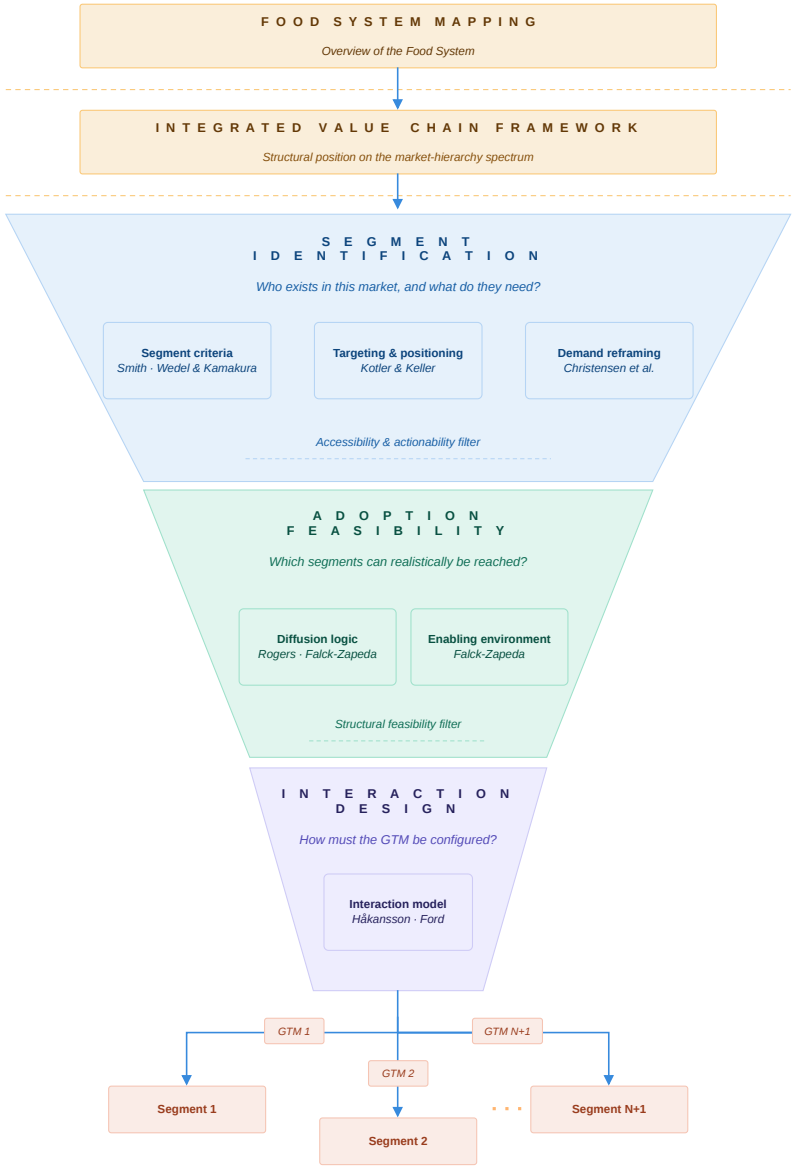


Figure 3.8: The Integrated Market Entry Framework.

3.8 Connecting Theory to Research Questions

The Integrated Value Chain Framework and the Integrated Market Entry Framework, presented in the two sections above, correspond directly to the three research questions that guide this study.

RQ1: How can food systems be mapped to inform GTM strategies in LMIC contexts?

Focus: Map the actors, flows, and structural conditions of the food value chain.

Applied Theory: Systems Thinking, (Agricultural) Value Chains, Stages of Transformation, Transaction Cost Economics

RQ2: Which market segments show the highest potential for dried food products in LMIC contexts?

Focus: Identify and evaluate candidate segments against structural feasibility.

Applied Theory: STP, JTBD, Diffusion of Innovations.

RQ3: How do contextual variables influence the design of GTM strategies for dried food products in LMIC contexts?

Focus: Examine how relational and structural conditions shape GTM strategy configuration.

Applied Theory: Interaction Model, Five GTM Components.

4 Background

This chapter provides a short contextual overview of the study. It begins by introducing Nepal's geography and climate, before tracing the country's modern political history and its effects on institutional development and modernisation. The chapter then describes the socioeconomic and agricultural conditions that characterise Nepal today. It subsequently introduces solar-drying as a food preservation method, comparing traditional open sun drying with improved solar-drying technologies. Finally, the chapter concludes by introducing the SolarFood project, describing the origins and learnings of its first phase and the market integration objectives of the current phase.

4.1 Country Context: Nepal

4.1.1 Brief Demographic Overview

Nepal is home to 29.6 million people, making it the world's 52nd largest country by population (World Population Review, 2024). Nearly 3 million people live in the Kathmandu Valley, most of whom (2 million) live in the city of Kathmandu (National Statistics Office Nepal, 2026). Pokhara, the second largest city, has a population of 572,000 people (World Population Review, 2026). Alongside outmigration abroad, Nepal has experienced significant internal rural-to-urban migration, with Kathmandu and Pokhara absorbing a growing share of the population (Bhattarai & Conway, 2021; National Statistics Office, 2024). Currently 67% live in urban areas (World Bank, 2026a). Of the urban population, approximately 50% belong to the fourth or fifth richest quintiles based on national per capita consumption. In rural areas, two thirds of the population instead belong to the poorest three quintiles.

Nepal has a rich and diverse cultural heritage, with more than 123 languages spoken as mother tongues (Sapkota, 2023; Gautam & Poudel, 2022). Although multiple religions coexist in the country, the majority of the population is Hindu (80%), while approximately nine percent are Buddhist and five percent are Muslim (Rose et al., 2026). Nepal is also widely recognised as the birthplace of Siddhartha Gautama (*Buddha*). The country is known for having one of the highest numbers of public holidays in the world, with 35 national holidays per year. Reflecting the country's religious coexistence, many Hindus celebrate Buddhist festivals, and vice versa. Among the largest national holidays are Dashain, Tihar, and Holi (Nepal Tourism Board, 2026).

Nepal's culture, natural landscapes, and religious significance attract tourists from around the world, and in 2024 more than 1.1 million tourists visited the country. Of these, 693,000 visited for holiday/pleasure, 175,000 for trekking and mountaineering, 166,000 for pilgrimage, and 112,000 for other reasons. Tourists usually reside in Kathmandu, Pokhara, or Chitwan during their travels, and the vast majority of trekkers stay in Kathmandu or Pokhara before trekking in Langtang, Annapurna, Manaslu, Mustang, or Sagarmāthā (Ministry of Culture, Tourism and Civil Aviation, 2024). According to World Bank Group (2019), Nepal has not capitalised on its tourist resources, and points to a lack of medium- and higher-end offerings in the tourism sector. It also mentions that wellness travelers spend upwards of 130% more than regular tourists.

4.1.2 Geography and Climate

Nepal is a landlocked country between China to the north and India to the south, situated in the mountainous Himalaya region. Featuring lowlands in the south, contrasted by some of the world's highest mountains in the north and connected by the valley-filled hill region, the elevation ranges from almost 60m to the top of Sagarmāthā (Mount Everest) at 8 848m (Adhikari, 2024).

Nepal spans one of the steepest elevation gradients on earth, rising from the flat Terai plains in the south to the high Himalayas in the north. This compressed geography produces different climatic zones:

Figure 4.1: Map of Nepal (GISGeography, 2025)

subtropical conditions in the Terai, a temperate climate across the mid-hills, and an alpine and arctic climate in the mountain region (Bhattarai & Conway, 2021).

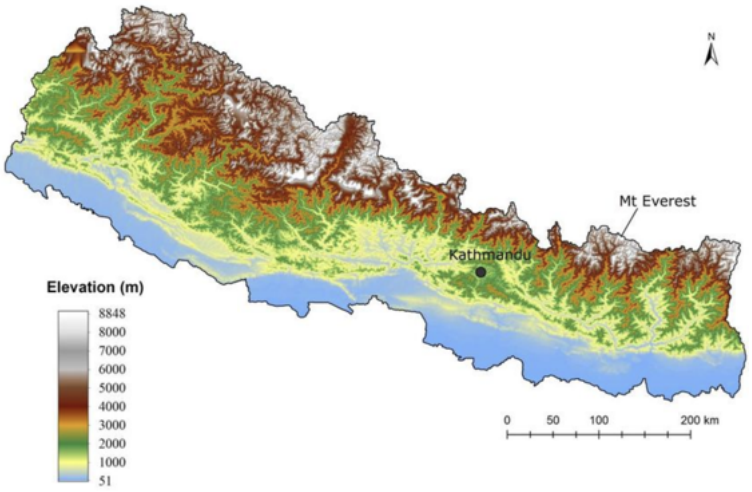


Figure 4.2: Elevation Map of Nepal (Sudhakar Reddy et al., 2018).

According to Karki et al. (2016), the country can be divided into five distinct climate types: tropical, arid, cold, polar, and mainly temperate. These are then further divided into sub-climate types that

focus on the winter and summer experiences, as seen in Figure 4.3. This creates variability in the country's climate and contributes to the unique nature of the country. Nepal further has three seasons: winter (from October to March), dry and hot summer (April to mid-June), and warm and rainy summer, known as monsoon season (from mid-June to September). Mean air temperatures during summer can range from below 0°C in the mountains to over 30°C in the Terai plains (World Bank, 2024a). This geographic variation affects when and where products can be supplied. For instance, Panday et al. (2025) describe how production conditions differ across regions, with the Terai suited for vegetable cultivation during cooler seasons, while higher-altitude regions can supply produce when lowland production declines due to heat or flooding.

Nepal is also, due to its unique mountainous topography and ecosystems, and variable monsoon-driven climate, highly exposed to natural disasters and climate shocks. It has been ranked as the second most vulnerable country in the world to mortality risks from hazards such as earthquakes, natural disasters, and disease outbreaks. Of course, these risks are further exacerbated by global climate change, placing additional strain on Nepal's modernisation efforts by repeatedly disrupting agricultural production, rural livelihoods, and the physical infrastructure on which food systems depend (Bhattarai & Conway, 2021; World Bank, 2022).

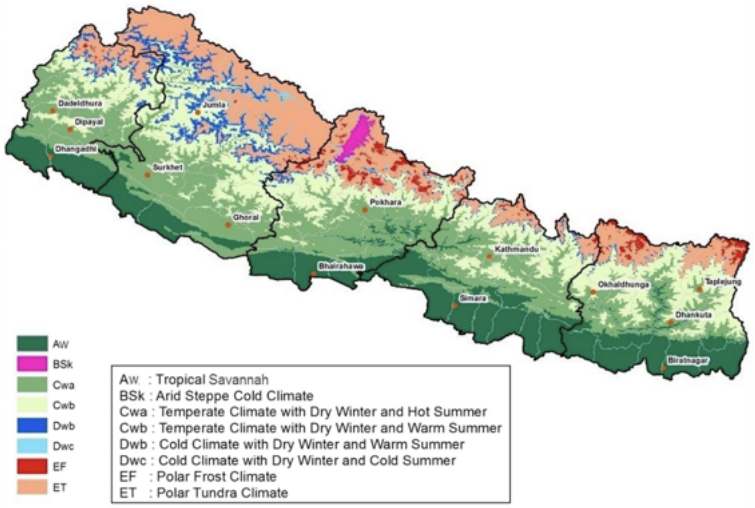


Figure 4.3: Climate Classification Map of Nepal (Karki et al., 2016).

4.1.3 Historical and Institutional Context

4.1.3.1 Brief Modern History

Nepal emerged as a nation state in the late 18th century when the Gorkha kingdom brought large parts of the Himalayan foothills under its control and the kingdom's *Shah dynasty* moved its court to Kathmandu. The Shah dynasty controlled Nepal until 1846 when the *Rana dynasty* overthrew the Shah's and seized the political power (Whelpton, 2005). The autocratic Rana was eventually removed by an alliance between the Shah monarchy and Indian-backed intellectuals in 1951. Following this, a parliamentary democracy was established (Whelpton, 2005; Sapkota, 2023).The democracy did not last long and in 1960, King Mahendra of Nepal centralised power to the royal palace and banned party politics and democracy. This lasted until 1990 when mass protests forced the return of a multi-party system and rule by elected governments. However, the patterns of previous years continued to return as the new system failed to provide a stable government. In 1996, the Communist Party of Nepal (Maoist) launched an insurgency against the monarchy, leading to a decade-long civil war that claimed over 17,000 lives and contributed to prolonged political

instability until the Second People's Movement in 2006 (Whelpton, 2005; Adhikari, 2024).

Following the Comprehensive Peace Agreement in 2006 and the end of the Maoist conflict, Nepal underwent nearly a decade of political instability and constitutional negotiations before a new constitution was officially adopted after the devastating earthquakes in 2015 (Sapkota, 2023; Adhikari, 2024). The constitution established Nepal as a secular federal republic with three tiers of government. The tiers consists of federal, provincial, and local governments, each with constitutionally defined responsibilities and authority to formulate laws, budgets, policies, and taxes within its jurisdiction (Constituent Assembly Secretariat, 2022). Since then, Nepal's political system has been characterised by a multi-party democracy and a coalition-based government (World Bank, 2024b).

However, the future of this system is yet to be decided after the 2025 Gen Z protests in Nepal that resulted in the death of 77 people and the subsequent resignation of Prime Minister (Sumina, 2025). On March 5th 2026, the centrist Rastriya Swatantra Party won the election with 66 % of the available parliamentary seats (Mueller & Solanki, 2026). The unprecedented victory puts the party in a strong position to push through substantial political reform and promote economic growth, and it remains to be seen which political direction the country takes moving forward(Mueller & Solanki, 2026).

4.2 Solar Drying as a Food Preservation Method

Drying is one of the oldest known preservation methods in agriculture, having been used to extend shelf life and prevent spoilage since the beginning of recorded history (Asif, 2024). The underlying principle is straightforward: by reducing the moisture content of a crop below the threshold at which microbial activity and enzymatic deterioration can occur, the product becomes shelf-stable for much longer (Otte et al., 2022). Usually when drying food, about 80% of the original weight is lost (Widowati et al., 2024). In Nepal, where post-harvest losses are

high (Aacharya et al., 2024; Otte et al., 2022), the potential of drying technologies is substantial.

The traditional and most widespread practice is open sun drying (Figure 4.4, in which produce is spread directly on the ground or on simple surfaces and left to dry under ambient conditions. While low-cost and accessible, open sun drying carries significant drawbacks. Drying times can extend to seven days or more for high-moisture crops, produce is exposed to dust, insects, and animal interference, and uneven drying frequently results in mould or partial spoilage during storage. Product discolouration and loss of nutritional value are additional documented concerns (Aacharya et al., 2024).

Improved solar dryers, drying cabinets that harness solar radiation in a controlled, enclosed environment, address most of these limitations. (Aacharya et al., 2024) They are categorised broadly as direct or indirect. Direct solar dryers expose the product to solar radiation within a transparent-covered cabinet, offering simplicity and low construction cost but risking uneven drying and some degradation of light-sensitive nutrients (Lundquist & Sonesson, 2024). Indirect solar dryers separate the collector from the drying chamber: a solar absorber heats incoming air, which is then channelled over the product without direct radiation exposure (Aacharya et al., 2024). This produces more consistent product quality and is particularly suited to fruits and vegetables with higher moisture content, though it requires greater technical complexity and cost (Lundquist & Sonesson, 2024; Aacharya et al., 2024).

Despite the evident potential of improved solar drying in the Nepali context, adoption among smallholder farmers has remained limited (Lundquist & Sonesson, 2024). Research conducted across three agroecological zones of Nepal identifies a lack of awareness as the primary reported barrier, alongside dissatisfaction with prevailing market conditions for dried products, limited access to government subsidies, and practical concerns about the weight, portability, and user-friendliness of current dryer designs (Lundquist & Sonesson, 2024).

4.3 The SolarFood Project

In the following subsections, the SolarFood project, which this research and thesis has been conducted in collaboration with, will be explained in detail. First, details on the previous iteration of the project will be presented, then leading into the current phase of the project, inaugurated in April of 2025 (Ruralis, 2025).

4.3.1 Origins, Objectives and Phase 1 Learnings

The first iteration of the SolarFood project started on the 1st of September 2021, with the aim of developing efficient and affordable solar dryers (Figure 4.4 that are locally produced and sourced while being socially accepted by smallholder farmers in Nepal and Bhutan (Otte et al., 2022).

Figure 4.4: The SolarFood Project has created improved solar dryers (right) to help smallholder farmers transition from the less efficient open sun drying (right).

As an initial step of the project, Ruralis conducted a need assessment in Nepal and Bhutan, carrying out a total of 80 interviews with the goal of identifying relevant crops for solar drying, map existing drying practices and provide insights and recommendations for further development of solar dryers (Otte et al., 2022). The need assessment identified four key problems with traditional solar drying practices;

low efficiency, unhygienic food handling, takes up a lot of space, and an alleged risk of significant vitamin loss in crops. Subsequent technical work produced several generations of an indirect-type solar dryer with an incorporated heat exchanger, tested at Kathmandu University Department of Mechanical Engineering in Nepal and Jigme Namgyel Engineering College in Bhutan (Aacharya et al., 2024). Social surveys conducted alongside this technical development in Mustang and Kavre districts pointed to market access and product demand as underexplored dimensions of adoption (Lundquist & Sonesson, 2024).

A dedicated study on adoption barriers and drivers across three agroecological zones of Nepal confirmed that the primary constraint was not technical unfamiliarity but a broader complex of market conditions, information gaps, and institutional failures in subsidy delivery (Lundquist & Sonesson, 2024). These findings have informed the next phase of the SolarFood project, moving beyond the technological development and putting an emphasis on social science, particularly the development of inclusive business models that use the solar drying technology (Ruralis, 2025).

4.3.2 SolarFood Phase 2 and Market Integration

As mentioned, the new version of SolarFood project started on the 3rd of April 2025, led by Ruralis and funded by the Research Council of Norway (NFR Forskerprosjekt). Collaboration partners include Lund University in Sweden, Jigme Namgyel Engineering College and Gedu College of Business Studies in Bhutan, and Kathmandu University in Nepal (Ruralis, 2025).

Where previous phases prioritised the development and optimisation of solar dryer technology, this phase reorients the project towards the social and economic conditions of adoption (Ruralis, 2025). The central objective is to develop and test inclusive business models that connect smallholder farmers, with particular emphasis on women-led agricultural cooperatives, to markets for solar-dried products (Ruralis, 2025).

This thesis contributes to a specific work package of the project, which

concerns market linkage and commercialisation. By mapping the food system for solar-dried products in Nepal, identifying viable market segments, and analysing the contextual variables that shape GTM strategy design, this study aims to provide strategic and structural insights on which the project's inclusive business model development can build and draw from.

5 Nepal's Food System

The following chapter builds on Chapter 4 and turns towards the food system itself. It examines the structural conditions shaping Nepal's food system, drawing on both international literature on AVC transformation in LMICs and context-specific studies on Nepal. It covers the value chain from producers through intermediaries to retail, the national enabling environment, and consumer demand and behaviour. The chapter provides the systemic foundation on which the empirical and analytical chapters build.

5.1 Value Chain

This section presents literature findings on the structure and functioning of Nepal's food value chains, tracing the key actors and flows from production to retail. As clarified in the limitations, food henceforth refers only to fruits, vegetables, and spices unless specified.

5.1.1 Producers

Nepal produces approximately 1.5 million tonnes of fruit and 4.7 million tonnes of vegetables annually (Statbase, 2024a; Statbase, 2024b), with seasonal production creating a supply-driven structure characterised by excess during harvest and near-zero supply in the off-season (Otte et al., 2022). The majority of production originates from smallholder farmers (Figure 5.1 operating on landholdings averaging 0.4 hectares (National Statistics Office, 2024). The producer types span from fully subsistence households to semi-commercial and fully commercial farmers, with the majority operating at subsistence or near-subsistence level. Commercial farming is concentrated in specific

locations in the Terai region and river basins where irrigation and road access are available, while hill and mountain production remains predominantly subsistence-oriented (FAO, EU and CIRAD, 2022). It is estimated that 25.1% of agricultural entities are commercialised (MoALD, 2015).

Figure 5.1: Photographs of urban smallholder farming plot in Lalitpur (left) and semi-rural smallholder farming plot outside Pokhara (right).

Post-harvest losses at the farm and collection level are significant, estimated between 20 to 44% for fruits and vegetables under normal conditions, reaching up to 50% in extreme cases (Otte et al., 2022). The loss accumulate at every stage of the value chain, with inappropriate packaging accounting for 52% of total losses and the absence of cold storage facilities responsible for a further 35% (Giri, 2023). These losses are driven by high moisture content in fresh produce, poor handling practices and storage facilities, and inadequate transport infrastructure. As a result, farmers are forced to sell their produce in the local market or to middlemen at a low price (Otte et al., 2022; Adhikari & Aarati, 2021). Research indeed shows that crop perishability significantly increases the market power of contractors over smallholders and that reducing perishability by 50% could increase farm profitability by 18% (Pokhrel & Thapa, 2007; Kopp & Mishra, 2022).

5.1.1.1 Productivity

The competitiveness of Nepal's agricultural sector has been constrained by low productivity, high production costs, and variable profitability

(MoALD, 2015). Compared to India, Nepal produces roughly half as much fruit and vegetables per hectare, with fruit productivity reaching 10.5 tonnes/ha and vegetable productivity 14 tonnes/ha in 2022 (Rokaya, 2023). However, productivity varies considerably between different crops and regions. In a case study by Shrestha (2016) on the production of Lapsi (an endemic hog plum) in the Bhaktapur district, productivity was estimated at only 0.9 tonnes/ha, with revenues corresponding to 98,000 NPR/ha.

Similarly, Rokaya (2023), in their value chain analysis along the Ratna Highway Corridor in western Nepal, identified substantial regional variation in yields between production zones. Along the Nepalgunj–Surkhet corridor, fruit yields averaged 4.9 tonnes/ha and vegetable yields 8.0 tonnes/ha, whereas the Ratna corridor recorded considerably higher outputs, with fruit yields reaching 8.8 tonnes/ha and vegetable yields 27.4 tonnes/ha. This suggests that productivity is highly dependent on local growing conditions, infrastructure, and market connectivity.

Large variations are also evident within individual crop categories. In a case study on ginger production, Chaudhary et al. (2023) found that yields in Palpa averaged 12.8 tonnes/ha, while production in Dadeldhura reached as high as 30.5 tonnes/ha. Similar disparities can be observed in the production of spices and cash crops. Drawing on examples from eastern Nepal, Holmelin (2021) reported that cardamom cultivation generated yields of approximately 0.133 tonnes/ha on plots averaging 0.30 ha, while simultaneously producing relatively high revenues per hectare. It was also noted that farmers sold dried cardamom at 900-1200 NPR/kg to middle-man traders. Chilli production was associated with even higher returns, estimated at around 250,000 NPR/ha (Holmelin, 2021).

Taken together, the literature indicates that productivity levels in Nepal vary considerably depending on the type of crop, region, and production system. Although the average productivity of fruits and vegetables is 10.5 tonnes/ha and 14 tonnes/ha respectively, the fruit production commonly ranges between approximately 1-10 tonnes/ha, vegetable production between 8-30 tonnes/ha, while spices such as cardamom generally produce substantially lower physical yields despite

often generating comparatively high economic returns per hectare.

5.1.2 Intermediaries

The intermediary layer between farm and retail is composed of several distinct actor types; a complex network of aggregators, processors, and distributors (Figure 5.2 who often exert significant market power. The aggregation layer includes local middlemen, collectors, brokers, road head-collectors, and rural procurement agents (Giri, 2023; WFP & FAO, 2007). Farmer-collectors (enterprising local farmers) are often preferred and viewed as more trustworthy due to established social ties (Pokhrel & Thapa, 2007). In the Kathmandu Valley, middlemen or brokers account for over 39% of the vegetable supply (Giri, 2023).

Figure 5.2: The aggregation and distribution function is performed by a range of actors, including informal roadside traders/road head collectors (left), bicycle traders (centre), and large distributors (right).

Profit margins in this layer have been reported to reach over 50% of the farm-gate price, reflecting the significant market power intermediaries have in relation to producers (Giri, 2023; Pokhrel & Thapa, 2007). These trends are also echoed by Kafle et al. (2022) who show that coordination failures and power imbalances at the aggregation and intermediary layers undermine the mechanisms through which market participation could generate greater incomes for smallholders. The processing layer remains underdeveloped relative to the production volumes. In a specific example of mandarins, only 1% of the supply is used for juice and marmalade, while most large-scale juice industries rely on imported concentrates (Pokhrel & Thapa, 2007).

Wholesale markets constitute the primary nodes through which significant volumes of produce are aggregated and redistributed before reaching retail, with Pun (2023) and WFP & FAO (2007) documenting *Kalimati Fruits and Vegetable Market* in Kathmandu as the central national wholesale hub (Figure 5.3. Importantly, the Kalimati Market has introduced a market pricing information system that presents the minimum, maximum, and average price of commodities and is updated daily. Few items are dried, but as an example, dry chilli averaged NPR 461 per kilo in 2023/2024 (Kalimati Fruit and Vegetable Market Development Committee, 2024). This information is disseminated through notice boards, Facebook, websites, and newspapers which thereby helps consolidate power dynamics between market actors by helping them monitor price fluctuation, increase transparency, and prevent exploitation of market power through usury that typically affects farmers and consumers negatively (Pun, 2023).

Figure 5.3: Fruit wholesaler at the Kalimati Market.

Logistics for fresh produce are dominated by pickup jeeps, which account for 87% of vegetable transport due to their speed and flexibility (Giri, 2023). For mountain produce, porters still carry goods in bamboo baskets to road-heads before vehicular transport, with the rough terrain isolating these regions from more developed infrastructure (Pokhrel & Thapa, 2007; Otte et al., 2022).

5.1.3 Retailers

The retail layer for fresh produce is diverse and largely decentralised, with retail channels including grocery stores, local retail stores (Figure 5.4, haat-bazaars (periodic rural/community markets), street hawkers (Figure 5.4 , door-to-door mobile vendors and modern supermarkets or online stores (FAO, EU and CIRAD, 2022). The retail infrastructure for fresh produce is often inadequate and traders commonly sell products directly on the ground in open street markets, increasing both post-harvest losses and sanitary risks (Giri, 2023). Despite the predominance of informal retail markets, more than 80% of household food consumption in Nepal is purchased rather than self-produced (FAO, EU and CIRAD, 2022).

Figure 5.4: A specialty spice retail store in Lakeside, Pokhara, (left) and an urban street hawker in Kathmandu (right).

5.2 Value Chain Maps & Market Pathways

Although there exists literature on value chain configurations in the Nepalese food system (Chaudhary et al., 2023; Kalimati Fruit and Vegetable Market Development Committee, 2024; Pun, 2023), few

studies have investigated the relative importance of the market pathways through quantitative flows between stakeholders. The lack of quantitative data in the food sector has been noted before (Thapa et al., 2019; MoALD, 2015), and hinders stakeholders in making informed decisions, thus increasing market uncertainty and risk associated with agricultural transformation (Holmelin, 2021). However, there are three notable exceptions to this rule. First, a study on the vegetable wholesale market in the Kathmandu Valley (Giri, 2023), second, a case study on the fruit and vegetable value chain along the Ratna highway in western Nepal (Rokaya, 2023), third, a case study on the lentils sector (Ghimire et al., 2026).

5.2.1 Value Chain Maps

Here, the authors present different portrayals ranging from value chain maps, more elaborative maps of the Nepali food system (containing sequenced value chain functions, actors, and the enabling environment), and maps that emphasise market pathways and quantitative flows.

The value chain for the Kalimati Market was mapped in the 2024 report from Kalimati Fruit and Vegetable Market Development Committee (2024), and essentially contains a simple flow chart based on actors. As Figure 5.5 shows, food arrives from a mix of upstream actors and passes through different types of downstream actors before end-consumption, indicating that different value chain configurations depend on the origin of the food and the consumer served.

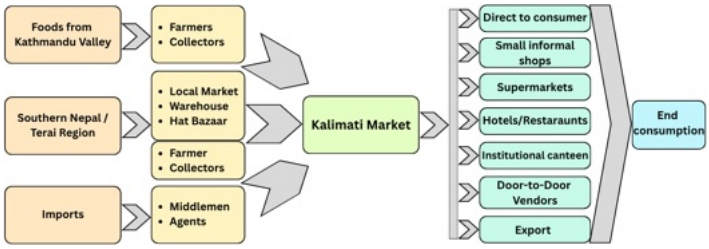


Figure 5.5: A visual representation of the Kalimati Market value chain, adapted from Kalimati Fruit and Vegetable Market Development Committee (2024).

Another study on the Kalimati Market by Pun (2023) structured the value chain differently, placing more emphasis on what different market pathways were prevalent (Figure 5.6). It presented examples on the shortest and longest market pathways, but it did not address how much food (or value) flowed through the different channels. The mentioned market pathways are presented below:

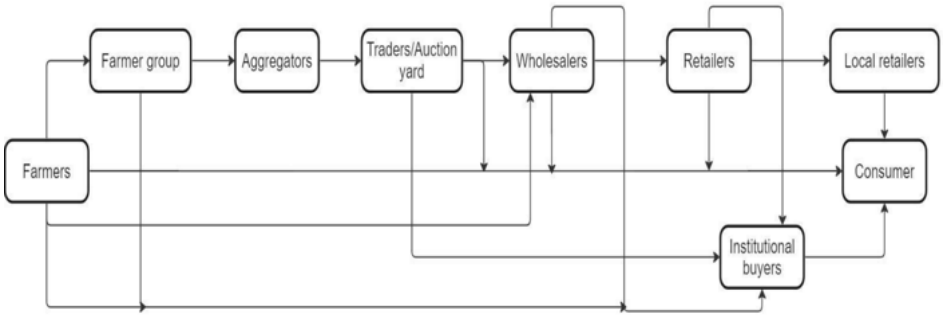


Figure 5.6: The Kalimati value chain from Pun (2023).

- **Shortest market pathway:** Farmers → Consumers
- **Longest market pathway:** Farmers → Farmer's group → Aggregators → Traders at Kalimati Action Yard → Wholesalers → Retailers (local) → Institutional Buyers → Consumers

Even though Pun (2023) did not provide information on the relative importance of the market pathways, the study by Giri (2023) provides some indications on how vegetables flow to wholesalers in the Kathmandu Valley. It found that wholesale suppliers predominantly source vegetables through intermediaries, with middlemen or brokers accounting for 39% of total supply. Direct sourcing from farmers also plays a significant role, with 22% coming from small-scale producers and 17% from medium-scale producers. In addition, 17% of wholesalers report sourcing vegetables through a combination of channels, including both intermediaries and direct farmer supply. Imports make up a relatively small share, contributing 4% of total supply. Overall, Giri's findings show wholesalers source vegetables through a mix of suppliers, including middlemen, small- and medium-scale farmers, and

through imports, but the very important quantifications were not present in the actual map (Giri, 2023).

Similarly, the ginger system map (Figure 5.7 from Chaudhary et al. (2023)) does not contain quantified flows nor alternative market pathways. Instead it presents the sequence of value chain functions, the flow of ginger between actors, and stakeholders within the enabling environment.

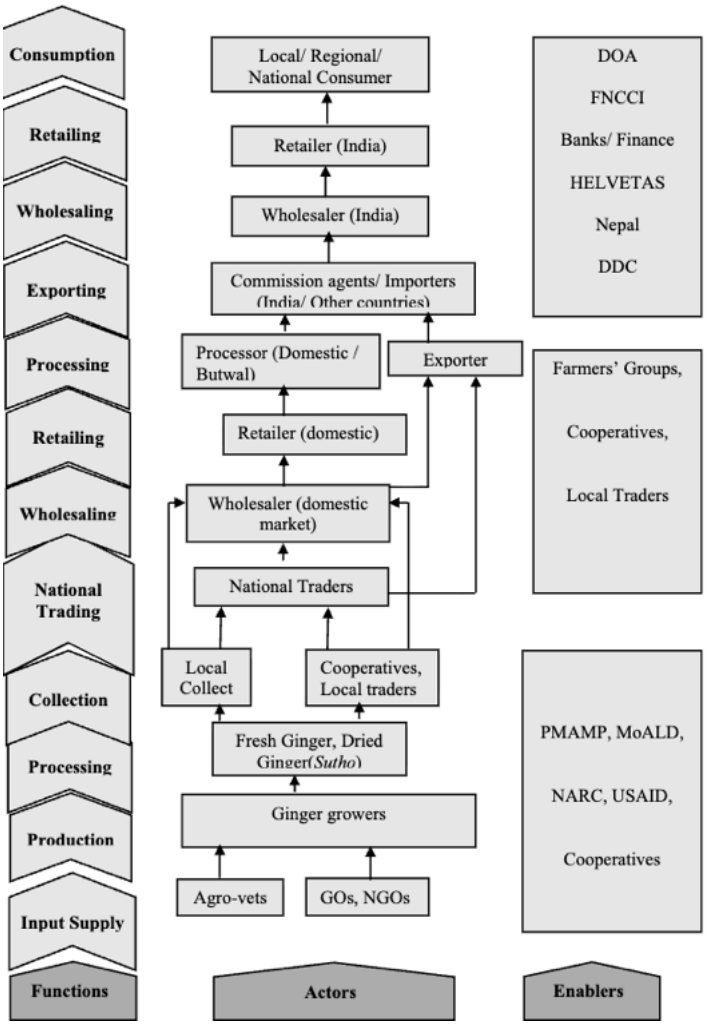


Figure 5.7: The value chain of ginger (Chaudhary et al., 2023).

In contrast, Figure 5.8 show the estimated share of produce flowing through each marketing channel at different stages of the supply chain (Rokaya, 2023).

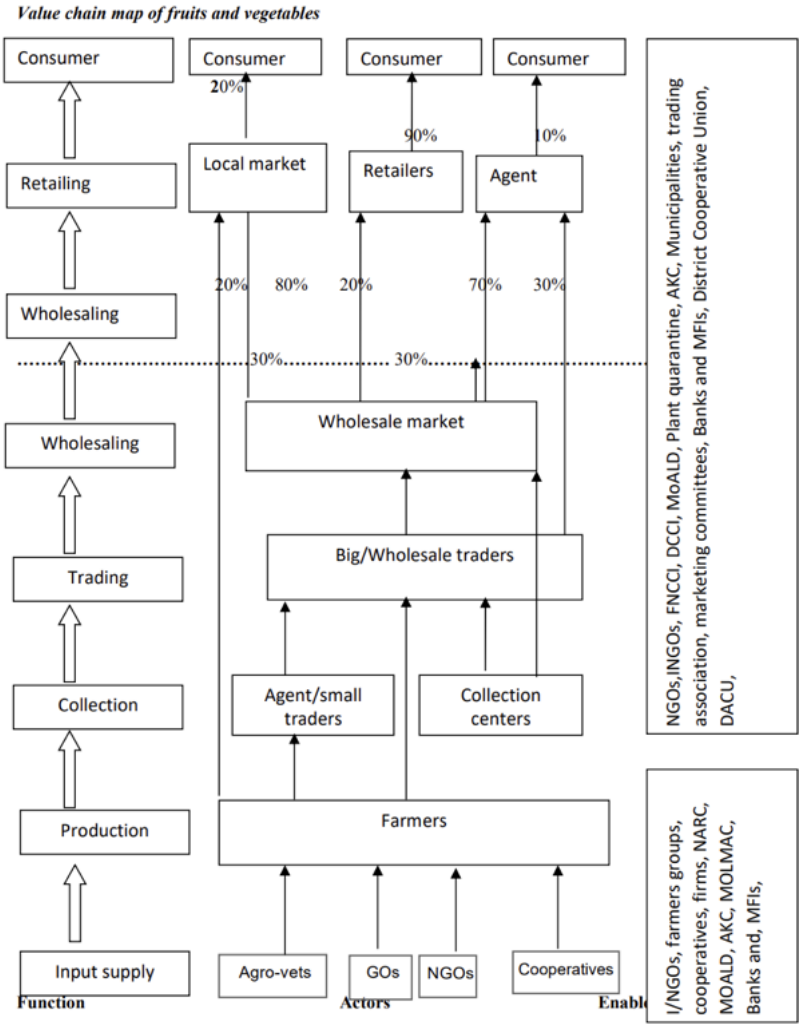


Figure 5.8: The value chain of fruits and vegetables along the Ratna highway (Rokaya, 2023).

Rokaya (2023) does provide some quantitative information, and found that the fruits and vegetables flows from suppliers to consumers in the following fashion:

- Suppliers send 20% to local markets/haat bazaars; 30% to agent traders/roadside traders; 30% to collection centers; 20% directly to wholesale markets.
- Agent traders and collection centres send to big traders and wholesalers.
- Big traders send 80% to wholesale markets; 20% to marketing agents.
- Wholesalers send 90% to retailers; 10% to marketing agents.

Finally, the most elaborative food system mapping is presented in Figure 5.9 Ghimire et al. (2026). The mapping provides more than a descriptive overview of value chain actors and functions. By combining actor relationships with quantitative flow data and stage-specific prices, the mapping enables analysis of both how lentils move through the system and how value increases between producer and consumer levels. It also incorporates elements from the whole food system as previously defined in Section 3.1.2.

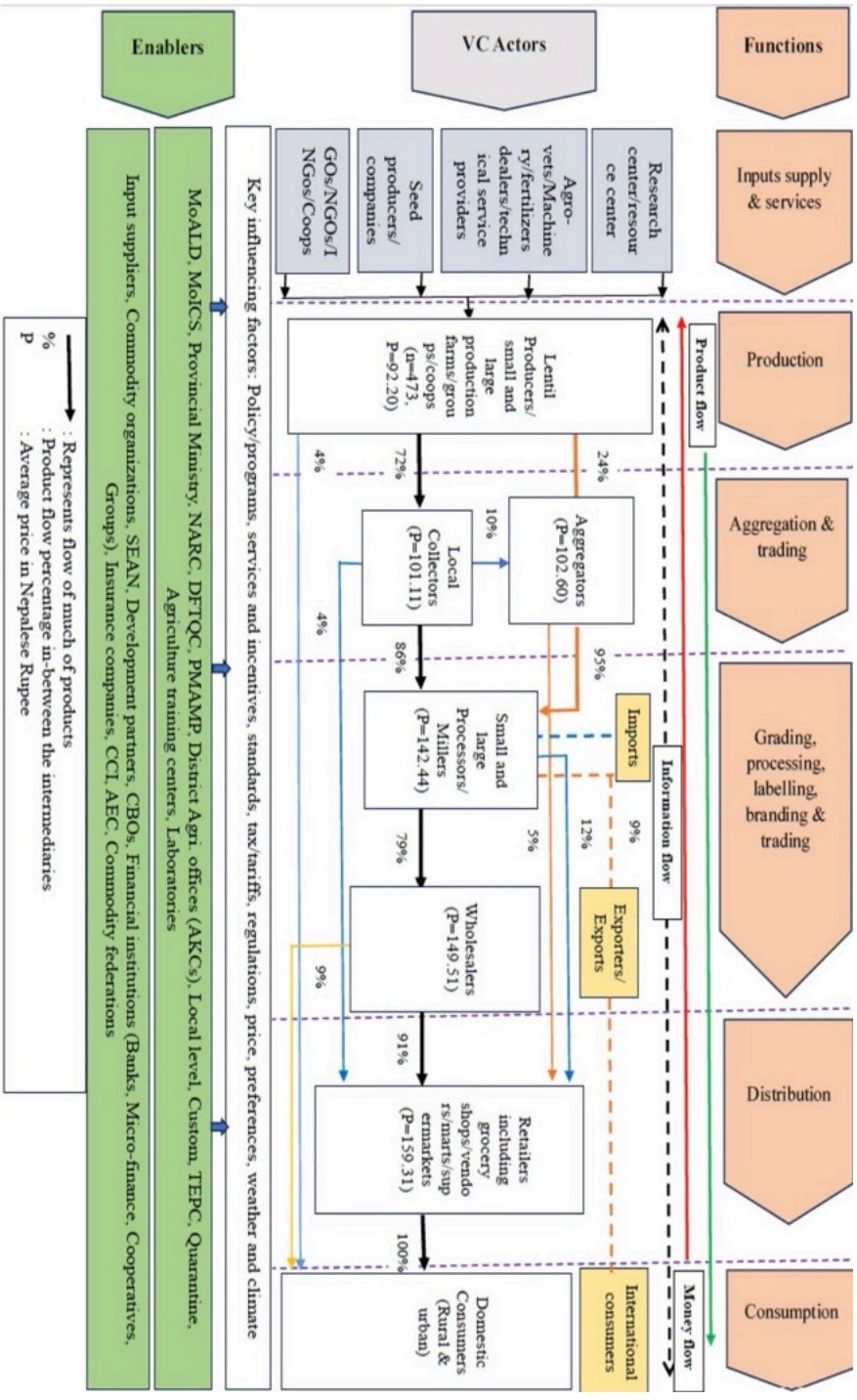


Figure 5.9: The food system concerning lentils (Ghimire et al., 2026).

The dominant market pathway of lentils in the study area in Ghimire et al. (2026) is presented below:

- **Dominant domestic pathway (≈45% of total flow):**
  Producer → Local collector → Processor/miller → Wholesaler → Retailer → Consumer.
  - Price change: 92 → 159 NPR/kg (+73%).

This mapping format therefore has clear implications for market strategies. First, the overwhelming majority of lentils pass through processing and milling stages before reaching consumers, indicating the central role of processors within the lentil system. Second, the largest increase in value occurs at the processing stage, where prices rise by approximately 38%, suggesting that processing represents the most significant value-adding activity in the chain. Finally, by integrating parts of the value chain, producers have the opportunity to increase prices and catch more of the value in the lentils sector.

5.2.1.1 Market pathways and implications on price

In Pun (2023), the price of one kg of radish increased more than 11 times from farmer to consumer: It cost 4 NPR at farm-gate, 8 NPR at auction yard, NPR 10-15 NPR at wholesale, 20-25 at Kalimati Market, and 45 at local retailers in Kathmandu. A similar price analysis was presented by Chaudhary et al. (2023). They identified two distinct ginger market pathways in Palpa, Nepal. Channel I represents a longer supply chain that involves collectors/local traders, wholesalers, and retailers before products reach consumers, whereas Channel II consists of a shorter pathway in which producers sell directly to retailers. The comparison below demonstrates that shorter marketing chains are associated with both lower consumer price increases and higher producer shares.

Channel I resulted in a 100% price increase between producer and consumer levels, compared to only 36% in Channel II. Producer shares simultaneously increased from 50% in Channel I to 73.33% in Channel

Table 5.1: Price development and producer shares across ginger marketing channels in Palpa, Nepal. The table was adapted from Chaudhary et al. (2023).

Metric	**Channel I Fresh**	**Channel I Dried**	**Channel II Fresh**	**Channel II Dried**
Producer sale price (NPR/kg)	40	250	55	500
Final consumer price (NPR/kg)	80	1200	75	1000
Total price increase	100%	380%	36%	100%
Producer share	50%	25%	73.3%	50%

II. Similar patterns were observed for dried ginger (Sutho), where prices increased by 380% in Channel I compared to 100% in Channel II, while producer shares increased from 25% to 50%. Additional intermediaries simultaneously increase final consumer prices and decrease the proportion retained by producers. It suggests that although farmers engage in value addition (drying), this does not necessarily translate into a higher share of profits; in some cases, returns are lower than for fresh produce. This points to a disparity in marketing capabilities along the value chain, where downstream actors appear more effective in capturing value (Chaudhary et al., 2023). Furthermore, the findings are consistent with earlier accounts indicating that longer value chains tend to decrease producers' share of profits (Panday et al., 2025; World Bank, 2022).

5.3 National Enabling Environment

5.3.1 Infrastructural Elements

Infrastructural conditions are widely recognised in the literature as a foundational determinant of how AVCs function in LMICs, particularly in shaping transaction costs, geographic integration, and the feasibility of commercialisation (Barrett et al., 2022). In LMIC contexts, inadequate infrastructure is consistently associated with high trade costs, fragmented markets, and significant price variations depending on location and season. As Barrett et al. (2022) demonstrate, weak transport systems and limited connectivity not only restrict market access and coordination between actors but also allow intermediaries to exercise disproportionate market power, particularly in remote regions. Infrastructural improvements, such as roads, bridges, and information and communication technologies (ICT), can reduce remoteness and are often identified as more influential for agricultural commercialisation than macroeconomic or trade policy interventions. Investments in cold storage further illustrate this transformative potential, as they stabilise seasonal supply, reduce post-harvest losses, and enable new coordination mechanisms, including the use of stored produce as collateral to alleviate credit constraints (Barrett et al., 2022).

In the case of Nepal, the literature points to a set of interrelated infrastructural constraints that shape the performance of agricultural value chains. The first constraint relates to the *road infrastructure* and the Nepali geography. Nepal's mountainous and landlocked topography significantly increases both transportation and production costs, thereby limiting competitiveness and integration into regional markets (Asian Development Bank, 2025). This geographic condition interacts with the inadequate transport infrastructure, where poorly connected rural areas and difficult terrain restrict access to markets, services, and resources (Figure 5.10). The uneven connectivity reinforces regional inequalities and limits the ability of producers to participate in higher-value market pathways (Sapkota, 2023). The economic implications are therefore substantial. Distribution costs alone typically account for 25-40% of the retail price of fresh vegetables, while marketing costs

Figure 5.10: The left photograph shows the damaged road between Kathmandu and Pokhara, and the right shows how the road between Kathmandu and Banepa deteriorates after rainfall.

more broadly represent roughly two-thirds of the final consumer price of food products, approximately half of which is linked to physical handling activities such as transport, storage, packaging, and loading. In the fresh vegetable sector specifically, assembly and distribution costs can become particularly severe, in some cases accounting for up to 80% of the final retail price (Giri, 2023).

A second infrastructural dimension concerns *irrigation and water infrastructure*. Agricultural production in Nepal remains heavily dependent on monsoon-fed irrigation, which contributes to seasonal variability and restricts productivity (Asian Development Bank, 2025). Limited access to reliable irrigation systems not only restricts the ability to intensify production but also reinforces the persistence of subsistence farming. More broadly, inadequate water infrastructure, including limited access to clean water and sanitation, continues to affect both agricultural practices and rural livelihoods (Sapkota, 2023).

A third set of constraints relates to *storage, logistics* and *market access*. Poor storage facilities and limited access to organised markets reduce farmers' ability to sell produce efficiently and increase vulnerability to post-harvest losses (Asian Development Bank, 2025). At the same time, underdeveloped logistical and trade facilities deter foreign direct investment and limit participation in more integrated value chains

(Asian Development Bank, 2025). This aligns with the larger evidence for LMICs, where inadequate infrastructure contributes to fragmented markets and limits opportunities for value chain modernisation (Barrett et al., 2022).

Energy infrastructure constitutes a fourth dimension. While access to electricity has expanded significantly, reaching approximately 96% of the population, the reliability of supply remains problematic due to underdeveloped transmission and distribution networks (Asian Development Bank, 2025). Unreliable energy supply increases operational risks for processing and manufacturing activities, which discourages investment in agro-processing and limits opportunities for value addition. Similarly, broader limitations in energy infrastructure continue to constrain industrial growth and the provision of essential services (Sapkota, 2023).

A fifth dimension relates to *ICT infrastructure*. While gaps in connectivity and digital literacy remain, Nepal has experienced rapid growth in digital infrastructure, internet access, mobile banking, QR payments, and digital financial services, creating new opportunities for market coordination and information exchange (Dawadi et al., 2026). The expanding digital ecosystem provides a foundation for digital market information systems, e-commerce solutions, and other platforms that can reduce information asymmetries and transaction costs across agricultural value chains. However, uneven adoption and persistent rural connectivity challenges still linger (Sapkota, 2023; Dawadi et al., 2026).

Finally, infrastructural conditions in Nepal are closely linked to environmental vulnerability. Climate-related hazards, including floods, landslides, earthquakes, and erratic rainfall, are exacerbated by the *lack of resilient infrastructure*, increasing risks across the value chain. Figure 5.10 depicts how even urban roads deteriorate after rainfall, thus affecting the connectivity between urban centres and rural populations. Notably, the country has the lowest road density in South Asia, with only 17% of the rural population having access to all-weather roads (Asian Development Bank, 2017). This creates persistent challenges for the reconstruction, maintenance, and expansion of the infrastructure (Asian Development Bank, 2025).

5.3.2 Institutional Elements

Barrett et al. (2022) conceptualised institutions as the formal and informal "rules of the game" that shape economic interactions, including policies, regulations, and governance arrangements. He notes that institutions define how exchange is coordinated, how quality is enforced, and how risks are distributed across AVC actors.

Barrett et al. (2022) argues that the transformation of the value chain is often characterised by a shift from informal quality institutions to formalised grading and quality standards, with private standards often exceeding public regulations. Although such standards can facilitate access to higher-value markets and incentivise technological upgrading, they may also exclude smallholders who lack the resources to comply. Similarly, contract farming is widely used as a coordination mechanism to address market failures related to inputs, credit, and demand, yet its effectiveness depends on the strength of the enforcing institutions. In contexts where formal enforcement is weak, Barrett et al. (2022) note that such arrangements remain vulnerable to opportunistic behaviour.

The literature identifies a number of institutional constraints that together shape AVCs in Nepal. A first key dimension concerns *state capacity* and *governance effectiveness*. Both Asian Development Bank (2025) and Panday et al. (2025) outline that the existing legal and regulatory frameworks, including those designed to support public–private partnerships (PPPs), have not delivered the expected outcomes due to limited institutional capacity in project procurement and implementation. This is further reflected in weak resource planning and management, where disconnects between development plans, investment projects, and budgets are combined with a chronic inability to utilise capital expenditure effectively. Asian Development Bank (2025) also points out the constraints at different levels of government, including limited fiscal space, insufficient human resources, and overlapping jurisdictions, all of which undermine the execution of responsibilities under Nepal's federal system.

A second institutional element relates to *political stability* and *policy continuity*. Sapkota (2023) argue that frequent changes in government have resulted in inconsistent policy implementation and poorly defined

roles between the three levels of government. For instance, since 1951, over 50 administrations have held office, and no prime minister has ever completed their whole term. This lack of continuity disrupts long-term planning and reduces the effectiveness of development initiatives. At the same time, institutional challenges are also embedded in the dynamics of the broader political economy, including corruption, weak governance systems, and limited transparency (Sapkota, 2023). These conditions have persisted despite efforts to decentralise governance and bring decision-making closer to local populations which suggests that institutional reform alone does not automatically translate into improved outcomes (Panday et al., 2025).

A third aspect concerns *regulatory quality* and *compliance with standards*. Although standards are theoretically positioned as mechanisms to facilitate market access, Asian Development Bank (2025) note that the absence of robust sanitary and phytosanitary standards in Nepal limits the ability of agribusinesses to access higher-value markets and integrate into global markets. This is further reinforced by Nepal's comparatively weak performance in compliance with trade-related standards, including safety, standardisation, and technical regulations. As a result, institutional limitations in regulatory systems reduces competitiveness against foreign actors, most notably India (World Bank, 2025).

In addition to formal institutions, *informal institutions* has surfaced as a significant element in shaping behaviour in the food system. Empirical evidence from Holmelin (2021) demonstrates that farmers can be aware of the economic benefits of policy-driven initiatives, such as shifting towards higher-value cash crops, yet remain reluctant to adopt them. This reluctance reflects the influence of norms, trust-based relationships, and socially embedded practices that govern decision-making in rural contexts. As such, institutional conditions in Nepal are characterised by a *dual structure*, where formal policies coexist with informal systems that often determine how economic interactions are actually conducted.

In sum, the literature on institutional elements points to a combination of constraints on governance capacity, political instability, regulatory limitations, and informal institutional norms.

5.3.3 Socio-Cultural Elements

Socio-cultural dynamics shape how actors interpret opportunities, manage risk, and engage with markets, particularly in contexts where formal institutions provide only partial guidance. In LMIC settings, Barrett et al. (2022) emphasises that economic exchange is often embedded within social relations, meaning that access to markets is not determined solely by prices or productivity, but also by trust, reputation, and network position. Social networks frequently act as gatekeeping mechanisms, determining who can participate in trade and under what conditions. This can concentrate market power among actors who are better connected, especially in activities requiring capital or scale. At the same time, structural shifts such as urbanisation and rising incomes are reshaping consumption patterns, as Barrett et al. (2022) show that demand is increasingly moving towards perishable and higher-value products, thereby extending value chains and changing the characteristics of labour, including increased participation of women.

In Nepal, these broader dynamics intersect with deeply embedded cultural and social structures. Drawing on Sapkota (2023), socio-cultural conditions can be understood through three closely related features: *the persistence of tradition*, *resistance to change*, and *enduring socio-economic inequalities*. Cultural norms often prioritise collective values, customs, and social obligations over egotistical economic pursuit, which can shape how agricultural practices are maintained or adapted. Resistance to new technologies or production methods is frequently linked to concerns about disrupting established social systems. At the same time, disparities between caste, ethnicity, gender, and geography contribute to unequal access to resources and opportunities, and limits the ability of certain groups to participate on equal terms in value chains. These inequalities are also reflected in patterns of access to land, finance, and mobility. As Asian Development Bank (2025) notes, marginalised groups, including Dalits, Muslims, and Tharus, continue to face structural barriers that restrict their economic participation. Such constraints are not isolated, but interact with other rural–urban divides such as access to education, healthcare, and services (Sapkota, 2023). In this sense, socio-cultural conditions shapes behaviour at the individual level and opportunities in the system.

Demographic changes add another layer of complexity. *Large-scale migration*, particularly among younger cohorts, has reduced the availability of labour in rural areas, contributing to both labour shortages and the abandonment of farmland (Asian Development Bank, 2025). While remittances provide important income streams, the associated outmigration also leads to a loss of skills and limits the diffusion of new technologies within the agricultural sector. This combination of labour scarcity and limited technical capacity constrains productivity and reinforces reliance on low-intensity production systems (Panday et al., 2025).

At the household level, these structural and cultural dynamics are reflected in decision-making patterns that do not always align with standard economic assumptions. Holmelin (2021) noted that farmers in Nepal seemed make a distinction between high use-value crops and high market-value crops. One example of this was that many farmers prioritised subsistence production even though higher-value alternatives were available. In monetary terms, a single plot of chilli can yield returns equivalent to six plots of millet, and one plot of cardamom corresponds to approximately four plots of rice. (Holmelin, 2021) says this reflects a "safety-first" orientation, where food security and reduced exposure to risk take precedence over maximising income.

The role of *social relations* is particularly evident in market access. Holmelin (2021) also shows that farmers attempting to engage in market-oriented production may struggle to sell their produce unless they are embedded in existing social networks.

The literature suggests that socio-cultural elements in Nepal operate through a combination of cultural norms, social hierarchies, demographic change, and relational mechanisms. These factors shape how actors respond to economic incentives, how risks are perceived and managed, and how access to markets is determined.

5.3.4 Economic Elements

Economic elements shape both the incentives for participation in agricultural value chains and the constraints that limit their development.

In Nepal, the literature consistently points to a dual dynamic with moderate macroeconomic growth and persistent structural weaknesses. As observed in Asian Development Bank (2025), the Nepali economy has demonstrated resilience over recent decades, with average annual growth of approximately 4.3% between FY1996 and FY2024. However, this growth has been accompanied by a shift away from agriculture towards services, largely bypassing industrial development, which limits the emergence of higher-productivity sectors.

Remittances have become a defining feature of Nepal's economy. Inflows of remittances amounting to 25% of Nepal's GDP are sent to 77% of households. While this alternative income stream has become a major driver of Nepal's growth through stimulated consumption, loan repayment, and poverty reduction, the large majority of remittance flows have not been directed to productive investment in agriculture (MoALD, 2015). Moreover, increased consumption has raised domestic prices and made them relatively more expensive to imports thereby reducing the competitiveness of Nepali products(Asian Development Bank, 2025; World Bank, 2022) .

These macro-level elements are reinforced by structural constraints within key sectors. Sapkota (2023) highlight that agriculture continues to account for 25% of GDP while the industrial sector remains underdeveloped at 13.5% of GDP. The coexistence of a large agricultural sector with weak industrialisation reflects a broader pattern of underdevelopment, where neither sector effectively drives sustained growth (Panday et al., 2025; World Bank, 2022).

The current Nepali labour market further illustrate these challenges. World Bank (2025) reports that approximately 80% of the Nepali agricultural workforce is employed in the informal sector, with more than half engaged in subsistence activities. Such employment is typically characterised by low productivity, limited job security, and restricted opportunities for skill development in LMICs (Barrett et al., 2022). The highly *informal agriculture sector* therefore constrains both economic growth and the development of more advanced value chains.

Market competitiveness is also shaped by external economic pressures.

As Panday et al. (2025) point out, heavily subsidised *agricultural products from India* dominate the Nepali market due to trade agreements that allow tariff-free access. Under these conditions, domestic producers cannot compete, particularly in staple and low-margin segments that demand low prices.

Access to finance represents a further constraint on value chain development. Asian Development Bank (2025) emphasises that limited access to formal financial services, especially in rural areas, restricts the ability of farmers and small enterprises to invest in inputs, technologies, and capabilities to expand their market. This is compounded by the fact that financial institutions often perceive agricultural activities as high-risk and require collateral that many smallholders are unable to provide (Panday et al., 2025). As a result, financial exclusion reinforces existing inequalities in value chain participation and limits the scaling of agricultural enterprises.

5.3.5 Organisational Elements

Organisational elements refer to the structures and arrangements through which value chain actors coordinate production, exchange, and distribution. Within AVCs, these include cooperatives, farmer groups, private firms, public agencies, and hybrid arrangements such as PPPs. Rather than operating independently, such organisational forms translate infrastructural access, institutional rules, and socio-cultural norms into concrete patterns of coordination.

In LMIC contexts, changes in organisational structures are often associated with broader transformations in food systems. Barrett et al. (2022) describe how the expansion of supermarket chains and food service actors has led to more centralised procurement systems, where sourcing becomes standardised and coordinated through fewer, larger buyers. This places new demands on suppliers, including consistency in quality, volume, and timing, which often requires greater aggregation and coordination at earlier stages of the value chain.

In Nepal, organisational arrangements are characterised by a mix of *formal and informal organisations*. *Cooperatives* represent one of the

most prominent formal organisational forms. According to Panday et al., 2025, Nepal has over 31,000 registered cooperatives involving approximately 7.3 million individuals. These organisations are expected to facilitate aggregation, improve access to markets, and strengthen bargaining power vis-à-vis buyers. However, their effectiveness is uneven. As Panday et al. (2025) note, many cooperatives face challenges related to weak governance structures, limited access to capital, and insufficient technical and managerial capacity. In addition, reliance on external funding often undermines their long-term financial sustainability.

Panday et al. (2025) highlight the potential of *contract farming and specialised commercial farming* systems, often implemented through cooperatives or PPPs, as mechanisms to transition from subsistence to more market-oriented production. Similarly, local-level organisational approaches, such as Palika-based (municipality) systems, emphasise coordinated production and storage, where local governments play a role in purchasing, warehousing, and redistributing agricultural products to stabilise prices and reduce dependence on intermediaries.

The role of public and hybrid organisations is further shaped by broader institutional and financial constraints. As observed in Asian Development Bank (2025), financial institutions have limited reach in rural areas, restricting access to credit for micro-, small-, and medium-sized enterprises (MSMEs) that form the backbone of AVCs in Nepal. In response, organisational innovations such as partnerships between development actors and financial intermediaries have been proposed to expand lending and support early-stage enterprises. At the same time, Asian Development Bank (2025) point to the growing role of *digitalisation in organisational coordination*, including the use of digital systems for revenue administration, public service delivery, market information systems, and procurement processes. Such developments have the potential to increase transparency and reduce transaction costs.

Despite the presence of formal organisational structures, informal coordination mechanisms remain highly influential. In many cases, production and exchange are organised through social networks and relational ties rather than formal contracts, reflecting the broader

socio-cultural context in which economic activity is embedded. This coexistence of formal and informal organisational forms suggests that value chain coordination in Nepal does not follow a linear trajectory towards modernisation but instead involves overlapping systems that operate simultaneously.

5.3.6 Environmental Elements

Section 4.1.2 showed that the natural environment not only influences agricultural value chains through exposure to climatic risks, but also by shaping production patterns and seasonal availability in different regions. In the context of Nepal, *agroecological diversity* creates both constraints and opportunities for value chain organisation. As noted by MoALD (2015), the country's varied altitude and climate zones enable the cultivation of a wide range of crops in different regions and seasons. Value chain actors may therefore operate across regions to match supply with periods of higher demand, linking geographically dispersed production zones through trade and distribution networks (MoALD, 2015).

At the same time, *environmental unpredictability* contribute to variability in production outcomes, which affects the reliability and consistency of supply. This has implications for value chain upgrading, as more formalised market channels, such as those requiring standardised volumes and consistent quality, depend on predictable production patterns Panday et al. (2025) and World Bank (2022). Environmental variability can therefore act as a constraint on participation in more coordinated or higher-value segments of the value chain.

Summarily, variations in climate and terrain influence input requirements, production costs, and the feasibility of mechanisation, while exposure to localised environmental conditions affects the comparative advantage of different regions.

5.4 Consumer Patterns and Market Demand

5.4.1 Evolving Consumer Patterns in Nepal

Recent research on South Asia has shown that overall urban food demand is projected to increase as urban population grows and average incomes rise (Bruin et al., 2021). Moreover, this also leads to shifts in what type of food is demanded, with a larger array of available products and places to buy and consume food. This includes processed fast-moving-consumer-goods (FMCG) like snacks, but also diverse and nutritious products for the people that can afford them. Evidence suggests that rising incomes in urban areas correlate strongly with shifted dietary preferences towards more animal products, fruits, and vegetables (Bruin et al., 2021). This pattern is apparent in Nepal as well, where rising urban purchasing power of this kind creates the conditions under which consumers begin to seek out higher-value and health-associated food products. (Bruin et al., 2021).

Khanal (2020), in a survey of consumers in Kathmandu and Bhaktapur, found that 91.5% of respondents expressed willingness to pay a premium for organic food products, with health consciousness, nutritional value, and food safety concerns as the dominant motivators. The study also observed that consumers with greater knowledge of the product had a stronger positive attitude towards premium pricing. Mishra et al. (2025) studying purchasing decisions in three urban centres in the Koshi province, confirmed health consciousness as the strongest predictor of organic food purchase intention, followed by environmental concern and product knowledge. Both studies, while small in nature, indicate that urban consumers with higher disposable income are willing to pay a premium for food products they associate with health, quality and safety.

Nonetheless, both studies also reveal an important caveat: consumer willingness to pay is conditional on awareness, and awareness cannot be assumed (Mishra et al., 2025). Insufficient information about product benefits is cited by Khanal (2020) as one of the primary

reasons consumers decline to purchase premium food products, even then they are in principle willing to pay more. Overall, understanding where this consumer base directs its spending requires looking at the structure of fruit and vegetable demand in Nepal more specifically.

5.4.2 Demand of Fruits and Vegetables in Nepal

The balance between domestic production and demand represents a growing challenge for Nepal's horticultural sector. National production reached approximately 1.5 million tonnes of fruit and 4.7 million tonnes of vegetables in 2022 (Statbase, 2024a; Statbase, 2024b). Despite this production base, projections suggest that domestic supply will be increasingly unable to keep pace with demand. According to FAO, EU and CIRAD (2022), domestic production is expected to satisfy only 59% of fruit demand and 65% of vegetable demand by 2035, implying a substantial and widening supply deficit. Evidence of this imbalance is already visible in wholesale market flows. Data from the Kalimati Market show that approximately 33% of commodities entering Nepal's largest wholesale market originate from India (Kalimati Fruit and Vegetable Market Development Committee, 2024). Together, these findings indicate a structural dependence on external supply, particularly for fruit and vegetables, which is expected to increase as consumption grows faster than domestic production.

Recent studies conducted under the leadership of the FAO provide detailed consumer-level insights on fruit and vegetable consumers. Table 5.2 below presents findings from three of their food system assessments, where the first offers a national-level perspective based on household survey data and stakeholder consultations (FAO, EU and CIRAD, 2022). In contrast, Raza et al. (2022a) and Raza et al. (2022b) focus on the urban food systems of Kathmandu and Pokhara, respectively. These latter studies are based on multi-actor surveys, including 450 Nepali consumers in each city, along with interviews with retailers, intermediaries, and producers. The authors want to note that the percentages reflect self-reported responses from samples of 450 consumers per city and indicate behavioural patterns rather than exact market shares.

Table 5.2: Comparison of fruit and vegetable consumption, market channels, consumer behaviour, and preferences in Nepal. Percentages refer to the share of surveyed consumers reporting a given behaviour or preference.

Dimension	**National (FAO, EU and CIRAD, 2022)**	**Kathmandu (Raza et al., 2022a)**	**Pokhara (Raza et al., 2022b)**
Consumption patterns	• Increasing F&V consumption • Still below nutritional needs • Vegetables: 12.4% of food expenditure • Strong income gradient	• Vegetables consumed daily: 99% • Fruits: 65% daily • Vitamin A-rich: 5-7% daily	• Vegetables: 92% daily • Fruits: 51% daily • Vitamin A-rich: 1-4% • Lower nutrient intake
Market channels	• Wet markets • Traders/ intermediaries • Small retailers • Fragmented supply chains • Increasing imports • Limited modern retail	• Small local shops: 99% • Wet markets prevalent • Street vendors prevalent • Proximity-based access • Decentralised system	• Small shops: 99.3% • Wet markets • Mobile vendors: 68.9% • Retailers source from wholesalers • Diverse last-mile channels

Dimension	National (FAO, EU and CIRAD, 2022)	Kathmandu (Raza et al., 2022a)	Pokhara (Raza et al., 2022b)
Consumer behaviour	• >80% of food purchased at retailer • Price-sensitive consumption • Income-constrained demand • Increasing market dependence	• Frequent, low-volume purchases • Price-driven decisions • Proximity is critical • Women buy the food • Need-based buying behaviour	• Frequent, low-volume purchases • Price important: 80% • Credit also: 76% • Reliance on small shops/vendors
Consumer preferences	• Demand for dietary diversity • Increasing F&V demand • Constrained by price/availability	• Low prices • Proximity to home • Small quantity purchasing • Food safety and trust • Preference for fresh produce • Convenience dominates	• Competitive prices: 80% • Credit access: 76% • Friendly service: 79% • Quality signals: 76% • Bargaining • Preference for fresh produce

As presented in Table 5.2, vegetable consumption is widespread and forms a daily staple, while fruit consumption is lower and more selective. At the same time, the very low intake of vitamin A-rich produce in both cities points to persistent nutritional gaps despite relatively high

overall vegetable consumption.

Market access is almost entirely mediated through informal, proximity-based retail channels. Small local shops, wet markets, and mobile vendors dominate in both cities, and fruits and vegetables are overwhelmingly purchased rather than self-produced. This reinforces the importance of last-mile distribution and limits the role of more formal retail structures.

Consumer behaviour is characterised by frequent, low-volume purchases and strong price sensitivity. For example, the median expenditure on fruits and vegetables per purchase occasion is approximately NPR 300 ($2) (Raza et al., 2022a; Raza et al., 2022b), indicating limited purchasing power and few bulk purchases. Purchasing decisions are largely driven by immediate needs, physical access, and available liquidity. Consumer preferences are shaped primarily by affordability, convenience, and trust in vendors, and there is a clear preference for fresh produce in both cities.

Overall, these patterns suggest that fruit and vegetable demand in urban Nepal is structurally constrained by market organisation, purchasing power, and retail accessibility, rather than driven primarily by nutritional considerations or product differentiation.

5.4.3 Dried Fruits, Vegetables and Spices

Against this backdrop, it becomes important, especially for the purpose of this thesis, to examine consumer dynamics for other forms of fruits, vegetables and spices such as dried products.

The literature on dried food as a consumer category in Nepal and comparable LMIC contexts is limited. The closest available evidence comes a previous SolarFood project. Lundquist & Sonesson (2024), in a master's thesis examining barriers and drivers for the adoption of solar dryers in three districts of Nepal, documented that dissatisfaction with market conditions for dried products was a recurring finding among farmers. While the literature allegedly often attributes this to limited market access, the authors found that it mainly stemmed from low demand for the products. In districts with availability of fresh produce

all year round, such as Chitwan or Kavre, farmers reported that dried products were perceived to lack commercial viability and would primarily be used for self-consumption. The demand was notably higher in remote mountain districts such as Manang, where lean seasons and the tourists' interest in local snack products created more favourable conditions (Lundquist & Sonesson, 2024). Andreasson & Lundevaller (2025), in a master's thesis examining barriers and drivers for the adoption of solar dryers in Bhutan, rather than Nepal, found a similar pattern of preference for fresh produce and farmer uncertainty about whether a sustainable commercial market for dried goods could be established at all. Both Lundquist & Sonesson (2024) and Andreasson & Lundevaller (2025) emphasise the need for broader studies on market possibilities, consumer preferences, and market trends for dried products.

6 The Industry and Its Actors

This chapter examines Nepal's food system from the perspective of its actors. Drawing on semi-structured interviews with producers, cooperatives, traders, retailers, development actors, and public institutions, it covers how the food value chain, market channels, consumer demand, and regulatory environment function in practice.

6.1 Perspectives of the Food Value Chain

This section examines how actors across the industry describe the structure and functioning of Nepal's food value chain, and provides context for the more actor-specific findings that follow in later sections.

6.1.1 Fragmented Production and Coordination Challenges

6.1.1.1 Smallholder Fragmentation Limits Market Coordination

Nepal's food value chain is, by the account of nearly every institutional actor interviewed for this study, deeply fragmented and poorly coordinated. Its basic structure is straightforward: smallholder farmers produce and harvest, regional collectors and traders buy at or near the farm gate, produce flows into wholesale markets and from there reaches small retailers, street vendors, hotels, restaurants, cafés, or in a small but increasing minority of the cases, modern supermarket chains. This structure has not been designed as much as accumulated over decades, shaped by geography, low levels of formal regulation, and the weight of existing trade dynamics.

The clearest quantitative picture of how volume distributes across these channels came from MoALD's Undersecretary. By his estimate, less than five percent of traded produce moves directly from producer to consumer. Around 20% is sourced directly from producers by retailers. The remaining 70-75% passes through traders and middlemen operating in and around the wholesale market system. He was careful to frame these as rough figures rather than measured data, as Nepal, according to him, does not have a systematic registration of all intermediary actors, meaning that precise channel shares are difficult to calculate. BigMart's Purchasing Officer echoed this absence of reliable market data from the retail end:

> *"Nepal is not a very data-driven country, so it's very hard to get data from the market. So whenever we have negotiations with suppliers, even they will not have data-orientation. So we basically follow our intuition and customer feedback."*
>
> — BigMart Purchasing Officer

Even as the operator of 150 stores across Kathmandu Valley, Pokhara and Chitwan, BigMart sources approximately 90% of its domestic fresh produce through wholesale intermediaries, with only ten percent procured directly from farmers. The Purchasing Officer described this as a practical constraint rather than a preference: the fragmentation of production across thousands of smallholder farmers makes direct sourcing logistically and commercially unviable at current store volumes. He estimated that setting up a system for direct farm procurement at scale would only become realistic at four to five hundred stores, roughly three times the company's current total.

Turning to the production end of the chain, the picture that emerges across the interviews is one of small scale. Smallholder farmers operate on landholdings that FAO Nepal's Value Chain Specialist, and Agricultural Economist, described as averaging below 0.5 ha, with MoALD's Undersecretary noting that land fragmentation and scattered production are among the most consequential bottlenecks in the system. He continued by explaining how this scale of production creates a fundamental aggregation problem: individual farmers rarely

produce volumes sufficient to be commercially interesting to any buyer above the immediate local level. This consequence was echoed by both FAO's experts and The World Bank Nepal's Agriculture Team, who also noted that the farmers they have encountered in their project work are largely orientated towards getting the product out of the farm gate by the most convenient route available. Often, this is allegedly done through a middleman who arrives with a truck, pays cash, and removes the burden of finding a buyer. The World Bank Agriculture Team described meeting a group of farmers who spoke enthusiastically about growing peas, putting them in sacks outside their house, and having a middleman collect them and take them to India, a transaction that they experienced as a success, with no awareness of or interest in where value was actually being created or captured in the process. The team framed this not as ignorance but as rational adaptation to a system that offers smallholders no realistic alternative: without market information, without contracts, and without the volume to negotiate, the path of least resistance was to accept whatever the intermediary offers. MoALD's Undersecretary described the same dynamic in structural terms, noting that middlemen do not want to deal with smallholders producing small quantities because the aggregation cost per unit is too high. This dynamic was also noted by BigMart's Purchasing Officer as the primary reason for not sourcing directly from farmers.

6.1.1.2 Weak Coordination Mechanisms Reinforce Existing Structures

The absence of buy-back agreements or any contractual mechanism between buyers and sellers was identified by the MoALD Undersecretary as one of the chain's most destructive failures. He described how farmers have no guarantee that produce will be purchased, which suppresses investment in quality and scale, while buyers have no guarantee of reliable supply, which in turn suppresses their willingness to invest in direct sourcing relationships. FAO's Value Chain Specialist, and Agricultural Economist both made a closely related observation, noting that deep social and cultural norms in Nepal compound this problem. They described how farmers are often bound by existing

relationships with local traders, sometimes selling to them out of obligation or social expectation even when better alternatives exist, which makes it structurally difficult to introduce new buyer-seller relationships even when the economics would support them.

6.1.2 Intermediary Function Relies on Informal Relationships and Information Advantages

6.1.2.1 Aggregation Functions Are Performed Informally

The intermediary layer sits between production and market, and was a recurring topic throughout the interviews. FNCCI's Representative described aggregation as a persistent constraint in the chain: the cost of collecting and consolidating produce from scattered smallholder farmers is high enough that private sector actors frequently prefer to import raw materials rather than source domestically. ADB's Officials named the gap directly by explaining how Nepal currently lacks organised aggregators. Many of the middlemen who perform aggregation functions do so informally, without registration, without contractual accountability to either producers or downstream buyers, and without investment in quality infrastructure. The World Bank Agriculture Team observed that what intermediaries actually do is primarily sort, grade, and package, activities that are logistically necessary but do not involve meaningful transformation of or value addition to the product. Packaging Company A's Manager, who operates as a packaging and processing node between smallholder producers and formal retail buyers, described the practical difficulty of maintaining consistent product standards when sourcing across many small farms. Quality varies significantly between producers and between harvests, and quality control has to happen at the aggregation stage, at the aggregator's cost and risk. Wholesaler Market A's Representative further described how producers and buyers come to them rather than the market reaching outward, which places the full burden of market access on whoever can physically get their product to the market, and as a consequence disadvantages the most remote producers.

> *"What Nepal is missing right now is aggregators in the food value chain - this is a big problem."*
>
> — ADB Officials

6.1.2.2 Information Asymmetry and Distrust Shape Market Relationships

The relationship between producers and intermediaries was often, across interviews, characterised by mutual distrust and poor information flow. FNCCI's representative described it as a recurring structural pattern, where farmers believe intermediaries capture disproportionate margins while intermediaries argue that their aggregation costs, e.g. transport across difficult terrain, spoilage risk, or coordination across many small producers, justify those margins. The Representative illustrated this with a concrete example: an aggregator loads a truck with produce from multiple smallholders and brings it to Kalimati, where a portion fails food safety checks at the market gate. The aggregator bears the financial loss, having already paid the farmers. The farmers bear no immediate financial consequence and are not informed of what happened, but the aggregator gets angry and decides not to work with those smallholders again. FAO's experts described a closely related problem: traders and intermediaries often hold more market information than producers, and this asymmetry is allegedly being used to create price structures that benefit the intermediaries and traders at the expense of the farmers, rather than helping build sustainable supply relationships with the farmers. ADB's officials further pointed to the absence of any digital or formal registration system for intermediaries as a compounding factor to this problem. If middlemen operate without registration, there is no mechanism for either buyers or government agencies to track their practices or distinguish reliable intermediaries from unreliable ones.

6.1.2.3 Wholesale Markets Function as Imperfect Coordination Nodes

The wholesale market layer sits at the centre of the chain. *Kalimati Fruit and Vegetable Wholesale Market* was described by MoALD's

Undersecretary as the backbone of Kathmandu's wholesale trade. Still, he explained that it was built 30-40 years ago and is now both outdated and too small for current volumes. The World Bank Agriculture Team described wholesaling on a national level: the federal government owns eleven wholesale markets, of which only Kalimati is meaningfully developed. The remaining ten are allegedly incomplete, do not meet food safety standards and function poorly as aggregation nodes. The team observed that Kalimati's congestion has direct behavioural consequences as well. Because the market is chaotic and overcrowded in the early morning hours when produce arrives, many farmers prefer to sell to intermediaries outside the market gate rather than navigating the uncertainty of finding a buyer inside. Wholesaler Market A's representative, operating within the Banepa wholesale system, handled approximately 14,000 kilograms of produce per week from a single outlet, which was one of around 40-50 similar operators in that specific market, which gives some indication of the volumes that move through smaller regional nodes, none of which have the infrastructure or regulatory oversight of Kalimati. The World Bank Agriculture team concluded by estimating that over 80% of the wholesale market is informal in nature.

6.1.3 Retail and Market Channels Exhibit Diverse Coordination Models

6.1.3.1 Formal Retail Favours Organised Suppliers Whilst Small Actors Skip Intermediation

At the formal retail end, many of the interviewees described DFTQC certification as the entry requirement to reach formal markets. BigMart's Purchasing Officer estimated that modern trade as a whole accounts for only five to eight percent of Nepal's retail food market, with BigMart, Bhat-Bhateni, and Salesberry as the dominant players. Local small retailers account for roughly 45% of sales, street vendors around 10% and the remainder of around 40% allegedly flows through wholesale markets. Store E's owner in Pokhara described cutting out intermediaries as a deliberate business strategy, sourcing some produce directly from their own farm and the rest directly from

other farmers specifically to push down prices and maintain quality. Store A's salesperson, operating a retail shop almost entirely oriented towards international tourists, described a vertically integrated model in which the business distributes coffee trees to over 200 farmers and communities around Pokhara and then sources directly from them. As a consequence, they build personal connection and reliability together. These models are notable examples of something that differs from the allegedly dominant pattern of intermediaries controlling the trade.

6.1.4 Value Capture and Infrastructure Constrain System Performance

6.1.4.1 Value and Transaction Costs Accumulate Through the Intermediary Layer

Regarding value distribution across the chain, MoALD's Undersecretary observed that value tends to concentrate at the intermediary layer. The World Bank Agriculture Team described this in concrete terms through an example: a kilogram of apples leaves the farm at ten rupees and arrives at the consumer at 40 rupees, an increase of 300%. They noted that this difference reflects the structure of the value chain, with the number of layers the product passes through and the absence of competitive alternatives at each layer. These middlemen do not add substantial value to the product, but they do add money and transaction costs. FAO's Value Chain Specialist attributed some of the post-harvest losses to the chain's inability to move produce quickly enough and in good enough condition, from where it is grown to where it is demanded. One of the farmers interviewed in Kathmandu Valley described demand volatility as one of his primary challenges, explaining that when demand swings unpredictably, it is difficult to forecast production levels. BigMart's Purchasing Officer described the same structural problem directly:

> *"From producer to consumer there will today be at least 3-4 middlemen — let's cut them out. One kilogram of potato costs ten rupees in the field, but when it comes to consumers it suddenly costs 40 rupees. 300% growth? Not*

sustainable."

— BigMart Purchasing Officer

6.1.4.2 Geography and Infrastructure Reinforce Market Inefficiencies

Finally, geography also shapes how all these dynamics play out in Nepal's different regions. The World Bank Agriculture Team noted that agricultural production is concentrated in the lower Terai region, which is better connected to urban centres, to the Indian border and to the road network. In contrast, they mentioned that the mid-hills and high hills face higher transport costs, longer journey times to any formal buyer, and weaker links to the wholesale market system. MoALD's Undersecretary pointed to the complementarity of Nepal's different geographical zones as a largely unrealised opportunity. Since the mountain, hill, and Terai regions have different growing seasons for similar commodities, there is an opportunity of year-round supply if the logistics connecting all the regions were functional. In practice, many interviewees noted that they are not. The World Bank Agriculture Team explained that of all the cold storage facilities built through government and development partner programmes in recent years, a vast majority is, in their words *"dysfunctional"*, due to being located in the wrong places, designed for the wrong commodities or left without the operational expertise or capacity to run them.

> *By the seventh week of fieldwork, the authors observed that interviews with institutional actors had begun to converge on an almost identical set of bottlenecks — volumes, organisation, communication, and infrastructure — with little variation across organisations. This convergence across actors as different as FAO, WFP, ADB, and MoALD suggests a degree of consensus about the nature of Nepal's food system challenges that goes beyond any single institution's perspective.*
>
> — Observed by authors during fieldwork

6.2 Farmers and Production

Here, the focus shifts to producers and explores how farmers, cooperatives, and agribusinesses experience production, commercialisation, and market participation in practice.

6.2.1 Commercialisation Remains Uneven Across Producers

Nepal's smallholder farming population is large, diverse and operating under conditions that make commercial market participation difficult for most, according to MoALD's Undersecretary. FAO's experts both described the sector as one where the transition toward commercial production is genuinely underway but remains partial and uneven, concentrated in areas with better infrastructure and closer proximity to urban markets. The World Bank Agriculture Team made a similar observation, noting that the farmers they have encountered through their project work range from those entirely oriented toward subsistence to what they called *"transitional farmers"*, producers who are beginning to engage with markets, invest in higher-value crops, and think about branding and buyers, but who have not yet made the full shift to commercial agriculture. Helvetas Nepal's Business Development Coordinator describes this spectrum as the starting point for any development intervention. The appropriate support and realistic market pathway looks different depending on where a given producer sits on that spectrum.

The farming operations visited during fieldwork for this study illustrate some of these farmer differences mentioned above, though they should be interpreted as indicative rather than representative of the agricultural sector. They ranged from cooperatives with limited commercial exposure, operating in hill areas, to a more professional individual farm in the outskirts of Kathmandu Valley. Farming Cooperative A, a women-led group based in a hill village, sells primarily through its own retail outlet, directly to consumers and has developed a recognisable identity around its products. Farming Cooperative B, a larger cooperative of around one hundred members, produces a range of

spices and vegetables but sells almost exclusively through traders and distributors, with terms of trade set largely by the buyer. Farming Cooperative C, a smaller group near Kathmandu University, grows a range of vegetables and sells primarily to wholesalers and small retailers. Individual Farm A operates a more professionalised mixed vegetable operation with the vast majority of production sold to market, a branded digital channel, and strong influence over its terms of trade. Individual Farm B, an orange and mixed-vegetable operation, sells the bulk of its produce to wholesalers and traders, with ambitions for a direct consumer channel but no established route to one yet.

6.2.2 Production Decisions Seldom Connected to Market Demand

6.2.2.1 Limited Market Information Creates Supply-Demand Mismatches

What farmers grow is shaped primarily by the local conditions and established practice rather than by market signals, which MoALD's Undersecretary described as one of the most consequential gaps in the food system. Without reliable price and demand information flowing back to producers, farmers make planting decisions based on what they have always grown and what their neighbours grow, which produces a chronic supply-demand mismatch. FNCCI's Representative described an example of just this among the entrepreneurs they had worked with: private sector actors who attempt to build domestic supply chains consistently report that raw material availability is the limiting factor on scaling, because production is neither predictable enough nor consistent enough in quality to plan around. Farming Cooperative B's Secretary described the supply pressure this creates at the farm level: distributors would sometimes refuse produce beyond their immediate needs, leaving the cooperative with post-harvest losses it had no mechanism to absorb. Moreover, as mentioned earlier, one of the farmers interviewed in Kathmandu Valley described demand volatility as one of his primary challenges, explaining that when demand swings unpredictably, it is difficult to forecast production levels.

> *"We are producing organic crops, and while producing a premium product you have to take a higher price, but the market has a lower benchmark and we are then unable to compete."*
>
> *"We have hot chillis, but the market demands weak chillis. We have red onion, but the market demands sweeter yellow onion. So if we cannot meet those demands, how can we change the consumers' demands and market our products as something unique, and local, and healthy?"*
>
> — Farming Cooperative B Secretary

> *During the visit to Farming Cooperative B, the authors observed that the cooperative struggled not only with market access but with communicating the value of its organic production to any channel beyond direct consumer contact. The setting itself — remote, visually striking, and clearly distinct from industrial production — suggested significant untapped marketing potential that the cooperative had no current means of activating.*
>
> — Observed by authors during fieldwork

6.2.2.2 Seasonality Complicates Production Planning

Furthermore, seasonal variations seem to shape production patterns profoundly across Nepal's different geographical regions. MoALD's Undersecretary described Nepal's topographic diversity as creating naturally complementary production windows: mountain, hill, and Terai zones have different growing seasons, meaning different commodities come into supply at different times of year. In principle this could support a more integrated national food system with year-round supply across a wide range of products. In practice it largely does not, because the logistics connecting these zones are too weak and storage infrastructure too limited for surplus production in one zone to reach markets in another before it deteriorates. The Undersecretary was explicit that leveraging this complementarity is not something individual farmers can do as it requires system-level coordination by

a larger commercial actor aggregating across regions. The World Bank Agriculture Team made the same point, noting that production geography in Nepal means that proximity to urban centres and the road network is one of the strongest predictors of whether a farmer can access formal markets at all, independent of what they produce or how well they produce it.

> *This was made tangible during fieldwork visits to Farming Cooperative B and to farms in the Dhulikhel and Banepa areas, where road conditions were consistently identified as a primary constraint. The journey to Farming Cooperative B in particular illustrated the physical reality behind the infrastructure gap: roads were in poor condition throughout, making the logistics of moving produce to any formal buyer difficult to imagine at any meaningful volume.*
>
> — Observed by authors during fieldwork

The practical consequences of this seasonal mismatch were described by Individual Farm A's manager, who identified demand volatility as one of his primary commercial challenges:

> *"Demand swings are a big problem, because it is hard to plan and forecast for, especially since we are controlled by seasons for growing."*
>
> *"There is a lack of communication between consumers and remote farmers. The consumers in the cities want a certain crop when it is out of season, and then when it is in season we have to waste the crops because they are not wanted anymore."*
>
> — Farming Cooperative A Manager

6.2.3 Market Access and Organisational Capability

6.2.3.1 Producer Groups Differ in Commercial Capacity

The internal structure of producer groups varies considerably and has direct implications for their commercial capacity. Farming Cooperative B's Secretary described a situation where the cooperative's members produce across a range of crops but the group itself has almost no bargaining power with distributors. The distributors control prices, payment terms, quality standards, volume, and delivery schedules. This is consistent with what FAO's experts observed more broadly in that producers in Nepal are not widely recognised as commercial actors with legitimate bargaining interests, and traders and intermediaries exploit when setting terms. They noted that social and cultural norms reinforce this, with farmers often feeling obligated to sell to established local traders even when commercially better alternatives exist. FNCCI's Representative described the same dynamic from a private sector perspective, noting that building trust between producers and buyers is one of the most persistent challenges in market linkage work and that it breaks down quickly when quality or reliability failures occur, with consequences that fall disproportionately on the producer. Individual Farm C, whose manager holds a Master's degree in Commerce and offered one of the more analytically precise accounts of intermediary dynamics, described his view of the situation in explicit terms:

> *"I think there are price cartels in our value chain at the intermediaries level. This is probably because the government does not regulate prices and because we are dependent on middlemen for delivering our products. The government could do more to reduce our need and reliance on intermediaries."*
>
> — Individual Farm C Manager

6.2.3.2 More Commercial Producers Reduce Dependence on Intermediaries

By contrast, Farming Cooperative A's manager described a more integrated model: the cooperative controls its own retail outlet, uses social media actively to promote products, and has built a recognisable identity that she noted resonates particularly with foreign customers. She described the cooperative's approach to quality and presentation in detail, noting that thorough written product descriptions and visible authenticity create a trust signal that is difficult for less organised producers to replicate. Individual Farm A represented the most commercially developed operation visited: the farm has a branded digital channel, exercises strong influence over its terms of trade, and is deliberately oriented toward direct consumer sales as a strategy for capturing the premium that organic production commands but that the wholesale channel does not recognise. ADB's Officials noted that exactly this type of transitional farmer, that is slightly larger, more educated, more willing to invest in branding and buyer relationships, is where they have seen the most commercial success in their project work, and that these cases tend to involve producers who have found a way to bypass or reduce dependence on the intermediary layer.

> *"We have an app where we publish products and then people can see it, see that it is organic, and get an interest. Our owner saw an opportunity to leverage technology to reach out to potential customers more easily"*
>
> — Individual Farm A Farmer

6.2.3.3 Cooperatives Face Challenges in Sustaining Market Linkages

The question of why more farmers do not join cooperatives or why existing cooperatives do not develop more commercial capability came up in several interviews. Individual Farm A's manager described a deliberate decision not to join a cooperative, noting that the cooperative model in Nepal typically involves pooling savings rather than coordinating commercial activity, which he did not find compatible

with his business orientation. MoALD's Undersecretary acknowledged that while the government has actively promoted cooperatives as a vehicle for smallholder commercialisation, providing subsidies and training through programmes such as Prime Minister Agriculture Modernisation Project (PMAMP), the results have been uneven, and cooperatives that receive support without building genuine market linkages tend to stagnate once project funding ends. Helvetas Nepal's Business Development Coordinator described this as a structural risk in the sector: initiatives build the cooperative, train the members, and establish market linkages, but when external support withdraws, the coordination that held the system together often dissolves because durable commercial relationships have not been built to replace it. He described the coffee value chain in Karnali as a case where this was avoided, where the cooperative there has continued to export to Germany, Australia, Japan, and Korea years after Helvetas withdrew. He attributed this to the fact that the product had genuine international market demand that the cooperative could access independently, rather than depending on a relationship that the project created.

6.2.4 Structural Constraints Extend Beyond Market Access

6.2.4.1 Gender Shapes Access to Commercial Opportunities

Gender dynamics in agricultural production were raised by several respondents as a structurally important dimension of the smallholder context. FAO Nepal's experts noted that women constitute around 60% of Nepal's agricultural workforce, but face significant barriers in accessing finance, markets, and training due to land ownership structures that concentrate assets in male hands. WFP Nepal's School Meals Programme Manager described a related pattern: as male migration to urban areas and abroad has accelerated, women have increasingly taken on primary responsibility for farm management, but without sufficient access to the commercial networks, market information, or financial services that would allow them to convert that responsibility into successful commercial outcomes. She noted that women-led cooperatives tend to be more savings-oriented and

less commercially aggressive than male-led ones, which is a pattern she observed as a challenge for market linkage work, where the goal is to move cooperatives towards active selling rather than passive saving. MoALD's Undersecretary specifically mentioned the government's efforts to make post-harvest technologies more accessible to women farmers, noting that equipment design and ease of use are significant factors in adoption and that technology interventions that do not account for the physical demands and time constraints of women farmers tend to go unused.

6.2.4.2 Market Access Alone Does Not Resolve Production Challenges

Beyond market dynamics, several respondents identified structural production problems that sit outside of any value chain intervention. MoALD's Undersecretary mentioned labour shortages driven by youth migration abroad, climate change, and increasingly severe weather events, but also human-wildlife conflict as compounding challenges for smallholder farmers. On the last of these, he was direct:

> *"Monkeys have been a major problem for farmers in Nepal — they eat 5% and destroy 95%."*
>
> — MoALD Undersecretary

Farming Cooperative B's Secretary independently confirmed damage through monkey attacks as a recurring production challenge, noting it alongside road conditions and communication failures with distributors as the cooperative's most persistent challenges. The observation from both a ministry official and a smallholder cooperative in a remote hill area points to a problem that is neither marginal nor easily resolved through market interventions alone.

> *The damage was visually evident during the visit to Farming Cooperative B, where members described ongoing losses to both monkey and*

> *jackal attacks as a recurring feature rather than an exceptional event.*
>
> — Observed by authors during fieldwork

6.3 Market Channels and Intermediaries

Having examined production, this section explores how products move through the industry, focusing instead on the market channels, intermediaries, and buyer relationships that connect producers with end markets.

6.3.1 The Intermediary Channel

6.3.2 Intermediaries Perform Coordination Functions

As established earlier, MoALD's Undersecretary estimated that around 70% of all traded produce moves through traders and middlemen, with direct producer-to-consumer and producer-to-retailer flows accounting for the remainder. What the interviews add to this picture is an account of how intermediaries actually function within that dominant channel, and why the channel persists in its current form despite being widely recognised as inefficient. The World Bank Agriculture Team offered one of the most direct accounts of what intermediates actually contribute:

> *"I don't think the middlemen even do much processing. The only thing that they do is sorting, grading and packaging. That's it. And that's not really value adding. That's just putting everything in a carton and sending it."*
>
> — World Bank Agriculture Team

The team was careful to add nuance to this, however, noting that intermediaries are not simply extractive actors. They allegedly do perform real coordination functions, absorb spoilage risk, finance

the supply chain through advance payments to farmers, and provide the market access that smallholders would otherwise lack entirely. The challenge, as the team framed it, is therefore not to eliminate intermediaries but to change the conditions under which they operate.

6.3.2.1 Information Asymmetries and Informal Relationships Shape Intermediary Behaviour

FAO's Value Chain Specialist and Agricultural Economist offered a more detailed account of how intermediaries fit into the information architecture of the chain. They noted that intermediaries are themselves often operating in conditions of uncertainty. They do not always know how consumers will respond to a product, what prices will prevail in a given week, or how much volume the market will absorb. This means that the informational asymmetry between intermediaries and producers, while very real, does not translate into a neat picture of informed traders exploiting ignorant farmers. In some cases, they observed, intermediaries are themselves in the dark, which creates coordination failures that hurt all parties. They described a pattern they had observed across several value chains where intermediaries suppress price information not because of a deliberate strategy to trick producers, but out of habit and the path-dependency of existing relationships, and where producers accept these terms not out of ignorance but out of the social obligation described earlier. ADB's Officials made a related point: the intermediary layer's informality and its absence of registration, contracts, or any form of accountability mechanism, means that even well-intentioned intermediaries operate without the conditions that would allow them to build reliable, scalable relationships. The result is a system that dysfunctions when aspects such as quality, consistency, traceability, or product differentiation are required.

> *During visits to markets in the Banepa area, one fruit seller noted that she had no objection in principle to stocking a new product in small quantities, describing herself as open to experimentation. This could suggest that resistance to new products may be lower at the informal retail level than formal channel entry requirements imply, and that the*

> *primary barrier to market entry may lie with end consumers rather than with the intermediaries and sellers who handle the product.*
>
> — Observed by authors during fieldwork

6.3.3 Alternative Channels Operate Under Different Conditions

6.3.3.1 Modernised Actors Prefer Aggregators Over Individual Producers

The modern retail channel, represented in this study by BigMart, operates on fundamentally different terms. BigMart's Purchasing Officer described a multi-step qualification process for new suppliers: products must have DFTQC certification, meet the company's internal quality specifications, and pass through a trial listing period of approximately three months during which sales performance determines whether a product is retained. The Purchasing Officer was candid about the company's commercial logic and said that it does not want to manage a large number of small suppliers, because the administrative cost of doing so is high relative to the volumes involved. The company's preference is to work with aggregators or processors who can present consistent volumes. This means that the channel is effectively closed to individual smallholder producers and open only to organised entities, e.g. cooperatives, processors, or traders that can meet volume and consistency requirements.

6.3.3.2 Institutional Procurement Creates Structured Market Access

The institutional procurement channel, represented most directly by WFP, operates under a different set of conditions. WFP Nepal's School Meals Programme Manager described a procurement model that has shifted significantly over recent years. What started as a centralised national procurement programme, using large distributors, has shifted toward decentralised municipal procurement, in which local governments purchase food directly from local producers and

cooperatives using cash transfers provided by the central government. This shift was described as deliberate, and the aim is to strengthen local food systems and rural economies, but it creates significant complexity for any supplier trying to engage with the programme at scale. Procurement decisions are made by municipal committees, which include representatives from schools, finance, and procurement and which operate with varying levels of capacity and governance quality across the country's different municipalities. The Manager described this decentralisation as genuinely positive and a great opportunity for local producers. The school feeding programme has also facilitated forward contracting that provide local smallholder farmers with guaranteed market access. In practice, it means municipalities commit to purchasing crops at a future date which reduces market uncertainties and food security risks otherwise associated with switching from subsistence to market-oriented crops. Through the programme and support from WFP, farmers are further assisted with access to inputs and finance, storage infrastructure, and the managerial capabilities needed to gradually transition from subsistence farming into more commercially oriented agribusinesses. On the other hand, she noted that many municipalities still lack the knowledge and systems to manage procurement effectively and that WFP is investing heavily in building this capacity. She described the programme's *"earning by learning"* model, in which schools receive cash in proportion to their procurement performance, as creating an incentive for municipalities to develop their procurement capability over time.

6.3.3.3 Direct Retail Relies on Producer-Buyer Relationships

The direct retail and farmers market channel is smaller but growing, particularly in Kathmandu and Pokhara. FAO's Value Chain Specialist described the current frontier of this channel as producers selling through their own retail networks, e.g. through websites, Instagram pages, and Facebook pages, as well as through emerging farmers markets in urban areas. Store E's Owner described his own operation as built explicitly around cutting out intermediaries, sourcing some produce from his own farm and buying the rest directly from farmers he

knows personally, and pricing to be accessible to a broad consumer base rather than positioning as a premium product. He described strong and growing interest among Nepali consumers in locally produced food, noting that this is a relatively recent shift driven partly by social media and partly by broader awareness of food quality and provenance. Store A's Salesperson in Lakeside Pokhara, operating almost entirely for international tourists, described a vertically integrated model in which the business sources directly from over 200 farmers and communities in the area with whom it has established long-term personal relationships, a model she described as providing both quality assurance and a compelling story for tourists.

> *The authors also observed during fieldwork that Nepali sellers rarely engage in active product recommendation or upselling. Products are typically displayed and sold passively, with consumers expected to seek out what they want. For a new and unfamiliar product category like solar-dried foods, this places the full burden of discovery on the consumer, reinforcing the importance of consumer-facing marketing and awareness over channel-level persuasion.*
>
> — Observed by authors during fieldwork

6.3.3.4 Determinants of Market Access

Across all of these channels, a consistent pattern emerges from the interviews: the channel a producer can access is determined less by what they produce and more by their organisational capacity, geographic location, and existing relationships. Individual Farm A's manager, with a branded digital channel and direct buyer relationships, can access premium urban consumers and negotiate his own terms. Farming Cooperative B, despite producing a range of commercially interesting spices and vegetables, sells almost entirely through traders on terms set by the buyer, because it lacks the organisational capacity and market knowledge to do otherwise. The World Bank Agriculture Team described this as one of the most important insights from their project work:

"When farmers are very confident that they have a market,

> *that would help create demand. And then that would help them forecast. Without that confidence, they produce defensively and in low-volume, which keeps them locked out of formal channels"*
>
> — World Bank Agriculture Team

6.4 Consumer Demand and Buying Behaviour

The focus in this section is directed towards the demand side of the industry, examining how different consumer groups perceive, purchase, and value food products.

6.4.1 Consumer Preferences and Demand for Dried Products

When it comes to consumer demand and buying behaviour within the food value chain, the starting point is that Nepal is very orientated towards fresh produce, something that the World Bank Agriculture Team stated explicitly: Nepali people are not accustomed to eating frozen or dried foods in the way that many other food cultures are and this shapes what producers, retailers, and consumers consider normal. The team described encountering a woman who had built an operation aggregating solar-dried fruits across 5,000 farmers, but whose product had found almost no traction in domestic markets and could not yet be exported due to certification gaps. The team's assessment was that the product was not well tailored to domestic tastes, and that this was not a marginal issue but a fundamental one. A product that consumers do not want to eat will not sell regardless of how efficiently it is produced. FAO's experts framed the same challenge in terms of consumer perception: a widespread belief exists in Nepal that nutritional value is degraded when food is dried or processed. They described this as a fallacy that needs to be actively debunked, not a minor misconception but a structurally important barrier to demand, because it means that even consumers

who could afford solar-dried products and have access to them may still not buy them. MoALD's Undersecretary echoed this, noting that awareness of the health benefits of dried fruits has not been developed among consumers, and that this makes it difficult for dried products to compete with fresh alternatives even when price and availability are comparable. Store B's Owner in Kathmandu Valley confirmed the same dynamic from a retail perspective, noting that customers consistently ask for fresh produce and show limited interest in dried alternatives. FAO's Value Chain Specialist described this not as a peripheral issue but as a fundamental demand-side barrier:

> *"People in Nepal feel that nutritional value will get depleted if it is kind of processed. We need to debunk this. Processed food can be nutritious — not 'can be', but it is."*
>
> — FAO Value Chain Specialist

6.4.2 Emerging Demand for Dried Products

Despite this baseline, demand for dried food products does exist in Nepal, and several respondents described it as growing. MoALD's Undersecretary noted that dried fruits feature prominently in Nepali festival culture, where many celebrations involve dried fruit consumption as part of established tradition. He further noted that urban demand for dried products as a whole has been increasing as a consequence in recent years. He described consumers who try high-quality dried products as often willing to pay a premium for them, suggesting that the barrier is more about awareness and first exposure than fundamental taste aversion. FNCCI's Representative confirmed that the domestic market has become more conscious about quality over the past decade, particularly among urban consumers, and that demand for health-oriented food products is rising alongside income levels. He noted, however, that imported goods continue to outcompete domestic equivalents in branding and presentation. This is a disadvantage for local producers that reflect marketing investment rather than product quality. Store C's Manager in Kathmandu Valley described a small but consistent customer base for dried and packaged local products, concentrated among younger urban consumers who follow food trends

on social media and are actively seeking out locally produced alternatives to imported snacks. MoALD's Undersecretary was notably optimistic about what happens once consumers actually encounter quality dried products:

> *"Consumers who once eat those products, they are ready to pay high for these things as well."*
>
> — MoALD Undersecretary

6.4.2.1 Dried Products Occupy a Marginal Position in Formal Retail

BigMart's Purchasing Officer provided the most concrete quantitative picture of where dried products currently sit in the formal retail market. Across the company's stores, fresh produce accounts for 8.86% of total sales, of which fruits represent 5.32% and vegetables 3.54% by value, though the volume split is roughly inverted, with vegetables accounting for around 75% of fresh produce by quantity and fruits 25%. Against this, the dried fruit-adjacent categories are marginal: titaura (candy made from Nepalese lapsi, an endemic plum) accounts for 0.28% of total sales, dry fruits and nuts for 0.26%, and banana chips for a negligible fraction of the snacks and beverages category. Combined, these categories represent around 0.54% of total sales, roughly six percent of what fresh produce generates. Expressed differently, dried fruit products generate approximately one rupee for every seventeen that fresh produce generates across the same stores. The Purchasing Officer described these as categories with some stability but limited growth momentum, and was candid that solar-dried products as a distinct offering are not yet visible in formal retail at all.

> *Packaging actors seemed to control how dried fruits and nuts were presented in mainstream grocery stores and supermarkets. The packaging was functionally designed and lacked marketing messages, apart from the packager's name, a DFTQC certification, and contact details. In smaller stores tailored to tourists, there were some exceptions where firms had greater control of storytelling, package design, and brand-*

> *ing. This allowed them target specific consumers and construct clearer narratives around nutrition, quality, and authenticity (Figure 6.1).*
>
> — Observed by authors during fieldwork

Figure 6.1: Packaged snack products in Nepal with respective prices and volume. 1 = lapsi candy; 2 = dried kiwi; 3 = dried apple; 4 = basuki pustakari, a traditional candy based on molasses; 5 = dried ginger.

6.4.3 Market Potential Varies Across Consumer and Buyer Segments

6.4.3.1 Premium Urban Consumers Show Promising Potential

The question of which consumer segments hold the most realistic near-term potential generated consistent responses across interviews, with

most respondents converging on a similar profile. FAO's Value Chain Specialist identified high-earning urban consumers and expatriates as the primary realistic segment. These were deemed as people who are nutritionally aware, can afford premium-priced products, and are already oriented toward health-conscious food choices. He described the segmentation as both behavioural and geographic: the relevant consumers are concentrated in Kathmandu and Pokhara, and within those cities, in the neighbourhoods, markets, and retail environments that cater to higher-income and internationally connected populations. He was furthermore explicit that reaching broader consumer segments would require economies of scale that are not currently achievable since the cost structure of solar-dried products makes them expensive relative to fresh alternatives, which in turn limits the realistic market to those who can and will pay a premium. MoALD's Undersecretary made a similar point: without investment in branding, marketing, and consumer awareness, solar-dried products can only reach higher-end consumers, and broadening the market requires both bringing costs down and educating the wider consumer base about the product's benefits. The World Bank Agriculture Team offered an illustration of what this premium domestic segment currently looks in practice, describing a solar-dried fruit producer whose products they had encountered:

> *"The only place in Kathmandu where I've seen her product is that Moksha farmers market — that farm shop where all these white people go to shop. And frankly, they also buy it because 'oh, it's Nepali organic and it's so amazing' — but that's not bulk purchase. That doesn't guarantee big returns."*
>
> — World Bank Agriculture Team

6.4.3.2 Tourists and Trekkers in Urban Clusters Emerged as Another Market Opportunity

The tourist and trekker segment was identified by several respondents as a distinct and potentially more accessible segment, at least in the short term. Store A's Salesperson in Lakeside Pokhara, whose shop is oriented almost entirely toward international visitors, described

strong and consistent demand for locally produced dried and packaged food products among tourists, as both snacks and as gifts to take home. He noted that tourists are significantly less price-sensitive than local consumers, are familiar with dried food formats from their home countries, and are actively seeking products with a local story. Store E's Owner described a consumer base that mixes health-conscious Nepali residents with tourists, with both groups showing interest in locally produced food when it is presented clearly and attractively. He noted that Nepali consumers at the market are increasingly drawn to local products, and that this trend has accelerated over the past two to three years, a shift he attributed partly to social media and partly to broader food culture changes among younger urban Nepalis. FAO's Value Chain Specialist pointed to the emerging farmers market circuit in urban areas as the channel where this type of consumer is most concentrated and most reachable.

> *Individual Farm A's operation illustrated one model for how consumer trust can be built in this market: the farm functions not only as a producer but as a destination that consumers can visit to verify growing practices, interact with the owner, and connect the product to a physical place and philosophy. The owner's international business background and deliberate use of technology and branding were described as central to this model and notably difficult to replicate without similar education and exposure.*
>
> — Observed by authors during fieldwork

6.4.4 Institutional and Business Buyers Offer Alternative Demand Channels

The institutional demand represented by WFP's school feeding programme operates on entirely different terms from consumer retail, and WFP Nepal's School Meals Programme Manager was detailed about what this channel actually requires. The programme covers 27,000 public schools across all 77 districts of Nepal, providing meals to approximately 2.8 million children. Procurement is decentralised to the municipal level, with local governments selecting from sixty approved

meal options and procuring ingredients locally. Dried food products do not currently feature in school meals, the Manager confirmed that no dried fruit or snack products are included in the standard menu, but she identified potential for locally produced solar-dried ingredients if they meet nutritional standards, cost requirements, and DFTQC certification. Products must contribute to covering 30% of children's recommended daily allowances for key micronutrients, with vitamin A and iron identified as particular priorities. Cost is equally important, the programme operates within tight per-meal budgets set by municipal governments, and any ingredient must be price-competitive with the fresh local produce that currently dominates procurement. The Manager noted that the programme's preference for locally sourced food is a policy commitment rather than just a preference, which means that a certified, affordable, locally produced solar-dried ingredient could in principle be integrated into menus, but that the path to doing so runs through individual municipal governments rather than any single national procurement body.

Helvetas Nepal's Business Development Coordinator raised a segment that received less attention in other interviews but that he considered more immediately viable than consumer retail: the business-to-business (B2B) market. He identified ginger, turmeric, and other spices as products where solar drying could add value and where demand already exists from buyers in the hospitality sector and pharmaceutical supply chains. He argued that in B2B sales, the buyer is a professional who understands what they are purchasing, does not need to be educated about the product category, and is making a purchasing decision based on specification and price rather than brand trust. This sidesteps the consumer awareness problem entirely. The World Bank Agriculture Team described a complementary observation: niche, high-value products with a clear geographic identity, e.g. Mustang Apples or Karnali coffee, tend to find buyers more easily than undifferentiated commodity products because buyers are willing to pay for the regional brand.

6.4.4.1 Current Pricing Limits the Reach of Dried Products to Premium Segments

Across all segments, a consistent theme in the interviews is that willingness to pay varies sharply by consumer type, and that the current pricing of dried products is calibrated to the premium end of the market in ways that limit volume. FAO's experts noted that if economies of scale could be achieved and procurement costs reduced, it would become possible to serve a wider range of consumer segments. Until then, the realistic market remains narrow: internationally connected consumers, tourists, health-conscious urban residents with above-average incomes, and institutional buyers with specific nutritional mandates. Individual Farm B's farmer described the market as being in its early stages but present, which is a picture that is broadly consistent across all interviews.

6.5 Quality, Certification, and Regulation

Finally, this section delves into how actors navigate quality requirements, certification processes, and regulatory frameworks when bringing products to market.

A consistent theme across the interviews was that Nepal has an established legal and regulatory framework for food safety and quality, but that the gap between what the framework requires on paper and what is enforced in practice is big. MoALD's Undersecretary was direct on this point: Nepal has many laws and rules covering food safety, quality certification and compliance, but one of the most significant problems is implementation. The rules themselves are not the obstacle, the organisational capacity to apply them consistently is. He was direct about where the problem actually lies:

> *"Frankly speaking, we have a lot of laws and rules and regulations for all of these, but one of the major issues is implementation. The rules are good, the organisation*

around them is not."

— MoALD Undersecretary

6.5.1 DFTQC Certification Represents the Threshold to Formal Markets

The Department of Food Technology and Quality Control - DFTQC - sits at the centre of this framework as the primary certification body for processed food products. DFTQC registration is the non-negotiable requirement for selling processed food through any formal retail channel, and BigMart's Purchasing Officer described it as an absolute necessity for listing: no DFTQC stamp, no entry to formal retail regardless of product quality. WFP's School Meals Programme Manager confirmed the same requirement for institutional procurement, and said that any processed or packaged food ingredient entering the school feeding programme must carry DFTQC certification. FAO's Value Chain Specialist described DFTQC certification as the minimum threshold for formalisation, the point at which a producer crosses from the informal economy, where products can be sold in open markets without documentation, into the formal one, where labelling, traceability, and compliance with food safety standards are required. He continued by explaining that below this threshold, producers can sell freely in informal channels. Above it, they gain access to supermarkets, institutional buyers, and formal export pathways, but they also take on compliance obligations that require investment in facilities, testing, and documentation.

6.5.1.1 Compliance Requirements Are Sometimes More Challenging Than Certification Costs

The cost and accessibility of DFTQC certification was discussed in several interviews, and the picture that emerged is more nuanced than a simple barrier narrative might suggest. Helvetas' Business Development Coordinator noted that for domestic market certification, the direct cost is quite low - below 2,000 NPR in his estimate, equivalent to roughly 15 US dollars - and that this is not in itself a prohibitive amount for most producers. The barrier, he suggested, is not the

fee but the surrounding requirements. Producers must demonstrate that their processing facilities and practices meet hygiene and food safety standards, which may require investment in equipment, facilities, or process changes that are substantially more expensive than the registration fee itself. MoALD's Undersecretary confirmed that the government is willing to subsidise certification for producers who want to pursue it, and framed certification as something to be encouraged rather than avoided, particularly if the broader goal is to move the food system toward a more formalised state.

However, FAO's experts noted that the DFTQC certification process is widely perceived as tedious and demanding, and that this perception discourages many small producers from initiating it even when the direct costs are manageable. They described the process as requiring multiple rounds of inspection and documentation that are difficult to navigate without support, and noted that many of the small-scale producers they have worked with simply do not have the time or administrative capacity to manage it alongside their primary farming or processing activities. Helvetas Business Development Coordinator echoed this by saying that it is not unusual for producer groups attempting to move from informal local sales to certified formal markets, and that interventions which assume a faster transition tend to leave cooperatives stranded.

6.5.1.2 Compliance Risks Are Concentrated Among Intermediaries

The practical consequences of operating below the certification threshold were described most vividly by FNCCI's Representative, who returned to the example of an aggregator at Kalimati that was introduced earlier. When a truck of produce arrives at Kalimati and government inspectors find that a portion does not meet food safety standards, the aggregator bears the full financial cost of destroying the non-compliant goods, having already paid the farmers who supplied them. The farmers, having been paid, face no financial consequence and receive no information about what went wrong. The quality problem that caused the failure persists upstream, invisible to the people who created it. The aggregator, having lost money through no

commercial failing of their own, rationally withdraws from working with those smallholders. FNCCI's Representative described this as a structural feature of the current system rather than an isolated incident, the liability for compliance failures is allocated entirely to the aggregator, even when the underlying cause lies at the production stage, which in turn creates a disincentive for formal market actors to engage with smallholder farmers.

The Packaging Company A's Manager offered a ground-level view of what quality control actually involves for a small processing and aggregation business sitting between smallholder producers and formal retail buyers (Figure 6.2. He described the central challenge as consistency. Quality varies significantly between producers, between harvests and even within a single delivery, and there is no standardisation at the farm level that would reduce this variation before produce reaches the processing stage. All quality control therefore happens at his end, at his cost and his risk. He described a system of visual inspection and basic testing that he conducts on incoming produce, rejecting batches that fall below threshold, which is a practice that protects his downstream buyer relationships but creates financial losses when rejection rates are high. He noted that the absence of any grading or standardisation infrastructure at the production or collection stage means that his operation absorbs a structural quality risk that is generated much earlier in the chain.

6.5.2 Mismatch Between Regulations and Institutional Enforcement

The regulatory environment beyond DFTQC was described by several respondents as broad in scope but weak in enforcement. MoALD's Undersecretary noted that Nepal has food safety laws, packaging and labelling requirements, and market regulation frameworks, including a market act currently under development, but that implementation capacity at the local level is insufficient to apply them consistently. He described a situation where inspectors at wholesale markets like Kalimati do conduct checks, but the frequency and rigour of these checks vary, and the absence of a comprehensive registration system

Figure 6.2: Packaging Company A is DFTQC certified and packages masala spices, cumin, turmeric, chili, and coriander for the local market.

for intermediaries means that many market actors operate without any regulatory oversight at all. The World Bank Agriculture Team described the government as having asked them on multiple occasions to help with market reform, specifically to improve food safety testing, pesticide residue monitoring, and market regulation, which suggests that the government itself recognises the gap between the legislation and its enforcement. FNCCI's Representative noted that smallholders typically have very limited knowledge of the regulatory requirements that apply to them, and that this ignorance is itself a structural barrier, since producers who do not know what standards apply to their products cannot comply with them, and cannot defend themselves when they inevitable fail to meet the requirements that they were unaware of. FNCCI's Representative was blunt on this point:

> *"We cannot just assume that these uneducated people will just magically learn about this. So this is up to the regulatory bodies and organisations and government bodies to provide knowledge."*
>
> — FNCCI Representative

6.5.2.1 Geographical Indications Create Commercial Incentives for Formalisation

ADB's Officials pointed to Geographical Indication (GI) registration as an emerging regulatory tool with commercial significance for food products with strong geographic identity. GI registration, which associates a product with a specific origin and set of production characteristics, is being developed as a legal framework in Nepal with ADB's support, and is intended to enable producers of products like Jumla or Mustang apples, or Ilam tea, to differentiate their products in formal markets and command premiums based on origin. The Officials described this as a flagship initiative within their current country partnership strategy, and framed it as one of the few regulatory mechanisms that creates commercial incentive for producers to formalise, rather than simply imposing compliance costs. FAO's Agricultural Economist noted that GI labelling is gaining traction among urban consumers who are willing to pay for origin-verified products, and described it as particularly relevant for mountain products that have distinctive characteristics that justify a premium. She noted, however, that GI frameworks are only commercially meaningful when backed by effective enforcement of the geographic and production standards they define, which brings back the same implementation capacity problem into the picture.

6.5.2.2 Current Regulations Favour Organisations with Greater Managerial Capacity

Farming Cooperative A's manager described the practical experience of operating within this regulatory environment as a smaller producer attempting to sell through formal channels. She noted that her cooperative had pursued registration and labelling requirements for the products sold through its own retail outlet, and that this had required considerable effort to navigate, not because the requirements were unreasonable, but because guidance on how to meet them was difficult to find and the process was slow. She described the experience as one that would be beyond the capacity of a less organised group, and noted that the cooperative's ability to manage it was directly related to her own

education and persistence rather than any institutional support. This observation echoes FAO's Value Chain Specialist's broader point about certification: it is technically accessible, but practically demanding in ways that systematically favour more educated, better-resourced, and more urban producers over the smallholder cooperatives in remote areas that development interventions are typically trying to support.

6.6 Summary of Key Empirical Findings

Table 6.1: Summary of Key Empirical Findings

Finding	**Source**
Overview of the Food Value Chain	
Approximately 70% of traded produce moves through traders and middlemen; direct producer-to-consumer flows account for less than 5%	MoALD
Even Nepal's largest modern retailer sources approximately 90% of domestic fresh produce through wholesale intermediaries	BigMart
Modern trade accounts for only 5-8% of Nepal's retail food market	BigMart
Nepal has no systematic registration of intermediary actors; precise channel shares cannot be calculated	MoALD
Of cold storage facilities built through government and development programmes, a vast majority is dysfunctional	World Bank

Finding	Source
The farm-gate to consumer price difference reflects coordination costs rather than value addition; apples bought at 10 NPR per kilo are sold at 40 NPR	World Bank
Post-harvest losses are estimated at 30-35% of production nationally	FAO
Farmers and Production	
Average smallholder landholding is below 0.5 hectares; individual farmers rarely produce volumes sufficient to attract formal buyers	FAO
Farmers are price-takers with almost no bargaining power; terms of trade are set by buyers	Farming Cooperative B; FAO
Social obligation to existing local traders suppresses new buyer-seller relationships even where economics would support them	FAO
Market linkages built during development projects typically dissolve when external support withdraws	Helvetas
Women constitute approximately 60% of Nepal's agricultural workforce but face significant barriers in accessing finance, markets, and training	FAO; WFP
Market Channels and Intermediaries	
Raw material availability, rather than technology or capital, is the most commonly reported constraint among agribusiness entrepreneurs	FNCCI

Finding	Source
The passive wholesale model places the full burden of market access on producers; remote and small-volume producers are systematically disadvantaged	Wholesaler Market A
Modern retail entry requires DFTQC certification, volume consistency, and a trial listing period of approximately three months	BigMart
WFP school meal procurement is decentralised across 753 municipalities; there is no single national buyer	WFP
B2B channels sidestep the consumer trust and awareness problem entirely	Helvetas
Compliance liability for food safety failures falls on aggregators rather than producers, disincentivising formal sourcing relationships	FNCCI
Consumer Demand and Buying Behaviour	
Nepal's dominant food culture is oriented toward fresh produce; dried and preserved foods are not a mainstream consumption category	World Bank
A widespread belief exists that nutritional value is degraded when food is dried or processed	FAO ; MoALD
Dry fruits combined represent 0.54% of BigMart total sales versus 8.86% for fresh produce	BigMart
The near-term realistic consumer segment for solar-dried products is narrow: urban high-earners, expatriates, and tourists	FAO; MoALD

Finding	Source
WFP nutritional requirements mandate coverage of 30% of recommended daily allowances, with vitamin A and iron as priorities	WFP
Quality, Certification, and Regulation	
DFTQC registration is a non-negotiable entry requirement for formal retail and institutional procurement	BigMart ; WFP
Domestic DFTQC certification costs below 2,000 NPR; facility and process compliance requirements are the substantive barrier	Helvetas
Organic certification for premium channels costs 600,000–700,000 NPR and requires multi-year capacity building	Helvetas
Nepal's food safety regulatory framework is broad but enforcement is uneven and implementation capacity at local level is insufficient	MoALD ; FNCCI
Smallholders typically have very limited knowledge of the regulatory requirements that apply to their products	FNCCI
GI registration is an emerging mechanism enabling producers to differentiate products by geographic origin in formal markets	ADB ; FAO

7 Analysis

The following analysis chapter draws on the literature review in Chapter 5 and the empirical findings in Chapter 6, interpreted through the theoretical framework established in Chapter 3. It is structured around the three research questions, beginning with a map of Nepal's food system before turning to market segmentation, the interaction model, and, finally, the design of GTM strategies under the contextual conditions identified in the field.

7.1 Food System Mapping

Prior mappings of Nepal's food system exist but remain insufficient for the purposes of this analysis. The maps in 5.2.1 tend to depict the system in broad strokes that capture the general functions, actors, and direction of flow but omit the intermediary complexity that determines how products actually move and where value is captured. For the purposes of a GTM strategy, which requires knowing not just that intermediaries exist but how many layers they comprise, what share of volume they handle, and where the structural bottlenecks sit, that level of detail is insufficient. A more granular map is therefore necessary, and constructing one by bringing together the structural conditions of Chapter 5 with the actor-level accounts of Chapter 6 is itself an analytical contribution of this thesis.

Figure 7.1 shows Nepal's food system for fruits and vegetables as a system of flows. It shows the functions of the value chain, the principal actors, the pathways through which products move between them, estimated flow volumes represented by arrow thickness and arrow colour indicating the originating actor. Flow estimates are based on triangulation across sources and should be read as informed

approximations rather than measured data. The map is not intended as a complete inventory of every possible route, but as a structural representation of the dominant configurations through which produce moves from farm to consumer.

Interestingly, the authors have identified longer domestic market pathways than previous mappings (Pun, 2023; Giri, 2023; Rokaya, 2023; Kalimati Fruit and Vegetable Market Development Committee, 2024; Chaudhary et al., 2023; Ghimire et al., 2026), indicating that previous researchers have underestimated the number of actors that make up the value chain. This has major implications on research and strategy. It suggests that Nepal's food value chains may be even more fragmented and transaction-intensive than earlier studies have captured. Strategically, this also brings previously overlooked power dynamics to the surface, as actors omitted in earlier mappings may exert considerable influence over how products are marketed, priced, and presented to consumers. This was particularly visible in the case of packaging actors, who were observed to play a central role in determining how products ultimately appear in retail environments despite being largely absent from previous value chain mappings. Their position close to the final consumer interface may give them disproportionate influence over branding, product presentation, and retail visibility, highlighting that market power within the chain is not evenly distributed.

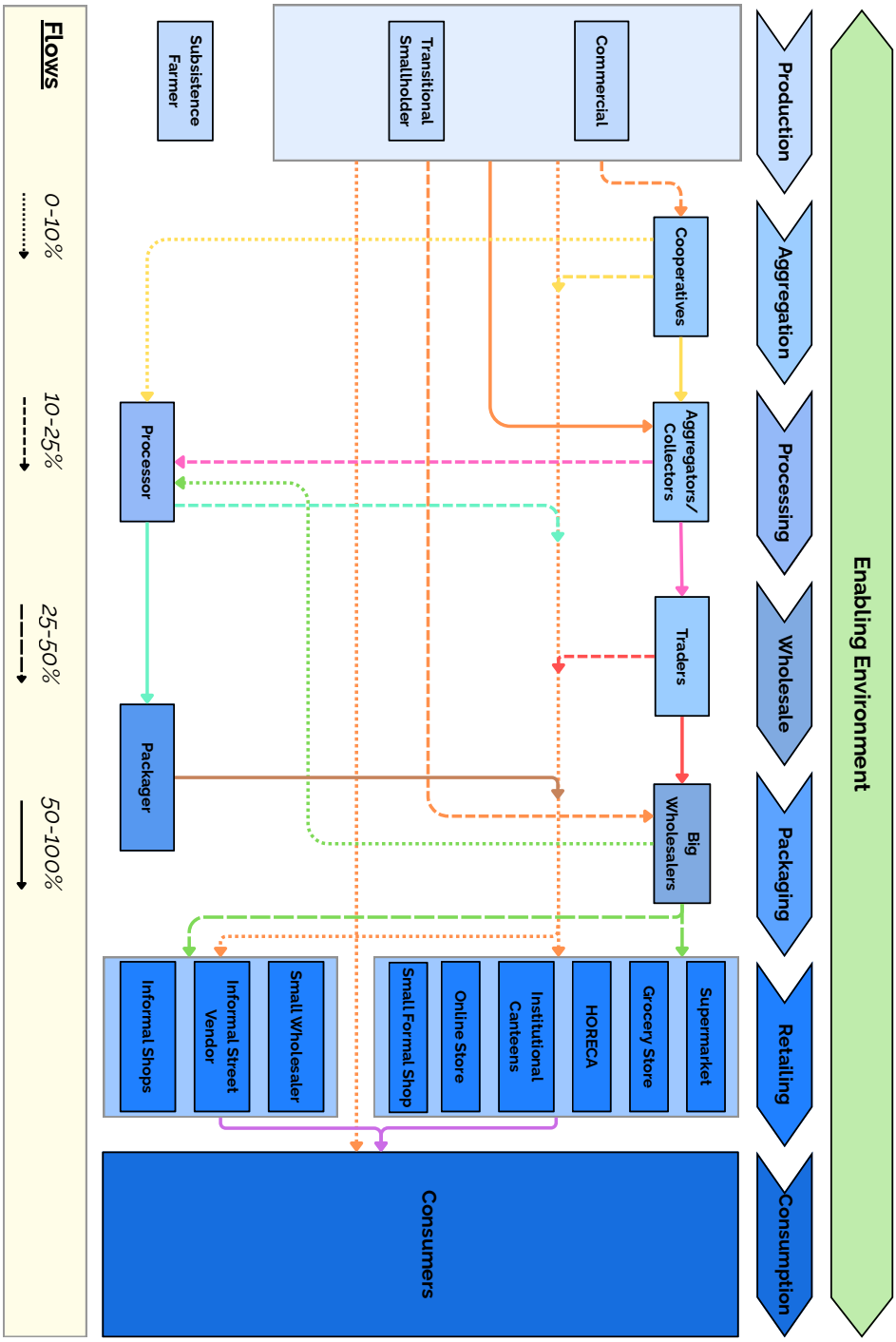


Figure 7.1: Authors' map of the Nepalese food system.

The dominant flow in the system runs from producers through aggregators and collectors into traders and onward to big wholesalers, consistent with MoALD's estimate that approximately 70–75% of traded produce passes through middlemen. This is also supported by the literature's characterisation of Nepal's intermediary layer as a complex network of local collectors, brokers and rural procurement agents through which the majority of smallholder produce flows (Giri, 2023; WFP & FAO, 2007). The concentration of market power at this layer, where intermediary margins are reported to exceed 50% of farm-gate price (Giri, 2023), helps explain why producers remain price-takers with limited ability to influence channel selection.

From the wholesale layer, the largest share reaches consumers via local grocery stores and informal retail, with BigMart's Purchasing Officer estimating local retailers account for around 45% of fruit and vegetable sales at the retail end. Modern supermarkets account for approximately 6% of retail sales, street vendors around 10%, and school canteens a smaller but distinct share. A minority flow, estimated at below 20%, moves directly from producers to retailers without passing through the full intermediary chain, and direct producer-to-consumer sales account for less than 5% of traded volumes.

Three distinct producer types are represented: commercial farmers, transitional smallholders, and subsistence farmers. The first two share an origin node, as the commercial flows they generate are difficult to disaggregate with the available data. Subsistence farmers are shown separately as they do not meaningfully participate in commercial market flows, consistent with the literature's observation that the majority of Nepal's agricultural producers remain at or near subsistence level, with commercial farming concentrated in areas with better infrastructure and road access (FAO, EU and CIRAD, 2022). Cooperatives appear as an intermediary node between producers and the aggregation layer, reflecting their documented role in consolidating smallholder volumes before onward sale, though their commercial reach remains limited.

The processing and packaging layer is shown as a distinct but thin pathway. The literature documents that the processing layer in Nepal remains severely underdeveloped relative to production volumes, illus-

trated by the finding that only 1% of the mandarin supply is processed into juice or marmalade, and most large-scale processors rely on imported concentrates rather than domestic raw material (Pokhrel & Thapa, 2007). Given that processing and packaging functions are in practice almost always performed by the same actor or bundled within the same commercial arrangement, they are treated as largely part of the same flow. Flows into this node originate primarily from aggregators and wholesalers rather than directly from producers, reflecting the capital and volume requirements that make processor relationships inaccessible to most smallholders.

7.1.1 National Enabling Environment

The map above shows the structure of Nepal's food system, with the actors, flows and relative volumes moving between them. What it cannot show directly is why the system is structured as it is. That requires examining the enabling environment closer and looking into the conditions that determine which constraints bind, which create opportunity, and why the system resists the coordination that would make it more efficient.

The findings from both the literature review and the empirical material have been compiled in Table 7.1. They suggest that Nepal's food system is constrained less by isolated bottlenecks than by the interaction between fragmentation, weak coordination, uneven institutional enforcement, and difficult geography. Consistent with observations on fragmented AVCs in LMICs (Barrett et al., 2022), the interviews indicate that many of the constraints faced by agribusinesses in Nepal emerge not from a lack of production alone, but from the inability to coordinate production, aggregation, processing, and distribution efficiently across the chain.

Table 7.1: Summary of literature-based and empirical findings on the national enabling environment in Nepal

Elements	Literature review	Empirics
Infrastructural	Poor road infrastructure Irrigation and water infrastructure Storage, logistics, and market access Energy infrastructure ICT infrastructure Lack of resilient infrastructure	Weak logistics connecting mountain, hill, and Terai regions Dysfunctional cold storage Undeveloped aggregation infrastructure Supply-demand mismatches
Institutional	Uneven state capacity Governance effectiveness Political stability Policy continuity Regulatory quality Compliance with standards Informal institutions Dual structure affecting decision-making	Weak implementation of regulations DFTQC certification as a threshold for formal market access Lack of contractual mechanisms and buy-back agreements Asymmetrical bargaining power Informational asymmetries Traceability and standardisation gaps
Socio-cultural	Strong traditional customs Resistance to change Enduring socio-economic inequalities Large-scale migration Strong social relations	Trust-based interactions Reluctance to change established buyer relations Gendered barriers to finance and market access Urban-rural divide

Continued on next page

Elements	Literature review	Empirics
Economic and financial	Remittance-based economy Informal agriculture sector Agricultural competition from India Access to finance	Inherently high transport and aggregation costs Value concentration at intermediary level
Organisational	Formal and informal organisations High potential for cooperatives Contract farming and specialised commercial farming Digitalisation to coordinate organisation	Dominance of informal intermediary networks Weak coordination between value chain actors Uneven cooperative capacity Direct-to-consumer models Retailers prefer consistent suppliers Dependency structures in value chain
Environmental	Agroecological diversity Environmental unpredictability	Seasonal production variability across ecological zones and weak ability to leverage it Climate and weather uncertainty Wildlife-related crop destruction

As discussed in Section 5.1.2, the literature consistently identifies infrastructural weakness, institutional limitations, and fragmented market structures as major constraints in Nepal's agricultural sector (Asian Development Bank, 2025; Sapkota, 2023). The empirical material refines this picture by showing how these conditions translate

into concrete operational challenges for agribusinesses across different value chain functions. In several areas, the interviews also reveal emerging leverage points that may support gradual upgrading towards more coordinated and market-oriented AVCs.

7.1.1.1 Fragmentation and Coordination Failure

The most pervasive binding constraint identified across both literature and interviews is fragmentation. Production remains highly dispersed across large numbers of smallholders operating at low scale, while the systems required to aggregate, coordinate, and move products efficiently between actors remain underdeveloped. The consequence is that coordination costs become exceptionally high across almost all stages of the value chain.

For producers, fragmentation limits bargaining power and makes participation in formal market channels difficult. Retailers and processors face the opposite side of the same problem: sourcing directly from farmers becomes commercially irrational when products must be collected from many geographically dispersed producers in small volumes. This was repeatedly reflected in the interviews with wholesalers, retailers, processors, and institutional actors. BigMart's Purchasing Officer, for instance, described direct procurement from farmers as practically unfeasible at current store volumes, while ADB officials identified the absence of organised aggregators as one of the most important structural gaps in the chain.

The lack of contractual coordination mechanisms further reinforces this fragmentation. The interviews repeatedly highlighted the absence of buy-back agreements, long-term sourcing arrangements, and intermediary registration systems. Under such conditions, producers have little certainty that products will be purchased, while downstream actors lack confidence in future supply consistency and quality. This discourages investment on both sides of the chain. Farmers therefore continue producing defensively and at low volume, while retailers and processors remain dependent on wholesalers and intermediary networks instead of investing in direct sourcing systems.

On the other hand, a potential avenue could be for agribusinesses

to create incentives for farmers to reinvest earnings in aggregative capacity through increased productivity, conjoined landholdings with nearby farmers, and storage facilities. As noted by Holmelin (2021), social incentives can be more effective than purely monetary ones in the Nepali context. An example could be to strengthen farmers' access to crops such as rice or millet that, despite their relatively low market value, have a high practical value for household use, rather than relying solely on monetary compensation.

Nonetheless, informational asymmetries deepen these coordination failures further. Consistent with broader literature on traditional and transitional AVCs (Barrett et al., 2022), traders and intermediaries frequently control access to market and pricing information. Several respondents described how producers often make planting decisions based on habit, neighbouring production patterns, or historical practice rather than actual demand conditions. The result is a recurring supply-demand mismatch that contributes to price volatility, inconsistent product availability, and significant post-harvest losses. Digital coordination tools could therefore be used as substitutes for missing physical or institutional infrastructure or as a means to coordinate geographically dispersed actors. In particular, digital market information system and procurement platforms that reduces information asymmetries have high potential to decrease coordination costs between producers, intermediaries, and customers (Asian Development Bank, 2025).

At the same time, several leverage points emerged around coordination. A small number of producers and cooperatives across the interviews have successfully established direct-to-consumer models, branded channels, and more integrated sourcing systems. These examples remain limited, but they demonstrate that reduced intermediary dependence is possible when producers possess sufficient organisational and managerial capacity to coordinate market relationships directly.

7.1.1.2 Informality and Weak Institutional Enforcement

A second major binding constraint concerns the coexistence of formal regulatory frameworks with highly informal market practices. The

literature already points to Nepal's limited state capacity and low governance effectiveness (Asian Development Bank, 2025; Sapkota, 2023), but responses from the field study demonstrates how these weaknesses shape day-to-day value chain operations.

The interviews consistently suggest that the core issue is not the absence of regulation itself, but inconsistent implementation. Nepal has food safety laws, certification systems under the DFTQC, and regulatory frameworks, yet enforcement remains uneven between actors and regions. Large sections of the intermediary system continue to operate informally, often without registration, traceability systems, or formal accountability mechanisms. This creates uncertainty across the chain and limits the ability of agribusinesses to establish reliable sourcing relationships.

The implications are particularly visible for the processing, packaging, and retailing functions. Formal retailers and institutional buyers require DFTQC certification and consistent quality standards, yet many producers lack the capacity, knowledge, or organisational support required to comply. Several respondents emphasised that the certification process itself is not necessarily prohibitively expensive but administratively demanding in ways that disproportionately disadvantage smaller and more remote producers.

Traceability and standardisation gaps create additional constraints. Processors and aggregators repeatedly described quality inconsistency between producers, harvests, and deliveries as one of the main operational challenges in the chain. Since grading and standardisation systems remain weak in the farm and collection stages, much of the quality risk becomes concentrated downstream at the aggregation and processing stages. This increases transaction costs and discourages formal buyers from engaging directly with dispersed smallholders.

Against this backdrop, certification systems and emerging traceability mechanisms also represent important leverage points. DFTQC certification functions as an entry point into formal retail and institutional procurement channels, while initiatives around geographical indications and origin-based branding may create opportunities for differentiated market positioning. However, these mechanisms remain

dependent on stronger implementation capacity and more coordinated organisational structures throughout the chain.

7.1.1.3 Geographic and Infrastructural Constraints

Nepal's geography constitutes a structural constraint that interacts with nearly every other element of the food system. Mountainous terrain, weak transport infrastructure, and uneven regional connectivity increase the cost of moving products across the chain and reinforce the fragmentation described above. Consistent with findings from the literature (Asian Development Bank, 2025; World Bank, 2022), the empirical material suggests that proximity to roads and urban centres is often a stronger determinant of market access than production capability itself.

These conditions affect all major value chain functions. Producers in remote mountain and hill areas face difficulties in reaching greater urban or Terai markets. Aggregators face high transportation costs and spoilage risks when collecting products from scattered producers. Retailers and processors struggle to establish reliable sourcing systems outside the most accessible regions. In many cases, imported products from India become commercially more viable than domestic sourcing, despite the local production potential.

Cold storage infrastructure illustrates these dynamics clearly. Although significant investments have been made in storage facilities, The World Bank Agriculture team described them as dysfunctional due to poor placement, unsuitable design, or lack of operational capacity. Rather than stabilising seasonal supply and reducing post-harvest losses, much of this infrastructure remains underutilised.

Yet geography also creates important leverage points. Nepal's agroecological diversity provides naturally complementary growing seasons across mountain, hill, and Terai regions, creating the potential for year-round supply coordination. Several respondents identified this as one of the country's most underutilised structural advantages. However, exploiting this complementarity requires coordination capacities that currently remain weak across both public and private sectors.

7.1.1.4 Uneven Organisational Capability

The interviews reveal substantial variation in organisational capability between actors within the food system. Some producers and cooperatives remain highly dependent on projects, intermediary networks, or informal market relations, while others have developed stronger branding strategies, direct buyer relationships, and more commercially orientated operations.

This unevenness emerged as both a binding constraint and a potential leverage point across interviews. Many cooperatives reportedly function primarily as savings groups with limited market coordination capability, and several respondents described how externally supported initiatives often weaken once donor or NGO involvement ends. Therefore, project dependency remains a significant structural issue within the sector.

At the same time, the more commercially successful cases encountered during fieldwork shared several common features: stronger managerial capacity, greater market knowledge, active branding strategies, and more direct engagement with consumers or downstream buyers. Producers using digital platforms, social media, and direct retail channels were consistently better positioned to negotiate prices, differentiate products, and reduce dependence on intermediary networks.

These findings suggest that organisational capability may represent one of the most important leverage points for value chain development in Nepal. The transition towards more coordinated AVCs does not depend solely on physical infrastructure or formal regulation, but also on whether actors possess the managerial, organisational, and commercial capacities required to coordinate increasingly complex market relationships.

Finally, as highlighted in the literature review, Nepal's remittance-based economy has contributed to increased household consumption while simultaneously strengthening labour shortages and reducing the competitiveness of domestic production (Asian Development Bank, 2025; World Bank, 2022). Despite the macroeconomic challenges remittances present, the financial inflow represents a clear leverage

point for smallholder agribusinesses wanting to scale up operations, as access to finance has been mentioned as a major barrier for many actors. However, an issue that Holmelin (2021) has pinpointed is that the farmer's willingness to reinvest can be more influenced by social structures, traditions, and risk-reducing motives than returns on investments. This indicates that while remittances can present a major opportunity for farmers, the leverage point actually lies in designing smart and contextually grounded incentive-structures that motivate farmers to actually reinvest in the agribusiness.

7.1.1.5 Implications for AVCs

In general, the analysis suggests that Nepal's food system is constrained by the combined effects of fragmented production, poor coordination, weak institutional enforcement, and difficult geography. These constraints increase transaction costs across production, aggregation, processing, wholesale, packaging, and retailing functions, and as a result, much of the system remains dependent on intermediary-led coordination.

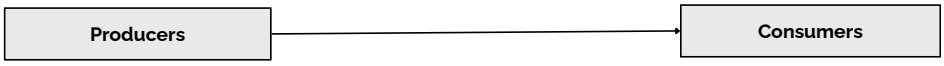
Simultaneously, the interviews show that these constraints do not affect all actors equally. Some producers, cooperatives, processors, and retailers have established more coordinated commercial arrangements through direct sourcing, branding, digital marketing, and stronger organisational capacity. The food system therefore consists of overlapping value chain structures, where highly informal and fragmented arrangements coexist alongside more coordinated and commercially orientated ones.

7.1.2 Market Pathways

The enabling environment conditions described above are not evenly distributed across the food system, they shape some pathways more than others. From the food system mapping in Figure 7.1, four distinct pathways can be identified, each reflecting a different configuration of actors, coordination mechanisms, and exposure to the constraints and leverage points outlined above. Building on the pathway con-

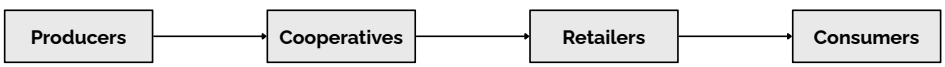
figurations described by Pun (2023), who documented the shortest pathway as a direct farmer-to-consumer route and the longest as a multi-intermediary chain passing through aggregators, traders, wholesalers and retailers, this study extends the framework by adding two intermediate configurations and estimating the relative volume flowing through each. These are not exhaustive descriptions of every possible route, but represent the principal routes through which produce moves from farm to consumer, each characterised by a different set of actors, distance, and end market.

Pathway 1 - Shortest Pathway (Direct Sales)



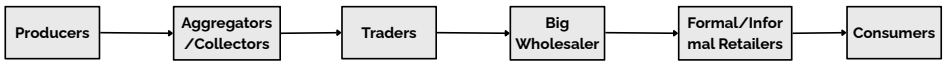
Description: *The shortest pathway bypasses all intermediary actors, with producers selling directly to end consumers. In practice, this occurs primarily through farm-gate sales, local haat-bazaars, or roadside stalls, and is most common among transitional smallholders with limited production volumes and strong proximity to a local consumer base. The absence of intermediaries means transaction costs are low in monetary terms, but the pathway is constrained by the producer's own market reach. Without aggregation or distribution infrastructure, volumes become low and geographic reach is narrow. As documented by MoALD's Undersecretary, this pathway accounts for less than 5% of traded produce, reflecting not a preference for intermediation but the structural reality that most producers lack the organisational capacity and market access to sustain direct sales at meaningful scale. The conditions that make this pathway marginal in size (fragmented landholdings, poor road connectivity, and weak market information) are precisely the enabling environment gaps that make intermediary dependence rational rather than chosen.*

Pathway 2 - Medium Distance Pathway (Local Sourcing)



Description: *The local sourcing pathway routes produce through cooperatives before reaching retailers and end consumers, bypassing the dominant wholesale system. It is characterised by a shorter chain, greater producer coordination and more direct relationships between supply and demand. Cooperatives serve as the aggregation mechanism here, consolidating volumes from member farmers to reach a threshold that most individual smallholders could not achieve alone. This pathway is represented in the empirics through examples such as Store E in Pokhara, which sources directly from over two hundred farmers and communities through a vertically integrated business model built on personal relationships. The pathway's success depends heavily on the cooperative's organisational capacity and its geographic proximity to retailers. These conditions exist in some places but it should be noted that they are far from universal. Where it functions, it offers producers a meaningfully higher share of end value than the dominant wholesale route, consistent with Chaudhary et al. (2023) who found that shorter market channels correlate with higher producer shares of final price. The pathway's scale remains limited due to the same aggregation bottlenecks described in Pathway 1: without sufficient volume and consistency, larger retailers cannot depend on cooperative supply alone.*

Pathway 3 - Medium-Long Distance Pathway (Dominant Route)



Description: *The dominant pathway routes produce from producers through aggregators, collectors and traders, onward into the big wholesale system and finally to formal or informal retailers, before becoming available to individual consumers. It accounts for the overwhelming majority of traded produce, with MoALD estimating that approximately 70-75% of volume moves through this intermediary chain, and its dominance is not a coincidence. The pathway exists as it does because it solves, however inefficiently, the coordination problem that the enabling environment creates: smallholder fragmentation makes individual farm*

volumes too small to attract formal buyers, poor infrastructure makes farm-gate access costly, and weak market information makes price discovery dependent on actors with established networks. Aggregators and traders absorb these coordination costs, and in doing so extract significant margins, reported at over 50% of farm-gate price by Giri (2023). This leaves producers as price takers with limited bargaining power, as acknowledged consistently across interviews with producers and institutional organisations such as FAO. The wholesale layer, anchored nationally by Kalimati and regionally by smaller markets, functions as the primary price-setting node of the system. From there, produce disperses across a fragmented retail landscape dominated by local grocery stores and informal shops, with modern supermarkets still only accounting for 6% of fruit and vegetable sales, according to BigMart's Purchasing Officer. The pathway functions because it solves a real coordination problem, but the solution comes at the cost of producer bargaining power and that trade-off is structural, not coincidental.

Pathway 4 - Longest Pathway (Refined Products)

Description: *The longest pathway extends the dominant route by routing produce through a processor and packager before reaching formal retailers. It is not very common, reflecting the broader underdevelopment of Nepal's processing sector. As documented in Chapter 5, the processing layer remains thin relative to production volumes, with large-scale processors predominantly relying on imported inputs rather than domestic supply. Where it does exist, this pathway is distinguished from the others by two features: first, it involves physical transformation of the product and, second, it requires DFTQC registration as a practical condition of entry. DFTQC registration becomes practically enforced at this stage in a way that it rarely is elsewhere in the system. Formal buyers such as supermarkets and institutional procurers enforce compliance as a non-negotiable requirement, meaning that the regulatory obligation which applies across all pathways is here actually binding. This does not imply that actors in other pathways*

are exempt from the requirement, but rather that the consequences of non-compliance become commercially concrete only when engaging with buyers who verify it. The pathway therefore demands a higher threshold of organisational capacity, capital investment and regulatory compliance than any other route, which systematically excludes smallholders operating without cooperative or institutional support. It is, however, the pathway most relevant to the commercialisation of solar-dried fruits and vegetables and the one through which the highest consumer value can potentially be captured, provided the coordination and compliance conditions can be met.

7.1.3 Stages of Transformation and Transaction Costs

Across the four pathways above, a consistent pattern emerges for the value chains that operate within them. None of them show the characteristics of a modern AVC as defined by Barrett et al. (2022). For example, there are almost no private standards enforced through contracts, no capital-intensive processing at scale, no vertically integrated logistics and no off-market distribution companies coordinating supply across the chain to any substantial extent. Instead, the value chains observed within these pathways span a spectrum of traditional and transitional configurations: spot markets, informal coordination through personal relationships, labour- and capital-intensive logistics and long rural-urban chains mediated by several layers of intermediaries. Even within *Pathway 4*, the most structurally advanced route, a few value chains reach only to the boundary of transitional-modern. Buyer-enforced compliance replaces contracts and processing exists but remains thin and most importantly dependent on imports. This is not by accident, because the system is held in place by structural conditions that make modernisation difficult to initiate and costly to sustain.

Barrett et al. (2022) argue that the transition from traditional to modern AVCs is not simply a function of investment or technology, it requires a shift in the coordination mechanisms through which actors organise change. Traditional and transitional value chains are

held together by informal trust, repeated interaction and personal relationships because the formal institutions that would make contracts enforceable and standards verifiable are absent or weak. In Nepal, this description maps precisely onto what the empirics reveal. Agreements between farmers and traders are verbal, many prices are negotiated at the point of transaction without external benchmarks and enforcement of laws and standards is sporadic. Moving toward modern AVC characteristics therefore requires not only capital investment but a transformation in the institutional context and this is something that no single actor in the chain can produce in their own. This is also where transaction cost economics provides a deeper explanation.

The theory created by Williamson (1989) predicts that when the costs of coordinating exchange between actors are high, rational actors will tempt to internalise those coordinating exchanges. They will try to bring functions inside the organisational boundary rather than managing them across different actors. In Nepal's food system, inter-firm transactions are high across the value chains observed within all four pathways. The price of a kilogram of radish increases from 4 NPR at farm gate to 45 NPR at retail in Kathmandu without any physical value addition, as documented by Pun (2023), with BigMart and Chaudhary et al. (2023) observing similar patterns across other commodities. The markup is not profit from transformation, it is the accumulated cost of search, negotiation, transport, and risk absorption across a fragmented and poorly connected chain. Each intermediary layer exists because it reduces one coordination problem while introducing another and the total cost of this arrangement is ultimately carried both by the producers through suppressed farm-gate prices, and then by the consumer through inflated retail prices. TCE would predict that under these conditions, actors with sufficient capital and organisational capacity will begin to internalise parts of the chain create the highest transaction costs, but this cannot be shown by the empirics. For example, BigMart sources only 10% of its supply directly from farmers, and described this more as a practical constraint than a preference. Direct procurement at scale would only become viable at four to five hundred stores, roughly three times the company's current size. BigMart has not internalised its supply function, despite being one of the largest actors on the market. Cooperative A, on the other

hand, have managed to internalise its entire value chain, but this has been made possible by the fact that the value chain is not of large scale, and is situated within a 5km radius.

These examples do not determine that the theory does not hold true in Nepal, but rather that the prerequisites it assumes are largely absent. As the empirics and literature indicate, most actors in Nepal's food system simply do not possess the organisational capacity, managerial depth, or capital strength required to take on the coordination responsibility that internalisation demands, unless at a small scale.

Moreover, the logic of internalising these coordinating exchanges is easier to apply downstream than upstream. Activities such as processing, packaging, and retail can be brought inside the organisation with capital investment and compliance efforts, but aggregation is different. It requires coordinating dispersed smallholder production across fragmented landholdings, poor infrastructure and weak information systems, which are precisely the conditions that make transaction costs high in the first place. This is why aggregation remains perhaps the last and most difficult problem in Nepal's food system. It is also, importantly, the problem most relevant to the commercialisation of dried food. Drying is not only a processing activity but also an aggregation mechanism in itself, capable of consolidating quickly spoiling products into a storable and durable product of greater volume that can then enter more formal market channels at a later time. Whether that potential can be realised depends on whether any smaller actors are capable of taking on coordination responsibilities and which market segments make it commercially rational to try.

7.2 GTM Strategy

Having established the structural conditions of Nepal's food system, the actor configurations, flow distributions, governance logic and transaction cost dynamics that define how value chains are currently organised, the analysis can now turn to the question of market entry opportunities for solar-dried products.

Henceforth, the term 'dried products' will consist of three broader

categories; *fruits*, *vegetables* and *spices*.

As outlined in the Integrated Market Entry Framework (Figure 3.8), this proceeds sequentially: from identifying which segments exist and what they need, through assessing whether the structural conditions for reaching them are in place, to designing the interaction logic and, finally, composing the GTM strategies themselves. Each subsection below corresponds to one layer of that framework, applied to the Nepali context established above.

7.2.1 Segment Identification

7.2.1.1 Candidate Identification/Segmentation

A producer looking to commercialise dried fruits and vegetables faces a market with several distinct potential end markets. By looking at the food system map and the four identified pathways through the lens of the empirics, eight candidate segments emerge as potential end markets for solar-dried fruits and vegetables. Each represents a buyer type with a distinct relationship to the product, a distinct channel through which they can be reached, and a distinct set of conditions that determine whether entry is viable.

- ***International Trekkers*** - international visitors on Nepal's trekking routes, purchasing food for consumption on the trail. They represent a geographically concentrated segment, moving through specific corridors and urban tourist hubs, such as Lakeside in Pokhara or Thamel in Kathmandu. Their purchasing behaviour is shaped by the practical constraints of trekking; weight, shelf life and portability matter. Due to this behaviour, this segment is deemed to be primarily relevant for dried fruit but less so for vegetables because they generally require preparation. Neither spices are deemed relevant, as international trekkers do not cook on shorter routes in Nepal. The authors notes that domestic trekkers could become an interesting segment in the future, but instead of intermittent snacking on the trail, they rely more on heavy meals at tea houses. Moreover, they are

substantially more price-sensitive than international visitors as noted by Farming Cooperative A's manager.

- ***Non-Trekking Tourists*** - international visitors in Nepal for pleasure/holiday, wellness trips, pilgrimage, and business. They are mostly passing through Nepal's urban tourism hubs purchasing dried products as souvenirs or gifts. They are concentrated in Kathmandu's Thamel district and Pokhara's Lakeside area, where specialty retail shops catering to international visitors already stock locally produced packaged goods. Unlike trekkers, their purchase context is leisure and cultural exploration rather than functionality and their decision to buy is shaped more by presentation, story, and perceived authenticity than by product specifications. Due to this behaviour, both dried fruit and spices are deemed relevant for this segment. Importantly, since tourists seldom cook, dried vegetables are not relevant.

- ***Urban Premium Consumers*** - higher-income Nepalis, expatriates, and health-conscious urban residents concentrated in cities. FAO's Value Chain Specialist identified this group as the most realistic near-term domestic consumer segment, describing their concentration in the neighbourhoods, farmers markets, and retail environments that cater to higher-income and internationally connected populations. Awareness of locally produced dried food products within this segment is limited but growing, driven by urbanisation, remittance-fuelled consumption, and social media influence on food culture. Because of this, they represent one of the few domestic segments with realistic demand across all three product categories. Dried fruit aligns with growing interest in healthier snack alternatives, dried vegetables with convenience-oriented and health-conscious cooking practices, and spices with demand for premium, organic, and locally sourced products.

- ***Urban Commuters*** - mid-income Nepali urban commuters seeking convenient portable snacks for daily consumption. They represent a larger and more price-sensitive population than urban premium consumers, purchasing through mainstream retail channels, e.g. local grocery stores, convenience shops

and street vendors, rather than the specialty retail stores that serve premium segments. Their purchasing behaviour is habitual and convenience-driven, and the product category of dried fruit is largely unfamiliar to them. Despite this, dried fruit snacks could be relevant for urban commuters as portable snacks fit existing consumption habits, particularly among younger urban consumers that purchase FMCGs like snacks through modern retail channels, as noted by BigMart's Purchasing Officer. Dried vegetables and spices are less relevant because they function primarily as cooking ingredients rather than direct-consumption products.

- ***Festival Consumers*** - urban households purchasing dried fruit for culturally embedded gifting and consumption at key calendar moments, most prominently Tihar. MoALD's Undersecretary specifically identified festival culture as an existing and growing context for dried fruit demand, noting that imported dry fruits currently dominate this segment. It is defined by occasion rather than demographic, meaning that it cuts across income levels and overlaps with other consumer segments at specific times of year. Dried spices may hold some secondary relevance through festival cooking traditions, while dried vegetables have little relevance in this context. In comparison to fruits however, those categories are marginal.

- ***HORECA*** - Hotels, restaurants, cafés and businesses purchasing dried products as ingredients. HORECA is relevant for all three categories because purchasing decisions are based on operational considerations rather than consumer familiarity. Dried fruit can function as a welcoming snack or an ingredient in breakfasts, baked goods, snacks, and tourist-oriented menus. Dried vegetables provide storage and shelf-life advantages in commercial kitchens and are often used in traditional recipes. Spices are of course already used extensively by the HORECA segment. Helvetas Nepal's Business Development Coordinator identified this as one of the most immediately viable B2B segments due to its focus on specification, reliability, and price rather than consumer awareness or brand trust.

- ***School Canteens*** - Schools with larger canteens purchasing dried products as ingredients or snacks. The WFP school feeding programme, covering approximately 27,000 schools and 2.8 million children, is the best-documented example in the empirical material, but the segment is broader. What distinguishes it from other segments is that purchasing decisions are made by procurement officers rather than consumers, and the evaluation criteria are dominated by cost, certification compliance, and supply consistency. Dried fruit may function as a nutritional snack or supplement, while dried vegetables fit large-scale meal preparation where the perishability of ingredients matter. Spices remain relevant for this segment as well.
- ***Remote Rural Communities*** - remote communities with limited access to fresh supply looking for shelf-stable nutrition. Dried fruits and vegetables can be relevant because of their shelf stability and ability to reduce seasonal nutritional gaps in geographically isolated areas. Dried vegetables may be particularly relevant where fresh produce availability fluctuates strongly across seasons. Spices are also relevant due to their low transport weight and long shelf life, although they address culinary preferences more directly than nutritional deficiencies.

A summary of the segments and their respective relevant product categories is presented in Table 7.2 below. Henceforth, product categories marked in red are excluded from further segment-specific analysis, meaning that subsequent discussions of each segment will focus only on the product categories assessed as relevant. An important note is that category relevance does not impact segment potential, which will continue to be analysed throughout this chapter.

Table 7.2: Product category relevance by market segment.

Segment	Dried Fruit	Dried Vegetables	Dried Spices
International Trekkers	●	●	●
Non-Trekking Tourists	●	●	●
Urban Premium Consumers	●	●	●
Urban Commuters	●	●	●
Festival Consumers	●	●	●
HORECA	●	●	●
School Canteens	●	●	●
Remote Rural Communities	●	●	●

● Relevant ● Not relevant

7.2.1.2 Viability Filter/Six Criteria/Targeting

Not all candidate segments that exist in theory can be reached in practice. Wedel and Kamakura (2000) identify six criteria that a viable market segment must satisfy: it must be identifiable, substantial, accessible, stable, responsive to differentiated marketing efforts, and actionable given the resources of the firm. For a producer entering Nepal's market for solar-dried products, these criteria function as a practical screen that separates segments worth pursuing from those that are commercially inviable given current structural conditions. Table 7.3 applies the filter to the seven remaining candidates.

Table 7.3: Wedel and Kamakura (2000) viability filter applied to candidate segments.

Segment	1 Identifiable	2 Substantial	3 Accessible	4 Stable	5 Responsive
International Trekkers	●	●	●	●	●
Non-Trekking Tourists	●	●	●	●	●
Urban Premium Consumers	●	●	●	●	●
Urban Commuters	●	●	●	●	●
Festival Consumers	●	●	●	●	●
HORECA	●	●	●	●	●
School Canteens	●	●	●	●	●
Remote Rural Communities	●	●	●	●	●

● Criterion satisfied ● Conditionally satisfied ● Not satisfied

* Criterion 6 (actionability) assessed in Section 7.2.2.

The filter reveals a differentiated picture across the eight candidates. Four pass cleanly, three pass conditionally and one fails.

International trekkers, non-trekking tourists, festival consumers and school canteens satisfy all five criteria. They are identifiable, substantial, accessible through existing market channels, stable over time and responsive to differentiated marketing efforts in ways that are immediately actionable.

Urban premium consumers and urban commuters both pass with a note on stability. Demand for locally dried products within both segments is growing but not yet consolidated into a reliable purchasing pattern. The trend is definitely clear but the segment has not yet reached the size that would make it structurally stable. HORECA passes with a note on responsiveness. Professional buyers evaluate suppliers primarily on specification, price, and reliability rather than differentiated marketing, meaning responsiveness to branding or provenance-based positioning is real but limited in scope. These qualifications do not disqualify any of the three segments, but they signal that there are some efforts to be made in order to make these segments convincingly viable. Entry here may require different investments and timelines than the cleanly passing segments before full commercial success could be possible.

Remote rural communities as a customer segment fail this filter. The need for dried food products is undoubtedly there and the segment is both identifiable and likely stable over time. However, it cannot be deemed to be substantial in commercial terms. The segment is in fact not one single segment, it is rather, as noted by WFP's School Meals Programme Manager, a group of many scattered, smaller segments that will be difficult to reach at scale and therefore not substantial enough at an individual level. The underlying need is real, but it is deemed to be a matter of food security to ensure that these communities' nutritional needs are met, rather than a market opportunity for smaller producers. Remote Rural Communities are therefore excluded from further analysis.

Criterion 6 - *actionability* - is not assessed here. This is because it depends heavily on the organisational capacity and resources of the entering producer, which vary significantly and are better assessed through the adoption feasibility and interaction design sections that follow later on in the analysis.

7.2.1.3 Positioning

The positioning analysis evaluates each segment according to six dimensions: The primary consumption situation in which the product is used; what Jobs-to-Be-Done each segment may want to employ dried

food products for using Table 7.4 wherein the authors chose to create a distinction between functional jobs and emotional/social jobs; the main competing alternatives currently fulfilling the same need; the core value proposition offered by solar-dried products, the key positioning logic through which the products may differentiate themselves; the mechanisms through which trust and legitimacy can be established within the segment; and lastly the segment's relative price sensitivity. The purpose of this section is not to formulate a complete marketing strategy, but rather to identify how different segments may perceive and evaluate dried products within existing consumption patterns and market structures. The findings from this section subsequently inform the later GTM analysis, where the broader market-entry strategy, interaction logic, and practical commercialisation pathways are developed in greater detail.

Table 7.4: Jobs to Be Done Across Candidate Segments

Segment	**Functional Job**	**Emotional/Social Job**
International Trekkers	• Portable nutrition • Dense nutrition and energy • Shelf-stable nutrition	• Adventure readiness • Authentic local experience
Non-Trekking Tourists	• Gift/traditional consumption • Collecting artifacts	• Cultural participation • Sharing the experience with people back home
Urban Commuters	• Convenient snack	• Modern/health-conscious identity

Segment	Functional Job	Emotional/Social Job
Urban Premium Consumers	• Healthy, locally sourced products • Guilt-free snack	• Modern/health-conscious identity • Supporting local producers
Festival Consumers	• Gift/traditional consumption	• Cultural participation • Maintaining tradition
HORECA	• Ingredient differentiation • Consistency • Hygienic	• Premium positioning • Local sourcing as differentiator
School Canteens	• Shelf stability/logistics • Nutritionally compliant • Cost-competitive	• Procurement reliability • Supporting local/rural producers

International Trekkers

International Trekkers represent one of the clearest positioning opportunities for dried fruits. In this segment, the products compete primarily against imported trail mix, protein bars, energy bars, and other packaged trekking snacks already embedded within trekking culture. The primary job consumers are trying to get done is to sustain energy and nutrition during long periods of travel without carrying heavy, perishable, or inconvenient food. Solar-dried fruits can therefore position themselves as lightweight, shelf-stable, and more natural alternatives to heavily processed imported snacks, while simultaneously offering a uniquely local connection to Nepal that imported products cannot replicate. Trust within this segment is likely

built through authenticity, visible local sourcing, and integration into trekking environments through guides, tea houses, trekking shops, local retailers, and tourism networks. Price sensitivity is low, as international trekkers are already accustomed to paying premium prices for imported trekking foods and convenience products.

Non-Trekking Tourists
Non-trekking tourists constitute a related but distinct segment where the products compete less against functional snacks and more against other souvenir-oriented products such as tea, handicrafts, imported dry fruits and spices, and packaged local goods. Here, the central job is not only wanting eat a healthy snack, but also to bring home something authentic, portable, and culturally connected to Nepal that can be consumed, gifted or shared socially. The positioning logic therefore shifts toward storytelling, local origin and attractive packaging rather than portability or convenience alone. Trust is likely shaped through presentation quality, perceived authenticity and the extent to which the product feels genuinely connected to local production and Nepali identity. Similar to international trekkers, this segment is likely relatively insensitive to price compared to domestic consumer groups.

Urban Commuters
Urban commuters represent a more price-sensitive and behaviourally difficult segment. The products compete primarily against crisps, biscuits, packaged snacks, and to some extent fresh fruit. Unlike tourists or trekkers, these consumers are not necessarily seeking authenticity or novelty, but rather convenient everyday consumption options that fit into their existing urban life. The underlying job is therefore to satisfy hunger conveniently during the day while avoiding products perceived as overly unhealthy or artificial. In this context, solar-dried fruit products would likely need to position themselves first and foremost around convenience and perceived healthiness, with local production functioning as a secondary differentiator rather than the primary value proposition. Trust is likely built less through storytelling and more through repeated retail presence, clear packaging, visible hygiene standards, and familiarity over time.

Urban Premium consumers

Urban premium consumers appear to represent one of the strongest near-term domestic opportunities identified in both the literature review and interviews. Respondents consistently described growing demand among younger and higher-income urban consumers for health-conscious, quality-oriented, and locally produced food products. Within this segment, solar-dried products compete primarily against imported dried fruits, nuts, and premium health snacks. The job consumers are attempting to get done extends beyond simple hunger reduction and relates more closely to maintaining a lifestyle associated with health, wellness, modernity, and conscious consumption. Products therefore position themselves around naturalness, minimal processing, local provenance, and perceived quality. However, multiple respondents also noted that imported products currently retain advantages in branding and presentation, meaning that packaging and perceived professionalism become central trust-building mechanisms within this segment. Price sensitivity appears moderate; willingness-to-pay exists, but products likely still need to remain competitive with imported alternatives.

Festival Consumers

Festival consumers constitute a particularly interesting segment because dried fruit consumption is already embedded within existing cultural practices. Interviews indicated that dried fruits and nuts already play an established role in festival gifting and celebratory consumption, although imported products currently dominate much of this market. The key job consumers are trying to get done is therefore not to discover a completely new product category, but rather to participate in socially expected gifting and celebration practices using products perceived as respectable and culturally appropriate. Solar-dried products can therefore position themselves as locally produced substitutes within an already legitimised category rather than attempting to create entirely new consumer behaviour. Attractive packaging, gifting suitability, and perceived equivalence to imported products become central trust-building mechanisms. Price sensitivity appears moderate, as consumers are already accustomed to paying premium prices for imported festival dry fruits, although local products likely need to remain within a familiar reference range to function as credible substitutes.

HORECA
The HORECA segment differs significantly from the previous consumer-oriented segments because purchasing decisions are more operational and business-oriented. Here, solar-dried fruits, vegetables, and spices compete primarily against imported dried ingredients and fresh produce. The main job buyers are attempting to get done is to maintain flexibility, reduce spoilage, and offer guests differentiated food experiences while controlling costs and ensuring consistency. Positioning therefore centres less on consumer branding and more on ingredient functionality, local sourcing, shelf stability, and the ability to contribute to locally embedded hospitality experiences. In some contexts, the products may also function as part of a broader hospitality narrative around authentic Nepali food experiences. Trust is likely built primarily through reliability, consistent quality, stable supply, and demonstrated usability within professional kitchen environments.

School Canteens
School canteens represent the most functionally driven segment identified in the analysis. The products compete primarily against inexpensive fresh produce sourced through wholesale channels, imported products, and low-cost processed foods already embedded within institutional procurement systems. The core job these actors are trying to get done is to provide nutritionally adequate food within strict budgetary, logistical, and operational constraints. In this context, solar-dried vegetables and fruits may create value through shelf stability, reduced storage complexity, concentrated nutrition, and simplified transport and procurement. Products targeted toward school feeding or institutional nutrition programmes may additionally position themselves around nutritional density and operational efficiency. However, unlike the more premium-oriented segments above, purchasing decisions here are likely dominated by cost, supply reliability, procurement compatibility, and certification requirements rather than branding or storytelling. Trust is therefore primarily institutional and procedural rather than emotional or identity-driven.

7.2.2 Adoption Feasibility

Having identified seven viable segments and established how solar-dried fruits and vegetables can be positioned within each, the analysis must now ask a more demanding question: given the structural conditions of Nepal's food system, how feasible is it that a producer can actually reach these segments and achieve adoption at meaningful scale? Viability and feasibility are not the same thing. A segment can satisfy all six of Wedel and Kamakura's (2000) criteria and still be unreachable in practice if the structural preconditions for adoption are absent.

Each segment is assessed through an integrated reading of Rogers' (2003) diffusion framework and Falck-Zepeda's (2026) LMIC extension. Rogers characterises the adoption challenge from the perspective of the potential adopter and asks how five perceived attributes of the innovation shape the speed and likelihood of uptake. Falck-Zepeda shifts the lens to the innovation system conditions that enable or constrain that uptake in the first place, asking whether the product is divisible enough for individual adoption logic to apply and whether the structural conditions identified in the enabling environment are in place. Rather than running these as two sequential passes, the assessment below integrates them, weighting each framework according to where it does the most analytical work for a given segment. Figure 7.2 provides a keyword overview of all seven segments across all six dimensions. The assessments that follow elaborate the reasoning behind each verdict, and the results feed into Table 7.5 and the surviving segments section that follows.

7.2.2.1 Diffusion and Adoption of Innovations

	International Trekkers	Non-Trekking Tourists	Urban Premium Consumers	Urban Commuters	Festival Consumers	HORECA	School Canteens
Relative Advantage	Lighter than fresh; Shelf stable; Local over imported trail mix	Local souvenir; Origin story that trumps imported alternatives	Local origin; Natural processing	Healthier than snacks; More convenient than fresh fruit	Local origin story trumps imported alternatives	Shelf-stability; Reduced spoilage; Local sourcing narrative	Shelf-stability; Nutritional option; Local origin
Compatibility	Trail food culture; Dried food formats already standard	Souvenir purchasing familiar; culturally connected gift	Health-conscious buyers already purchase dried fruit and snacks	Already purchase snack formats; Behavioural change required	Dried fruits are embedded in festival culture	Professional kitchens already use dried ingredients	Already procure vegetables and grains at scale
Complexity	No preparation; Straightforward consumption; No learning curve	No preparation; Straightforward consumption; No learning curve	No preparation; Straightforward consumption	No preparation; Straightforward consumption	No preparation; Straightforward consumption	No new equipment; Minimal new preparation tech.	No new equipment; Minimal new preparation tech.
Trialability	Single bag; Low Commitment	Small packaging; Low price relative to tourist spending	Possible in small quantities; Constrained by distribution	Small quantities, but not present in mainstream retail today	Small packaging makes trial low-risk during festival season	B2B trials are standard, but initiating contact is a threshold	Institutional approval is an initial threshold
Observability	Visible on trail or through guide recommendation; Word of mouth	Less peer visibility than trekking; Word of mouth slower	Social media potential; Not yet present in visible contexts	Commuter snacking not social; Low peer influence	Seasonality of festivals makes visibility lower	B2B decisions not socially visible; Slow word of mouth in network	Institutional decisions not visible across municipalities
System Conditions	Urban retail concentration. DFTQC threshold	Similar channel as trekkers; Packaging crucial; - DFTQC threshold	Awareness a binding constraint - market building required	Requires big habit change and heavy investment to create demand	Seasonal supply coordination critical; Many channels	Supply consistency and relationships a binding constraint	Decentralised procurement; DFTQC threshold; WFP support
Assessment	Near-term; All attributes are enabling	Near-term; Most attributes are enabling	Near-to-Medium-term; some market building is required	Excluded; Attributes and system conditions are constraining	Near-term; Strong cultural fit but coordination required	Excluded; Unrealistic entry demands for small producers	Near-to-Medium-term; Feasible for small producers; Capacity-building

Figure 7.2: Rogers' Attributes and Falck-Zepeda Assessment

International Trekkers
All five Rogers attributes point toward fast diffusion. The product slots directly into existing trekking culture without requiring behavioural change, purchase commitment is minimal, and the social nature of trekking creates strong word of mouth. The system conditions are also enabling: the primary purchase point is urban retail in Thamel and Lakeside, concentrating the distribution challenge into a small number of accessible locations rather than small mountain routes. DFTQC certification and professional packaging are non-negotiable requirements in this channel, but once cleared they do not complicate the diffusion further. Adoption is feasible in this segment.

Non-Trekking Tourists
Three out of five attributes point toward fast diffusion, with compatibility and observability carrying question marks. Non-trekking tourists are familiar with souvenir purchasing and dried fruit as a format, but buying locally produced dried fruit as a culturally connected gift is less established than trail snacking, requiring some behavioural change. Peer visibility is also lower than among trekkers. The system conditions are nonetheless enabling. The channel infrastructure is similar to trekkers, meaning a producer supplying one segment can likely serve both simultaneously. Packaging and presentation carry more weight here than functionality, making these aspects critical. Adoption is feasible, with success dependent on retail environment and presentation.

Urban Premium Consumers
Two out of five attributes point toward fast diffusion, with relative advantage, trialability, and observability all carrying question marks. The product's advantages are genuine but not self-evident without prior awareness, and the retail channel is thin and unreliably stocked. Unlike tourist buyers who arrive with prior exposure, urban premium consumers have limited awareness of locally produced dried fruit as a category. Awareness must be built before the individual adoption curve can start, and that is a market-building function no single producer can fund alone. Adoption is possible but requires prior investment in consumer awareness and channel development, making this a medium-term opportunity.

Urban Commuters
One out of five attributes points toward fast diffusion, three carry question marks, and observability scores low. The product is marginally healthier than existing alternatives but not compelling enough to disrupt current purchasing behaviours on its own. The system conditions compound every concern: mainstream retail is inaccessible without scale and established supplier relationships, and the awareness problem is more severe here than for any other segment since commuters are not seeking this product, it must displace current habits rather than respond to any latent demand. No coordinating mechanism in the current innovation system bridges that gap. This segment is excluded from near-term GTM strategy.

Festival Consumers
Three out of five attributes point toward fast diffusion, with trialability and observability carrying question marks. The cultural embeddedness of dried fruit in festival gifting, particularly Tihar, means the product does not ask for a new behaviour, only a substitution. The seasonal concentration of demand is both the opportunity and the constraint: a producer must be able to supply urban retail reliably within a narrow window, requiring production planning, aggregation capacity, and logistics that many smallholder producers currently lack. Missing the window means waiting a full year. Adoption is feasible for a producer with sufficient organisational capacity to execute seasonal supply.

HORECA
Two out of five attributes point toward fast diffusion, with relative advantage and trialability carrying question marks and observability scoring low. Professional kitchens already use dried ingredients routinely, eliminating the compatibility barrier, but the advantage of dried local products is product-specific and will not appeal to all buyers equally. Some will prioritise price or volume over local origin. Initiating a trial in this segment is also more demanding than in consumer-facing channels. It requires establishing contact, building trust, and navigating existing supplier relationships in a food system where reluctance to change established buyer relations is the norm. The system conditions reveal a structural pattern in that the consumer awareness problem does not apply, but the relevant question shifts

from whether consumers know the product to whether procurement officers know the producer. Supply consistency is a second binding constraint that most individual producers cannot meet without cooperative or intermediary support. There is genuine potential for adoption, but entry is dependent on building relationships and organisationally demanding.

School Canteens

Two out of five attributes point toward fast diffusion, two carry question marks, and observability scores low. The relative advantage of dried products over fresh local produce is modest given that most school programmes already have local sourcing policies. The system conditions are conditionally enabling but still demanding. WFP's decentralised procurement model distributes decision-making across 753 municipalities, meaning there is no single entry point at scale, although this is better understood as a scaling challenge than a barrier to initial entry. DFTQC certification is a non-negotiable threshold that disproportionately disadvantages smaller producers, though WFP support for reaching that threshold is available. For an established producer this segment offers limited scale per municipality; for a smaller producer seeking a first formal market entry, the institutional support pathway makes it genuinely attractive. Entry is feasible one municipal relationship at a time.

Table 7.5: Rogers' (2003) perceived attributes of innovation and system conditions applied to candidate segments.

Segment	1 Relative Advantage	2 Compa-tibility	3 Com-plexity	4 Triala-bility	5 Observa-bility	6 System Conditions
International Trekkers	●	●	●	●	●	●
Non-Trekking Tourists	●	●	●	●	●	●
Urban Premium Consumers	●	●	●	●	●	●
Urban Commuters	●	●	●	●	●	●
Festival Consumers	●	●	●	●	●	●
HORECA	●	●	●	●	●	●
School Canteens	●	●	●	●	●	●

● High / Enabling ● Medium / Conditionally enabling ● Low / Constraining
Note: for Complexity, low = favourable (green).

7.2.2.2 Surviving Segments

The assessment produces two exclusions. HORECA is eliminated despite its operational compatibility and absence of a consumer awareness problem. The binding constraints, which are supply consistency, organisational capacity, and the need to build individual procurement relationships in a context dominated by incumbent suppliers, prove more demanding than the Rogers profile suggested. Urban Commuters

are eliminated on two compounding grounds: the distribution challenge of reaching mainstream retail and the investment required to shift purchasing behaviour both exceed what the innovation system currently supports for a new entrant.

Five segments survive: International Trekkers, Non-Trekking Tourists, Urban Premium Consumers, Festival Consumers, and School Canteens. This assessment also completes the evaluation of Criterion 6 of Wedel & Kamakura (2000) - *Actionability* - which was deliberately moved from the viability filter because it depends on structural conditions rather than segment characteristics alone.

Table 7.6: Surviving segments, survival rationale, and indicative implementation timeline.

Segment	**Why It Survives**	**Timeline**
International Trekkers	Concentrated urban retail infrastructure, buyers familiar with format, no market-building required	Near-term
Non-Trekking Tourists	Same retail infrastructure as trekkers, fits existing buying behaviour	Near-term
Festival Consumers	Substitution logic already culturally established, no new behaviour required	Near-term, seasonally constrained
Urban Premium Consumers	Strong attribute fit but requires prior market-building and channel development	Near-to-medium-term
School Canteens	Feasible for small producers seeking a stable trade relationship and partner to build capacity	Near-to-medium term

7.2.3 Indicative Demand and Production Capacity Estimates

Estimated demand and production calculations for the segments analysed are presented in Appendix A. Due to limited and unreliable data, no calculations were conducted for dried spices or school canteens. The results are presented in Table 7.7.

Table 7.7: Indicative demand and production capacity estimates for selected customer segments.

Segment	**Estimated Demand [tonnes/year]**	**Required Fresh Production [tonnes]**	**Required Cultivated Area [hectares]**
Trekkers	87.5	550	61
Non-trekking tourists	194	1,200	135
Urban premium consumers (dried fruit)	900	5,625	625
Urban premium consumers (dried vegetables)	5,040	31,500	2,625
Festival consumers	8,000	50,000	5,500

7.2.4 Interaction Design

The analysis has now established which segments are viable, which are feasible to reach, and what the structural conditions of Nepal's food system look like. What remains is the question that RQ3 directly asks: *how do those contextual conditions influence the design of GTM strategies?* Answering it requires a different analytical lens. Segment identification and adoption feasibility both operate primarily at the level of the segment by asking who exists, what they need, and whether they can be reached. The interaction design question instead asks, on

a system level, what binding constraints and leverage points that the environment and atmosphere create and what those in turn force or enable a producer to do. This is a perspective that the Interaction Model is intended to capture.

This section therefore ties back to the findings made in Section 7.1.1 and Section 7.1.3 and analyses what this means for the relationships and exchange episodes that a producer will have to navigate.

7.2.4.1 Taking on Coordination in Fragmented Value Chains

Nepal's fragmentation forces producers targeting higher-value segments to take on coordination functions the system cannot provide. TCE predicts that actors will internalise coordinating exchanges when external coordination costs become too high (Williamson, 1989) and for producers of differentiated products, that threshold is reached quickly. Intermediaries are built to move large volumes, not to preserve origin narratives, packaging quality, or product differentiation. Routing a solar-dried product through the dominant wholesale pathway risks losing precisely what makes it valuable. The interaction implication is therefore not merely that intermediaries exist, but that producers attempting to commercialise differentiated products become incentivised to bypass parts of the intermediary structure altogether.

This logic was visible across several of the surviving segments. Producers targeting international trekkers or non-trekking tourists are incentivised to establish direct relationships with specialty retailers in Thamel or Lakeside rather than relying entirely on wholesalers. The coordination costs of managing these retailer relationships are high for small producers, but still lower than the costs associated with losing control over packaging, storytelling, quality presentation and shelf positioning to intermediaries. The same logic emerged in the urban premium segment, where producers attempting to differentiate themselves through origin stories, health-conscious branding or product quality often relied on direct retail relationships, farmers markets or social media channels instead of wholesale distribution.

However, without formal contracts to anchor these relationships, social exchange becomes the binding mechanism. Factors such as regular

contact, demonstrated reliability, and accumulated trust are then especially important. Retailers become carriers of the product narrative, meaning producers must actively equip them with packaging, provenance information and quality signals rather than leaving that work to the wholesale system. Here, digitalised coordination emerges as a potential tool to manage these interactions. It could facilitate continuous communication, faster information exchange, and more direct coordination with retailers, and other intermediaries in extension. Rather than replacing intermediaries, social media platforms, digital market information systems, and online communication channels may help producers maintain greater control over branding, customer relationships, and responses to demand variations.

Nonetheless, most early-stage producers will not be able to fully achieve the level of managerial capacity for this. The realistic expectation is some sort of selective internalisation by managing a small number of direct retail relationships while remaining dependent on intermediaries elsewhere. The GTM challenge is not eliminating fragmentation but compensating for the coordination failures most critical to the target segment.

7.2.4.2 Building Trust Without Institutional Support

A second major implication of Nepal's enabling environment is that producers entering formal channels cannot rely on institutional trust mechanisms to reliably coordinate exchange. Informality and weak enforcement reshape how legitimacy must be established within market relationships.

Producers entering formal retail, premium consumer channels or institutional procurement face buyers who cannot rely on relational history because the producer is mostly unknown to them. The interaction implication is straightforward in that producers must substitute missing institutional trust with visible signals. DFTQC certification, professional packaging and consistent labelling become trust signals. Specialty retailers, urban premium buyers, and school procurement systems all use certification as a filter for reducing uncertainty when no prior relationship exists.

At the episode level, repeated successful exchanges gradually institutionalise the relationship itself. A producer who reliably supplies retailers during one festival season becomes easier to trust during the next. A producer already stocked in recognised tourist retail outlets gains legitimacy when approaching urban premium retailers later. This therefore creates reputational effects that accumulate over time and open up opportunities for new segments and market pathways.

Nonetheless, professional packaging, certification compliance and brand development all require resources many smallholders lack independently. The realistic near-term solution is basic packaging improvements, certification tied to specific channels or reliance on NGO support during early market entry. The gap between what the market demands and what producers can deliver is not incidental, it is a structural feature of GTM strategy design in this context.

7.2.4.3 Urban Concentration as a Structural Necessity

The enabling environment analysis demonstrated that Nepal's geography and infrastructural conditions create exceptionally high coordination costs across dispersed rural areas, which in turn pressures market entry efforts to focus on a small number of urban hubs. But, by concentrating interaction effort geographically, producers also reduce the number of relationships, logistics routes, and coordination interfaces that must be managed simultaneously.

The atmosphere layer within these urban hubs is both more competitive and more relationally accessible than the broader national food system. Retailers in Thamel or Lakeside already interact with differentiated local products and are therefore more receptive to them than mainstream wholesale markets. However, competition for shelf space and buyer attention is also significantly higher. Producers are not competing only against other dried foods but against a broad ecosystem of imported products, FMCGs, souvenirs, tea, handicrafts, and premium packaged goods.

At the episode level, this produces dense interaction environments where a producer who successfully establishes credibility with a small number of urban retailers can gain visibility within larger networks

and thereby expand its business. Similarly, social media and direct information channels become more effective because the target audiences themselves are socioculturally and geographically concentrated.

However, the risks are real. Dependence on a small number of urban hubs exposes producers to higher competition and seasonal tourism spikes. It also risks reproducing the rural-urban asymmetry identified in the enabling environment, in that producers located far from urban centres face interaction costs that remain uneven regardless of product quality.

Even so, the realistic near-term solution is selective concentration. Establishing a small number of manageable urban relationships capable of generating revenue and legitimacy before broader expansion becomes organisationally feasible.

7.2.4.4 Sequencing as a Response to Uneven Organisational Capability

The final major implication of Nepal's enabling environment is that GTM strategy must develop sequentially rather than simultaneously. Uneven organisational capability across the food system means that most producers cannot pursue multiple market configurations at once. For instance, tourist segments are attractive partly because their interaction requirements are manageable. They have a limited number of urban retailers, clear packaging requirements, and concentrated logistics. More demanding pathways such as school canteens or broad urban premium consumers require substantially greater coordination capability, and are therefore likely difficult to target early on. Pursuing all segments simultaneously can therefore be counterproductive before organisational capabilities are in place.

Early exchange relationships therefore do more than generate revenue because they also build the said capabilities. A producer who establishes supply relationships with tourist retailers develops packaging competence, delivery routines, certification experience, and buyer credibility that later transfer into more demanding segments. E.g. school canteen procurement therefore becomes more feasible once certification, logistics and aggregation capacity have already been developed

elsewhere.

The atmosphere layer also changes over time as capability develops. Early-stage producers enter relationships from weak bargaining positions and must adapt to retailer or institutional requirements. Over time, repeated successful exchange can shift the balance slightly by increasing the producer's legitimacy and reducing buyer uncertainty. Trust therefore becomes cumulative.

The sequential logic here is not a strategic preference. It is a structural consequence of the enabling environment. The interaction configurations required for successful market entry are more organisationally demanding than most producers can deliver immediately. This points to a gap between what contextual conditions demand and what a producer can actually do.

7.2.4.5 Implications for GTM Strategy Design in LMIC Food Systems

Taken together, the analysis suggests that GTM strategy design in fragmented LMIC food systems differs fundamentally from more mature market environments. In Nepal's food system, producers are not simply selecting target segments and optimising marketing channels. They are instead designing relationships capable of compensating for weak coordination systems, uneven institutional enforcement, fragmented supply chains, and uneven organisational capability.

This furthermore suggests that GTM strategy in LMIC food systems is a structural problem as much as it is a marketing problem. Producers targeting differentiated market segments must selectively internalise coordination functions, construct legitimacy through visible trust signals, concentrate interaction efforts geographically, and sequence market entry according to organisational capability. The structure of the enabling environment thus shapes not only which market opportunities exist, but also what kinds of exchange relationships are required to reach them.

Importantly, the analysis also demonstrates that different market pathways represent different interaction configurations responding to

these contextual conditions. The dominant intermediary-filled pathway persists not because it is efficient, but because it solves coordination problems that most actors cannot yet solve independently. Shorter pathways involving e.g. direct retailer relationships or cooperative coordination represent attempts to reorganise exchange under high transaction cost conditions. Therefore, the design of GTM strategies become fundamentally tied to how producers navigate, compensate for, and selectively restructure the interaction patterns embedded within the surrounding food system.

7.2.5 GTM Strategy Composition

The five GTM strategies below are the applied output of the preceding analysis, structured around Friedman's (2002) five components and presented as visual figures for each surviving segment. They are intended to summarise the analytical findings in a concise and actionable format. The sequencing logic established in earlier sections carries through: international trekkers, non-trekking tourists, and festival consumers are near-term entry points, while urban premium consumers require prior investment in marketing to build demand, and school canteens are a longer-term institutional objective.

7.2.5.1 GTM 1 - International Trekkers

1 International Trekkers — Near-Term — Dried Fruit

International visitors on Nepal's trekking routes, purchasing food for consumption on the trail. Purchase decisions are driven by portability, shelf-life, and weight rather than price, and trekkers are already used to spending money on imported trail snacks. The segment is geographically concentrated in urban tourist hubs such as Thamel or Lakeside, and to some extent also smaller villages such as Lukla.

2 Value Proposition

A lightweight, shelf-stable trail snack with an origin story that imported alternatives cannot match. Solar-dried local fruit satisfies the functional job of portable, natural nutrition on the trail while delivering the emotional job of authentic local connection. There is a possibility of product differentiation by creating e.g. fruit and nut bars or trail mixes, which can be a better way of competing with current FMCG alternatives.

3 Channel Strategy

Formal retailers in Thamel and Lakeside is the primary channel, requiring DFTQC-certified product and a packager relationship unless handled in-house. Guiding companies represent a secondary B2B channel through which the product can be bundled directly into trekking packages. Tea houses along major trekking routes are a possible future opportunity as familiarity grows.

4 Pricing Model

International trekkers are accustomed to paying premium prices for imported trail snacks and price sensitivity is relatively low, although it should be noted that the purchase decision is driven primarily by function and perceived quality. Nonetheless, local origin can be differentiation strategy, and a higher price can also act as a quality signal, reinforcing the product's image as a local, healthy and organic option. Depending on the fruit, a price range of NPR 300-500 for 100 grams is therefore defensible.

5 Communication Approach

Packaging and labelling that communicates the product's origin story at the shelf without requiring retailer explanation. Guide recommendations and peer visibility among trekkers on the trail accelerate word of mouth. A social media presence builds brand recognition within the international trekking community, creates a direct outreach channel to guiding companies, and could lay the groundwork for reaching the domestic urban premium segment over time.

Figure 7.3: GTM Strategy - Trekkers.

7.2.5.2 GTM 2 - Non-Trekking Tourists

1 Non-Trekking Tourists — Near-Term — Dried Fruit & Dried Spices

International visitors to Nepal's urban tourism hubs purchasing dried products as snacks or gifts. Concentrated in urban centres and cultural heritage sites, where specialty retail already stocks local packaged goods. The purchase decision is shaped by presentation, authenticity, perceived health benefits, and cultural connection rather than functional specifications, meaning packaging and storytelling carry more weight here than for trekkers.

2 Value Proposition

An authentic, portable, organic, and local product that functions simultaneously as a consumable and a cultural souvenir. The dried fruits fullfill daily recommended intakes of key vitamins or mineral, whilst dried spices brings the Nepali cuisine home to you. Competes not against trail snacks but against tea, handicrafts, and imported packaged goods and differentiates on Nepali origin and traceability that no imported alternative can claim.

3 Channel Strategy

The same urban specialty retail infrastructure as trekkers, creating a combined opportunity where a single retail relationship can serve both segments simultaneously, although clear product differentiation is required to distinguish between segments. Producers can strengthen the narrative control by establishing farm visits, homestays, or spice cooking classes for both consumers and downstream buyers, further differentiating from existing competitors on the market.

4 Pricing Model

Price sensitivity is low, and the segment is not shopping for value but for authenticity which creates room for a price premium provided that packaging and labelling quality justify it. Willingness to pay premium prices is high and dried fruits positioned towards this segment are currently priced upwards of NPR 1000 for 100g. Because of the diversity of non-trekking tourists, producers could reach a larger market share if they offer a wider range of dried fruits and spices at several premium price points.

5 Communication Approach

Packaging and labelling should communicate the product's origin story, which can be further strengthened by experiences such as farm visits or cooking classes. Geographic identification, religious symbols, and fairtrade or organic certifications has major effects on positioning. QR codes on the packaging can serve as an additional interface connecting customers and retailers to the producer's story. Furthermore, a social media presence builds brand awareness and can also extend reach.

Figure 7.4: GTM Strategy - Non-Trekking Tourists.

7.2.5.3 GTM 3 - Urban Premium Consumers

1 Urban Premium Consumers — Near-to-Medium-Term — All Categories

High-income Nepalis, expatriates, and health-conscious urban residents concentrated in Kathmandu and Pokhara. Identified as a realistic near-term domestic segment, with demand growing but not yet consolidated into stable purchasing patterns. Unlike tourist segments, this segment requires active communication and marketing before adoption can occur at meaningful scale.

2 Value Proposition

Locally produced, minimally processed food associated with health, quality, and conscious consumption. Competes against imported products but differentiates on traceability and local narrative, which is something imported alternatives cannot offer. Packaging and presentation must make that claim clear, as imported products currently retain advantages in branding. Taste and quality must be tailored to domestic preferences.

3 Channel Strategy

Farmers markets and local retailers are the primary entry channels, identified empirically as where this consumer base concentrates and is most reachable. Modern supermarkets and grocery stores represent a secondary opportunity but carries higher supply consistency requirements. Initial channel focus should be narrow with one or two retail relationships before broader distribution is attempted.

4 Pricing Model

Prices should be slightly higher but competitive with imported alternatives. Willingness to pay exists but is conditional on awareness. Unlike tourist segments, domestic consumers have a clearer sense of what a reasonable price looks like in Nepal, meaning that pricing too far above imported options risks undermining adoption before brand recognition is established. Nonetheless, the local narrative is a differentiation advantage that should be used and reflected in the price point.

5 Communication Approach

Social media is empirically the most impactful channel for this segment, given the role of influencer-driven food culture among younger urban Nepali consumers. Farmers market presence provides direct consumer interaction and builds trust that retail alone cannot replicate. Transparent labelling about e.g. origin, process, and nutritional content also reinforces the health and quality positioning at the point of sale.

Figure 7.5: GTM Strategy - Urban Premium Consumers.

7.2.5.4 GTM 4 - Festival Consumers

Figure 7.6: GTM Strategy - Festival Consumers.

7.2.5.5 GTM 5 - School Canteens

1 School Canteens — Near-to-Medium-Term | All Categories

Municipal governments sourcing ingredients for school feeding programmes in 27,000 schools, feeding 2.8 million children daily. Recieves technical assistance from development actors, most prominently the WFP. Procurement is decentralised to municipalities and the food must be procured from local producers according to government policies. Importantly, the school feeding programme connects local smallholder farmers to greater networks that facilitate both access to inputs and agrobusiness development.

2 Value Proposition

Shelf-stable, nutritionally concentrated food that can be integrated into existing school meals either as ingredients or as healthy snacks. The dried products must meet or preferably exceed the specific nutrient requirements, e.g. vitamin A and iron, within tight per-meal budget constraints. Unlike fresh produce, dried products do not spoil, are easier to transport, and are available year-round, which likely matters more to procurement officers than brand stories

3 Channel Strategy

Direct supply to a single municipality, built through the homegrown school feeding framework. DFTQC certification is a non-negotiable precondition. The logic here is not expansion across municipalities, as this is not possible with current governmental policies, but instead using stable school and development actor relationships to build the capabilities needed to enter the formal food system.

4 Pricing Model

Will have to be cost-competitive with fresh local produce, which currently dominates institutional procurement. The programme operates within tight per-meal budgets set by municipal governments, and any ingredient must demonstrate clear cost-effectiveness to be adopted. High nutritional values could justify slightly higher prices. However, the primary focus should be to produce at cost that ensures a profitable margin within the quoted price range.

5 Communication Approach

The decision makers are procurement officers, development actors and municipalities, so communication is relational. Documented nutritional compliance, certification, and supply reliability are the signals that matter most. A successful pilot with clear successful outcomes is the most effective way to open doors to additional opportunities.

Figure 7.7: GTM Strategy - School Canteens.

8 Discussion

This chapter begins by reflecting on the key findings from the analysis before connecting them back to the theoretical frameworks and existing literature, examining where the findings confirm, extend or challenge what the theories anticipated.

8.1 Analysis Findings

One of the clearest findings from the analysis is that the five market segments are not independent strategic choices. They are a set of entry points that, if pursued in the right sequence, can build on each other, where what you learn and establish in one segment makes the next one easier to reach. International trekkers and non-trekking tourists are not simply two segments that happened to survive the feasibility filter, they are the natural starting point precisely because their interaction requirements are manageable and their retail infrastructure is already in place. The organisational capability built there, e.g. certification, packaging, logistics, buyer relationships, is then what makes other more demanding segments reachable over time.

Yet, this logic assumes a producer with at least some baseline capability. For a smaller producer without the resources to reach even those segments, a different sequence may make more sense. For example, starting with school canteens, securing institutional support from development actors, becoming a reliable local supplier, and building capability and experience within a structured and supported environment could provide a more realistic path to commercial success.

Another finding was that packaging actors appear to play a disproportionately large role in the presentation of packaged food products

in formal retail stores like grocery stores and supermarkets. Despite this position, packaging lacked branding, storytelling, or other differentiating features. As a result, opportunities to build stronger brand identities and customer relationships appear to be underused, potentially limiting producers' ability to access wider retail channels and capture greater value from products. As packaging actors were often overlooked in previous food system mappings, these observations suggest that this function deserves more attention in the future.

Moreover, the analysis suggests that the root cause of uncompetitive AVCs in Nepal is aggregation rather than the existence of multiple intermediary layers diluting profits. These challenges are compounded by fragmented production, low productivity, poor infrastructure, and difficult terrain. Even larger AVCs have been unable to internalise aggregation functions effectively. This indicates that the large number of intermediaries is less the main cause of inefficiency and rather a structural symptom of aggregation challenges.

8.2 Connecting Back to Theory and Literature

Returning to the sequencing finding and what it implies for the theoretical framework. Rogers' (1962) Diffusion of Innovation was included to take sequencing into account through the five adopter categories and the logic of who adopts first and why. In principle, this is exactly the tool needed to reason about which segments to approach in which order. In practice, however, applying it required more data on consumer behaviour and demand than was available in this context. Without that data, confidently mapping segments onto adopter profiles proved difficult, meaning that Rogers' sequencing logic could only be partially applied. This pushed Falck-Zepeda's (2026) structural layer and the interaction model from Håkansson (1982) to compensate for missing demand data in Section 7.2.2 and Section 7.2.4, respectively, by shifting the question from who the adopters are to what the system structurally enables. That compensation was valuable, but it could only go so far.

This suggests that the frameworks are not inadequate, but rather incomplete when applied in isolation, and that there is meaningful value in continuing to develop and test integrated approaches in LMIC food system contexts. There is therefore a need for more research into how GTM strategies should be designed when producers operate at different capability levels, and when reliable data on consumer behaviour and market demand is scarce or unavailable. This is of particular interest in LMIC food system contexts where these dynamics are perhaps most pronounced, and where private actors need to be better informed on how to position themselves on competitive markets.

The finding that aggregation is the root cause of uncompetitive AVCs has direct implications for TCE theory. Williamson (1989) predicts that actors will internalise the functions that create the highest transaction costs, which would then be aggregation in the case of Nepal, but the findings did not support this. Instead, market actors followed a path of least resistance when choosing which functions to target first.

The most plausible explanation adds nuance to this tension rather than dismissing it. Actors are not necessarily ignoring the logic of TCE, they are responding rationally to a context where the organisational and infrastructural conditions for acting on that logic are absent. This reveals something that the framework does not account for: it assumes actors can internalise where costs are highest, but in fragmented LMIC food systems that assumption does not necessarily hold. Where TCE does hold strongly is in explaining power dynamics. The eleven times price increase between farm-gate and retail is exactly what the framework would predict when coordination costs are high and formal institutions are weak. The takeaway is then that the framework can explain the problems that arise from higher coordination costs, but not necessarily what the actors will and can do about those problems.

The aggregation finding is equally relevant when examined in the context of the Stages of Transformation framework. The framework was useful for locating Nepal's food system on a spectrum between modern and traditional AVCs, but the findings reveal a gap in how it conceptualises the transition between them. It focuses on value chain maturity, but implicitly assumes that aggregation is solved organically

as the value chain matures. It treats traditional AVCs as short and local, and modern ones as long and integrated, without accounting for what happens when a chain is both long and poorly organised at the same time, which is the exact case for Nepal.

The result is that the framework assumes an aggregative ability that does not exist, and directs attention towards functions such as upgrading processing or logistics as a path toward more modern AVCs, but these measures are contingent on the ability to aggregate sufficient volume and reinvest in better facilities. Therefore, when applied to Nepal, the findings suggest that the dimension of aggregation should be added to the framework. In traditional AVCs, aggregation is fragmented and ad hoc. In transitional ones, it becomes dependent on intermediaries. In modern ones, it is managed through vertical integration. Whether this addition holds beyond Nepal is an open question, because the country's mountainous geography and weak road infrastructure compound aggregation challenges to a degree that may not be representative of other LMIC contexts. The underlying point, however, that a value chain cannot modernise without first solving aggregation, is something that the framework has not made explicit, and likely applies beyond Nepal as well.

Both academic literature and reports from development actors tend to focus primarily on what governmental actors can or should do, often at the expense of analysing how private sector actors can respond to the existing system. Although this emphasis is understandable in the Nepali context given constraints related to government effectiveness, policy continuity, and political instability, it also risks placing agency for development in the hands of the very institutions that have struggled to enable it. Instead, by focusing on actors that operate successfully within these constraints, there may be greater potential to identify contextually appropriate business models that support both economic growth and a more stable macroeconomic environment. This insight could be of relevance in other LMIC contexts, where weak institutions, fragmented markets, and political instability often represent persistent challenges.

Another important finding is that the value chain appears to be longer than previous mappings in the literature. This suggests that the

number of actors involved in moving products from producers to consumers has been underestimated. This is important, especially in the context of informing GTM strategies in LMICs, because it reveals additional transaction costs, coordination challenges, and power dynamics that shape how value is distributed.

Returning to what the findings imply for the interaction model, the framework was originally developed for industrial B2B contexts with relatively formal and structured relationships. Despite this, it proved to be one of the more useful theoretical tools in the analysis. Where the interaction model added the most value was in showing that to do about power dynamics and dependency structures. By integrating the national enabling environment into the atmosphere and environment layers of the model, it became possible to ground the GTM analysis in structural conditions, which gave an explanation to why the dominant intermediary pathway persists and what that means for how producers must build relationships over time. Its main limitation is that it was designed for dyadic relationships, while Nepal's food system involves many simultaneous and overlapping ones across a fragmented network. Applying it therefore required a degree of simplification, and future research in similar contexts might benefit from a framework better suited to capturing many actors at once.

8.2.1 A Note on Likert scales

The use of Likert scales proved difficult, as respondents frequently clustered answers around extreme values or verbally contradicted their actual responses. This resulted in the authors discarding the data collected using Likert scales. The authors instead suggest using scales suited for verbal data collection, for instance semantic differential scales or a longer verbal and visual explanation of how the Likert scale is meant to be used.

9 Conclusion

This chapter brings the thesis to a close. It begins by directly answering the three research questions before assessing to what extent the study fulfilled its stated purpose. It then presents the theoretical and empirical contributions of the thesis, reflects on the methodology, and closes with suggestions for future research.

9.1 Answering the Research Questions

9.1.1 RQ1

How can food systems be mapped to inform GTM strategies in LMIC contexts?

Food system maps have the potential to inform GTM strategies by illustrating power dynamics, dependency structures, and strategic opportunities within LMIC food systems. To accomplish this, mappings can identify the sequence of value chain functions, key actors, quantitative product flows, and the dominant market pathways through which food moves from producers to consumers. Preferably, they could also show how value transforms and is captured, as well as understanding where value accumulates and which pathways dominate has major implications for GTM strategies. At the same time, the enabling environment remains important to include as it strongly shapes how actors are able to operate within LMIC food systems.

Applied to Nepal, this revealed a longer and a more complex chain of intermediaries than previous mappings had captured, with packaging actors emerging as an overlooked but influential role in market pathways to formal retailers.

9.1.2 RQ2

Which market segments show the highest commercial potential for dried food products in the studied LMIC context?

The segments with the highest potential for dried food products in LMIC contexts can be identified by applying three sequential filters. First, candidate segments can be identified and screened against basic viability criteria. Second, each surviving segment can be assessed against the structural conditions of the food system to determine whether reaching it is realistic. Finally, interactions between producers and different value chain actors can be analysed to establish how producers can overcome barriers related to power dynamics and develop channel strategies that strengthen their connection to customers within specific market pathways.

Applied to Nepal, the process filtered eight initial candidates down to five. The segments showing the highest commercial potential for dried products in Nepal are international trekkers, non-trekking tourists and festival consumers as near-term entry points, with urban premium consumers as a near-to-medium-term opportunity and school canteens as an alternative pathway better suited for smaller producers seeking institutional support and a structured environment in which to build capability. At the LMIC level, the contribution is not the specific list of segments but the framework and filtering logic that produced it, which can be applied in other LMIC contexts.

9.1.3 RQ3

How do contextual variables influence the design of GTM strategies for dried food products in LMIC contexts?

The analysis examined how the structural conditions of Nepal's food system shape the design of GTM strategies across the five surviving segments. Four binding constraints emerged consistently: fragmentation and coordination failure, informality and weak institutional enforcement, geographic and infrastructural constraints, and uneven organisational capability. Together, these conditions push GTM strat-

egy to develop in ways that standard frameworks do not necessarily anticipate.

Rather than selecting a target segment and optimising a channel strategy around it, producers operating under these conditions can approach market entry differently. Despite uneven organisational capability, they can take on coordination functions that the system cannot provide, construct legitimacy through visible signals such as certification and packaging where institutional trust is absent, concentrate interaction efforts geographically to keep coordination costs manageable, and sequence market entry according to what their organisational capability can actually support. The result is that GTM strategy in fragmented LMIC food systems can be as much a structural problem as it is a marketing one, and it is shaped not only by what producers want to do but also by what the surrounding system makes possible.

9.2 Fulfilment of Purpose

The purpose of this study was to identify how GTM strategies can be designed within food systems in LMIC contexts. This is considered to have been fulfilled through the development of an integrated analytical framework that moves from food system mapping through segment identification and adoption feasibility to GTM strategy composition, addressing both the structural conditions that shape market entry and the practical configurations through which producers can reach viable segments. The framework was applied to Nepal's food system for dried fruits, vegetables, and spices, producing five segment-specific GTM strategies grounded in empirical fieldwork across producers, intermediaries, retailers, and institutional actors.

9.3 Contributions

9.3.1 Theoretical Contributions

The theoretical contributions of this thesis emerge from testing existing frameworks in an LMIC context and identifying where they hold, where they fall short, and what modifications would make them more useful. In total, six concrete theoretical contributions can be identified, and together they fulfil both the validity testing and modification ambitions stated in the introduction.

1. **Food system mapping as a GTM tool**
   Food system maps can become more useful for GTM analysis when they include quantitative flows, dominant market pathways, and intermediary structures rather than only describing value chain functions. The mapping conducted in this thesis revealed a longer and more complex chain than previous mappings had captured, with packaging actors playing an overlooked but influential role in determining how products appear to consumers in formal retail environments.

2. **Aggregation as a missing dimension in AVC transformation**
   The Stages of Transformation framework assumes aggregative ability that does not yet fully exist in fragmented LMIC food systems. The thesis therefore suggests that aggregation should be treated as a more explicit dimension within AVC transformation theory.

3. **Extending TCE in LMIC contexts**
   The findings both support and challenge TCE theory in fragmented LMIC food systems. TCE holds strongly in explaining why Nepal's food system contains long intermediary chains, high markups, and dependency on traders and wholesalers. The findings suggest that these structures emerge because coordination costs between fragmented actors are exceptionally high under weak infrastructural and institutional conditions. However, the

analysis also shows that actors are not necessarily able to internalise the functions associated with the highest transaction costs, even when doing so would be efficient in theory. In Nepal, aggregation represented the dominant coordination challenge, yet even larger actors struggled to internalise it due to fragmented production, weak infrastructure, and limited organisational capacity. The thesis therefore suggests that TCE can explain the emergence of coordination problems and intermediary dependence in fragmented food systems, but should be modified to account for situations where actors lack the structural capacity required to internalise the very functions generating the highest transaction costs.

4. **Sequential GTM design in fragmented LMIC food systems**
   GTM strategy in fragmented LMIC food systems might benefit from being designed sequentially rather than simultaneously. Standard segmentation and GTM frameworks evaluate segments independently and do not account for how pursuing one segment builds the capability needed to reach the next. The thesis demonstrates that the right sequence depends on the producer's starting position rather than segment attractiveness alone.

5. **Expanding the validity of the interaction model to LMIC contexts**
   The interaction model, originally developed for industrial B2B settings, can be meaningfully applied in LMIC agricultural contexts by integrating the national enabling environment into its atmosphere and environment layers, allowing it to surface structural constraints and power dynamics that standard GTM frameworks overlook.

6. **Framework integration in LMIC contexts**
   The integrated approach of combining food system mapping, segmentation, diffusion, and interaction perspectives, proved to be well suited to the analytical demands of this thesis. By drawing on multiple frameworks in sequence, it was possible to address questions that no single framework was designed to answer alone, suggesting that integrated approaches of this

kind have meaningful value in LMIC contexts where structural conditions are complex and data is scarce.

9.3.2 Empirical Contributions

The empirical contributions of this thesis emerge from the fieldwork conducted in Nepal and the analytical outputs it produced. Three concrete empirical contributions can be identified, both of which fulfil the ambitions stated in the introduction.

1. **A more detailed mapping of Nepal's food system**
   The field study has, to the authors' best knowledge, resulted in a more granular mapping of Nepal's fruit and vegetable food system than previously documented. The authors have identified additional intermediary layers in the dominant market pathways that points to existing power dynamics and dependency structures.

2. **Packaging actors as overlooked sources of market power**
   The field study identified packaging actors as influential but largely overlooked actors within Nepal's food system. Their role in shaping product presentation and retail visibility suggests that packaging functions exert greater influence over branding and market access than previous mappings or literature, to the authors' best knowledge, have captured.

3. **GTM strategies for dried products in Nepal**
   Practically, the thesis contributes five GTM strategies for dried fruits, vegetables, and spices, grounded in fieldwork among producers, intermediaries, retailers, and institutional actors in Nepal. The strategies are structured around Friedman's (2002) five components and sequenced according to the organisational capability required to reach each segment. They are intended as actionable recommendations for the SolarFood project, with the caveat that the demand estimates underpinning them rely on proxies rather than primary quantitative data, and should be treated as approximations, not absolutes.

9.4 Evaluation

Recalling the validity, reliability, generalisability, and objectivity criteria presented in Section 2.6, the trustworthiness of the study must be understood in relation to its exploratory purpose, broad analytical scope, and the contextual complexity of Nepal's food system.

9.4.1 Validity

Several measures were taken to strengthen the validity of the study. Most importantly, findings were triangulated across literature, interviews, and field observations, allowing patterns to be corroborated through multiple sources of evidence. Furthermore, the use of semi-structured interviews enabled respondents from different parts of the food system to discuss issues relevant to their specific context while still addressing common themes linked to the research questions.

At the same time, the study faced limitations affecting validity. The analytical framework (Figure 3.8) combined food systems analysis, value chain analysis, market segmentation, diffusion theory, and interaction dynamics within a single study. While this breadth enabled a holistic understanding of GTM strategies in Nepal, it inevitably reduced the depth with which individual components could be analysed. In hindsight, some analytical areas may have benefited from more focused investigation, one notable being customer behaviours.

Fieldwork coordination also proved more difficult than anticipated, limiting access to certain stakeholder groups such as the DFTQC, cooperative trade organisations, and existing 3PL providers. These actors could have contributed valuable perspectives on certification, aggregation strategies, trust-building, and formal retail access.

Moreover, although interview guides were often shared beforehand, few respondents appeared to have reviewed them in advance. More active follow-up or calendar reminders may have increased preparation and potentially resulted in more reflective responses.

9.4.2 Reliability

Reliability was strengthened through the use of semi-standardised interview guides that ensured core themes were consistently addressed across interviews. Although questions were adapted to different stakeholder groups, the overall structure remained sufficiently consistent to facilitate comparison between respondents. The research process, analytical framework, and methodological choices have also been documented in detail to improve transparency and traceability.

Nonetheless, several factors limit the reliability of the findings. The non-probability sampling strategy means that the specific group of respondents is unlikely to be replicated in a future study. In addition, the adaptive nature of semi-structured interviews resulted in different follow-up questions across interviews, making exact replication impossible.

Translation introduced a further source of variability. Long responses were occasionally condensed into shorter summaries by translators, creating a risk that nuances or contextual details were lost. Although follow-up questions were used to clarify responses, there remains a possibility that some interpretations were unintentionally influenced by the translators themselves.

9.4.3 Objectivity

The study was conducted by researchers originating from a socio-economic and cultural context substantially different from that of Nepal. As a result, certain contextual factors may have been under- or overemphasised compared to how local actors themselves would prioritise them. One example concerns Nepal's evolving political trajectory, which may alter important aspects of the national enabling environment over time.

To reduce the influence of such biases, the authors worked closely with Nepali supervisors throughout the project and continuously discussed emerging interpretations and findings. The inclusion of multiple stakeholder perspectives from different parts of the food system further

reduced reliance on any single viewpoint.

At the same time, the outsider perspective also provided analytical advantages. Distance from the context made it easier to question assumptions that local actors may perceive as self-evident and to identify patterns that were not explicitly recognised by respondents themselves. The identification of packaging actors as a potentially influential but underrepresented function within the food system is one example of such an observation.

9.4.4 Generalisability

The findings should be generalised with caution. The study does not seek statistical generalisability, but rather analytical insights that may support understanding of similar LMIC food systems characterised by fragmented value chains, weak institutional enforcement, coordination challenges, and limited market transparency.

While several of the structural dynamics identified in Nepal are also present in other LMIC contexts, food systems remain heavily shaped by local sociocultural, political, economic, and environmental conditions. The study therefore contributes less through universally transferable conclusions and more through the analytical approach developed for understanding GTM strategies within complex LMIC food systems.

9.5 Future Research

Several avenues for future research emerged throughout the study.

First, the findings point toward the need for more quantitative mapping of food systems and market pathways in LMICs. Existing mappings often describe actors and functions but omit information on relative flow volumes, intermediary complexity, and value distribution. Future studies could build on this thesis by developing more data-driven approaches to mapping product flows, pricing structures, customer dynamics, and coordination mechanisms in LMIC value chains.

Second, the role of packaging actors within food systems deserves

further investigation. The field study suggested that packaging actors may exert disproportionate influence over branding, presentation, and retail visibility despite being largely overlooked in previous value chain mappings. Future research could therefore examine how packaging functions shape market access, consumer perception, and value capture in Nepal and other LMICs in extension.

Third, the aggregation function also deserves greater attention within research on AVC transformation in LMICs. The analysis indicated that aggregation functions as a prerequisite for upgrading towards more coordinated and modern AVCs, yet existing frameworks tend to treat it as something that emerges organically as value chains mature. Future studies could therefore examine whether aggregation plays a similarly foundational role in other LMIC food systems beyond Nepal, or whether the findings are primarily shaped by Nepal's geography and infrastructural conditions..

Lastly, future research could also examine existing cases of how private actors have successfully developed AVCs in LMICs. Existing literature on LMIC food systems currently focuses heavily on governmental and development-led interventions and places less attention on how private actors coordinate and operate within these systems. In the case of Nepal, some producers, cooperatives, and retailers compensate for institutional gaps through direct sourcing relationships, trust-based networks, branding, and selective vertical integration. Future studies could therefore investigate how private actors in fragmented LMIC food systems create commercially viable business models under weak governance conditions and what organisational and managerial capabilities enable this.

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A Calculations

To provide an indicative understanding of the scale associated with different customer segments, rough estimations of dried-product demand and corresponding production requirements were conducted for selected segments. These calculations are not intended as precise market forecasts, but rather as exploratory approximations intended to contextualise the relative scale of different market opportunities and the agricultural production capacity potentially required to supply them.

A.0.0.1 Assumptions and Limitations

The estimations are based on a number of simplifying assumptions:

- Average annual dried fruit consumption is assumed to be 0.5 kg per person for urban premium consumers (Statista, 2026a). Trekkers were assumed to consume approximately 0.5 kg of dried fruit per trip also.
- Non-trekking tourists are assumed to consume 0.2 kg of dried products per visit, corresponding approximately to one package per person per trip.
- Average annual dried vegetable consumption is assumed to be 2.8 kg per person (Statista, 2026b).
- Drying fruits and vegetables reduces the original product weight by approximately 80% (Widowati et al., 2024).
- Post-harvest losses are assumed to amount to 20% under adequate handling and storage conditions (Bhattarai, 2018).
- Fruit productivity among smallholder farmers is assumed to be approximately 9 tonnes per hectare (Rokaya, 2023).

- Vegetable productivity among smallholder farmers is assumed to be approximately 12 tonnes per hectare (Rokaya, 2023; Chaudhary et al., 2023). This is slightly below national averages due to the influence of larger commercial farms on aggregate productivity statistics.
- Nepal imported approximately 8,000 tonnes of dried fruits during the three months preceding Tihar in 2023 (The Rising Nepal, 2023). This quantity is used as a proxy for total festival-related dried fruit demand.
- Due to limited data availability and reliability, no quantitative estimations were conducted for dried spices or school canteen demand.

Festival Consumer Demand for Dried Fruit

Festival-related demand was estimated using Nepal's 2023 dry fruit imports prior to Tihar as an upper-bound proxy for the market.

$$\frac{8,000}{0.2 \times 0.8} = 50,000 \text{ tonnes of fresh fruit}$$

Assuming average fruit productivity of 9 tonnes per hectare, this corresponds to:

$$\frac{50,000}{9} \approx 5,556 \text{ hectares}$$

Thus, fully substituting festival-related dried fruit imports with domestic production would require approximately 50,000 tonnes of fresh fruit production, corresponding to roughly 5,500 hectares of cultivated fruit area.

Urban Premium Consumer Demand

Based on the demographic estimates presented in Section 4.1, the urban premium consumer segment consists of approximately 1.5 million people in the Kathmandu Valley and 286,000 people in Pokhara, corresponding to a total segment size of approximately 1.8 million consumers.

Dried Fruit Demand Assuming annual consumption of 0.5 kg of dried fruit per person:

$$1.8 \text{ million} \times 0.5 \text{ kg} = 900,000 \text{ kg/year}$$

$$900,000 \text{ kg/year} = 900 \text{ tonnes/year}$$

Accounting for drying-related weight reduction and post-harvest losses:

$$\frac{900}{0.2 \times 0.8} = 5,600 \text{ tonnes of fresh fruit}$$

Assuming average fruit productivity of 9 tonnes per hectare:

$$\frac{5,625}{9} \approx 625 \text{ hectares}$$

Thus, supplying the estimated dried fruit demand of the urban premium segment would require approximately 5,625 tonnes of fresh fruit production, corresponding to roughly 625 hectares of cultivated fruit area.

Dried Vegetable Demand Assuming annual dried vegetable consumption of 2.8 kg per person:

$$1.8 \text{ million} \times 2.8 \text{ kg} = 5.04 \text{ million kg/year}$$

$$5.04 \text{ million kg/year} = 5,040 \text{ tonnes/year}$$

Accounting for drying-related weight reduction and post-harvest losses:

$$\frac{5,040}{0.2 \times 0.8} = 31,500 \text{ tonnes of fresh vegetables}$$

Assuming vegetable productivity of 12 tonnes per hectare:

$$\frac{31,500}{12} = 2,625 \text{ hectares}$$

Supplying the estimated dried vegetable demand of the urban premium segment would therefore require approximately 31,500 tonnes of fresh vegetables, corresponding to roughly 2,625 hectares of cultivated vegetable production.

Trekker Demand for Dried Fruit

In 2024, approximately 175,000 tourists visited Nepal for trekking and mountaineering purposes. Assuming average dried fruit consumption of 0.5 kg per trekker:

$$175,000 \times 0.5 \text{ kg} = 87,500 \text{ kg/year}$$

$$87,500 \text{ kg/year} = 87.5 \text{ tonnes/year}$$

Accounting for drying-related weight reduction and post-harvest losses:

$$\frac{87.5}{0.2 \times 0.8} \approx 547 \text{ tonnes of fresh fruit}$$

Assuming fruit productivity of 9 tonnes per hectare:

$$\frac{547}{9} \approx 61 \text{ hectares}$$

Thus, supplying the estimated dried fruit demand of the trekking segment would require approximately 550 tonnes of fresh fruit production, corresponding to roughly 61 hectares of cultivated fruit area.

Non-Trekking Tourist Demand for Dried Fruit

Non-trekking tourists were estimated by combining visitors travelling for holiday purposes, pilgrimage, and other reasons:

$$693,000 + 166,000 + 112,000 = 971,000 \text{ tourists}$$

Assuming average consumption of 0.2 kg of dried fruit per tourist:

$$971,000 \times 0.2 \text{ kg} = 194,200 \text{ kg/year}$$

$$194,200 \text{ kg/year} \approx 194 \text{ tonnes/year}$$

Accounting for drying-related weight reduction and post-harvest losses:

$$\frac{194}{0.2 \times 0.8} \approx 1,213 \text{ tonnes of fresh fruit}$$

Assuming fruit productivity of 9 tonnes per hectare:

$$\frac{1,213}{9} \approx 135 \text{ hectares}$$

Supplying the estimated dried fruit demand of non-trekking tourists would therefore require approximately 1,200 tonnes of fresh fruit production, corresponding to roughly 135 hectares of cultivated fruit area.

B Invitation to Participate in a Research Interview

Go-to-market strategies for solar-dried food products in Nepal

You are invited to participate in a research interview on the food system and market pathways for solar-dried food products in Nepal. We are two Master's students from Lund University in Sweden, conducting a six-month thesis project on go-to-market strategies for solar-dried food products in Nepal. Our research is carried out in collaboration with the SolarFood project — an international research initiative involving universities and institutions from Nepal, Bhutan, Sweden and Norway — which aims to explore how improved solar drying technology can create sustainable livelihoods and income opportunities for smallholder farmers and women-led cooperatives in the Himalayan region. The SolarFood project is led by Ruralis — Institute for Rural and Regional Research, and the project is registered with the Norwegian Agency for Shared Services in Education and Research.

Our thesis focuses specifically on the market side of this challenge: understanding which market segments hold the most potential for solar-dried products, and what conditions shape viable go-to-market strategies in the Nepali context. To do this, we are conducting interviews with a range of stakeholders across the value chain — from producers and cooperatives to buyers, organisations, and procurement bodies.

Participation consists of an interview about your experiences and perspectives related to food production, distribution, marketing, and/or food systems in Nepal. The interview will take approximately 30–60 minutes and may be conducted in person or online. With your permission, the interview may be audio-recorded to ensure accurate documentation.

The information collected will be used for research purposes within the SolarFood project and for a master's thesis analysing market pathways for solar-dried food products in Nepal. Parts of the interview may be included as quotations in research outputs. As the thesis will be submitted to and published by Lund University, it will constitute an official public document under Swedish law (*Offentlighetsprincipen*), meaning that it will be freely accessible to the public after publication. If you wish to withdraw your participation, or request that specific parts of your contribution are excluded from the final report, you are entitled to do so at any time before the publication date of 31 May 2026.

All information will be treated confidentially. If you wish to remain anonymous, the data will be anonymised so that you cannot be identified. We will not store or publish directly identifying personal information such as your name, telephone number, or email address. In research outputs, participants will be referred to in an anonymised form, for example as "informant" or according to their role in the food system.

Interview recordings will only be used for transcription and analysis. After transcription, identifying information will be removed by 31 May 2026. Audio recordings will be deleted after the project has been completed (31 May 2026).

Participation in the study is voluntary. You may decline to answer any question, stop the interview at any time, or withdraw from the study without giving a reason. You also have the right to access the personal data registered about you, request corrections, request deletion of your data, or receive a copy of the information collected about you.

We appreciate your willingness to contribute to this research. Your insights will help improve understanding of food markets and support the development of food preservation solutions in Nepal.

Contact information

If you have questions related to the thesis or interview, or wish to make use of your rights, please contact:

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C Appendix

C.1 Interview Guide — Farmers

Introductory Information
Time and Date: _____ **Location:** _____ **Number interviewed:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Background
Name _____ *Age* _____ *Education:* ☐ *Illiterate* ☐ *Elementary* ☐ *Basic (Gr. 1–8)* ☐ *Secondary (Gr. 9–12)* ☐ *Higher*
Are you part of a cooperative? ☐ *Yes* ☐ *No If no, why not?* _____ *If yes, how many members?* _____
Total production area of your farm (m^2/hectare/ropani): _____
Is farming your main income-generating activity? ☐ *Yes* ☐ *No If no, what is?* _____
How long have you worked in agriculture? ☐ *<10 yrs* ☐ *10–20 yrs* ☐ *>20 yrs*
Section 2: Production
Main reason you cultivate: ☐ *Self-consumption* ☐ *Selling purposes* ☐ *Equal parts* ☐ *Depends on harvest*
What crops do you farm?
What do you mainly sell on the market? How much food do you sell in a year?
Which of the following do you currently sell to? (check all that apply) ☐ Consumers directly ☐ Wholesaler ☐ Cooperative ☐ Traders/distributors ☐ Food service ☐ Other retailers ☐ Cafés/restaurants/hotels/schools
*To which would you **prefer** to sell? Why?* ☐ Consumers directly ☐ Wholesaler ☐ Cooperative ☐ Traders/distributors ☐ Food service ☐ Other retailers ☐ Cafés/restaurants/hotels ☐ Schools/Universities/Organisations/Government
Section 3: Distribution
Do you deliver or does the buyer collect? ☐ *Deliver* ☐ *Collect Distance to buyer (km):* ☐ *0–10* ☐ *10–25* ☐ *25–50* ☐ *>50*
How do you communicate with downstream actors?

Is there any available support from government or other organisations that you know of? Do you currently receive that support? Why/why not?
How is the product transported? ☐ *Open vehicle* ☐ *Closed vehicle* ☐ *Scooter* ☐ *Push cart* ☐ *Bicycle* ☐ *Head load* *Cold storage?* ☐ *Yes* ☐ *No*
Section 4: Terms of Trade
To what extent can you influence the terms of trade with your suppliers and buyers? Rate each (No influence / Limited / Some / Strong / Full control): Suppliers Buyers
Who typically determines the following aspects of your transactions? Rate each (Mostly other party / Shared / Mostly you / N/A): Prices Payment terms Quality standards Volume/Quantity Delivery schedules Contract conditions Design Packaging
Section 5: Customer Priorities and Buyer Problems
What matters most for your customers? Rate each 1–7 (1 = does not matter, 7 = matters very much): Price Quality Packaging How it looks Sustainable Where it comes from Quantity Accessibility Taste Service Brand
What are the biggest problems you have with your buyer? Rate each 1–7 (1 = no problem, 7 = big problem): Multiple intermediaries High transport cost Long delivery time High production cost Poor communication Other
Section 6: Post-Harvest Activities and Storage
Post-harvest activities performed before sale (check all that apply): ☐ Harvesting/handling ☐ Threshing ☐ Cleaning ☐ Drying ☐ Storing ☐ Processing ☐ Packaging ☐ Transport ☐ Marketing
Annual cost of these activities (NPR): ☐ *0–100k* ☐ *100k–250k* ☐ *250k–500k* ☐ *>500k*
Would you like to start or stop any of these activities? Which, and why?
How do you store the food? ☐ *Sheds* ☐ *Ventilated stores* ☐ *Cold storage* *For how long?* ☐ *0–1 wk* ☐ *1–2 wks* ☐ *2–4 wks* ☐ *1–3 mo* ☐ *3–6 mo* ☐ *6–12 mo* ☐ *>12 mo*
Do you experience any problems with selling your products on the market?
Section 7: Solar Dryers
Do you currently use solar dryers? ☐ *Yes* ☐ *No* *If no, are you interested in using one?* ☐ *Yes* ☐ *No*
If no, what are the main reasons you haven't invested in one already?

What would be the most important factors if you were to invest in one? Rate each 1–7 (1 = not important, 7 = very important): Investment cost Size Drying capacity Portability Drying time Ease of use Variable/maintenance costs Government support Training and extension services
In your opinion, what are the main barriers against improved solar drying technologies in your village?
Anything else you would like to mention?

C.2 Interview Guide — Intermediaries

Introductory Information
Time and Date: _____ **Location:** _____ **Number interviewed:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Background
Name _____ *Age* _____ *Education:* ☐ *Illiterate* ☐ *Elementary* ☐ *Basic (Gr. 1–8)* ☐ *Secondary (Gr. 9–12)* ☐ *Higher*
Intermediary services provided (check all that apply): ☐ Trading ☐ Wholesale ☐ Distributing ☐ Packaging ☐ Processing (drying, fortification, refinement etc.) ☐ Storage ☐ Certification
Geographical markets served:
Years in business: ☐ *0–1* ☐ *1–5* ☐ *5–10* ☐ *10–20* ☐ *20+* *Company size:* ☐ *0–10* ☐ *10–25* ☐ *25–50* ☐ *50–100* ☐ *>100 employees*
Revenue (optional): _____
Section 2: Wholesale Operations
Can you give us an overview of the wholesale industry in Nepal?
What is important to consider for new or existing wholesalers? (laws, registration, infrastructure, personal connections etc.)
Distance to producers (km): ☐ *0–10* ☐ *10–25* ☐ *25–50* ☐ *>50* *Distance to buyers (km):* ☐ *0–10* ☐ *10–25* ☐ *25–50* ☐ *>50*
How do you communicate with suppliers and buyers? How do you get in contact with new producers/buyers?
What would need to be in place for you to consider handling new products from new producers?
Section 3: Problems with Suppliers and Buyers

Biggest problems with suppliers? Rate each 1–7 (1 = no problem, 7 = big problem): Multiple intermediaries Long distances Poor infrastructure Reliability Poor communication Capacity Quantity/volume Payments
Biggest problems with buyers? Rate each 1–7 (1 = no problem, 7 = big problem): Multiple intermediaries Long distances Long delivery time Poor communication Payments Reliability Capacity
Section 4: Supplier Selection and Terms of Trade
Important factors when considering new producers/suppliers? Rate each 1–7 (1 = not important, 7 = very important): Cost Reliability Communication Production capacity Distance Existing infrastructure Payment terms
To what extent can you influence the terms of trade with your suppliers and buyers? Rate each (No influence / Limited / Some / Strong / Full control): Suppliers Buyers
Who typically determines the following aspects of your transactions? Rate each (Mostly other party / Shared / Mostly you / N/A): Prices Payment terms Quality standards Volume/Quantity Delivery schedules Contract
Section 5: Distribution Operations
Can you give us an overview of the distribution industry in Nepal?
What is important to consider for new or existing distributors?
Do you collect from producers or do producers deliver? ☐ Collect ☐ Delivered
Distance to producers (km): ☐ 0–10 ☐ 10–25 ☐ 25–50 ☐ >50 Distance to buyers (km): ☐ 0–10 ☐ 10–25 ☐ 25–50 ☐ >50
How do you communicate with producers and buyers?
Transport method: ☐ Open vehicle ☐ Closed vehicle ☐ Scooter ☐ Push cart ☐ Bicycle ☐ Head load Cold storage? ☐ Yes ☐ No
How do you store food during distribution? ☐ Non-ventilated ☐ Ventilated ☐ Cold storage ☐ Cartons ☐ Boxes ☐ Bags ☐ Bulk
For how long do you usually store food? ☐ 1–2 days ☐ 3–7 days ☐ 1–2 wks ☐ 2–4 wks ☐ >1 month
How do you get in contact with new producers/buyers? What would need to be in place for you to consider distributing new products from new producers?
Section 6: Packaging Operations
Can you give us an overview of the food packaging industry in Nepal?
What is important to consider for new or existing packagers? (laws, registration, infrastructure, technology, personal connections etc.)
What foods do you package?
What are the quality demands on your packaging? (material, look, brand, sustainability, durability)
What are your requirements on producers in terms of volume, reliability, quality, financial process etc.?

To what extent can you influence the terms of trade with your suppliers and buyers? (same scale as Section 4)
Who typically determines the following aspects of your transactions? (same scale as Section 4, plus: Design and Materials)
How do you get into contact with new producers/buyers? What needs to be in place for you to consider packing new products from new producers?

C.3 Interview Guide — Sellers

Introductory Information
Time and Date: _____ **Location:** _____ **Name of Business:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Background
Type of organisation: ☐ *Retail shop* ☐ *Café/Restaurant* ☐ *School* ☐ *Hotel* ☐ *Wholesaler* ☐ *Chain store*
Main customers: ☐ *International tourists* ☐ *Nepali tourists* ☐ *Locals* ☐ *Companies (café, restaurant, supermarkets etc.)*
Type of food sold: ☐ *Dried fruit* ☐ *Fresh fruit* ☐ *Dried vegetables* ☐ *Vegetables* ☐ *Snack products* ☐ *Sweets*
Roughly how much do you sell per week/month (all together)?
Section 2: Customers and Consumer Behaviour
What packaging size works best for your customers? What price range works in this category?
What matters most for your customers? Rate each 1–7 (1 = does not matter, 7 = matters very much): Price Quality Packaging How it looks Sustainable Where it comes from Quantity Accessibility Taste Service Brand
How do your different customers differ from each other in terms of preferences and price sensitivity?
Do you target specific customers? ☐ *Yes* ☐ *No If yes, how? If no, why not?*
Section 3: Distribution and Sourcing
Do you source directly from farmers or through a distributor? ☐ *Directly* ☐ *Distributor*

What matters most when choosing a supplier? Rate each 1–7 (1 = does not matter, 7 = matters very much): Price Quality Packaging How it looks Sustainability Where it is from Quantity Accessibility Taste Certification Brand Consistency/Reliability
Section 4: Terms of Trade
To what extent can you influence the terms of trade with your suppliers and buyers? Rate each (No influence / Limited / Some / Strong / Full control): Suppliers Buyers
Who typically determines the following aspects of your transactions? Rate each (Mostly other party / Shared / Mostly you / N/A): Prices Payment terms Quality standards Volume/Quantity Delivery schedules Contract conditions
How do you usually pay suppliers? ☐ *Cash* ☐ *Credit* ☐ *Invoice*
Section 5: Supplier Issues and New Products
Main issues experienced with suppliers: ☐ *No problem* ☐ *Multiple intermediaries* ☐ *High transport cost* ☐ *Long delivery time* ☐ *Reliability* ☐ *High price/unit* ☐ *Poor communication*
What would make you stop working with a supplier?
If a new local supplier approached you, what would need to be in place for you to consider their product or stock it regularly?
Notes:

C.4 Interview Guide — FAO Nepal

Introductory Information
Time and Date: _____ **Location:** _____ **Name:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Overview of FAO in Nepal
Q: What are FAO's primary focus areas in Nepal?
Q: What programmes or interventions is FAO currently running that relate to food systems or agricultural value chains?
Q: How does FAO typically engage with smallholder producers and cooperatives in Nepal?
Q: Who are FAO's main partners and counterparts in Nepal — government, NGOs, international organisations?

Section 2: Nepal's Food System — Structural Overview
Q: How would you characterise the overall structure of Nepal's food value chains — who are the key actors, and what does the relationship between them look like?
Q: Where are the most significant bottlenecks or inefficiencies in the system, and what drives them?
Q: How is Nepal's food system changing — which trends are most important right now?
Q: Where do you see the greatest opportunities for local food producers?
Section 3: Smallholder Market Access
Q: What are the most persistent barriers stopping smallholder producers from accessing formal or higher-value markets?
Q: Are there structural differences between how male and female producers experience these barriers?
Q: In your experience, what role do intermediaries play in determining the prices and opportunities available to smallholder producers? Can this dynamic be changed, or is it more realistic to work within it?
Q: Have you seen models where smallholder integration into formal markets has worked well in Nepal? What made them succeed?
Q: What typically causes these initiatives to fail?
Section 4: Value Addition and Processed Products
Q: How developed is the market for dried and preserved food products in Nepal?
Q: What are the main constraints facing small-scale producers trying to adapt their production to meet this market?
Q: How does geographic remoteness affect a producer's ability to access markets for dried or preserved goods?
Q: Do you know of any concrete examples in Nepal where small-scale producers have successfully commercialised dried or preserved products? If yes, what did the market linkage model actually look like in those cases?
Section 5: Policy and Regulatory Landscape
Q: What policies or programmes currently exist to support smallholder market linkages in Nepal?
Q: Are there regulatory barriers — e.g. certification, food safety, packaging standards — that disproportionately affect small producers?
Q: Are there upcoming policy developments that could significantly shift the landscape?
Q: Are there specific programmes or policy instruments that FAO has been directly involved in here that you would point to as important — either as successes or cautionary tales?
Section 6: Solar Drying as a Concrete Case

Q: From a value chain perspective, where does solar drying technology fit — what problem does it solve, and for whom?
Q: If solar-dried products were to scale sustainably in Nepal, which actors in the value chain would need to behave differently, and what would it take for them to do so?
Q: Which market segments do you think hold the most realistic potential for this kind of product?
Section 7: Open Reflection
Q: If you were designing a market-linkage intervention for smallholder food producers in Nepal today, what would you do differently from what has been tried before?
Q: What does FAO see as the most important levers for improving Nepal's food value chains?
Q: Is there anything we haven't asked that you think is relevant?
Q: Is there any other actor in the food system you would suggest we speak to?

C.5 Interview Guide — WFP Nepal

Introductory Information
Time and Date: _____ **Location:** _____ **Name:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: The Nepali Food System — Overview
Q: What does WFP's relationship to other actors in the food system look like? Do you collaborate with government ministries or departments, distributors, wholesalers, larger chain store owners or other actors?
Q: What are the biggest structural weaknesses in Nepal's food system?
Q: From your perspective, is Nepal's food system changing? If so: in which ways, and who are the emerging key actors?
Q: Are there policy or regulatory developments that will significantly affect local food procurement in the near future?
Q: Where do you currently see the greatest opportunities for local food producers in Nepal?
Section 2: WFP School Feeding in Nepal — Overview
Q: Could you briefly describe the overall work WFP is doing in Nepal? What is your role?
Q: How does the school feeding programme operate in Nepal — scale, geography, which and how many schools are included?

Q: How is procurement organised — centralised nationally or managed at regional/district level? Imported goods from abroad or sourced domestically?
Q: Without naming specific suppliers, how would you characterise the current supplier base — large national distributors, local producers, a mix?
Section 3: Supplier Approval and Selection
Q: What does the process look like for a new supplier to enter the programme?
Q: What are the formal requirements — food safety certifications, packaging standards, minimum volumes, consistency of supply?
Q: What makes a supplier an order winner?
Q: Are there any methods of solicitation or documentation requirements that are important to understand?
Q: How would it be difficult for small or local suppliers to qualify under current requirements?
Q: Are there any active efforts to source more locally or from smallholder producers?
Section 4: Local Sourcing and Smallholder Integration
Q: How important is geographic proximity of production to the school — is there a preference or requirement for local sourcing?
Q: What logistical challenges arise when sourcing from remote or rural areas?
Q: Have you worked with women-led cooperatives or similar producer groups before?
Section 5: Solar-Dried Products as a Concrete Case
Q: What is served in Nepalese schools? Does it differ between kindergarten, primary school, secondary school, and university?
Q: Do dried food products currently feature in school meals — as snacks or otherwise?
Q: What product characteristics would matter most — food safety, packaging, shelf life, nutritional value?
Q: Could a school or cooperative owning a dryer and producing on-site be a viable model in your view?
Section 6: Open Reflection
Q: What would be needed for a smallholder solar drying initiative to become a credible WFP supplier?
Q: Looking back at programmes or suppliers that have worked well — what did they have in common that others did not?
Q: Are there structural or systemic barriers in how WFP procurement works that make local smallholder integration genuinely difficult, regardless of product quality?
Q: If you were advising a women-led cooperative in Nepal trying to enter this market, what would you tell them?
Q: Is there anything we haven't asked that you think is relevant?
Q: Is there any other actor in the food system you would suggest we speak to?

C.6 Interview Guide — Ministry of Agriculture and Livestock Development (MoALD)

Introductory Information
Time and Date: _____ **Location:** _____ **Name:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Overview of MoALD
Q: From the Ministry's perspective, how would you describe the current stage of Nepal's agricultural transition from subsistence production toward more commercial and market-oriented agriculture?
Q: What programmes or interventions is MoALD currently running that relate to food systems or agricultural value chains?
Q: How does MoALD typically engage with smallholder producers and cooperatives on the ground?
Section 2: Nepal's Food System — Structural Overview
Q: How would you characterise the overall structure of Nepal's food value chains — who are the key actors, and how does value flow between them?
Q: Where are the most significant bottlenecks or inefficiencies within Nepal's agricultural value chains — e.g. production, technological maturity, aggregation, processing, logistics, market access? What drives them?
Q: How is Nepal's food system changing — which trends are most consequential right now?
Q: Where do you see the largest opportunities for increasing value within Nepal's agricultural value chains?
Q: How large are the different market flows? What percentage of total produced vegetables and fruits flows through each channel approximately?
Section 3: The Agricultural Development Strategy
Q: The latest Implementation Status of the Agricultural Development Strategy (2015–2035) was published in January 2023. Have you or are you writing a new one, and where can we find it?
Q: Have you been able to achieve your goals in the ADS, especially those related to Profitable Commercialisation and Increased Competitiveness?
Q: What challenges have you faced? What challenges remain? What will you focus on going forward?

Q: Activity 410 in the ADS speaks of promoting development of market infrastructure through the creation of new markets and improving existing ones. Which markets are these in general, and in particular for dried fruits?
Q: What underutilised or hidden markets currently exist for dried fruits? What market channels have not been activated yet due to poor infrastructure, poor market access, or lack of knowledge?
Q: Which agricultural subsectors or commodities have shown the strongest progress toward commercialisation?
Section 4: Status of Nepalese Producers
Q: What food is grown in Nepal, and does it differ by region? What food is dried in Nepal, and does that also vary by region?
Q: What are the main challenges that small-scale farmers face when it comes to having a stable food supply throughout the year?
Q: How do seasonal variations impact food availability and affordability in different regions of Nepal?
Q: What are the main obstacles for rural small-scale farmers regarding markets — access, conditions, pricing?
Section 5: Competitive Landscape
Q: How would you describe the overall competitive situation for a farmer or company wanting to sell solar-dried fruits and vegetables?
Q: How competitive are Nepalese dried fruits and vegetables currently in domestic and regional markets?
Q: What prevents people from buying solar-dried food? On the other hand, what brings people to buy solar-dried products?
Q: How can an actor wanting to sell solar-dried food build their value chain for it to become a competitive advantage?
Q: How developed are Nepal's systems for food safety, quality certification, and compliance?
Section 6: Barriers and Drivers of Solar-Dried Foods
Q: From a value chain perspective, where does solar drying technology fit — what problem does it solve, and for whom?
Q: What are the main challenges or barriers preventing rural small-scale farmers from widely adopting solar drying technology?
Q: What policies or incentives exist to encourage adoption of sustainable energy solutions in agriculture, such as solar drying?
Section 7: Open Reflection
Q: If you were designing a market-linkage intervention for smallholder food producers in Nepal today, what would you do differently from what has been tried before?
Q: Is there anything we haven't asked that you think is relevant?
Q: Is there any other actor in the food system you would suggest we speak to?

C.7 Interview Guide — Asian Development Bank (ADB) Nepal

Introductory Information
Time and Date: _____ **Location:** _____ **Name:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: ADB's Role in Nepal's Food and Agriculture Sector
Q: Could you briefly walk us through ADB's current priorities in Nepal's agriculture and food systems space, and how they fit within the new Country Partnership Strategy for 2025–2029?
Q: How does ADB typically engage with smallholder producers and cooperatives — directly or through partners or intermediaries?
Q: The 32nd objective in the Nepal Country Partnership Strategy emphasises ADB's support of Nepalese competitiveness and green economic transformation through improving the business climate, reducing the cost of business, and promoting private sector investments. From the perspective of agrobusinesses, what business models, market channels, and opportunities are you expecting to open or develop through this objective?
Section 2: Nepal's Food System — Structural Overview
Q: How would you characterise the most significant structural weaknesses in Nepal's agricultural value chains right now?
Q: Other stakeholders describe Nepal's food value chains as highly fragmented, with coordination failures at every node — does ADB's experience resonate with that?
Q: The CPS names remittance dependence as suppressing Nepal's export competitiveness through real exchange rate effects — how does that macro constraint factor into ADB's thinking on agricultural value chain development?
Q: The CPS also names rugged terrain, infrastructure gaps, and political and policy uncertainty as persistent operational challenges — how do these play out specifically in the food and agriculture sector, and how does ADB navigate them in practice?
Q: How is Nepal's food system changing — which trends are most important right now?
Q: Where do you see the greatest opportunities for local food producers?
Section 3: Smallholder Market Access
Q: What are the most persistent barriers stopping smallholder producers from accessing formal or higher-value markets?

Q: ADB's recent case study on women farmer incomes concluded that impact was strongest when value chains were tackled end-to-end — what does that look like in practice, and where do interventions most commonly fall short?
Q: When we spoke to FAO they noted that progress created through development projects sometimes stops once the project ends — is that a pattern ADB recognises, and if so, how do you try to build continuity beyond a project timeline?
Q: Have you seen financing or investment models that have worked particularly well for smallholder value addition in Nepal — and what made them succeed?
Q: What typically causes these initiatives to fail?
Section 4: Policy, Investment Climate and Regulatory Landscape
Q: How would you describe the regulatory environment for agribusiness and food commercialisation in Nepal?
Q: ADB's Food Safety and Agriculture Commercialisation Programme aimed to improve regulatory capacity and align Nepal's standards with international requirements — did that work translate into meaningfully easier market access for small producers, or did the benefits accrue primarily to larger operators?
Q: Nepal is expected to graduate from LDC status in 2026, losing preferential market access for exports — how do you expect that to affect smallholder food producers trying to access higher-value markets?
Q: Are there upcoming developments — e.g. policy, infrastructure, investment — that could significantly affect conditions for local food producers?
Section 5: Solar Drying as a Concrete Case
Q: From a development finance and value chain perspective, where does post-harvest technology like solar drying fit — what problem does it solve, and for whom?
Q: One perspective we have encountered is that the dryer alone is not enough — producers also need to understand what can be dried and what market value it creates, and consumers need to trust that nutritional quality is preserved. Where should intervention efforts be directed — technology, market development, or behaviour change?
Q: ADB's digital development agenda is a cross-cutting theme in the new CPS — is that work reaching agricultural value chains and smallholder market linkages, or is it primarily focused elsewhere?
Q: What conditions would need to be in place for a smallholder solar drying initiative to attract investment and scale sustainably in Nepal?
Q: Which market segments do you see as most realistic for this type of product?
Section 6: Open Reflection
Q: Imagine you were in our shoes creating a go-to-market strategy for solar-dried fruits and vegetables in Nepal. 1) How would you structure your value chain? 2) What market pathways would you utilise? 3) What social, economic, organisational, and logistical conditions would you take into account in your business plan?
Q: Is there anything we haven't asked that you think is relevant?

Q: Is there any other actor in the food system you would suggest we speak to? Can you help us get into contact with them?

C.8 Interview Guide — World Bank Nepal

Introductory Information
Time and Date: _____ **Location:** _____ **Name:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Overview of World Bank Nepal
Q: Could you briefly walk us through World Bank Nepal? What are your current priorities in Nepal's agriculture and food systems?
Q: How does the World Bank typically engage with smallholder producers, farmers' groups, and cooperatives — directly or through intermediaries?
Section 2: Food System Structure and Value Distribution
Q: How would you characterise the overall structure of Nepal's food system — who are the dominant actors and how is it structured?
Q: How has the market evolved over the last five to ten years, and what trends are most consequential right now?
Q: How would you say that value is distributed across different stages of the value chain — production, aggregation, processing, distribution, retail? Where does most value addition currently take place?
Q: Who primarily captures this value? Is it smallholder farmers, traders, processors, or larger firms?
Q: Where do you see the largest inefficiencies or value leakages within Nepal's food value chains?
Section 3: The Tripura Sundari Rural Municipality Project
Q: In the initiative described, farmer groups are linked more directly to markets through aggregation and coordination mechanisms. Could you walk us through where the products ultimately end up — e.g. local markets, urban retailers, institutional buyers — and where the end-consumer typically purchases these products?
Q: From a quantitative perspective, how does production from these farmer groups flow through the value chain? How much is retained for local consumption versus sold into markets, and how much passes through intermediaries versus direct channels?
Q: Based on this model, what key market characteristics in Nepal determine whether such farmer–market linkage initiatives succeed, particularly in terms of demand consistency, buyer structure, price formation, and the role of intermediaries?

Section 4: Existing Market Pathways and Channel Dynamics
Q: What are the main market pathways through which food products move from producers to consumers in Nepal?
Q: Based on your data or experience, how significant are these different pathways in terms of volume or share?
Q: How dominant are informal market channels compared to formal, regulated ones?
Q: How do these pathways differ between rural and urban areas, or between regions such as remote provinces versus central Nepal?
Q: Which market pathways are currently growing the fastest, and what is driving that growth?
Q: What are the most persistent barriers stopping smallholder producers or SMEs from accessing formal or higher-value markets such as modern retail chains, the hospitality sector, or institutional buyers?
Section 5: Missing Market Pathways and System Gaps
Q: Are there market pathways or value chain designs that you would expect to exist in Nepal but currently remain underdeveloped or absent?
Q: What are the key missing elements preventing these pathways from emerging — e.g. infrastructure, finance, coordination, policy, demand?
Q: Where do you see the greatest commercial opportunities for smallholder food producers?
Section 6: Solar Drying as a Concrete Case
Q: From a development finance and value chain perspective, where does post-harvest technology like solar drying fit — what problem does it solve, and for whom?
Q: Looking back at your Tripura Sundari Rural Municipality project — what role did dried products play in the farmer groups' commercial development? How much of the produce was dried, and how much of turnover came from dried products?
Q: What conditions would need to be in place for a smallholder solar drying initiative to attract investment and scale sustainably in Nepal?
Q: Which market segments do you see as most realistic for solar-dried products?
Section 7: Open Reflection
Q: Imagine you were in our shoes creating a go-to-market strategy for solar-dried fruits and vegetables in Nepal. 1) How would you structure your value chain? 2) What market pathways would you utilise? 3) What social, economic, organisational, and logistical conditions would you take into account in your business plan?
Q: Is there anything we haven't asked that you think is relevant?
Q: Is there any other actor in the food system you would suggest we speak to? Can you help us get into contact with them?

C.9 Interview Guide — Helvetas Nepal (InElam)

Introductory Information
Time and Date: _____ **Location:** _____ **Name:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Overview of InElam and Helvetas Nepal
Q: Could you briefly describe your role as Business Development Coordinator and what that involves in practice within the InElam project?
Q: InElam operates in Madhesh and Karnali — two of Nepal's most economically challenged provinces. What does that context mean in practice for enterprise development work?
Q: InElam has been running in various forms for quite some time. What has changed most significantly across the different phases? What works and what has been dropped?
Section 2: From Producer to Market
Q: InElam uses Area Potential Surveys and Sub-Sector Assessments to identify which value chains to enter. What does that process look like in practice, and what determines whether a value chain looks promising?
Q: Once a value chain is selected, how does InElam move from identifying an opportunity to actually getting an enterprise to the point where it can access markets — what are the key stages and where does it most commonly break down?
Q: InElam follows a three-stage model: research and innovation, piloting, and capacity building with private sector support. What does this look like in practice, and how often does that full sequence actually complete?
Section 3: Market Linkage
Q: Other stakeholders describe aggregation as one of the most persistent structural problems in Nepal's food system — too scattered, too costly, too dependent on middlemen. Does that match InElam's experience, and have you found approaches that circumvent these challenges?
Q: Have you seen cases where a producer group or cooperative has successfully broken into a formal or higher-value market in Nepal — what made it work, and what was different about those cases compared to the ones that didn't?
Q: When market linkage initiatives end — funding stops, project staff leave — which parts continue working and which break down? What would need to change for results to be more long-lasting?
Q: Are there market channels or buyer types that you have found more reliable or accessible for small producers than others, and why?

Section 4: The Enabling Environment — Finance, Policy and Business Services
Q: Access to finance comes up consistently as a barrier for small producers. In your experience working with micro-enterprises, what does that barrier actually look like in practice, and have you seen financing models that work?
Q: InElam connects entrepreneurs with financial institutions and government subsidies. How functional is that ecosystem in reality — are the products and processes actually suited to the enterprises you work with?
Q: What kinds of non-financial business support have proven most valuable for the enterprises InElam works with — training, mentoring, market information, or something else?
Section 5: Solar Drying as a Concrete Case
Q: From your experience through InElam, where does a post-harvest technology like solar drying fit — what problem does it solve, and for whom does it make the most sense?
Q: For a women-led cooperative producing solar-dried fruit or vegetables in a remote area, what would the realistic path to market look like — and what conditions would need to be in place for that to be viable?
Q: InElam's model relies on demonstrated pilots attracting private sector investment to scale. Do you think a solar drying initiative could realistically reach that threshold — what would it need to show to convince a private sector actor to invest?
Q: Which market segments do you think are most realistic for solar-dried products in Nepal — and which ones sound plausible in theory but are harder in practice than people assume?
Section 6: Open Reflection
Q: If you were designing a market-linkage intervention for a women-led cooperative producing processed food products in a remote Himalayan area, what would you do differently from what has generally been tried in Nepal?
Q: Is there anything we haven't asked that you think is relevant?
Q: Is there any other actor or organisation you would suggest we speak to? Can you help us get into contact with them?

C.10 Interview Guide — FNCCI / Agro Enterprise Centre

Introductory Information

Time and Date: _____ **Location:** _____ **Name:** _____	
Can we record the interview? ☐ Yes ☐ No	
Section 1: Overview of FNCCI and the Agro Enterprise Centre	
Q: Could you briefly walk us through what FNCCI does and how the Agro Enterprise Centre fits into that wider picture?	
Q: How does AEC typically engage with smallholder producers and cooperatives — directly or through intermediaries?	
Q: AEC has historically been involved in initiatives like the Prefeasibility Assessment on Potential Agricultural Processing Industries in Karnali Province, the HIMALI project, and One Village One Product. Could you tell us more about what you have been involved in recently?	
Q: What are the key lessons from these projects in terms of connecting smallholder producers to markets?	
Section 2: Insights from the Karnali Province Prefeasibility Assessment	
Q: Based on your experience from that work, what organisational models — e.g. cooperatives, MSME processors, contract farming arrangements, aggregator models — have proven most effective in linking smallholder farmers to scalable and profitable value chains?	
Q: The report identifies several marketing channels ranging from direct farm-gate sales to value chains involving wholesalers, retailers, and processors. In practice, which of these have shown the greatest potential for smallholder farmers or MSMEs to move into higher-value markets, and what conditions were necessary for those channels to function effectively?	
Q: How transferable are these findings and insights to Central Nepal? What considerations need to be made?	
Section 3: Nepal's Agribusiness Landscape	
Q: How would you characterise the food industry in Nepal — who are the dominant actors, and how is it structured?	
Q: How has the market evolved over the last five to ten years, and what trends are most consequential right now?	
Q: How competitive is the domestic market relative to imports?	
Q: Where do you see the greatest commercial opportunities for local food producers?	
Section 4: Smallholder Market Access and Barriers	
Q: What are the most persistent barriers stopping smallholder producers from accessing formal or higher-value markets?	
Q: What are the main constraints that consistently prevent smallholder producers from scaling up?	

Q: Have you seen cases where smallholder producers have successfully broken into formal markets in Nepal? If so, what enabled that, and what typically causes these initiatives to fail?
Q: What underutilised or hidden markets currently exist for dried fruits? What market channels have not been activated yet due to poor infrastructure, poor market access, or lack of knowledge?
Section 5: Value Addition, Pricing and Market Infrastructure
Q: How well developed is Nepal's distribution and logistics infrastructure for food products — where are the biggest gaps?
Q: Are there trade dynamics or import pressures that make it particularly difficult for local processed food products to compete?
Section 6: Customers and Consumer Behaviour
Q: From the perspective of solar-dried products and similar competing products, who are the main customers and how do they differ in terms of preferences, lifestyles, buying behaviour, age, and demographics?
Q: Which market segments do you think hold the most realistic potential for solar-dried products in Nepal — e.g. tourists, locals, wealthier urban consumers?
Q: What matters most for customers when buying dried fruits or substitutes such as crisps, nuts, or processed snacks? Rate each 1–7 (1 = does not matter, 7 = matters most): Price Quality Packaging Looks Sustainable Origin Quantity Accessibility Taste Service Brand Other
Section 7: Dried and Preserved Products
Q: How developed is the industry for dried and preserved food products in Nepal — is it growing, stable, or marginal?
Q: How does local versus imported product performance compare in this category?
Q: Do you see unmet demand for locally produced dried food products, or would this be creating a new category from scratch?
Q: Do you think dried fruit products could realistically compete with established snack categories like crisps or confectionery — or is that an entirely different customer mindset?
Section 8: Policy and Regulatory Landscape
Q: Are there regulatory barriers — certification, food safety, packaging standards — that disproportionately affect small producers?
Section 9: Open Reflection
Q: Is there anything we haven't asked that you think is relevant?
Q: Is there any other actor in the food system you would suggest we speak to?

C.11 Interview Guide — BigMart Nepal

Introductory Information
Time and Date: _____ **Location:** _____ **Name:** _____
Can we record the interview? ☐ Yes ☐ No
Section 1: Overview and BigMart's Role in the Food System
Q: Could you briefly walk us through how BigMart operates — how many stores, what categories, and who you primarily serve?
Q: How do you see your role in Nepal's food value chain — do you see yourselves as influencing what gets produced and supplied, or primarily responding to what's available?
Q: How has the retail food market in Nepal changed over the last five to ten years, and what trends are you responding to?
Section 2: Customers and Consumer Behaviour
Q: Who are your main customers, and how do they differ from each other in terms of preferences and buying behaviour?
Q: Do you target specific customer segments, and if so how?
Q: What matters most for your customers? Rate each 1–7 (1 = does not matter, 7 = matters most): Price Quality Packaging Looks Sustainable Origin Quantity Accessibility Taste Service Brand
Section 3: Sourcing and Supplier Relationships
Q: How do you source your products — directly from producers, through distributors, or a mix?
Q: What matters most when choosing a supplier? Rate each 1–7 (1 = does not matter, 7 = matters most): Price Quality Packaging Looks Sustainable Origin Quantity Accessibility Taste Service Brand
Q: What are the main issues you experience with suppliers?
Q: What would make you stop working with a supplier?
Q: Local versus imported — is there a strategic preference, or is it purely driven by price and availability?
Section 4: Existing Market Pathways and Channel Dynamics
Q: Nepal produced nearly 1.5 million tonnes of fruit and 4.7 million tonnes of vegetables in 2024. Very generally, what are the main market pathways through which food products move from producers to consumers in Nepal?

Q: How significant are these different pathways in terms of volume or share? How much passes through intermediaries such as traders, aggregators, wholesalers, processors, or distribution companies — and how much through retail actors?
Q: How dominant are informal market channels compared to formal, regulated ones?
Q: How do these pathways differ between rural and urban areas, or between regions such as remote provinces versus central Nepal?
Q: Which market pathways are currently growing the fastest, and what is driving that growth?
Section 5: Dried and Preserved Products
Q: How developed is the category for dried and preserved food products in your stores — is it growing, stable, or marginal?
Q: How much dried fruit do you sell per year in kg and NPR? What sells well in this category, and what doesn't — and what drives that?
Q: What price points and margin structures are typical for products in this category?
Q: How does local versus imported product performance compare in this category?
Q: Do you see unmet demand for locally produced dried food products, or would this be creating a new category from scratch?
Q: Do you think dried fruit products could realistically compete with established snack categories like crisps or confectionery — or is that an entirely different customer mindset?
Q: What would need to be true about the product, price, or positioning for dried fruit to genuinely challenge those categories on your shelves?
Section 6: New Product Introduction
Q: What does the process look like when a new product enters your stores — from first contact to trial to regular listing?
Q: What are the most common reasons a new product fails to make it past the trial stage?
Q: If a new local supplier approached you tomorrow, what would be needed for you to consider stocking their product regularly?
Section 7: Open Reflection
Q: Where do you see the biggest gaps or opportunities in Nepal's food retail landscape right now, and for which stakeholder?
Q: Is there anything we haven't asked that you think is relevant?
Q: Is there any other actor in the food system you would suggest we speak to?