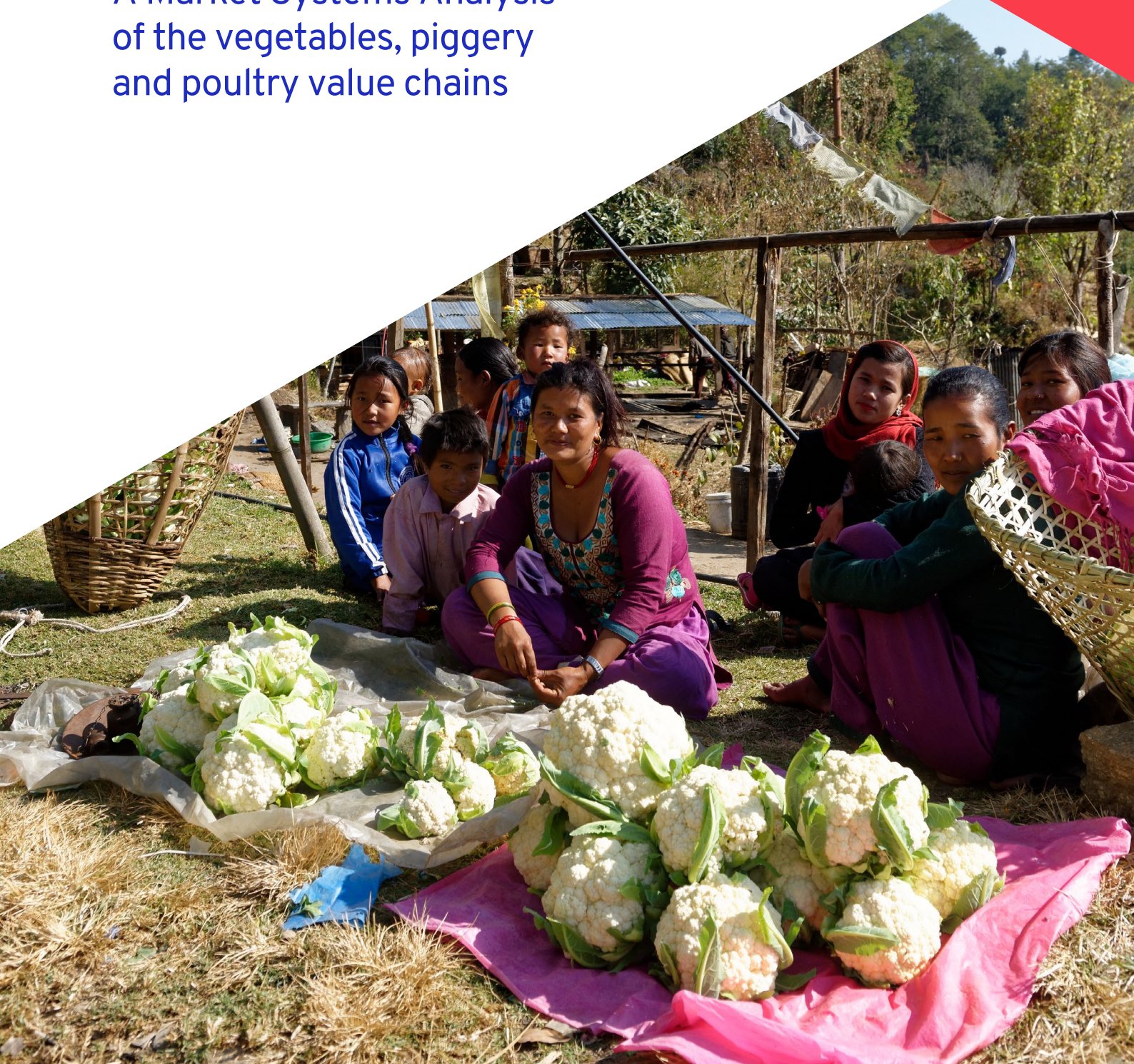


► Building inclusive markets for refugees and host communities in Province 1, Nepal

A Market Systems Analysis
of the vegetables, piggery
and poultry value chains



Building inclusive markets for refugees and host communities in Province 1, Nepal

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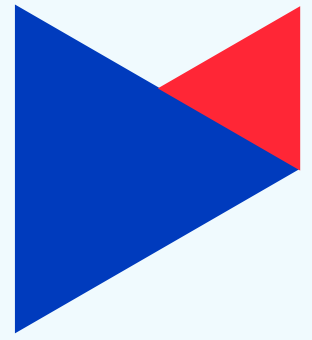
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▶ Acronyms

ADS	Agricultural Development Strategy	KSCL	Krishi Samagri Company Ltd.
AEC	Agro-Enterprise Centre	LFPR	Labour Force Participation Rate
AI	Artificial insemination	LI-BIRD	Local Initiatives for Biodiversity, Research and Development
AICC	Agriculture Information and Communication Center	LSSC	Livestock Service and Sub-service Centre
AICL	Agriculture Inputs Company Limited	LWF	Lutheran World Foundation
AKC	Agriculture Knowledge Centre	MFI	Microfinance institution
ASC	Agriculture Service Centre	MoALD	Ministry of Agriculture and Livestock Department
BDS	Business development services	MoICS	Ministry of Industries, Commerce and Supplies
CLDP	Community Livestock Development Project	NARC	Nepal Agriculture Research Council
CTEVT	Council for Technical Education and Vocational Training	NHIS	National Health Insurance Scheme
DCSI	Department of Cottage and Small Industries	NLBO	National Livestock Breeding Office
DDSD	Digital Data Systems for Development	NLDCP	National Livestock Disease Control Program
DFTQC	Department of Food Technology and Quality Control	NPR	Nepalese Rupee
DLS	Department of Livestock Services	NRB	Nepal Rastra Bank
DoA	Department of Agriculture	OCR	Office of Company Registration
DOAD	Directorate of Agriculture Development	OSH	Occupational safety and health
DOC	Day-old chick	PAN	Permanent Account Number
EPR	Employment-to-Population Ratio	PMAMP	Prime Minister Agriculture Modernization Programme
FNCCI P1	Federation of Nepalese Chamber of Commerce and Industry, Province 1	RFTQC	Regional Food Technology and Quality Control
GAP	Good agricultural practices	SEAN	Seed Entrepreneurs' Association of Nepal
GDP	Gross Domestic Product	SMS	Short Message Service
GMP	Good Manufacturing Practices	SQCC	Seed Quality Control Center
GoN	Government of Nepal	SSSC	SEAN Seed Service Centre Ltd.
GVA	Gross value added	STCL	Salt Trading Corporation
ICT	Information and Communication Technology	T & V	Training and Visit
ILO	International Labour Organization	UNHCR	United Nations High Commissioner for Refugees
IPM	Integrated pest management	VCA	Value chain analysis



▶ 1. Introduction

Nepal has a long tradition of providing asylum to refugees. The main arrivals took place in 1959 with the Tibetans and in 1990/91 with the Bhutanese. From 2007 to 2016, 113,500 Bhutanese refugees were resettled to eight third countries due to a lack of voluntary repatriation prospects (UNHCR, 2020). As of 2020, there are still 6,365 Bhutanese refugees, of which 46% are women, who are still living in Nepal in two settlements at Beldangi and Sanischara of Jhapa district in Province 1 in the East of Nepal.

While forcibly displaced persons face specific vulnerabilities, including psychological trauma, lack of opportunity and protection risks, host communities also struggle to pursue their development efforts in an environment that has been transformed by an influx of newcomers. As displacement has become increasingly protracted, responses focus more on durable solutions backed by more dignified, inclusive and comprehensive programmes for refugees and the communities that host them.

In this context, the United Nations High Commissioner for Refugees (UNHCR) and the International Labour Organization (ILO) collaborated on conducting a market system analysis in Nepal. Employing the ILO-UNHCR approach to inclusive market systems (AIMS), as detailed in the "[Guide to market-based livelihood interventions for refugees](#)", the overarching objective of the market system analysis was to develop and propose interventions that will enable refugees and host community members to access decent economic and employment opportunities. Specifically, the market assessment aims to:

- a) Provide an understanding of the socio-economic conditions of the target group and the overall context in which they are embedded.
- b) Identify value chains that have the potential for profitability, growth and decent employment for the target group.
- c) Identify the systemic chain level issues that hinder or promote the gainful participation of target groups in the selected value chains.
- d) Develop actionable and realistic recommendations to support the development of a market-based livelihoods strategy for refugees and host communities.

The report contains two separate but interlinked analyses:

Socio-economic assessment and context analysis: This presents refugees and host community members' profiles, characteristics, and backgrounds. A snapshot review is also shown on the overall environment that target groups are embedded in, including an overview of the policy context, rules and regulations that influence the access of target groups to livelihood opportunities and support services.

Sector selection and value chain analysis (VCA): The sector selection component outlines the rationale for the prioritisation of three subsectors, namely: vegetables, poultry, and piggery. The VCA presents the constraints and opportunities in the three subsectors that have the most significant impact on the gainful inclusion of the target groups. The results of the VCA form the basis for the development of livelihood intervention strategies.

▶ 2. Methodology

The study consisted of the following phases:

Phase 1: Socio-economic assessment and context analysis. The focus of the data gathering and analysis was on the following: (i) socio-economic profile of the target groups; (ii) rules and regulations pertaining to refugees' access to economic opportunities in Nepal; and (iii) access to support services for target groups.

Data gathering was carried out through the following: (i) review of literature; (ii) survey of 74 refugees; (iii) in-depth interview of target groups; and (iv) interview of public and private sector providers, enterprises, and government officials.

Phase 2: Identification of high potential value chains. Based on desk review and data gathered during Phase 1, criteria-specific profiles of the shortlisted value chains were prepared and used as the basis for selecting value chains that will be the foci of the value chain study.

Phase 3: Livelihood market analyses. This involved the following: (i) value chain analyses of the three identified high potential value chains (vegetables, poultry, and piggery); and (ii) formulation of recommendations for market-based refugee livelihoods interventions.

Secondary research on the three subsectors was undertaken before initiating the fieldwork and continued through the report preparation. Key informant interviews were used for collecting data on individuals' perspectives, experiences, and quantitative data. The interviews used semi-structured guide questions to allow in-depth discussions. Interviewees consisted of refugees, host community target groups, market actors, financial and non-financial service providers, government officials, and input suppliers.

The collected data were analysed systematically to characterise the value chains. The value chain study analysed: i) core value chain actors and their functions; b) factors affecting the performance of the value chain and livelihoods of refugees and host community members, including end markets, the enabling environment, interfirm cooperation and support services; and c) the relationships between market actors and the distribution of benefits throughout the chain. Based on this analysis, the constraints to gainful participation of target groups in the selected subsectors were identified. Market-based solutions were suggested to address the constraints.

▶ 3. Context

3.1 Economy of Province 1 and Nepal

In 2015, Nepal shifted from a unitary system to a three-tier government, which consists of a federal government, seven provincial governments, 753 village and municipal levels governments, and 6,743 hamlets. The goal is to decentralise power and create economic and political growth opportunities by overcoming various internal and external challenges. Province 1, the easternmost of the seven provinces, has been the temporary home of refugees for the past three decades. The refugees are hosted in two settlements in the Jhapa and Morang districts.

After three consecutive years of over six per cent growth of its gross domestic product (GDP), the economy of Nepal contracted by 2.1% in 2020 (World Bank, 2021), which is more severe than the economic loss caused by the earthquake in 2015. The decline in the GDP was mainly due to movement restrictions and lockdowns imposed by the government to contain the spread of the COVID-19 infection. Other factors that contributed to the decline in the country's economy even before the pandemic included a delayed monsoon, outbreak of armyworms, tightening domestic credit conditions, continued low execution rates of public investment projects, deceleration in remittances growth and a slowdown in tourism receipts.

The services sector had the highest gross value added (GVA) at 61%, followed by agriculture and industry at 26% and 13%, respectively. However, despite having fertile land ideal for farming and two-thirds of its population dependent on agriculture, Nepal's annual food imports (e.g., rice, vegetables, fruits) have increased to NPR 3.23 trillion in 2020, which is three times higher than in 2014 (Kumar, 2021).

Province 1 accounted for 16% of the GDP in 2020 and ranked second after Bagmati Province. The main contributors to the GDP were agriculture (36%), wholesale and retail trade (10%),

and construction (9%). Agriculture is the mainstay of the economy and provides livelihood to about three-fourths of its 4.5 million residents (NepalOutlook, 2020), including the refugees. The economy of Province 1 and Nepal, as a whole, and consequently, the livelihoods of its people are very dependent on the climate. Nepal is one of the most vulnerable countries to climate change, with frequent flash floods, glacial outbursts, droughts, landslides, heat waves, cold spells, and unpredictable rainfall. The country ranked 128th out of 181 countries in the 2019 ND-GAIN Index, which summarises a country's vulnerability to climate change and other global challenges combined with its readiness to improve resilience.

Biratnagar, the capital city of Province 1, is considered Nepal's industrial capital. The most prominent establishment in this city is the Biratnagar Jute Mills, the first large-scale industry established in Nepal. The mill is owned by the Golchha Organization, which operates over 100 companies in Nepal, including a state-of-the-art manufacturing facility for vaccines and other health products for poultry and livestock. Other industries in the area are rice and sugar mills, steel mills, and tobacco manufacturing.

Biratnagar is the entry point to eastern Nepal and north-eastern India. It is the second Nepalese city, after Janakpur, to have a connection with the Indian Railways. It is also the only city other than Birgunj to operate an integrated check post on the Indian border. As a trade gateway, many traders are operating in the province. Some traders source vegetables and livestock from refugees, albeit intermittently and only when the latter has a tradeable surplus.

The province has the third-largest number of poor people. Of the 5 million poor people in Nepal in 2019, about 773,000 live in Province 1. The economy in the province tended to depend on upstream activities, which were not sufficient to generate productive activities that could help increase income and employment.

3.2 The labour market

The national Labour Force Participation Rate (LFPR) and Employment-to-Population Ratio (EPR) were 38.5 per cent and 34.2 per cent, respectively. The LFPR and EPR in Province 1 were slightly lower than the national figures. In Nepal and Province 1, male LFPR and EPR were higher than females. It should be noted, though, that those engaged in subsistence activities were considered to be outside of the labour force in line with the definition adopted during the conduct of the labour force survey in 2018.

Almost half of the total number of enterprises fall in the informal sector being unregistered (CBS, 2019). The informal sector also provided over 60% of the jobs in Province 1 and Nepal in general and was the most accessible for those with little or no education. Industries in the informal sector with a high share of employment were agriculture, wholesale and retail sales, including service shops and construction. Refugees are employed in the informal sector not only due to legal constraints but also because of the lack of competencies and skills. Refugees are also confronted with trust issues, whether with employers in the formal or informal sectors.

► Table 1. Province 1 and Nepal: Key labour market indicators by sex, 2018

	Number of persons (in '000)					In Percentage		
	Working-age population	Employed	Unemployed	Not in the labour force	Labour force	UR	EPR	LFPR
Nepal	20,744	7,086	908	12,750	7,994	11.4	34.2	38.5
Female	11,537	2,640	397	8,500	3,036	13.1	22.9	26.3
Male	9,208	4,446	511	4,250	4,958	10.3	48.3	53.8
Province 1	3,556	1,208	136	2,211	1,344	10.2	34.0	37.8
Female	1,957	442	60	1,456	502	11.9	22.6	25.6
Male	1,598	766	77	756	842	9.1	47.9	52.7
UR: Unemployment rate EPR: Employment-to-Population Rate LFPR: Labour Force Participation Rate								

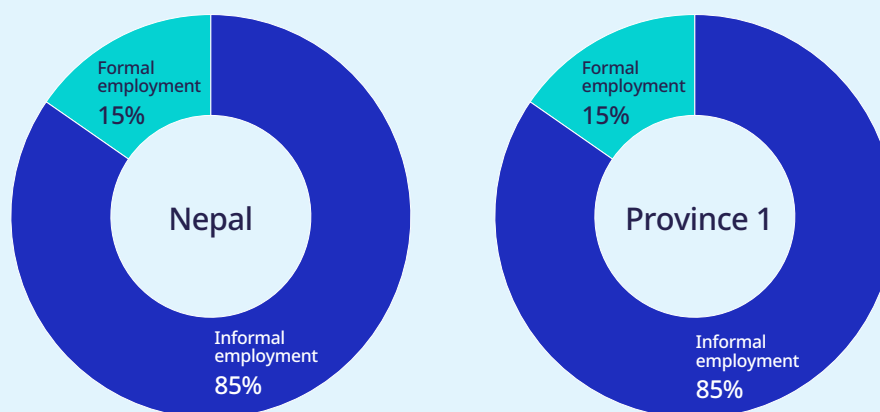
Source: (CBS, 2019)

► Table 2. Province 1 and Nepal: Employment in the formal and informal sector, 2018

	Workers employed in the formal sector (In '000)			Workers employed in the informal sector (In '000)			
	Agriculture	Non-agriculture	Total	Agriculture	Non-agriculture	Private households	Total
Nepal	90	2,586	2,675	1,434	2,904	73	4,411
	1.3%	36.5%	37.8%	20.2%	41%	1%	62.2%
Province 1	21	422	444	246	508	10	764
	1.7%	35%	36.7%	20.4%	42.1%	0.8%	63.3%

Source: (CBS, 2019)

► Figure 1. Nepal and Province 1: Formal and informal employment, 2018



Source: CBS 2019

More than 84% of Nepalese workers in Province 1 and Nepal, as a whole, were in precarious employment in 2018. It would seem that there was not much difference in the employment status of refugees and the more significant majority of Nepalese workers. Nepalese citizens, however, have better access to employment opportunities than refugees due to legal constraints faced by the latter. The new Labour Act 2074, enacted in 2018, retains previous limits on hiring foreign labour. Companies can employ non-Nepalese workers only if no Nepalese are available to fill the vacancy.

Based on interviews conducted, refugees who opted for wage employment worked in the construction sector and a few on the farms. Refugees also hired daily workers to help on their farms. Among refugees, the general preference was to work in the construction industry as these

offered higher wages than the agriculture sector. Construction companies though prefer migrant workers from India as they were thought to be more skilled than Nepalese and refugee workers. Farms are generally unable to provide competitive wages due to low productivity.

Among South Asia countries, Nepal has the lowest value-added per worker in agriculture, industry, and services. Low productivity does not only translate to low wages but also erodes the price competitiveness of Nepali crops and products, both in the domestic and international markets. In most sectors, Nepal's exports are curbed by high costs. Low productivity partly explains the high prices of local vegetables compared to those from India. Among the seven provinces in Nepal, Province 1 had the third lowest gross value added per worker.

▶ 4. Profile of target groups

4.1 Age and gender

The refugees in the settlements in Province 1 are composed of first-generation and second-generation refugees. Children comprise 29% of refugees, while 60 years old and above make up 13%. The remaining 59% are between the ages of 18 to 59. (Table 3)

4.2 Relationship with host community

A more significant majority of the respondent refugees were fairly satisfied with their relationship with the host community members. The “fairly satisfied” rating was influenced by the following: (i) economic competition over scarce resources (e.g., firewood) between host and refugee communities in the past; (ii) “last in line” experiences when accessing public services (e.g., healthcare services) outside of the camp; (iii) discrepancy in

wages received or offered especially among better educated Bhutanese refugees; and (iv) failed projects with host community members due to lack of clarity of roles and sharing of benefits. Vulnerable members of the host communities also felt some resentment toward the support received by refugees, especially during the very early years of the refugee settlements.

Refugees who gave a “satisfied” rating were primarily those who have established business relationships with members of the host community. Some examples of business relationships mentioned were the following: (i) vegetable vendor from the host community allowing a refugee to share her stall; (ii) traders picking up crops at the camp and providing advice on seeds and inputs; (iii) communal farms with host community members initiated by Lutheran World Federation (LWF); and (iv) refugees buying vegetables, pork, and poultry from wholesalers for selling inside the camp. Economic interaction between the refugee and host communities helped increase trust over time.

▶ Table 3. Age and gender of Bhutanese refugees in Nepal, 2020

Age group	Number of refugees			% share
	Male	Female	Total	
0 - 4	150	146	296	5%
5-11	384	378	762	12%
12-17	420	338	758	12%
18-24	337	343	680	11%
25-49	1,177	1,073	2,250	35%
50-59	455	349	804	13%
60+	485	330	815	13%
Total	3,408	2,957	6,365	100%
	54%	46%	100%	

Source: (UNHCR, 2020)

4.3 Economic activities

Subsistence farming was the most dominant livelihood activity, with the majority (93%) of the refugee respondents. Most of them planted

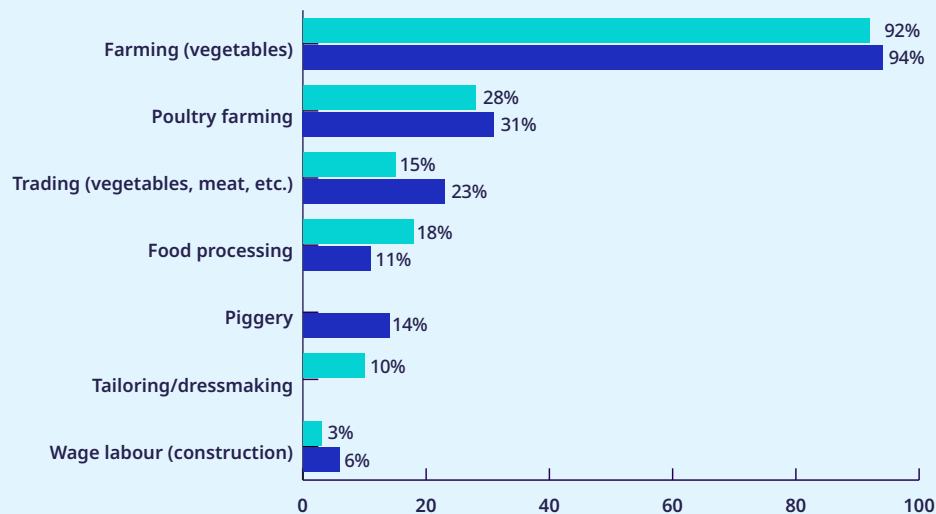
vegetables. The other economic activities were poultry farming, trading of agricultural produce and meat, food processing, and piggery. Most farming activities were carried out in small plots near their homes or on communal farms

► Figure 2. Degree of satisfaction: Relationship with host community members



Source: CBS 2019

► Figure 3. Key economic activities of refugees



Source: CBS 2019

► Figure 4. Examples of collective livelihood initiatives of refugees



Piggery jointly owned by refugees and host community members.



lastic tunnels for off-season vegetable production; sold within and outside the refugee settlement. Most of the plots are small.

operated by both refugees and host community members.

The host community also had a similar range of livelihood activities. With the development of road networks especially in Jhapa, more than 50% of the harvests are sold at the Birtamod agriculture market and passed on to intermediaries selling to other provinces and the Indian markets.

The very few respondents who were engaged in wage labour worked in the construction sector. Both women and men refugees, however, prefer to own businesses or self-employment rather than wage employment.

Table 4 outlines the factors that hinder refugees from accessing wage employment. The top

constraints identified were: (i) no information on opportunities; (ii) does not know whom to approach; (iii) limited skills; and (iv) legal barriers.

Except for legal barriers to employment, the host community share the same problems. In Nepal, there is a general lack of a system to disseminate information on job opportunities. Likewise, vocational education and skills training are, in many cases, not aligned to labour market needs. There are emerging brick and mortar as well as mobile employment shops that provide skills training and job placement in other Provinces, which may be encouraged to set up branches or franchises in Province 1. The government has also mandated enterprises to advertise their job vacancies. However, refugees still cannot take advantage of these opportunities until they are legally allowed to work.

The factors that hinder refugees from setting up and/or scaling up enterprises are outlined in Table 5. The key constraints identified were the following: (i) lack of capital; (ii) does not know of opportunities; (iii) limited market; (iv) lack of skills; and (v) legal barriers. The host community members also face similar constraints. These will be elaborated on under the market systems analysis section.

4.4 Horizontal relationship

About 60% to 70% of refugees and host community residents were members of membership organizations. Based on the field interviews, a greater percentage of refugees than local villagers were members of collective organizations. The LWF and other development organizations have also initiated collective organizations comprised of refugee and host communities.

► **Table 4. Factors that hinder access of refugees to wage employment**

Factors that hinder access to wage employment	Female	Male	Total
Does not know of opportunities	92%	77%	85%
Does not know whom to approach	82%	74%	78%
Limited skills	72%	74%	73%
Legal barriers (the law does not allow refugees to work)	67%	80%	73%
Discrimination	38%	49%	43%
Has another source of income (e.g., remittance)	13%	20%	16%
Unacceptance by the host community	5%	9%	7%

Source: AIMS Survey 2021

► **Table 5. Factors that hinder setting up or scaling up of enterprises among refugees**

Factors that hinder setting up or scaling up of enterprises	Female	Male	Total
Lack of capital	95%	94%	95%
Does not know of opportunities	74%	86%	80%
Limited market	72%	77%	74%
Lack of skills	62%	71%	66%
Legal barriers	54%	74%	64%
Discrimination	10%	43%	26%
Has another source of income (e.g., remittance)	10%	11%	11%
Unacceptance by the host community		9%	4%

Source: AIMS Survey 2021

► Figure 5. Refugees and membership in collective organizations



Source: AIMS Survey 2021

Essential services provided by the refugee self-help groups were savings and credit. Men were more likely to be members of a group than women. Similarly, men availed more of the savings and credit services than women. In most cases, the self-help groups did not necessarily serve as a platform for growing and managing livelihoods/enterprises. The self-help groups, though, facilitated access to training and some services that enabled refugees to start an income-generating activity.

Collective groups of host community members also provide savings and credit services to members as well as training and market information. The more mature organisations have expanded into common service facilities for postharvest activities and marketing. These organisations have established linkages with intermediaries. Collective units composed of refugees and host community members are engaged in vegetable farming and pig farming on leased land outside the refugee camp. Members generally attend individually to the plot or pigs allocated to them. Each member also sells their harvest. While some degree of economy of scale is enjoyed by

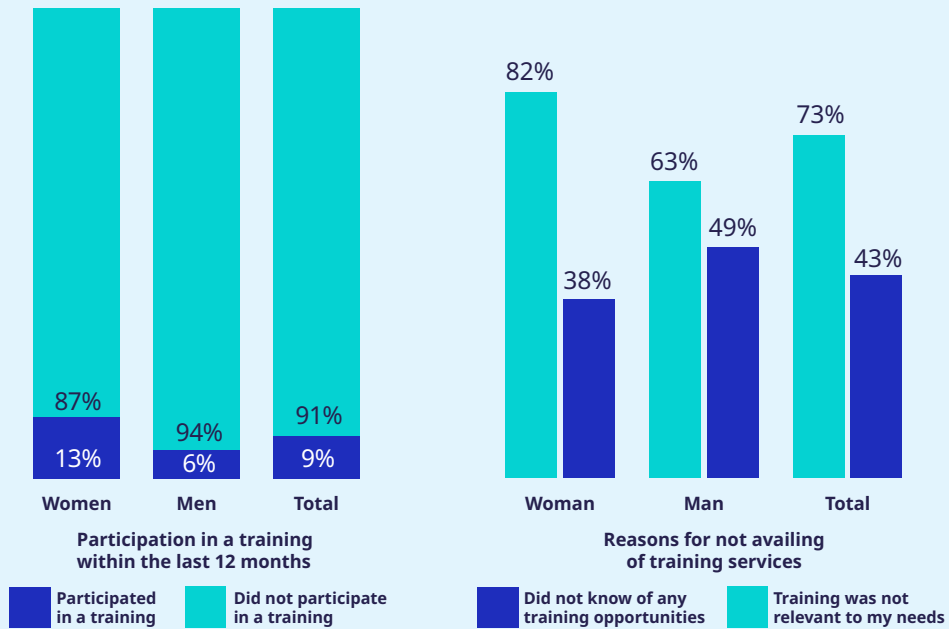
members, the groups are generally not able to fully exploit their collective bargaining power, especially in terms of accessing inputs, veterinary services, and marketing.

5.5 Acquisition and use of support services

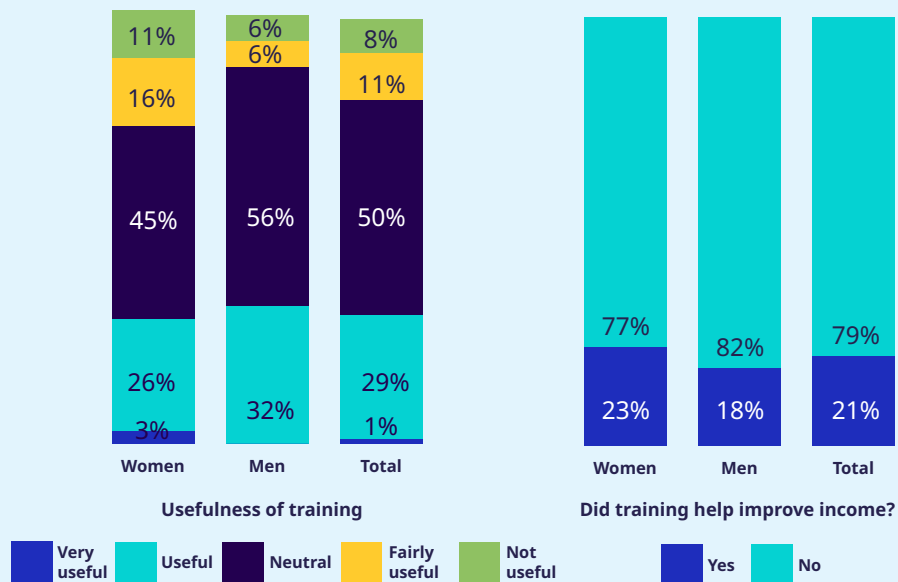
This subsection presents the results of the survey conducted in November 2021 on the availability and accessibility of refugees to support services. The survey had 74 respondents and, of which, 53% were female.

- Only 9% of the respondents attended training during the past 12 months. There were more women than men who participated in the training. Some respondents though indicated that they have participated in a training a few years ago. The training services were funded and provided by non-government organizations. It seems that the local capacity within the settlements to organize and provide training has not been tapped and developed. (Figure 6)

► Figure 6. Training participation among refugees during the past 12 months



► Figure 7. Usefulness of training



The top reasons for non-participation in training were: (i) refugees did not know about training opportunities, and (b) training was not relevant

to their needs. Training topics included financial literacy, entrepreneurship skills, and basic skills for employment or starting a business. The lack

of interest to attend training may not necessarily be due to the fact that the topics were not relevant to their needs, but rather due to the preconceived lack of the means to pursue opportunities and apply learnings.

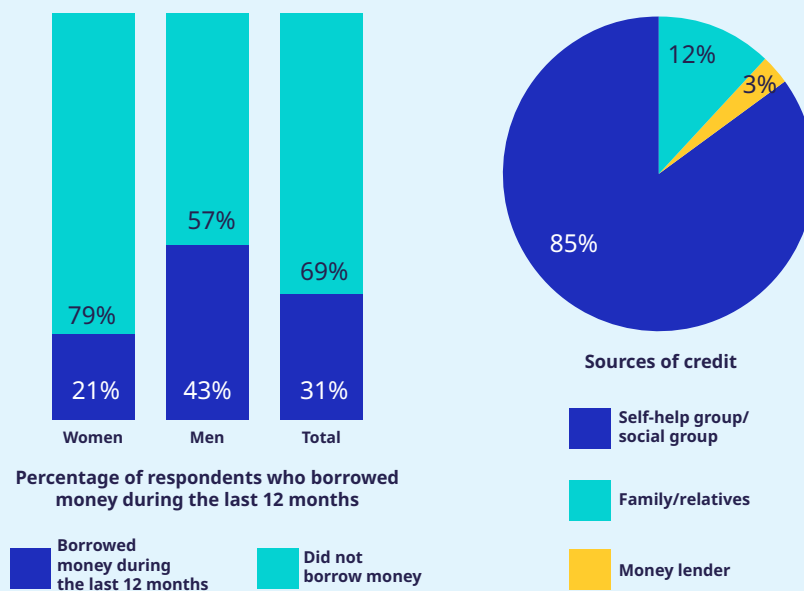
- b) Majority of the respondents rated the training to be neither useful nor not useful. This may be because benefits were not readily visible or based on the perception of respondents that training did not improve their income generation capacity. (Figure 7)
- c) About 89% of the respondents had bank accounts, which were opened using the government-issued refugee identification card.
- d) Only 31% of the respondents borrowed money during the past 12 months. The main providers of loans were the self-help groups, which had more men members than women.

It also followed that there were more men than women who availed of a loan. (Figure 8)

The loans were used mainly to pursue a job opportunity or start a business. When respondents were asked how they would use future loans, the majority responded that they would use them to start a business rather than looking for wage employment.

- e) Despite the presence of self-help groups and private banks willing to lend to refugees, a greater percentage of the respondents indicated that they found it difficult to access loans. Difficulties in accessing loans stemmed mainly from not knowing providers, which can be an indication of a lack of access to information. The other factor mentioned by respondents was the lack of collateral. Generally, banks in Nepal only extend credit on collateral of land and buildings with a preference for immovable assets.

► Figure 8. Percentage of respondents who borrowed money during the last 12 months



▶ 5. Sector selection

5.1 Selection process and criteria

To minimise subjectivity in the selection of subsectors for intervention, the following steps were undertaken:

- ▶ *Step 1.* Identification of potential subsectors through a desk review of the industry and economic profile and statistics of Province 1.
- ▶ *Step 2.* Shortlisting of subsectors was primarily informed by the socio-economic assessment of target groups. Priority was given to value chains in which a more significant majority of the refugee and host communities are embedded. The shortlisted subsectors were vegetables, poultry, piggery, and construction.
- ▶ *Step 3.* Profiling of shortlisted subsectors based on the following selection criteria: (i) potential for growth and employment creation; (ii) relevance to the target groups; and (iii) feasibility of interventions.
- ▶ *Step 4.* Ranking and prioritisation of subsectors. The summary of scores is presented below.

▶ **Table 6. Subsector selection criteria and summary of scores**

Selection Sub-Criteria	Weight	Weighted Score			
		Vegetables	Poultry	Piggery	Construction
Potential for growth and employment creation		4.65	3.65	2.00	3.00
Scale and size of industry	30%	1.50	1.20	0.60	0.90
Prospects for market growth	35%	1.75	1.40	0.70	1.05
Prospects for employment growth and promoting decent work	35%	1.40	1.05	0.70	1.05
Relevance to the target groups		5.00	4.00	3.00	2.00
Current participation in the value chain	30%	1.50	1.20	0.90	0.60
Potential to engage target groups in the VC	35%	1.75	1.40	1.05	0.70
Alignment of opportunities with preference and skills of target groups	35%	1.75	1.40	1.05	0.70
Feasibility of intervention		4.75	4.25	3.95	2.25
Synergy with upcoming and ongoing programs	20%	1.00	0.80	0.80	0.40
Feasibility of addressing pressing challenges to gainful inclusion	30%	1.50	1.20	0.90	0.60
Presence of incentives among market actors to invest in upgrading and inclusion	25%	1.00	1.00	1.00	0.75
Interest of providers and government to invest in upgrading and inclusion	25%	1.25	1.25	1.25	0.50
TOTAL SCORE		14.40	11.90	8.95	7.25

5.2 Overview of shortlisted subsectors

5.2.1 Vegetables

The fresh vegetable subsector contributed 11.92% to the agricultural GDP and 4.79% to the national GDP in 2019/20 (MOALD, 2021). Province 1 was the second largest producer of vegetables and had the second highest yield among the seven provinces, with more than 600,000 households engaged in vegetable cultivation. Research showed a strong relevance to the target groups, with 93% of the 74 refugee respondents indicating that their main income-generating activity was vegetable farming. Households, and women in particular, are attracted to the cultivation of vegetables due to its short production cycle and immediate earning potential, even from small plots of land. Farmers with no land can enter the sector using leased land.

In addition to the existing prevalence, a myriad of opportunities also exists within the sector that generate high potential and feasibility for productive interventions. In general, Nepal is a net vegetable importer despite the increase in production. This represents a possibility for import substitution and greater commercialisation of smallholder vegetable farms. Additionally, many vegetables have short seasons, providing for quick returns on investments and continuous income opportunities. Since the income of intermediaries is dependent on high and constant volume of vegetables, they would most likely be open to supporting initiatives to expand the supply base. Robust growth of the vegetable subsector would also be aligned to the interests of seed companies.

Given the relevance and opportunities for growth, research found strong interest among the target group for pursuing the sector. Indeed, about 54% of the 74 refugee respondents selected vegetable farming as the most viable livelihood. Overall, the sector has numerous stages where the poor can engage, with increases in vegetable production also generating more job opportunities in collection, transportation, post-harvest handling, and small-scale processing. Moreover, it is ideal for poverty reduction since it is well suited to small land areas, intensively uses labour, and requires lower capital than other crops and livestock raising.

5.2.2 Poultry

The poultry subsector contributed 1.55% to the national agricultural GDP in 2019/20 (MOALD, 2021). Province 1 was the third-largest chicken meat producer, after Bagmati (54%) and Lumbini (13%). In 2019/20, Province 1 produced 29,994 MT of chicken meat, or 12% of the national production (MOALD, 2021). Although Nepal has achieved self-sufficiency in poultry products this year, demand is forecasted to grow. From only 5% of national meat consumption in the 1980s, poultry meat now contributes over 46% of the total annual meat consumption (Kumar, 2021).

Many households in Province 1 keep a small poultry flock. About a third of the 74 refugee respondents surveyed currently raise chicken as a livelihood activity, with most engaged in an informal contract growing arrangement with a buyer (e.g., trader, integrated poultry enterprise, etc.). Host community members were also active participants in both the chicken egg and meat value chains. For refugees and host community members alike, additional decent work opportunities may also be generated in the slaughter and distribution nodes of the value chain or in the introduction of organic chicken farming. Both refugees and host community poultry farmers also signified interest in a collective trading enterprise.

The sector is well suited for the target group because poultry reproduction cycles are short and support income and consumption smoothing at the household level. Growth and expansion of poultry farmers also provides the bases for the expansion of larger enterprises in the value chain, including Integrated poultry companies and poultry suppliers. As a result, these actors can also play a key leadership role in potential interventions and in establishing sourcing relationships and providing financing.

5.2.3 Piggery

The piggery subsector accounted for 0.31% of the national agricultural GDP in 2019/20 (MOALD, 2021). Province 1 was the top producer of pork in Nepal. In 2019/20, it accounted for 47% of national production. The province also has a high population of pig farming ethnic communities. In terms of growth potential, pork is increasing in popularity,

especially in Pokhara and other urban areas. Nepal is also aiming to export pork to neighbouring countries.

Similar to the poultry sector, job opportunities at the primary production level are generally in the form of self-employment given the limited number of commercial and intensive farms. The sector also offers potential opportunities in the slaughter, processing, and marketing nodes. However, although demand growth indicates strong market opportunities, pig farming requires higher capital than poultry and is therefore currently less accessed by the target groups compared to the other selected sectors. In the survey conducted by the research team, only 7% of the 74 respondents already raised pigs as a livelihood activity. Integrating larger numbers of refugees and host community members will thus hold higher resource requirements. Potential solutions to this could involve the strong change drivers already existing within the sector, for instance among breeder farms and feed mills.

Additional benefits of the sector that are applicable to the target groups include the fact that pig raising can be used as an integral part of diversified and livestock farming strategy to reduce the risk of climate change impact. They can be sold at any time, meaning they can be used to meet emergency or unforeseen household expenses.

5.2.4 Construction

As of 2018, there were 278 construction companies in Province 1 (CBS, 2019), with construction contributing 9% to the GDP of Province 1 in 2020 (MoF, 2020). Before the COVID-19 crisis, the annual growth rate of the construction sector was around 9%. Since the government is the biggest client of construction companies, growth is dependent on government budget and development programs to a significant extent. Travel and other pandemic-related restrictions also caused a labour crunch in the Nepalese construction industry, which relies heavily on migrant labour from India. However, this is expected to ease as the rate of vaccination increases in both Nepal and India. This will facilitate progress on previously stalled construction projects.

Between 2008 and 2018, the construction sector had the highest increase in wage jobs at 642,981.

However, the sector is also characterized by high levels of informal and temporary jobs. In fact, 98% of workers are reported to be under informal employment conditions (CBS, 2019). The target groups are no exception, with essentially all participating in the construction sector as temporary workers. About 4% of refugee survey respondents indicated that they intermittently worked as temporary construction workers. Participation of target groups in the construction sector will most likely be confined as temporary workers due to legal restrictions. Although temporary workers in the construction sector receive higher pay than similar workers in the other sectors, it may be more difficult for refugees to enter the construction sector on a sustainable basis given the preference for Indian workers and the Labour Act, which gives priority to Nepalese citizens for job vacancies. In light of this hindered feasibility and potential for growth among the targeted refugee populations, the construction sector was not selected for further analysis.

5.3 Synergies between vegetables, pig, and poultry subsectors

- a) The three products are cultivated mainly by smallholders, who face a common constraint in accessing financial services. Interventions in the financial services market will therefore benefit all three subsectors. The subsectors are also accorded priority in the government's Monetary Policy 2020-21, which directs formal financial institutions to invest at least 15% of total credit in the agriculture sector by July 2023 and 15 per cent in MSMEs.
- b) While all the subsectors are vulnerable to climate change impact and some susceptibility to price volatility, the risk profiles are, to some extent, different. If the programme takes a portfolio approach, the realization of a specific risk in one chain does not undermine overall progress of the activity. At the household level, support to a variety of value chains can encourage diverse livelihoods that spread risk, maximize the sustainable use of land and labour resources, and allow for greater income smoothing.

- c) The three subsectors are mutually beneficial to each other. Vegetable crop residues/rejects can be used as animal feed, while animal manure can be utilized to enhance soil fertility and carbon sequestration that can enhance agricultural productivity. Although at the present, there is little appetite among target groups to engage in feed production, vegetables and spices constitute major raw materials for concoction of feeds for organic poultry and pig farming. Fostering horizontal collaboration between vegetable farmers and poultry/pig raisers and/or promotion of diversified farming system can enhance soil biological activity and nutrient recycling, improve profits, increase crop yields, intensify land use, prevent soil erosion, reduce poverty and malnutrition, and strengthen environmental sustainability.

▶ 6. Market systems analysis: vegetables

6.1 Value chain description

6.1.1 Value chain map

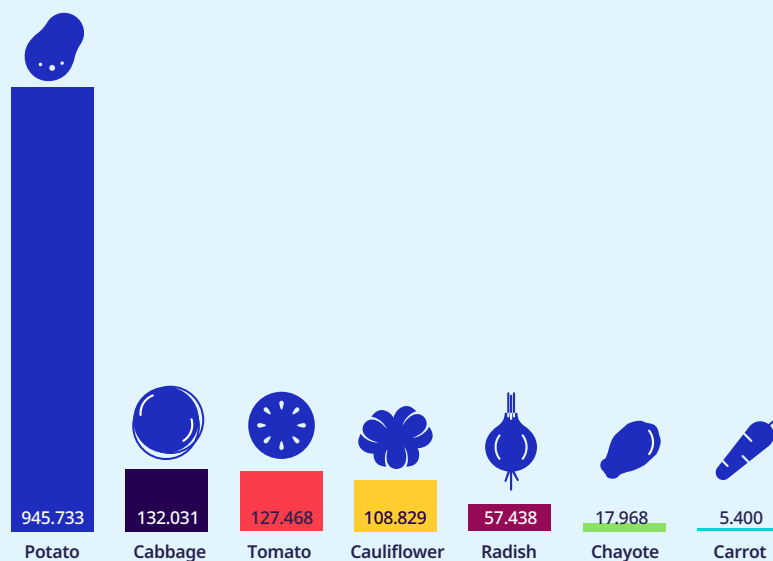
About 60% of the annual vegetable supply in Nepal is produced locally with smallholders as the main suppliers. The remaining 40% are sourced through importation from India and China, with the former accounting for over 50% of the supply. Among the major products imported are potatoes, tomatoes, cauliflower, and cabbage, which are also the main crops grown in Province 1. Nepal exports off-season vegetables, with a greater percentage exported through informal channels.

Nepal's demand for vegetables is increasing due to population growth, economic progress, and increased spending power from income growth and migrant remittances. Per capita vegetable consumption in Nepal is at par with developed economies such as the United States (US) and Europe. Per capita vegetable consumption of

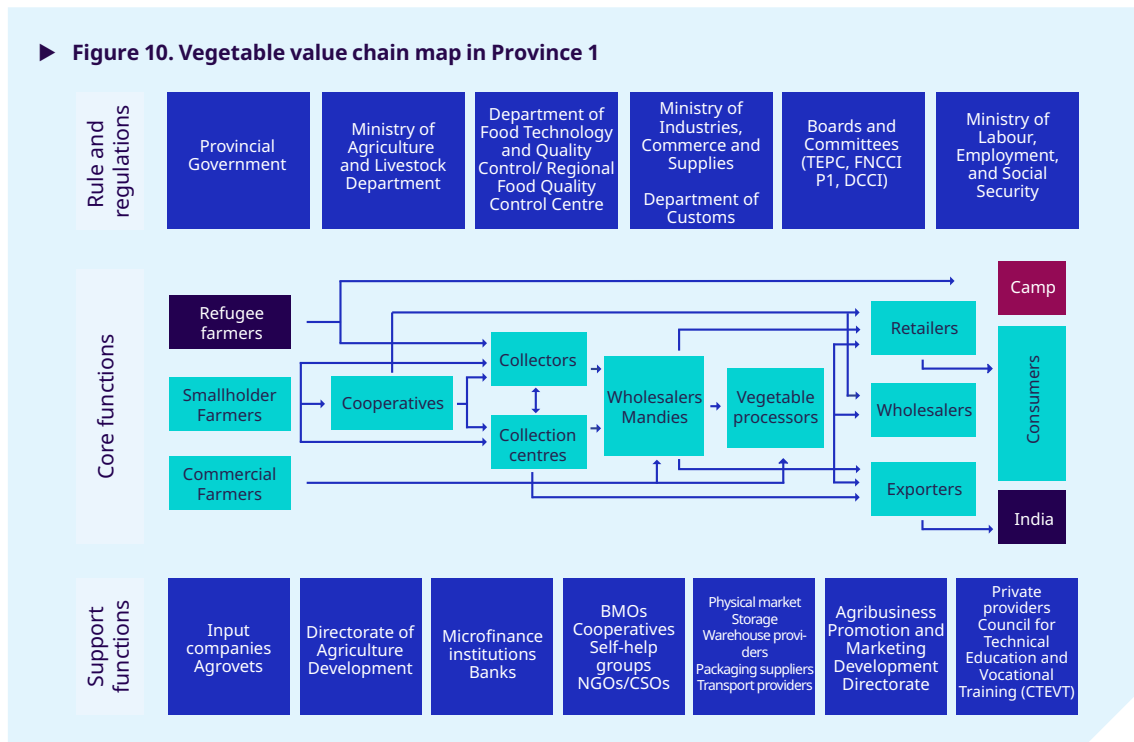
Nepal in 2013, for instance, was 114 kilograms (kg) compared to Europe at 115 kg and the US at 114 kg (Siddiq, 2019).

Vegetables flow through a number of intermediaries before reaching consumers resulting to high cost of goods. In Province 1, majority of the host community smallholder farmers sell their harvest to the collectors who pick up the vegetables and bring them to the wholesale market centres. Farmers may also opt to sell to collection centres, which are usually owned and managed by cooperatives. There are about five collection centres in Jhapa and seven in Morang. The farmers may also bring their products directly to vendors in retail markets. They may also sell to consumers through the Haat bazaars, sidewalk stalls, or door-to-door marketing. As of 2017, there were 117 Haat bazaars in Jhapa and 91 in Morang (BPRC, 2017). Main factor considered by farmers in choosing whom to sell is the transportation cost and the projected net income.

▶ Figure 9. Production volume (in MT) of top vegetables grown in Province 1, 2019/20



► Figure 10. Vegetable value chain map in Province 1



Medium and large farmers generally sell directly to wholesalers and medium/large scale vegetable processors. Supermarkets are catered by wholesalers and vegetable processors (processed vegetable products; packed fresh vegetable products). Province 1 has five wholesale markets: (i) Dharan Krishi Upaj Bazar Sthal – Sunsari; (ii) Gudri Market - Biratnagar; (iii) Krishi Upaj Thok Bazar – Birtamod Jhapa; (iv) Vegetable Wholesale Market Damak – Jhapa; (v) Wholesale Market Charali – Jhapa. Collectors and collection centres also deliver to exporters catering to the markets in Siliguri, India. In Province 1, most of the vegetables exported are produced in Koshi and Mechi hill area corridor.

Similar to the host community smallholders, refugees generally opt for the shortest distance from their homes when selling vegetables to protect margins given that they produce only small quantities of vegetables. Refugees sell either directly to their peers at the refugee settlements or through collectors who pick up the produce at their homes. The refugees generally do not engage in collective marketing even those involved in the communal farm.

Once the vegetables reach the wholesale markets, these are bought by processors, exporters,

wholesalers, and retailers. Prices across the chains are influenced by wholesalers depending on the domestic market demand and export/import opportunities. The wholesalers who are, oftentimes, also the exporters and importers send out the buying prices to their networks. The intermediaries also more or less agree on their buying and selling prices for the day.

None of the market actors interviewed had supply agreements or contracts. As far as the key informants interviewed during the field work, contract farming is not implemented in the vegetable sector although there is often some commitment to buy based on prevailing market price at the time of the pick-up from the farm. The dominance of spot transactions limits the flow of information, inputs, and credit.

The vegetable market is highly price sensitive. A greater majority of the Nepali consumers prefer to buy Indian vegetables on the basis of price rather than quality. Although Nepali vegetables are said to be tastier and of better quality than Indian vegetables, the former are comparatively more expensive than vegetables from India as Indian farmers benefit from subsidies and also have the advantage of higher yield and better infrastructure,

thereby reducing production costs (Siddiq, 2019). Indian traders also provide credit of 6–12 months, which makes them an attractive proposition for wholesalers. For Nepali vegetables, payments across the different functions of the chain are usually made one week to a month after delivery. There are some wholesalers who pay collection centres upon delivery. The preference for vegetables from India remains strong mainly because of the comparative cost benefits for both buyers and traders.

6.1.2 Key market actors

Farmers

Among smallholder farmers, size of land planted to vegetables range from 0.2 to 0.5 hectares. The

size of vegetable plots of refugees ranged from 50 to 2500 square metres. In a communal farm (leasehold farming) established with the support of LWF, each of the 20 members (10 refugees; 10 host community) is allocated 200 square metres. The potential of leasehold farming to provide an opportunity for improving livelihoods of landless families (e.g., refugees) can be further strengthened through promotion of commercial farming, land intensification, and efficient marketing.

Vegetable farming is largely seasonal. The vegetables grown by farmers depend on the topography, altitude, temperature and rainfall of the area. Majority of the refugees are able to grow vegetables for a period of 4 to 7 months in a year. Host community farmers, on the other hand, cultivate vegetables for 7 to 9 months in a year. There are a few who are able to extend their growing period by practicing multiple cropping and greenhouse/

► **Figure 11. Vegetable production system**



Tunnel production

- Year-round
- Higher price for off-season vegetables
- Higher investment than open field; only one group of refugees engaged in tunnel cultivation

Host community farmers: Open field - able to grow vegetables for 7 to 9 months/year

A tomato farm operated by a refugee family/refugees.
Each refugee has 3 to 4 katha each.
One hectare = 30 katha



A vegetable plot operated by a refugee family/refugees

Refugees grow vegetables for 4 to 7 months per year



tunnel production. Greenhouse technology, especially the plastic tunnel, is becoming more popular among commercial farmers to tap into the off-season market. A group of refugees supported by JICA has ventured into tunnel production which enabled them to supply off-season vegetables, which are sold both in the domestic market and India.

Seeds or seedlings are purchased from agrovets and nurseries. In the case of crops such as potatoes, refugees and host community farmers use tubers from previous harvests. Most use composted manure. For fertilizer, refugee farmers source from agrovets, while most host community farmers make their own fertilizer. Refugee farmers can potentially make their own compost fertilizer if they have reliable access to manure. Interest in the production of organic fertilizer seems to be lukewarm based on field interviews. However, refugee farmers indicated that affordability and inconsistent quality of fertilizer constrain their vegetable production.

Collectors

The collectors pick up the produce directly from the farms of both refugees and host community members. They do not make any distinction between refugees and host community farmers, as their most important considerations are volume and reliability of supply. Some collectors give a small price premium to high volume suppliers. The collectors prioritize pick up of vegetables in areas where there is a high supply of vegetables to maximize vehicle load capacity. In the case of potatoes, collectors provide poly sacks to the farmers. Vegetables of poor quality are either rejected outright or purchased at discounted prices. Quality is assessed visually based on local standards dividing them by either very poor quality or good. The collectors do not sort or grade the vegetables.

Generally, collectors do not take any risk of loss due to price fluctuation because they only make their purchase in the village after knowing the wholesale market price. Based on prices set by wholesalers, the collectors in the same village come into an agreement on the farm gate price for the day. Farmers merely accept the price. The unpredictability of prices contributes to farmers' hesitancy to invest in improved technologies.

Collectors suffer losses when farmers deliberately cheat them by putting good quality products at the top and the lower quality and rejects at the bottom. They also suffer postharvest losses due to poor packaging especially the use of big baskets, which do not provide adequate protection to the vegetables. To the extent possible, the collectors deliver the vegetables to their buyers at the soonest time possible to avoid spoilage.

Collection centres

Collection centres are generally owned and managed by cooperatives, and many have been established with the support of government and development programs. The collection centres are usually located near the vegetable farmers, allowing most farmers to deliver the vegetables themselves. Depending on the financial capacity of the centre, farmers may be paid upfront or a few days after the centre receives the payment from the buyers.

The centre delivers produce to the wholesale market, corporate houses, and retailers. Some collection centres also have their own retail outlets. In some collection centres, there is a semblance of sorting and grading especially for those supplying to corporate houses (exporters). The more progressive collection centres provide training and advisory services to their members. They may also be involved in the production and distribution of inputs.

Wholesalers/Exporters/Importers

The wholesalers generally control the trade of the vegetables in Nepal. In many cases, they are also the exporters and importers. Wholesalers do not have written contracts or agreements with suppliers and buyers. They have, however, developed long-term relationships with many of their suppliers and large buyers.

Wholesalers seldom store vegetables for more than two days. Vegetables are sorted mainly based on origin (i.e., Nepal, India, or district popular for a particular variety) and size. Buyers at wholesale markets are also not allowed to sort and grade while purchasing. As per a report from the CASA Nepal project, buyers often have to dispose at

least 20% of the total volume procured due to damages and bad quality (CASA Nepal, 2020).

Wholesale markets also do not provide premium for organically produced vegetables due to the following: (i) they do not specifically cater to specialty/niche markets; (ii) it is difficult to distinguish between organically produced vegetables and conventional products and to inform consumers of the production method used given the lack of certification; and (iii) the organic market is still very small to warrant investment for separate storage and handling to preserve product integrity.

Processors

The processors in Province 1 are mostly small and medium enterprises except for Rijal Tashi Industries Limited and the Golyan Group. The SMEs primarily produce pickles, potato chips, and packaged fruits and vegetables. Rijal Tashi Industries is the manufacturer of Druk products, which is a Bhutanese brand. Main products are processed tomato and other vegetable products and fruit juice. One of the businesses under the Golyan Group is engaged in the production and distribution of organic vegetables. The vegetables are sorted, graded, packaged, and sold under the brand name "Mato."

The table below shows the distribution of processors based on list from the Regional Food Technology and Quality Control (RFTQC). There may be more home-based processors in Province 1 that are not in the RFTQC database. Small scale processors tend to have seasonal operation and operate informally (not registered). Operations of home-based processors are not generally aligned with Good Manufacturing Practices (GMP).

The processors use imported and locally produced vegetables. Domestic supply of vegetables especially potato and tomato are not sufficient to meet the requirements of processors particularly the medium and large-scale companies. Key problems faced by processors include the following (SAHA, 2020): (i) domestic production, which is marked by seasonality, is not sufficient to sustain year-round operations; (ii) inconsistent quality of vegetables; (iii) varieties grown by majority of the farmers are not suitable for processing (e.g., potatoes); and (iv) wide price fluctuation.

The operation of artisanal processors is dictated by harvest season of their raw materials. In most cases, they sell their products within the district. They are also not able to sell to supermarkets due to difficulties in complying with food safety standards and coping with payment terms. Small and medium scale processors sell their products to

► Figure 12. Large vegetable processors in Province 1



► Table 7. Breakdown of processors in Province 1

Product	No. of processing units	Location/concentration area	Scale of operation
Pickle Processing	25	Sunsari, Morang, Jhapa, Ilam	Small, medium, and large
Potato processing	4	Jhapa, Morang, Sunsari	Small and medium.
Tomato processing	1	Sunsari	Large
Fresh fruits and vegetables packaging	11	Jhapa, Morang	Large and medium

Source: RFTQC; (SAHA), 2020)

wholesalers and supermarkets in major cities like Biratnagar, Damak, Dharan, and Itahari. Large processors sell their products nationwide.

There are also a few home-based processors among the refugees. The products are sold in their shops inside the camp. Small quantities are also sent to family members and relatives for retail selling within their network.

Retailers

A few refugees have set up vegetable retail stalls inside the refugee settlements. They get their

stocks from their own farms, refugee farms, and local wholesalers. Some refugees also sell in the local market and Haat Bazaar. In the local retail market, the refugee shares a stall with a host community vendor.

The Haat Bazaar is an open-air market, which operates on specific days of the week. Unlike the retail market which has stalls, most of the bazaars operate in open field with no permanent shed. Majority of the bazaars lack drinking water and lavatory facilities. The haat bazaars are the main distribution outlets of vegetables. Some districts do not yet have a permanent retail market. The sellers in the bazaars consist of both vendors and

► Figure 13. Vegetable retail outlets



farmers. Oftentimes, the vendors are the first customers of the farmers. Other retail distribution channels in Province 1 are the online sellers and supermarkets. The vegetables sold in these channels are of better quality. In the retail market, vegetables are generally sorted and graded.

6.1.3 Distribution of costs and profit in the chain

Production and marketing costs comprised about 53% of the retail price of tomatoes. Farming accounted for 49% of the costs while distribution expenses made up the remaining 51%. Transportation accounted for the largest share in the distribution costs. Logistics in the chains are weak creating high access-to-market costs and increased levels of post-harvest losses. The changes in the value of the tomatoes as they move away from production along the marketing channel to the consumers is the increased utility by making the goods available rather than adding value in terms of increased shelf life and food safety.

Profit comprised about 47% of the retail price. About 30% of the profit generated from primary production to final sale accrued to the farmer.

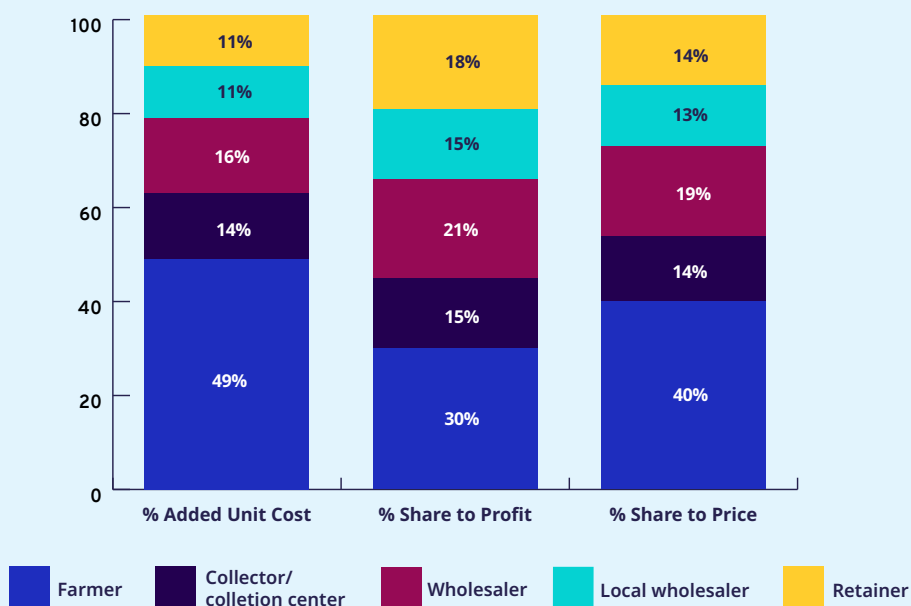
The remaining 70% of the profit is shared by the different intermediaries with the regional wholesaler getting the highest share. The relatively high profit margin is a risk mitigating measure given that tomatoes are highly perishable commodities and the existing lack of adequate system to reduce postharvest losses. The relatively high number of intermediaries from the farm to end market contributed to high cost of goods as well as thinning out of profit margin of each of the market actors.

In the potato value chain, profit comprised 54% of the retail price while cost accounted for 46%. Percentage share of farmers to total profit was about 30%, which is similar to tomatoes. Distribution expenses were also higher than farming costs. (Figure 15)

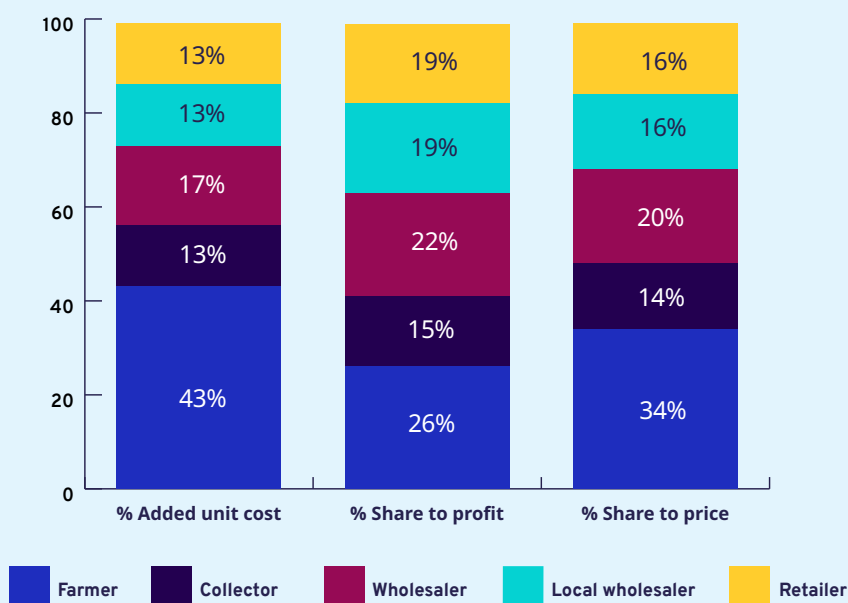
Vegetables from India were about NPR 10 to 15 cheaper than Nepali produce. During the last week of December, Indian red potatoes were sold at NPR 22 at the Kalimati wholesale market while Nepali red potatoes were priced at NPR 32 per kilogram.

Farmers generally do not have a problem in finding a buyer for their vegetables. The key challenge

► Figure 14. Distribution of costs and profit in the tomato value chain



► Figure 15. Distribution of costs and profit in the potato value chain



they face is improving the income they earn from their vegetable plots.

6.2 Rules and regulations

6.2.1 Economic participation of refugees

- a) Nepal is not a party to the 1951 Convention Relating to the Status of Refugees (hereafter, Refugee Convention) and its 1967 additional Protocol. In addition, Nepal is not a state party to the 1954 Convention Relating to the Status of Stateless Persons and the 1961 Convention on the Reduction of Statelessness. However, Nepal has acceded to a number of other international human rights instruments and has been hosting large groups of refugees for over 65 years.

Refugees have access to the following (UNHCR, 2020):

- Refugees have access to public health services, including COVID-19 testing and treatment equal to nationals.

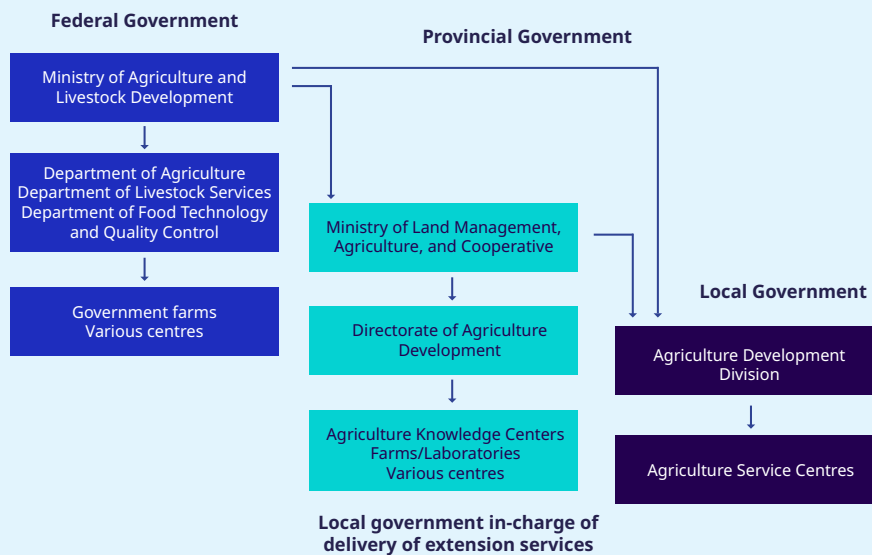
- Bhutanese refugees have access to the National Health Insurance Scheme (NHIS) which started to be rolled out so far only in Province.

- Refugee children have access to public schools in practice. UNHCR funded the construction and handed over two additional public school buildings in Province 1 to strengthen access to public schooling for both, Bhutanese refugee children and local host community children.

- Refugees with identification cards are allowed to open a bank account.

According to press releases, the Ministry of Home Affairs has sent a proposal to the Cabinet regarding the resumption of the distribution of identification cards to Bhutanese refugees. It is said that this the identification cards will ensure the rights of the refugees to work and own business so that they can self-sustain while they are in Nepal (Giri, 2021). However, the inclusion of Tibetan refugees in the distribution of the cards is doubtful.

► **Figure 16. Structure and linkage of the three tiers of government in the agriculture sector**



Adapted from: Dahal, et al. 2020

- b) The Labour Act 2074 does not also allow non-Nepalese citizens to be engaged in work that was disallowed in the previous Act. A local entity can only hire a foreign national if a Nepalese citizen is not available for any technical post despite multiple advertisements on national public newspapers and journals. If foreign nationals do obtain work in Nepal, they need to request a work permit as per section 22 and 23 of the Labour Act 2074. Currently, the Government of Nepal does not provide work permits to refugees.
- c) While foreign investors are allowed to formally open a business in Nepal and get a Permanent Account Number (PAN), refugees are yet not legally allowed to own a business including getting a stall on their own in public markets and Haat Bazaar.
- d) The Cooperative Act of 2017, which consolidated all prevailing laws on cooperatives in different sectors, explicitly states that members should be Nepali citizens. The following are the key highlights of the 2017 Act (ICA-AP, 2019):
- Promotes one member one vote principle.
 - Allows for the formation of various secondary level cooperatives.
 - A minimum of 15 and maximum of 100 Nepali citizens can form a cooperative.
 - 33% representation of women in the board of cooperatives.
 - Establishes a Cooperative Promotion Fund for infrastructure development, training and education, marketing, and monitoring cooperatives.
 - Provision for a Stabilisation Fund by saving and credit cooperatives to protect themselves from operational losses.
 - At least 25 cooperatives may form a specialized cooperative association, register it and carry out large-scale, capital-intensive projects.
 - Establishes a compulsory Patronage Refund to return benefits to its members based on the annual volume of transactions between the cooperative and the members.

- ▶ Defines roles and responsibilities of the National Cooperative Federation of Nepal.

6.2.2 Enterprise and agriculture sector policies

- a) Enterprise registration can be done at various government institutions such as, Company Registrar, Municipalities, Ward (local government) and Department of Cottage and Small Industries (DCSI). To encourage women to register the enterprises under their name, the government provides subsidies for the registration fee for the female entrepreneurs. The government has also introduced the online business reintroduction at the Office of Company Registration (OCR) to fast track the process.

Some of the basic requirements to register a business are the following: (i) application form for enterprise registration; (ii) enterprise project plan; (iii) entrepreneur's citizenship photocopy and stamp of NPR 10, which refugees do not have; (iv) land ownership certificate with recent receipt of land tax and minimum 6 years contract if leased or rented, which can be challenging even for host community members as lease contract is usually only for three years; and (v) recommendation from local government.

- b) The agriculture sector is under the concurrent responsibility of all three levels of government (federal, provincial, and local). The Ministry of Agriculture and Livestock Department (MoALD) has the overall responsibility for the growth and development of agriculture and livestock sector. It has three major departments: (i) Department of Food Technology and Quality Control (DFTQC); (ii) Department of Agriculture; and (iii) Department of Livestock Services.

The whole bureaucracy is still in the phase of evolution and characterized by ambiguity in the division of responsibilities within and across the different bodies. There is also a lack of coordination among the bodies resulting to weak implementation of policies. The new structure is top-heavy, while agricultural units at local government level are often short of staff (IFAD, 2021).

The Agricultural Development Strategy (ADS), which was approved in 2015, is a national sectoral strategy of Nepal for the period 2015-2035. The overall objective of the ADS includes five dimensions of increased food and nutrition security, poverty reduction, competitiveness, higher and more equitable income of rural households, and strengthened farmers' rights. Vegetables (ranked 3rd) was among the top 15 value chains prioritized in the ADS. With the support of the European Union, MoALD is strengthening the capacity of the provincial Ministry of Land Management, Agriculture, and Cooperatives to implement the ADS under the federal structure.

- c) The Department of Food Technology and Quality Control (DoFTQC) conducts sampling of food products sold in the domestic market. Nepal's Food Act stipulates a penalty of NPR 50,000 or a jail term of five years or both for firms for those found to be guilty of selling substandard food. Implementation of the Food Act, however, has generally been weak, which not only poses health hazards to consumers but also disincentivizes upgrading in food supply chains. Likewise, there is a lack of awareness among enterprises on the Food Act.

One of the main thrusts of the government during this year is to enhance the capacity of the monitoring agencies especially the National Food and Feed Reference Laboratory to maintain the hygiene and quality of food items. A mobile service will be launched in major agricultural wholesale and Haat Bazaar to test pesticide residues (MOF, 2021).

- d) The following are some of the key directions of the government for 2021/22 (MOF, 2021) that can potentially provide opportunities and pathways for the gainful inclusion of refugees in close partnership with host community members:

Crosscutting: vegetables, poultry, and piggery

- ▶ At least fifty branches of Bhumi Bank will be established in each province with co-financing of the Government of Nepal and local level. Arrangements will be made to provide unutilized private, government, public and reclaimed land on lease to

individuals, groups or organizations for commercial farming and processing of agricultural products.

- ▶ Concessional loan to cooperatives to enable them to engage in storage, processing, packaging and marketing of local products.
- ▶ Assistance to cooperatives to establish agricultural market centres in partnership with the local government.
- ▶ Subsidy through cooperatives for the purchase of seed, machinery and equipment required for cultivation of food crops, legumes, vegetables, and cash crops.
- ▶ Technical assistance and grants based on return to enhance capacity of cooperatives that expand employment opportunities.
- ▶ Regular information through mobile applications to the farmers regarding the availability of seed and fertilizer, market prices of agricultural produce and weather condition.

Vegetables

- ▶ Subsidy of up to 50% of cost of seeds to farmers who plant improved seeds purchased from the licensed sellers.
 - ▶ Development of hybrid varieties of food crops, vegetables and fruits through Nepal Agriculture Research Council.
 - ▶ Set up a chemical fertilizer factory within three years and increase of subsidy chemical fertilizers to NPR 12 billion.
 - ▶ Up to 50% capital grant to the private sector for the establishment of organic pesticide factory.
 - ▶ Expansion of irrigation coverage.
- e) Other enables in the agriculture sector are the following:
-
- ▶ Ministry of Industries, Commerce and Supplies (MoICS): The key functions of the ministry is the creation of conducive

atmosphere for industrial development and investment promotion. It is also responsible for the regulation and facilitation of internal, bilateral, and regional trade.

- ▶ Federation of Nepalese Chamber of Commerce and Industry, Province 1 (FNCCI P1): The federation is a representative body of business organizations. It represents the interests of the private sector and is involved in promotion of socio-economic development through private sector led economic growth. It provides advisory services to government and assist in the formulation and implementation of business and industry related policies.

6.3 Support functions

Input supply

Vegetable seeds

There are two types of vegetable seeds marketed in Nepal, namely:

- a) Domestically produced seeds, which are mainly open pollinated varieties. These are produced by seed companies, farmer groups, and cooperatives. Onion, radish, bean, cowpea, cauliflower, green cress, mustard, pea, and hybrid Nepalese tomato varieties are the major vegetable seeds produced domestically. Vegetable seeds are sold by agrovets in small manually packed bags (often without names of producers), in pre-packed aluminium bags of about 20 to 50 grams (with company names and other information) or loose in larger bags from which the desired amount gets weighed off.

Formal seed companies and local seed traders outsource seed production to smallholders and farmer groups/cooperatives. Contract farming is already quite established in the seed sector, reducing risks for both the company and farmers. The contractual agreements are done at least two years in advance for source seed and at least one year for commercial seed. Foundation seeds are usually provided

► Figure 17. Truthfully labelled vegetable seeds



by the seed company as this is one of the important ways to guarantee quality seed production. Seed production requires technical skills and, as such, formal seed companies provide training and regular monitoring. Access to water is also important in seed production. Economy of scale is important for domestically produced seeds to be competitive with imported seeds. Individual production in smaller quantity and across scattered plots involves high costs of transportation and quality monitoring.

After a new variety is developed and registered with the Seed Quality Control Center (SQCC), it can be released to the market and seeds of the variety can be produced on a larger scale. Seeds produced in Nepal are only “Truthfully Labelled” where the quality is declared by concerned trader/seed company and are not certified. This required labelling though is not properly enforced. A key complaint received by agrovets is the low germination rate of seeds, which affects their credibility among their customers.

b) Imported seeds consisting mainly of hybrid varieties from more than 30 international seed companies. Importers may also be the formal seed companies in the country. The seeds are

marketed through the same channels at the domestic seeds.

Seed Entrepreneurs’ Association of Nepal (SEAN) is the lead organization among the seed entrepreneurs of Nepal. Many of SEAN members are involved in wholesaling and retailing of vegetable seeds in Nepal. Many of the members are also seed importers.

The table below lists some of the major multinational and national vegetable seed suppliers and the range of activities undertaken in Nepal.

SEAN Seed Service Centre Ltd. (SSSC), which was established in 1999, is among the pioneers in seed production. It has its headquarters in Kathmandu. Although farmers are generally not brand conscious, SEAN has a high brand visibility especially among commercial farmers. The company is both a producer of seeds and an importer. Seed production is outsourced to smallholders, who are trained by the company.

Lal Teer Seed provides extension services to both its contract growers (seed production) and farmer-customers. It has 40 technical staff devoted to delivery of extension services. The company has its headquarters in Bangladesh. Previously known as East-West Seed Bangladesh, it was established

► Table 8. Vegetable seed companies with operations in Nepal

Vegetable seed company	Activity in Nepal					
	Breeding location	Testing location	Seed production	Processing location	Sales	Extension services
Bejo Seeds Inc.					●	
Charoen Pokphand					●	
East-West Seed		●			●	
Enza Zaden					●	
Kalash Seeds		●			●	
Known-You Seed					●	
Lal Teer Seed	●	●	●	●	●	●
Nongwoo Bio		●			●	
Rijk Zwaan					●	
Annapurna Seeds			●		●	
National Seed Company	●		●		●	
Unique Seed	●		●		●	
Anamolbiu	●	●	●	●	●	●
SEAN Seed Centre	●	●	●	●	●	●

Source: (Access to Seeds Index, 2019); AIMS field work

in 1995 as a joint venture between Multimode Group and East-West Seed. The company is still part of the agriculture business of Multimode Group alongside North South Seed, Chens Crop-Science and Tinpata Quality Seeds.

Anamolbiu, on the other hand, provides training and extension services primarily to its contract growers, with some of them located in Jhapa. It has a cluster office in Surunga, Jhapa. One of the shareholders of the company with about 49% share is the Local Initiatives for Biodiversity, Research and Development (LI-BIRD), a Nepalese

non-government organization who is also active in implementation of development programs (Lang, 2015). Other shareholders are private persons and enterprises consisting of: LI-BIRD staff, agrovets shops, community-based seed producer groups (CBSP), and general members.

The company has a license to produce its own breeder seed. Some of the breeder and foundation seeds are provided by NARC. The company produces open pollinated varieties of vegetables and the F1 tomato seed of the variety Srijana, a Nepalese hybrid variety. Seed processing,

transport, and marketing are carried out by Anamolbiu. Seeds are sold by agrovets, which are also provided with information materials. The seed multiplication is performed by contract growers (individual farmers, farmer groups, and cooperatives) under a contract farming agreement, under two schemes (Lang, 2015):

- ▶ Provision of foundation seeds (e.g., 100 kg), which are then deducted from the improved seeds produced. For example, if a farmer produces 1000 kg from the 100 kg provided, he will be paid only for the 900 kg. This enables farmers with insufficient resources to get engaged in seed production.
- ▶ Provision of seed on a subsidized rate. Supposed the market price for foundation seed is 100 NPR per 1 kg, the farmer will receive 1 kg for 50 NPR. Seeds produced are sold back to Anamolbiu although there are farmers who do not stick to the agreement.

The farmers get paid the latest 14 days after delivering their produce. They receive a fixed price which has been agreed on upfront in a written contract. Anamolbiu is among the very few companies with written agreement as most transactions in the vegetable subsector is carried out through verbal agreements.

Although refugees interviewed during the field work were generally not very enthusiastic on seed production, vegetable seed contract farming can be a potential opportunity.

Fertilizer

The state-owned Krishi Samagri Company Ltd. (KSCL)/Agriculture Inputs Company Limited (AICL) and the Salt Trading Corporation (STCL) are the main importers of chemical fertilizer distributed to farmers at subsidized prices plus actual transportation costs from point of entry to distribution point. Farmers can avail of subsidized fertilizers for up to 0.75 ha and 4 ha in the hills and terai for three crops a year (KSCL, 2021). The fertilizers can be bought from cooperatives and the KSCL/STCL field offices. There are 644 cooperatives in Province 1 that have dealership agreement with KSCL. Government provides NPR 250 commission

to the cooperatives per tonne of all fertilizer products sold.

On the average, KSCL and STCL import about 350,000 to 370,000 MT of fertilizer per year. Annual chemical fertilizer requirement is estimated to be within 600,000 MT to 1.1 million MT (Prasain, Chemical fertiliser shortage is a perennial problem. It stems from multiple factors, 2021). A report from the USAID indicated that nearly 70% of the 600,000 to 800,000 tonnes of fertilisers consumed in Nepal is improperly imported. Price of smuggled fertilizer is higher than those imported by the government. The price of urea, for example, can reach as high as NPR 50/kg in the black market vis-à-vis the normal price of NPR 15/kg.

The Ministry of Agricultural Development (MoAD) promotes the establishment of organic fertilizer production plant by providing 50 per cent subsidy for entrepreneurs. Province 1 has two government supported production plants, namely: (i) Janakpur Fertilizers Industries; and (ii) Annapura Agriculture Fertilizer Industry. The two plants are located in Morang and each has an annual production capacity of 10,000 MT

To promote the use of organic fertilizer from government subsidized plant, MoAD provides NPR 10 per kg or 50 per cent of the sales price whichever is less, as subsidy on purchase of organic fertilizers. Despite the subsidy, uptake has generally been low due to the following (Amgai, Paudel, Bista, & Poudel, 2017): (i) bulky nature of organic fertilizers and difficulty in transportation; (ii) lack of quality assurance of the organic fertilizers; and (iii) farmers are producing organic fertilizer locally for their own use.

Pesticides

Nepal imports more than 635,000 MT of pesticides annually from India, China and other countries. There are about 3,034 pesticide trade names and 169 pesticides registered in Nepal, along with 11,777 retailers dealing in pesticides (Prasain, 2019). The government does not provide any subsidy in pesticides. Farmers buy the pesticides from the agrovets.

The vegetable subsector is the top user of pesticides. Fungicide was used in highest amount followed by insecticides and herbicides. Amount of bio-pesticide

or botanical pesticide used in the country is very low as compared to synthetic pesticides.

6.3.2 Acquisition and use of support services among vegetable farmers

- a) All of the farmers interviewed indicated that they have attended several trainings on vegetable farming. Most popular training topics were on fertilizer, pesticides, and pest and disease management. Only half of the host community farmers and 10% of the refugee farmers have attended training on postharvest practices. Only 20% of host community farmers have attended training of marketing and none among refugees.

Training topics were generally determined by organizers with some consultation from the farmers. Among refugees, the main provider was LWF. A few of the refugees were able to attend a training provided by Mansarobar Agriculture Cooperative, which has its farm and office near the refugee camp. Host community farmers took the training from a wider range of providers including from government

extension offices with Mansarobar as the key provider.

The majority of the refugee farmers found the training useful. A greater majority of the host community farmers rated the training they have attended to be very useful. However, based on yield losses and farm productivity challenges faced by farmers, knowledge on good agronomic and postharvest practices require improvement and upgrading.

- b) All host community farmers interviewed have acquired business development services (BDS) other than training. On the other hand, only 80% of the refugee farmers have availed of BDS. The range of BDS received by refugees was narrower than those accessed by host community. Refugees received the BDS from LWF and a few from vegetable traders/collectors. Among host community farmers, the same set of providers and traders provided the BDS.

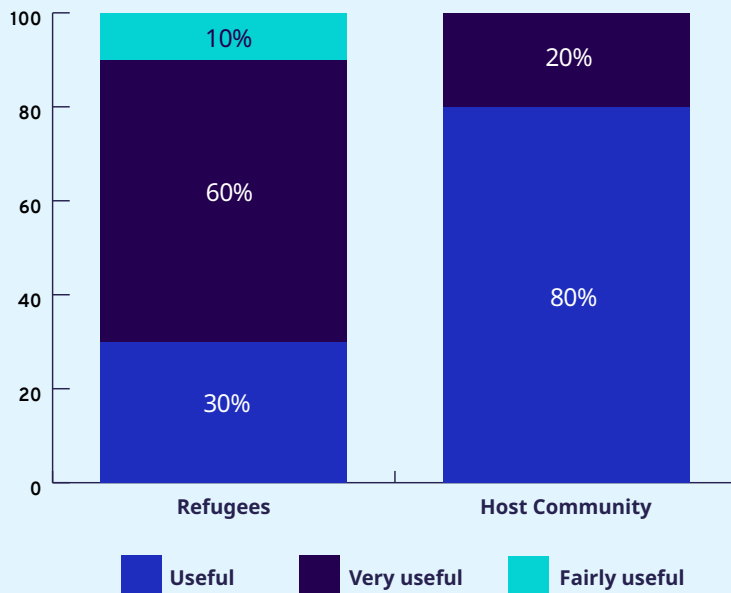
About 80% of the refugee farmers interviewed indicated that they were satisfied with the services. Among host community farmers, 70% were very satisfied with the services.

► **Table 9. Training specific to vegetable cultivation received by refugees and host community farmers**

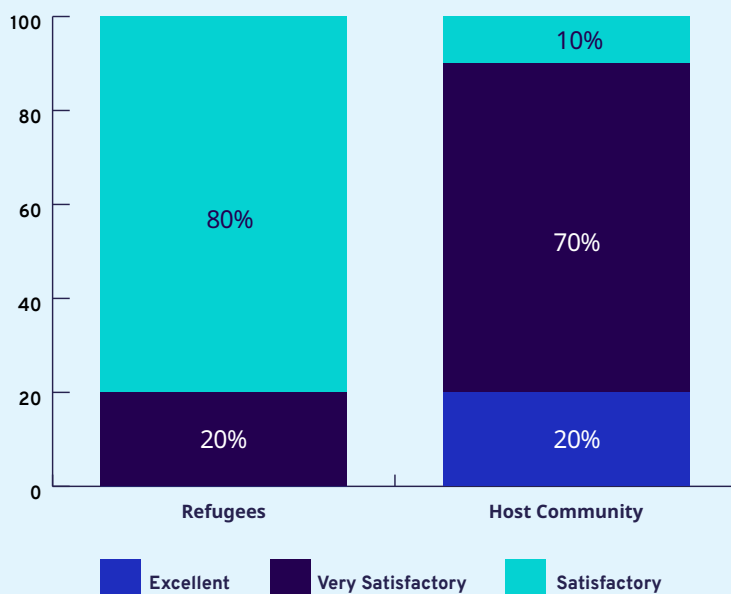
Training topic	Number of farmers who have participated	
	Refugees	Host Community
Fertilizer application and management	80%	100%
Pesticide application and management	90%	100%
Pest and disease management	70%	100%
Good postharvest practices	10%	50%
Good vegetable farming practices	50%	60%
Vegetable marketing		20%
Farm management	30%	70%
Providers	<ul style="list-style-type: none"> ► LWF ► Mansarobar Aamchok Damak 	<ul style="list-style-type: none"> ► Mansarobar ► AKC ► Vegetable Zonal Programme ► Agriculture officer ► LWF

Source: AIMS field interview 2021

► Figure 18. Usefulness of various training specific to vegetable farming



► Figure 19. Satisfaction rating of BDS received among vegetable farmers



c) Based on their self-rating of their skills on the various aspects of vegetable farming, refugee farmers would most likely need support services to improve marketing and financial management practices. Host community farmers,

on the other hand, felt that they need to improve on their postharvest practices.

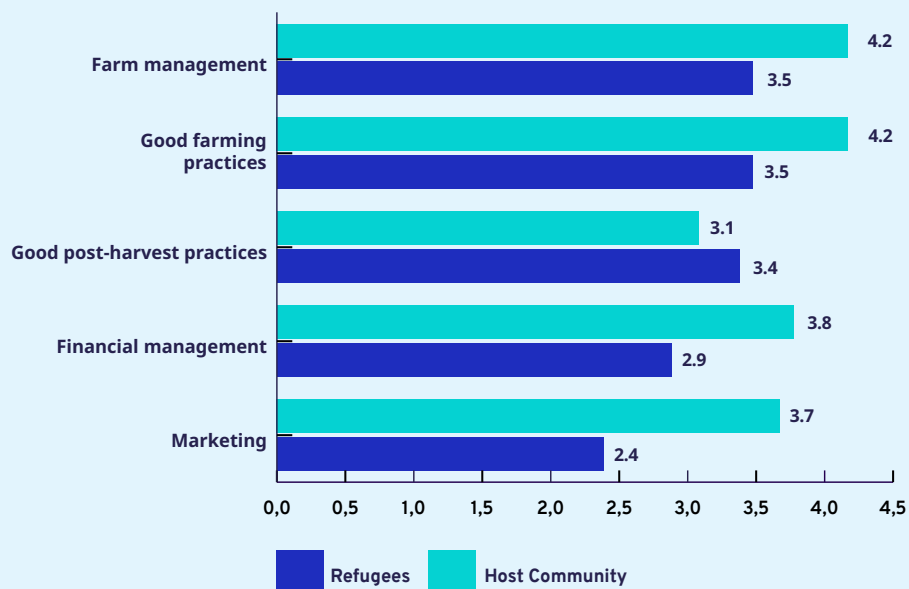
Refugee and host community farmers may need some exposure to good practices to give them a

► Table 10. BDS received by refugee and host community vegetable farmers

Business Development Services (BDS)	Number of farmers who acquired BDS	
	Refugees	Host Community
Market linkage		60%
Market information		70%
Business advisory	70%	40%
Technical advice/information	10%	20%
Business planning		10%
None	20%	
Providers	<ul style="list-style-type: none"> ► LWF ► Traders 	<ul style="list-style-type: none"> ► Mansarobar ► Traders ► AKC ► Agriculture Officer ► LWF

Source: AIMS field interview 2021

► Figure 20. Self-assessment of skills and competencies on various aspects of vegetable farming business



better idea on areas for upgrading. Benchmarking

may also trigger increased interest to use support services and invest in upgrading.

- d) All the farmers interviewed had no crop insurance. Crop insurance is a major component of risk management that farmers could use together with climate information to reduce vulnerability to climate change related impacts.
- e) Majority of the host community farms used their own money to start their vegetable farms. A few of the farmers indicated that they borrowed from the bank. The money was used to buy inputs. The greater majority said that it was difficult to borrow from the bank due to collateral requirements.
- f) Refugee farmers used their own money to start their vegetable plots. Some received support from development programs/non-government organizations (NGOs). Very few farmers borrowed money from self-help groups to buy inputs.

6.3.3 Public sector extension and support services

The table below outlines the responsibilities of the three government tiers in the agriculture sector in the delivery of support services (other than inputs and financial related services), as per the constitutional provisions.

Estimate of farmers reached by extension and other support services range from 15% to 25%. The 2015 constitution devolved frontline agricultural support services to local governments with the Agriculture Service Centres (ASCs) and the Livestock Service and Sub-service Centres (LSSCs) as the primary extension arms. The ASCs and LSSCs generally lack the human resources and expertise. The ratio per ASC and LSSC is 1:11396 farmers and 1:4312 farmers, respectively (Thapa, et al., 2020). There is also a need to increase the number of female extension personnel given the increasing numbers of women engaged in agriculture. Advisory and training services also tend to be generic with little consideration on agro-ecological factors (e.g., hills, terai, etc.).

To date, the Agriculture Knowledge Centres (AKCs), which are under the provincial Directorate of Agriculture Development (DOAD), appear to be better equipped to provide extension services. In Province 1, extension services are provided

through eleven AKCs, three Agriculture Contact Centres, the Agribusiness Promotion Support and Training Centre and eight different farm centres and laboratories. There appears to be little coordination between the ASCs and the AKCs.

Research and/or resource centres located in the different districts are supervised by the Nepal Agriculture Research Council (NARC), which is under the federal government. The AKCs and local governments are assigned to share NARC's findings to farmers, or orient and train them on new tools and technology. Engagement of the local government with NARC and AKC in research and necessary support to farmers is critical but appears to be missing in the current institutional arrangement (ADB 2019).

All districts in Province 1 have haat bazaars. Nine districts have public retail markets while only three districts have public wholesale markets. Market management committee and the local government are responsible for managing the market centres. Many of the markets require upgrading to be compliant to food safety standards, reduce postharvest losses, and promote occupational safety and health among vendors and workers. (Table 11)

6.3.4 Private sector service providers (other than financial institutions)

- a) Agrovets are wholesalers and/or retailers selling farm inputs and tools directly to farmers. The basic requirements to operate as an agrovet are: (i) seed and pesticide retailing certificates, which are issued after administration of tests; (ii) a month-long certification course for veterinary sales and support; and (iii) registration as a business entity with the Department of Cottage and Small Industries.

Agrovets have expanded their roles beyond "selling" as a means of retaining customer loyalty as well as expanding their income streams. In the case of vegetable seeds, for example, agrovets carry out a combination of any of the following activities: (i) distribution of seeds – purchase seeds from seed producers and sell to farmers; (ii) act as seed company – buy seeds directly from seed growers, package them, and sell to farmers; (iii) collection of seeds from

► **Table 11. Responsibilities of the three tiers of government in the delivery of support services**

National	Provincial	Local
Agriculture extension		
	Agriculture extension, farmers training, and capacity building and empowerment	Management, implementation, and control of agriculture extension
Agribusiness		
Agri-industrialization, inter-provincial development, promotion, and coordination	Agriculture industrialization, business development and promotion	High-value agriculture products promotion, development, and commercialization
Agriculture infrastructure and markets		
	Development, promotion, and operation of agriculture markets, infrastructure, and agriculture farm centres	Operation, monitoring, and regulation of agriculture and Haat bazar, infrastructure, small irrigation, training, technology extension and/or support, agri-inputs supply, farmers' capacity development
Agriculture mechanization		
	Agriculture mechanization, and improved tools development and promotion	
Diseases and epidemic control		
Pest and diseases monitoring; outbreaks control	Crop diseases, insects and epidemic control Disease diagnosis laboratory management and regulation	Agriculture-related natural disaster and disease outbreak control
Farming Modality		
	Implementation and promotion of collective farming, cooperative farming, and contract farming	
Foreign trade, treaties and agreements, and statistics		
Foreign trade facilitation Agriculture statistic system, research and data source protection, development and promotion National and international treaties, agreements, conventions communication and coordination	Agriculture and food technology-related study, research and development and promotion, specialized services, data system management and dissemination	Local-level statistics management and information system

Source: (ADB, 2019)

► **Figure 21. Mansarobar Agriculture Cooperative in Damak-3, Jhapa**



► Mansarobar Agriculture Cooperative

- Damak 3, Jhapa
- Established 8 years ago
- 500 members
- Own 11-hectare farm ; integrated crops and livestock farming
- Open to working with refugees

Services

- Collection centre
- Savings and credit
- Rental of tools and equipment

Training on: integrated pest management, vegetable production, good agricultural practices, organic farming, etc

growers in behalf of domestic seed companies; (iv) directly import seeds and sell it themselves or distribute to other agrovets; and (v) provide advice from seed selection to harvesting.

In some parts of Nepal, agrovets serve as branchless banking agents of Laxmi Bank. Agrovets are the more accessible sources of credit, albeit these are offered in-kind (inputs). Some agrovets also offer in-kind (input) credit to regular customers. Others provide inputs on credit under a buy back scheme.

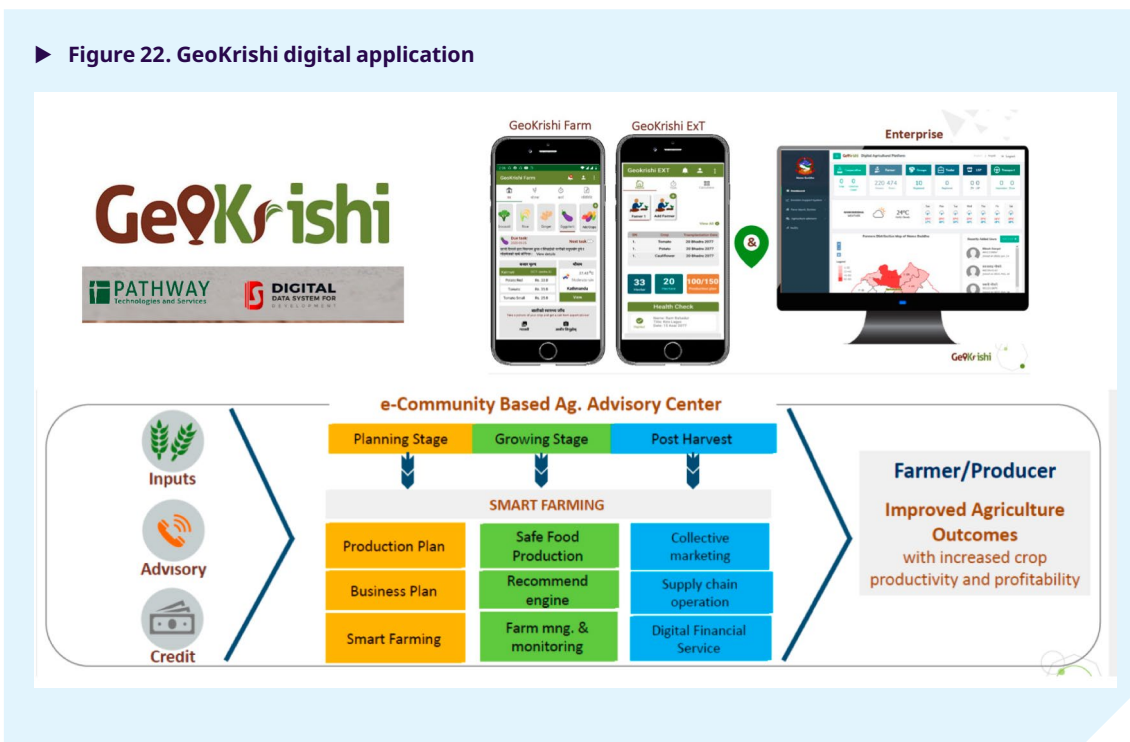
The importance of agrovets lies not only in their service of facilitating access to inputs but also being source of technical information and advice. The quality of the agrovet advice depends on factors such as education and technical training, farming background, and familiarity with product line. Agrovets receive information from their formal suppliers but there is no program that enables them to regularly upgrade and update their knowledge.

- b) The Agro-Enterprise Centre (AEC), which is the agribusiness arm of FNCCI, provides the following services: (i) business counselling; (ii) business registration and licensing facilitation;

(iii) legal counselling; and (iv) agribusiness incubation service.

- c) Farmer groups and cooperatives are widely-used models across Nepal. Majority of the cooperatives/farmer groups in Province 1 are engaged primarily in savings and credit services. There are a few who have established collection centres with the support of government and/or development programs. The collection centres are engaged in the consolidation and marketing of fresh produce from members and non-members. In most cases, cooperatives with collection centres also provide training services and sell inputs.
- d) Digital agricultural platforms such as the Smart Krishi, IBA Krishi, Krishi Guru, Hamro Krishi, NARC Krishi, Krishi Kapurkots, and GeoKrishi. The GeoKrishi (location specific agriculture) was established in 2017 by Pathway Technologies and Services Pvt. Ltd. (Pathway) and Digital Data Systems for Development (DDSD). It is an award winner of the US. Data-Driven Farming Prize. GeoKrishi applies a data driven system approach to translate knowledge into actionable, timely and context-specific advisories, covering all stages of the crop value chain. Each

► Figure 22. GeoKrishi digital application



farm registered in the GeoKrishi platform is geotagged, enabling location-specific, precise, and customized recommendations for individual farms based on their micro-properties (World Bank, 2020). Farmers have access to a suite of tools covering priority crops, including a planning tool, farm management solutions, advisory services, market access, climate services, credit access, notifications, and alerts. To date, the app does not cover livestock.

A critical part of the scalable digital and data platform of GeoKrishi is the e-Chautaries, which are community-based, trained, advisory hub, equipped with internet connectivity, that provide bundled solutions and services to farmers. The e-Chautaries are housed in municipality and ward offices, cooperatives, and farmer-based organisations allowing an easy access to timely and contextualized information and knowledge products. The LWF Nepal is working with GeoKrishi in promoting the use of the app among host community and refugee farmers.

The business sustainability of GeoKrishi is anchored on the following (Pathway, 2020):

- Platform as a service: a digital farm management and advisory system to coordinate with hundreds of farmers.
 - B2B: matching farmers with input and output suppliers, agreed commission on sales.
 - Franchisees/commission-based/subscription: subscription based mobile advisory at minimal cost, percentage of which is given as an incentive to the local service providers for every farmer they register and retain. It can also be percentage of shared service charges (e.g., in built with bank loan borrower).
 - There are only a few businesses engaged primarily in the delivery of BDS to farmers. Most of them are based in Kathmandu. The table below lists down some of the BDS providers who can potentially cater to enterprises in Province 1.
- e) Vegetable collectors/traders provide refugee and host community farmers with market information and technical advice. The quality of information shared by traders depends on

► Table 12. BDS providers that can potentially provide services to enterprises in Province 1

Company	Services
Gaun Ghar Krishi Farm Nuwakot District Bagmati Province	Training and technology transfer: vegetable farming, pig farming, poultry farming Business counselling Marketing/linkage with input and output markets Cost-benefit analysis
Himalayan Center for Agriculture and Agroforestry Promotion Pvt Ltd Kathmandu	Promotions and marketing services
Grow Nepal Social Enterprise Kathmandu	Business planning Financial planning and management Strategic planning Operations management

depth of relationship, experience of traders both in farming and trading, and the network from which he/she derives information.

6.3.5 Financial services landscape

Financial inclusion is one of the key objectives of the Nepal Rastra Bank (NRB). To promote financial inclusion, NRB has implemented various policy measures, ranging from providing incentives to commercial banks to set-up branches in underserved areas and initiatives to increase financial literacy. As of mid-April 2021, there were 897 branches of regulated Banks and Financial Institutions (BFIs) comprising Commercial Banks, Development Banks and Finance Companies in Province 1 (NRB, 2021). Branches per 100,000 population was at 18.24. There were also 681 branches of microfinance institutions (MFIs) as of mid-June 2020.

Total number of accounts per 1000 population in Province 1 was at 807 (NRB, 2021). About 31.63% of those with accounts used mobile banking services. Male population held higher number of accounts relative to female population. The same pattern was observed among refugees although variance between women and men refugees was lower compared to host community residents. About 91% of men refugees had bank accounts compared to 87% of women respondents.

Farmers have weak access to formal financing institutions. Among vegetable growers, main sources of credit are self-help groups and cooperatives. Below is an overview of the key features of loan products from cooperatives/self-help groups, MFIs, and banks. The clients of banks and finance companies are mostly corporates and individuals in urban areas. Most bank loans to the agriculture sector have been for medium to large scale enterprises. Banks are reluctant to extend financial services to rural enterprises because of higher risks and costs associated with small loans in rural areas. Further constraints include (ADB, 2019): (i) banks' limited rural branch network and outreach; (ii) banks' limited knowledge and risk assessment capacity in rural enterprise financing, and (iii) rural enterprises' difficulty in securing valid loan collateral. The banks only extend credit on collateral of land and buildings with a preference for immovable assets. Many of the farmers do not have or have insufficient immovable collateral. Furthermore, many farmers are reluctant to seek formal sector credit because they consider the process complicated and overly bureaucratic.

Borrowers of MFIs, cooperatives, and self-help groups are low-income individuals. While cooperatives and self-help groups are the most accessible providers of loan services, loanable amounts are small and waiting time for turn to get a loan can be long. MFIs have higher interest rates than cooperatives and loan tenure is usually short.

► **Table 13. Bank accounts per 1000 population by gender in Province 1**

	Women	Men
Number of accounts held	1,460,139	2,505,373
Accounts per 1000 population	561	1,070

Source: (NRB, 2021)

► **Table 14. Overview of loan products of cooperatives, MFIs, and banks**

	Cooperatives/ Self-help groups	MFIs	Banks
Loanable amount	Max NPR 50,000 (though often lower)	Max 700,000 NRB allows MFIs to provide loans above NRs700,000 and up to NRs1 million for microenterprises with collateral.	Depends on purpose --- can be up to NPR 100 million
Interest rate	15% - 18%	18% - 24%	Base rate + 2% premium Base interest rate as of December 2021: 7.12% (ADBL)
Collateral requirement	None	None	Land and other immovable assets

Source: (ILO, 2019)AIMS Field Interview 2021

Awareness of the crop insurance program of the government is generally low. During the fiscal year 2020/21, only 179,216 farmers had agriculture and livestock insurance (Sangroula, 2021). Majority of the insurance was for livestock rather than crops. The low uptake of insurance among farmers is attributed to: (i) lack of awareness and promotion; (ii) the inability of insurance companies to function actively; (iii) insurance companies faced difficulties in reaching farmers in remote areas.

There are 20 insurance companies in Nepal. To make their operations effective, the government has assigned them to specific districts. The government pays 75% of the insurance premium.

6.4 Analysis of bottlenecks and opportunities

- a) **Poor quality seeds and associated difficulties among farmers to make informed seed choices during purchase.** Seed is a major component to food security and quality of yield. Key problems related to seed quality are: (i) low germination rate; (ii) poor survival rate; and (iii) weak resistance to diseases and adverse weather conditions: Inconsistent quality of seeds affects income of both farmers (refugees and host community) as well as agrovets. To retain clients, an increasing number of agrovets offer discount on replacement packets if customers experience problem with the seeds.

At the supply node, the problem on seed quality can be attributed to the following: (i)

deterioration of source seed due to continuous use without maintenance; (ii) improper drying, storage, and packaging of seeds among seed growers and intermediaries; (iii) weak quality management; and (iv) weak adaptation of seeds to the different agro-ecological conditions in the country. At the distribution and marketing nodes, the following factors hinder the ability of farmers to make informed purchasing decisions: (i) seed packets lack information to help farmers evaluate quality and suitability, which also weakens traceability and, consequently, accountability of seed producers; (ii) lack of monitoring among government authorities to validate the truthfulness of claims in the label and, corollary to this, the lack of validated point of sale information on seed quality; and (iii) weak appreciation among farmers on the importance of knowing sources of seeds (beyond the agrovet) and corresponding quality to guide future purchase.

b) **Limited access to good quality fertilizer and inadequate soil nutrition management.**

Refugees are only able to access fertilizer sold in the open market since subsidized fertilizer is distributed mainly via cooperatives. Fertilizer sold in the open market is not only priced higher but also of dubious quality.

On the other hand, there is an abundance of agri-waste materials that can be made into organic fertilizer: Farmers though do not have the adequate facilities and scale that will enable cost effective production and distribution of good quality fertilizer.

While refugee and host community farmers try to visually assess soil nutrient requirements, they lack access to proper and regular soil analysis as well as the technical know-how on proper fertilizer management and application. Under fertilization and improper fertilization cause depletion of the nutrient reserve in the soil, which is costly financially and to the environment.

c) **Low technological capacity and lack of access to providers/services to improve agronomic practices to reduce incidence of pests and diseases.** Both refugee and host community farmers experience pest and disease outbreaks, especially in tomatoes and

potatoes. Refugees estimate a yield loss of 10% to 29% per season due to pests and diseases. Among host community farmers, the estimated yield loss is estimated to be less than 10% per cropping season. The refugee farmers generally use inorganic pesticides while host community members employ a mix of organic and inorganic pesticides, with a greater preference for the former. In Nepal, farmers traditionally have been practicing farming using naturally available, local, and chemical-free inputs.

Poor agronomic practices are also responsible for many of the productivity issues faced by farmers. While many of the farmers may have basic skills on vegetable farming, the changing conditions brought about by climate change require regular updating and upgrading of technologies. The depth and breadth of outreach of government extension services is limited leaving a large segment of farmers without access to extension services and information (technical, market, price, climate, etc.). Refugees are generally the least priority in government extension services. Donor funded extension services are needed to jumpstart the upgrading process but reliance on the medium to long-term scenario is unsustainable.

d) **Lack of resources and skills to pursue year-round production and optimize land utilization.**

Refugees do not have access to government support for tunnel production. Protected cultivation is more sophisticated than open field cultivation and requires higher start-up and operational costs as well as more diligence and precision. On their own, refugees cannot afford to pay upfront for the materials and establishment costs. Furthermore, they lack the technical know-how on protected cultivation. The short tenure of leasehold farming agreement also deters investment in infrastructure (e.g., tunnels, deep wells) necessary for increasing crop productivity. Adoption of greenhouse technology can promote efficient use of inputs and year-round self-employment while enabling farmers to get better prices for off-season vegetables.

An efficient irrigation scheme is also important, which in many areas is not available. Most farmers are dependent on seasonal rainfall and

lack access to irrigation technologies, such as pumps and drip irrigation. According to some refugee farmers, water sources in their areas are far away and, as such, they depend mainly on rainfall. Among leasehold farmers, investment in deep well and similar infrastructure poses some risks as lease contract is usually only for three years. In recent years, weather in Nepal has become more erratic than ever especially the temperature and rainfall, which posed more challenges for farmers especially that majority practice open field cultivation. At times, farmers shifted the planting time to align with weather conditions and reduce risk of pests and diseases.

- e) **Lack of post-harvest facilities and access to technologies parallel to lack of incentives to adopt good postharvest practices.** The problem of postharvest losses appears to be more prevalent among refugees than host community farmers. According to refugees interviewed, losses due to defects and quality deterioration ranged from 5% to 20% of harvest. Host community farmers gave a lower estimate of 5% and below. Different studies show that postharvest losses are anywhere between 25-50% in vegetable value chains.

Farmers including collection centres incur losses both in terms of quality and quantity due to poor postharvest practices. There is a general lack of focus on low-cost postharvest technologies in many of the existing extension programs. Lack of capital to acquire improved technologies especially among farmers, collection centres, and local intermediaries is one of the serious constraints for reducing postharvest losses. Furthermore, current marketing system does not offer rewards for proper sorting, grading, and packaging. In general, post-harvest losses at the farming level are most commonly caused by deficiency in water, fertilizer, etc.; pests and diseases; lack of

information on standards/informal norms on product quality, and; late or early harvesting. At the handling and packaging phases, losses are incurred by rough handling; large baskets (dokos) and sacks with rough lining that damage the produce; improper storage, for example left under the heat of the sun, and; unsanitary conditions.

High postharvest losses contribute to high prices that consumers, which include refugees, have to pay for while farmers receive low prices.

- f) **Individual selling of small quantities of vegetables resulting to diseconomies of scale, weak bargaining power, and high transaction costs.** To date, refugee farmers tend to sell individually rather than collectively. Given the small quantities individual farmers produce, selling such a small quantity is expensive in terms of time and transportation costs for both the intermediaries and farmers. Small volumes of output pre-dispose farmers to weak bargaining position in the market.
- g) **Lack of access to capital.** Both refugee and host community farmers are deprived of access to loan due to lack of collateral.
- h) **Limited farm enterprise management and marketing skills.** Transforming subsistence farmers' practices to meet the demands of a commercial market requires more than improved agricultural techniques. It requires changing behaviour around the traditional seasonal planting calendar and developing the capacity to manage vegetable production as a small business. Farmers generally do not have access to training and other business development services. The very few BDS providers in the area generally cater to commercial farms and/or work with development programmes.

7. Market Systems Analysis: poultry

7.1 Value chain description

7.1.1 Value chain map

The fowl population in Province 1 in 2019/20 was about 9.52 million with 13% laying hen (MOALD, 2021). The province produced 142 million eggs and 29,994 MT of chicken meat during the same year. The chickens are reared by backyard and commercial farmers. An increasing number of poultry farmers including refugees get their day-old chicks (DOC) and feeds on credit under a buyback policy from the traders or poultry suppliers as they are called in Nepal. The traders source the DOCs and feeds from their network of hatcheries and feed companies. The traders may also be vertically integrated poultry businesses. The eggs and live chicken or broiler are collected by the traders from the farmers at the agreed schedule (e.g., 45 days for broilers). Farmers who bought their own DOCs and feeds can sell their poultry products

to buyers of their choice including direct to consumers through the Haat Bazaar.

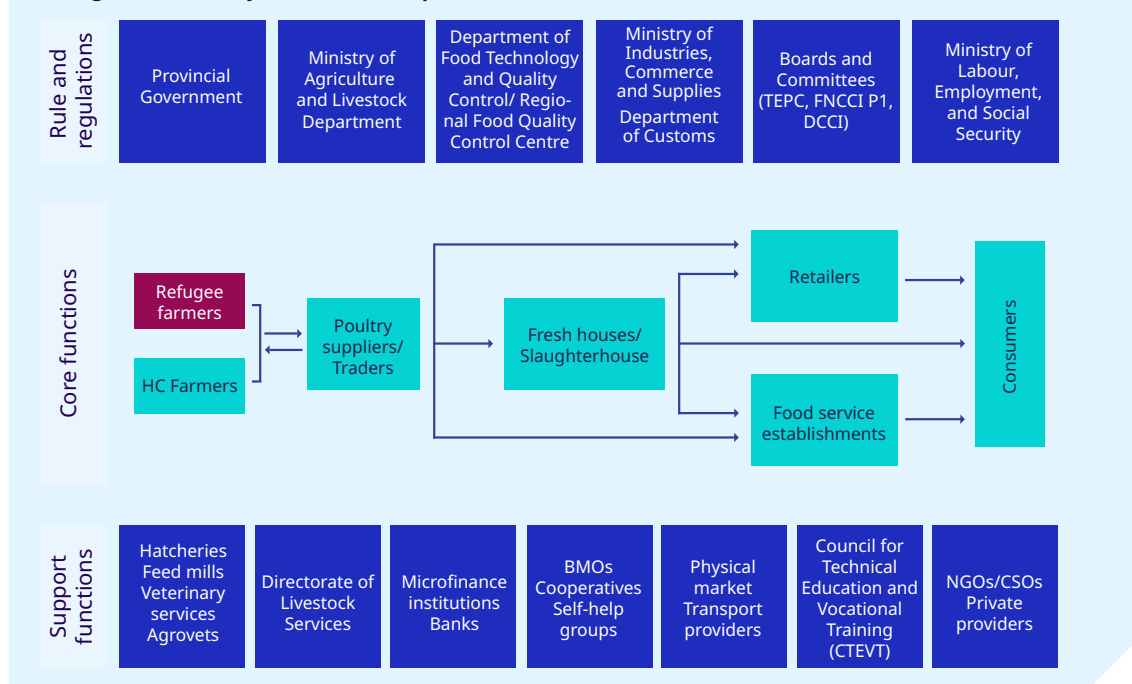
Traders sell live and dressed chicken to fresh houses, food service establishments, and retailers. A fresh house is a meat shop that may or may not have its own slaughterhouse. The poultry products may also be traded in the poultry market in Damak, which runs every Thursday and Monday. Most of the products sold here are intended for Kathmandu.

7.1.2 Key actors in the chain

Poultry farmers

The buyback scheme has evolved along with the expansion of commercial poultry farming. The poultry farmer is provided the inputs on credit and ensured purchase of the output. The trader

► Figure 23. Poultry value chain map in Province 1



► Figure 24. Poultry farm with production capacity of 4,000 broiler chicken per week



► Table 15. Technical inefficiency and efficiency of poultry farms in Province 1

District	Technical Inefficiency	Technical Efficiency
Bhojpur	4%	96%
Dhankuta	14%	87%
Ilam	4%	96%
Jhapa	6%	94%
Khotang	3%	97%
Morang	9%	92%
Okhaldhunga	8%	92%
Panchthar	8%	93%
Sankhuwasabha	6%	94%
Sunsari	9%	91%
Taplejung	3%	97%
Terhathum	13%	88%
Udayapur	9%	91%
Average	7%	93%

Source: (Pradhan & Raut, 2019)

usually requests from the farmer a deposit to partially cover the cost of inputs in case of contractual default and losses (expenses on chicks, feeds, transportation higher than value of output). The debt of the farmer is collected against the value of the delivered products. The buying price of the poultry products is based on the prevailing market price. The average duration of the grow-out cycle for broilers is about 45 days. Agreement between farmers and traders is usually verbal. The buyback scheme does not address production and price risks faced by farmers but it does provide them with access to inputs especially so that it is difficult for them to get a loan.

Feed efficiency or feed conversion ratio is a major variable that determines the profitability of a farm. Feed efficiency is influenced by the breed, rearing condition, and the quality of feeds used. Based on interview, feeds account for about 60% to 70% of the costs. A sound technical know-how may be helpful for both farmers and traders to understand the efficacy of particular quality of feed in the particular type of environment and breed of chicken.

Closely related to feed efficiency is the overall technical efficiency of farms. A study in 2019 conducted by Pradhan and Raut showed that poultry farms in Province 1 produce, on the average, about 93% of its potential maximum output. This suggests that there is room to improve technical efficiency by 7% through upgrading of technical knowledge on

poultry raising and quality checks of feed ingredients, vaccine, and DOCs.

The biological nature of broiler (for chicken meat) production and the unsuitability of the product for long-term storage is an important cause of price instability and losses. During the prolonged lockdowns to contain the spread of the COVID-19 virus, farmers incurred losses as they were not able to deliver the broilers at the right age and time. Aside from the additional cost of feeds, overgrown chicken commands a lower price.

The farmers utilize the manure in the following ways: (i) use in their vegetable garden; (ii) sell to vegetable/crop farmers; and (iii) give to interested farmers if volume is small.

Traders/Poultry suppliers

Poultry suppliers or the traders are the bridge between the farmers and the input suppliers as well as between farmers and meat/egg retailers. In many ways, they control the whole chain. They provide regular feedback to the millers regarding demand and supply conditions, farmer preferences, and satisfaction about the feed. The traders also convey feedback to the hatchery about the performance and quality of chicks.

The traders usually determine the price of live birds and meat in the district/area of operation.

► Figure 25. Fresh house in Jhapa



They have strong relationship and linkages with upstream and downstream market actors.

Slaughterhouse/Processors/Fresh houses/ Retailers

At the most basic level, chicken processing refers to the slaughter, de-feathering and removal of head, legs and internal organs and are undertaken by consumers at home, traders, slaughterhouses, and fresh houses. Further processing involves cutting the carcass into portions, de-boning and chilling or freezing.

The fresh houses are also the main distributors and retailers of dressed chicken. In Jhapa, there are more than 40 fresh houses and 15 slaughterhouses. Biosecurity status in many of the slaughtering places is poor.

7.1.3 Distribution of costs and profit in the poultry value chain (chicken meat)

About 67% of the retail price represented costs incurred by the market actors at each node of the chain. The remaining 33% of the price was the total profit earned by all market actors. Among

the three key market actors, the farmer received the highest share of the price at 73%.

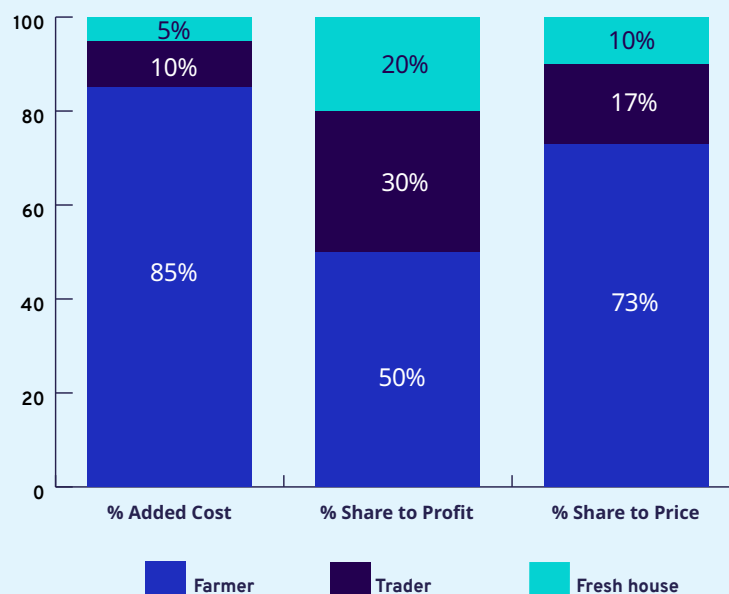
Farming accounted for about 85% of the total costs of producing and bringing the chicken meat to the consumers. Slaughter and distribution costs made up the remaining 15%. Although farming had the highest percentage share to profit at 50%, it was not proportionate to farmer's share to production cost. Improvement in technical efficiency can potentially reduce production costs, providing opportunity for improved profitability and increased competitiveness over imported chicken.

7.2 Rules and regulations

Please refer to 6.2 for rules and regulations on economic participation of refugees and overview of the government bodies mandated to promote the agriculture sector.

The policy for poultry development is mainly spread throughout agriculture and other sectoral policies in the country. The Agriculture Perspective Plan (1995-2015), National Agricultural Policy (NAP) 2004, Agriculture Business Promotion Policy 2007 (ABPP), and the ADS 2015-2035 are the major policies that guide the development of the poultry

► Figure 26. Distribution of costs and profit in the poultry (fresh chicken meat) value chain



sector. Poultry (ranked 8th) was among the top 15 value chains prioritized in the ADS.

For 2021/22, the following are the key focuses of government support to poultry subsector:

- ▶ Support for improved shed construction, production of animal feed and forage development and expansion of pastureland.
- ▶ Support to the establishment of model slaughterhouses in all provinces.

7.3 Support functions

7.3.1 Input supply

Day-old chicks

Hatcheries import grandparent stocks to produce fertilised eggs which hatch into broiler chicks. The hatcheries sell day-old chicks (DOCs). There are 209 hatcheries in Nepal, and, at the least, ten are located in Province 1. The hatcheries in Province 1 supply the DOCs mainly to poultry suppliers/traders and large poultry farms within the province. Some of the supply of DOCs come from hatcheries in Chitwan and other districts.

The largest hatchery in Nepal is the Avinash Hatchery Pvt. Ltd, which was established in 1992. The company produces 600,000 broiler chicks per week. On the other hand, the Avinash Hyline Nepal Pvt. Ltd. Specializes in layer chicks. Established in 2010, the company produces 80,000 layer chicks per week. It has an 85% market share (AG, 2018).

Backyard poultry farmers particularly those who finance their operations through advances and buy back schemes with the traders generally have very little contact with hatcheries during the purchase of DOCs. Traders handle the procurement and arrange the delivery of DOCs to the poultry farmers. Farmers who finance their own operations may buy directly from the hatcheries or agrovets.

Feeds

Only 20 -25% of the feed ingredients are produced in Nepal (FAO, 2020). The remaining 75% to 80% of the ingredients are imported from India, Bangladesh, Brazil, USA and other countries. The feed companies have their network of poultry suppliers/traders and agrovets. Similar to DOCs, backyard farmers do not interact directly with feed mills. Choice of feeds depends on the traders providing the inputs under the buy back scheme.

▶ Table 16. Some of the hatcheries in Province 1

Company	District
Om Shree Pashupati Breeders Pvt Ltd.	Morang
Pashupati Poultry Farm and Breeders Pvt. Ltd.	Morang
Kankai Hatchery	Jhapa
Bhatbhateni Hatchery	Jhapa
Satya Sai Hatchery	Sunsari
PK Poultry Farm	Sunsari
Saptakoshi Hatchery	Sunsari
Itahari Hatchery	Sunsari
Purbanchal Hatchery	Sunsari
B and B Hatchery	Sunsari

► Figure 26. Distribution of costs and profit in the poultry (fresh chicken meat) value chain



► Table 17. Some of the poultry feed mills in Province 1

Feed mill	District
Star Feed Industry	Jhapa
Bhadrapur Feeds	Jhapa
Valley Feeds	Jhapa
Sagar Feeds	Sunsari
Purbanchal Feeds	Sunsari
Sun Feeds	Sunsari
Koshi Feeds	Sunsari
Chandani Feeds	Sunsari
Upakar Feeds	Sunsari
Bright Feeds Industries	Sunsari
Naya Pashupati Pvt. Ltd.	Morang
Pashupati Feed Industries	Morang
Anmol Feed Industries	Morang

There are a few feed companies such as Pro Bio-Tech Industries (brand name – Shakti) and Shreenagar (brand name: Sinaulo) who provide training to farmers. In many cases, feed mills are subsidiaries of hatcheries. They may also be engaged in the distribution of broilers and eggs especially those produced by users of their DOCs and feeds. Figure 36 shows an example of a business model of an integrated poultry company in Nepal.

Some of the feed mills in Province 1 are listed in the table below. Other feeds distributed in Province 1 are those produced by Triveni, Shakti Feed/Pro Bio-tech, Uttam Feed, Nuova Feeds, Asian Feeds, Poshak Feeds, and other feed mills in Chitwan.

Vaccines

The most popular vaccines used by poultry farmers are the live vaccines. There are three registered laboratories for vaccine production, namely: (i) National Vaccine Production Laboratory (NVPL), a government owned laboratory located in Tripureshwor; (ii) Hester Biosciences Nepal, a private laboratory in Kavrepalanchowk District; and (iii) Biovac Nepal, a private laboratory in Kathmandu. NVPL produces most of the live poultry vaccines. The NVPL vaccines are available to the farmers mostly free of cost through the National Livestock Disease Control Program (NLDCP) or at nominal prices recommended by the GoN via veterinarians and agrovets.

The country augments its supply of vaccines especially the live vaccines through importation by the private sector (wholesalers/agrovets, trading companies). NVPL can increase its production of vaccines if provided with additional staff, and facilities.

In Province 1, agrovets with cold chain facilities buy all types of live poultry vaccines (e.g. ND, IBD, AIB, ND+IB, AE, MD, Lasota, Fowl Pox, etc.) required for both layers and broilers from the superstockists/wholesale agrovets in Kathmandu and distribute to the poultry farmers as per vaccination schedule given by hatcheries in coordination with poultry suppliers (FAO, 2020). Vaccines are mostly manufactured in Nepal and Bangladesh.

7.3.2 Acquisition and use of support services among poultry farmers

- a) Refugee and host community poultry farmers received training and advice on the basics of poultry farming. None of the refugee farmers underwent training on enterprise and financial management specific to poultry farming. The providers of the services were poultry suppliers/traders (embedded service; advice) and the livestock extension office (free service; training). Satisfaction rating suggests that quality of services need to be improved. The farmers were generally satisfied with the marketing related services (transportation and logistics; price and market information) provided by poultry traders.
- b) None of the farmers interviewed borrowed money from bank, self-help group, and other financial institutions. The inputs were provided by poultry suppliers on credit under a buyback scheme. (Table 18)

7.3.3 Public sector extension and support services

The local government units are responsible for the delivery of extension services to livestock farmers and enterprises. The Livestock Service Centres (LSCs) are facing difficulties in providing technical services due to inadequate basic diagnostic facilities, budget, and adequately trained human resources. The frequent split and merging of the ministry of livestock with MoAD during the past years has also destabilized programmes and services. It is, however, expected that with the creation of the LCS in the municipalities, the transition of the delivery of extension services from the provincial government to the local government will soon stabilize.

The local government units are also in-charge of the management and regulation of slaughterhouses and cold storage. Currently, most of the slaughterhouses are not compliant with hygiene and food safety standards.

7.3.4 Paravets

The paravets (*Doctor Saheb*) are community-based extension workers who assist a veterinary

► **Table 18. Satisfaction rating of services received by poultry farmers**

Service	Satisfaction rating	
	Refugees	Host Community
Food safety	2.0 80% have not availed	2.3 40% have not availed
Training on poultry management	2.3 40% have not availed	2.4
Extension services	2.6	2.8
Feed preparation	3.0	2.7
Marketing related services	3.4	3.6
Financial management	None has availed	2.0 40% have not availed
Enterprise management	None has availed	3.0 40% have not availed
Providers		Poultry collectors Livestock extension office
Rating scale	5 – Very satisfied 4 – Moderately satisfied 3 – Satisfied 4 – Fairly satisfied 5 – Not satisfied	

Source: AIMS field interview 2021

physician in the performance of their duties, or carry out animal health care independently. Paravets are popular among the farmers because of accessibility, affordability, and good understanding of the local context. A paravet covers about 2 to 6 village development committee (VDCs) comprised of about 2,000 to 5,000 households. Range of services include: (i) technical advice; (ii) curative services; (iii) vaccination; and (iv) laboratory tests. Majority of the paravets earn from NPR 0.5 to 2 million (Thapa N., 2020).

Most of the paravets received veterinary training from the Council for Technical Education and Vocational Training (CTEVT). They received further training from the Community Livestock Development Project (CLDP) on practice management as an enterprise, veterinary technical skills and artificial insemination. They, however, require training on how to deal with diseases (bird flu, swine flu, etc.), artificial insemination, and veterinary medicine (Thapa N., 2020). The MOALD does

not currently have programme on upgrading of paravets. The paravets also have difficulty in accessing credit to upgrade and/or expand their business.

7.3.5 Transportation services

DOCs, feeds, drugs/vaccines, and poultry products are transported using the vehicles of poultry suppliers/traders, hatcheries, and feed mills. Drivers of these vehicles are aware of risk of cross contamination but they rarely wash the vehicles after delivery of the consignment to the farms due to limited supply of water along the routes (FAO, 2020). They also do not consistently use disinfectants to clean the vehicles. If feed or DOC is delivered by the hired vehicles, sanitary and hygienic practices are oftentimes not observed.

7.4 Analysis of bottlenecks and opportunities

The graph below shows farmers' rating of factors that affect their poultry farming business. Both refugee and host community farmers ranked disease outbreak as their top constraint. This was followed by inadequate training on poultry farming.

The following were the major diseases of poultry in Jhapa and Province 1 (FAO 2020) during the recent years: (i) Infectious Bursal Disease; (ii) Chronic Respiratory Disease; (iii) Salmonella infection; (iv) E. coli; (v) Low Pathogenic Avian Influenza and Colibacillosis; (vi) New Castle Disease; and (viii) Highly Pathogenic Avian Influenza. After the implementation of the new structures by the government, only passive surveillance of these diseases is being conducted. The lack of risk-based surveillance by government is compounded by limited awareness among farmers of the diseases, poor biosecurity, inadequate housing, and limited know-how on disease diagnosis and treatment.

The research suggests that these aforementioned constraints stem largely from the following bottlenecks and root causes:

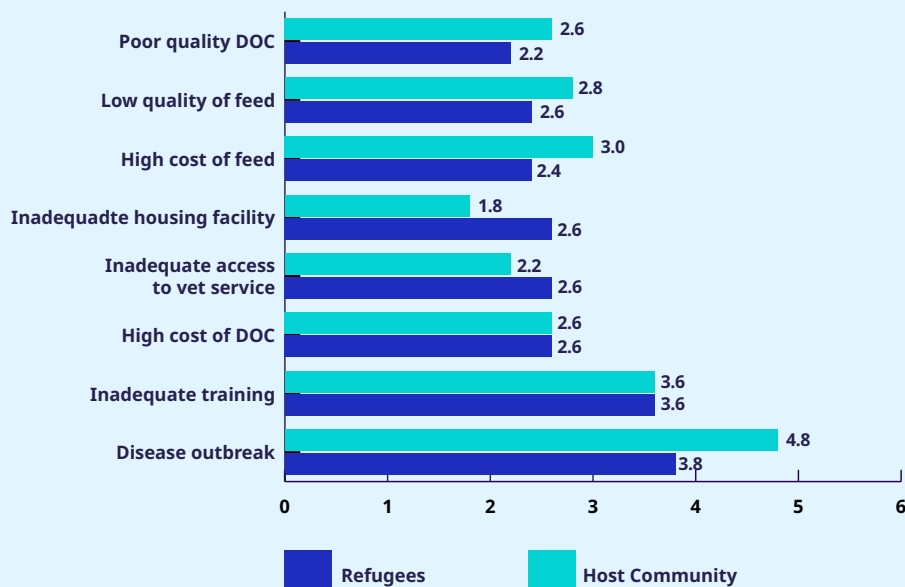
c) **Inadequate technical skills and husbandry knowledge.** A key dimension of the problem

relates to inadequate extension services received by refugee and host community poultry farmers. Farmers have limited knowledge of husbandry to help overcome the problems in managing improved genetic material as their indigenous knowledge is most applicable to the raising of local breeds. Inadequate biosecurity coupled with poor hygienic practices increases vulnerability to poultry diseases. Farmers also lack adequate knowledge on early identification of diseases and disease control. When birds get sick or infected, FCR declines and mortality rises resulting to losses. Handling of sick or infected chicken without protection can also pose human health hazard.

d) **Lack of entrepreneurship skills.** If and when extension services are available, these are usually focused on the technical aspects of poultry farming. Since many of the backyard farmers raise chicken on a buy back scheme with inputs provided by traders, little attention is given on how to grow the business and/or improve profitability.

e) **The majority of the poultry farmers have no livestock insurance.** Refugees are not covered by the government program. Many of the host community farmers are not aware of the government's program on livestock insurance and/or do not fully appreciate the importance of having one.

► Figure 28. Rating of factors that affect poultry farming business of refugees and host community



▶ 8. Market systems analysis: Pig

8.1 Value chain description

8.1.1 Value chain map

Refugee and host community pig farmers sell pigs and piglets to traders. In many cases, backyard farmers are in direct contact with the collectors than the major traders in the district. The collectors may sell to the traders or deliver directly to butchers and processors. The major traders tend to sell to buyers outside the district while collectors sell within the district. The butchers slaughter the pig and meat are sold to processors, retailers, and direct to consumers. Fresh meat is the most dominant product form in the market.

Processors procure either meat from the butchers or live pigs directly from the collectors and traders and slaughter the pigs themselves. The processed product (e.g., pork cuts, frozen meat, sausages,

etc.) are sold to consumers primarily via supermarkets. A few processors have started exporting to China.

At times, farmers may slaughter the pigs themselves and sell the meat to neighbours. In the refugee camp, one enterprising refugee has set-up a butcher shop. He slaughters one pig per day and meat is displayed in a makeshift shed.

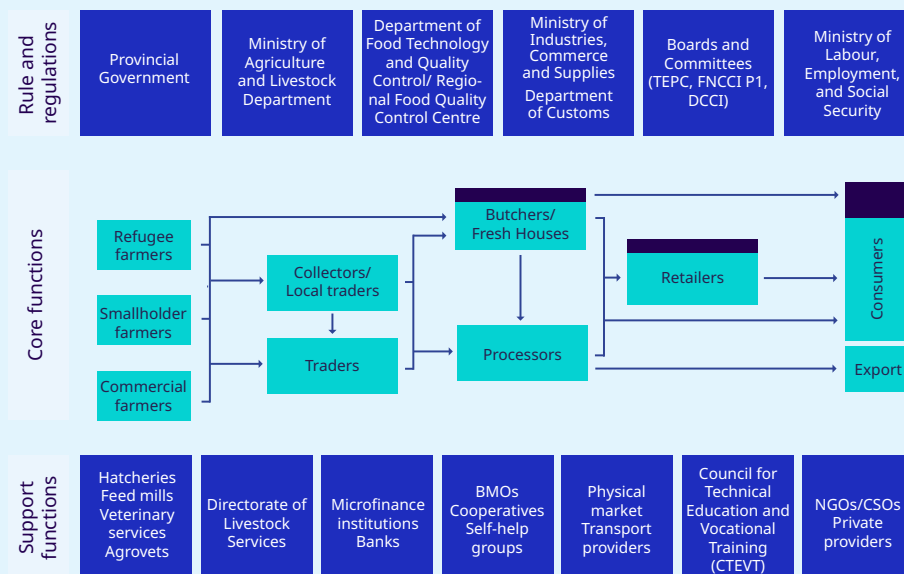
8.1.2 Key market actors

Pig farmers

Pig raising in Province 1 involves any or all of the following operations:

- a) Farrow to weaning (piglet production): This activity involves the keeping of breeding sows for

▶ Figure 29. Pig value chain map in Province 1



the production of piglets, which are raised until weaning age. Two farrowing per year can be obtained, with a litter size of 8 to 12 piglets per farrowing. For piglets marketed as inputs to farmers engaged in pig fattening, the weaning age is around 2 months.

- b) Farrow to finish (full cycle operation): This production activity is similar to the previous one with the keeping of breeding sows and production of offspring. It differs from farrow to weaning in that the pigs are raised and fattened to maturity, with the final product being slaughter hogs. This activity requires the largest resources and longest gestation period to take full advantage of its income generation potentials.
- c) Grow to finish (fattening): This type of production activity delivers fattened slaughter hogs as final output, but differs from the full cycle operation in that the purchased stock are weaned piglets for fattening rather than breeding sows. Marketable weight of 60 to 90 kilograms is achieved over three to four months, depending on breed, type of feeds, and rearing condition.

The refugees interviewed were primarily engaged in piglet production. Majority of the host community farmers, on the other hand, had a combination of the three types of operation and, thus, can produce different types of output for the market. This mixed production system is the most flexible and helps in sustaining incomes of pig raisers. Farmers though would need to assess the combination that would provide the most optimum benefits based on their resources.

Feeds account for 50% to 60% of production costs and can further increase especially if these are all purchased as was the case with majority of pig farmers interviewed. It would also seem that farmers are moving towards rice bran and forages rather than swill feeding, which can be a cause of disease outbreak.

Traders

Collectors may be independent businesspeople, or they may be affiliated with a trader. In most cases, the relationship between collectors/traders and

farmers is on a cash and carry basis. At the farm gate, prices are usually determined by the traders/collectors, who sometimes provide a cash advance to a regular supplier. These agreements are made verbally and based on mutual trust. Trading between traders and butchers or fresh houses operates mainly on spot markets.

Butchers/Fresh Houses/Processors

Processing may involve the following: (i) pig slaughter and cutting the carcass into different parts; and (ii) manufacture of pork consumer products such as ham, bacon, sausages and other products. Main enterprises in Province 1 involved in slaughtering hogs, packing and processing the meat, and distributing the products to consumers, retailers, food service establishments, and processors are the butchers or fresh houses.

Manufacture of consumer products take place mainly in Kathmandu. The consumer products are sold to supermarkets and generally cater to higher end market segments. Many of the processors use both locally produced and imported meat. Domestic pork production is not yet able to supply reliable volume of quality meat.

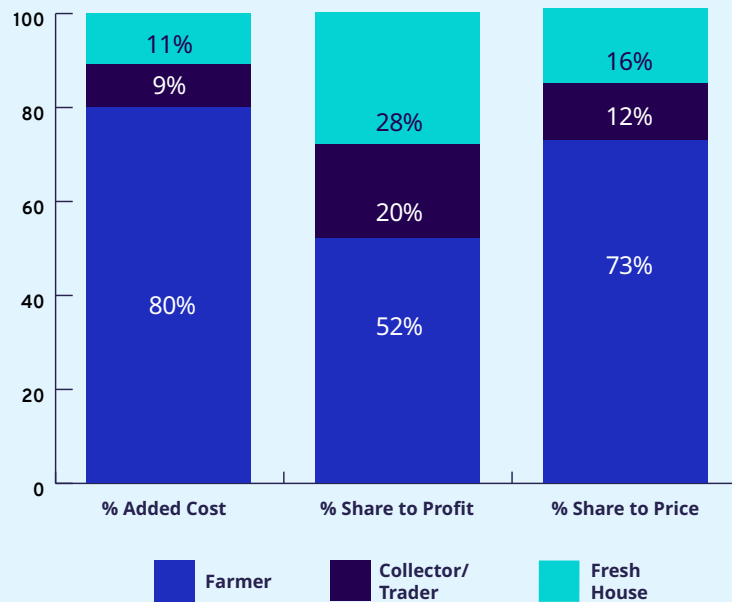
Slaughter methods are still generally rudimentary. This can adversely affect quality, food safety, shelf life of pork.

8.1.3 Distribution of costs and profit in the pig value chain

Costs comprised about 74% of the price, leaving only about 26% for profit margins to be shared by the different market actors. Pig farming accounted for about 80% of the costs. Slaughtering and retail distribution made up 11% of the costs. The remaining 9% was incurred by traders and collection with the greatest percentage spent on transportation costs.

Farmers received the greatest proportion of the price at 73%. Likewise, they also had the greatest share of the profit at 52%. Farmer's percentage share of the profit though was lower than their contribution to added costs. Husbandry practices need to be improved to achieve the target marketable weights for live pigs, but at the same time

► Figure 33. Distribution of costs and profit in the pig (fresh pork) value chain



lowering current production costs. The price of feed has the largest effect of all inputs on the profitability of pig farming. One of the most consistent determinants of relative profit efficiency, and thus, of profitability over time, of pig farming is the use of good quality feeds. The use of good feeds in conjunction with the use of good quality animal breeds shows up in the taste of the meat, the percentage of fat, and also in better feed conversion ratios. Likewise, a change in the price of feed has a large impact on the profitability of pig farmers.

8.2 Rules and regulations

Please refer to 6.2 for rules and regulations on economic participation of refugees and overview of the government bodies mandated to promote the agriculture sector.

The environmental consequences of pig production are of increasing public concern, particularly regarding the management of pig manure in relation to water and air pollution. Water pollution arises from inappropriate disposal of pig manure. There are also human health issues, especially for those engaged in or living nearby large-scale pig operations. There are, however, technological

developments on pig housing facilities, manure storage and treatment systems, and alternative energy production units as well as husbandry practices that can help ease the environmental pressures associated with pig farming.

8.3 Support functions

8.3.1 Input supply

Breeder farms/artificial insemination

The Livestock Development Farm in Pokhara, which is the biggest of the ten farms of the Department of Livestock Services (DLS) and managed by the National Livestock Breeding Office (NLBO), is the main source of superior pig genetic materials. The Pig Breeder Farmers Group of Pokhara is among the main sources of high quality weaner piglets in the country.

The NLBO is also in-charge of the artificial insemination (AI) program of the government. It produces and distributes semen, liquid nitrogen, and other AI materials. The NLBO has a mobile AI

service. It also expands its outreach through partnership with the DLS district offices and the private sector. Progressive paravets and farmers are trained to provide fee-based AI services.

In Province 1, there are commercial farms such as the Kulung Pig Farm which produces improved breeds of piglets and conducts artificial insemination. The farm also provides advice and training to its customers. Piglets can be purchased from both backyard and commercial farms. Genetic quality is generally assessed based on local norms.

Feeds

Common feeds used by backyard raisers are cereal grain by-products such as rice bran, vegetable wastes, green grass, fodder tree leaves, banana leaves, and other similar crops. These are readily available in the local market and cheaper than the formulated commercial feeds. Large scale farms rely on commercial feed (pelleted or mash) from feed mills. Many of the poultry feed mills also produce feeds for pigs.

8.3.2 Acquisition and use of support services among pig farmers

- a) Refugee farmers received advice on basic pig farming primarily from breeder farms. Only about 20% of the refugee farmers interviewed received formal training in pig farming. None of the refugee interviewees has attended enterprise and financial management training specific to piggery business. On the other hand, the local veterinary office was the main provider of training and technical advice to host community farmers. Feed company and agrovets provided technical advice as well as price and buyer information.

The ratings suggest that services need to be improved to match the needs of pig farmers. (Table 19)

- b) The greater majority said that they did not borrow money in connection with their piggery business. It seems, however, that among host community farmers there were times that they borrowed informally for the purchase of feeds.

8.4 Analysis of bottlenecks and opportunities

The graph below shows farmers' rating of factors that affect their pig farming business. Both refugee and host community farmers ranked high cost of feeds as their top challenge. Inadequate training was identified by refugee farmers as the second top factor that hindered their ability to earn more from pig farming. Host community farmers were more concerned with feed quality.

The field research reinforced the findings that limited pig farming knowledge was a key constraint to greater productivity in the value chain. Especially among backyard farmers, knowledge on the recommended space requirements and the set-up of the proper facilities like feeders, drinking troughs, farrowing pens and brooders was often found to be inadequate. Housing and facilities were constructed based on a one-size-fits-all system for either sows or grower-finishers. Moreover, biosecurity is not fully understood by most growers thus making farms vulnerable to disease outbreaks. The common diseases in pigs were diarrhoea, gastroenteritis, parasitic infestation, colds, and other respiratory diseases.

Besides at the farming and production level, additional constraints were identified elsewhere in the value chain. According to collectors and traders interviewed, many of the farmers were often not able to reach the targeted weight of the pigs. High transport costs and accessibility of pig farms were also among the challenges faced by traders and collectors.

Based on the analysis of these constraints, the following bottlenecks and root causes within the value chain were identified:

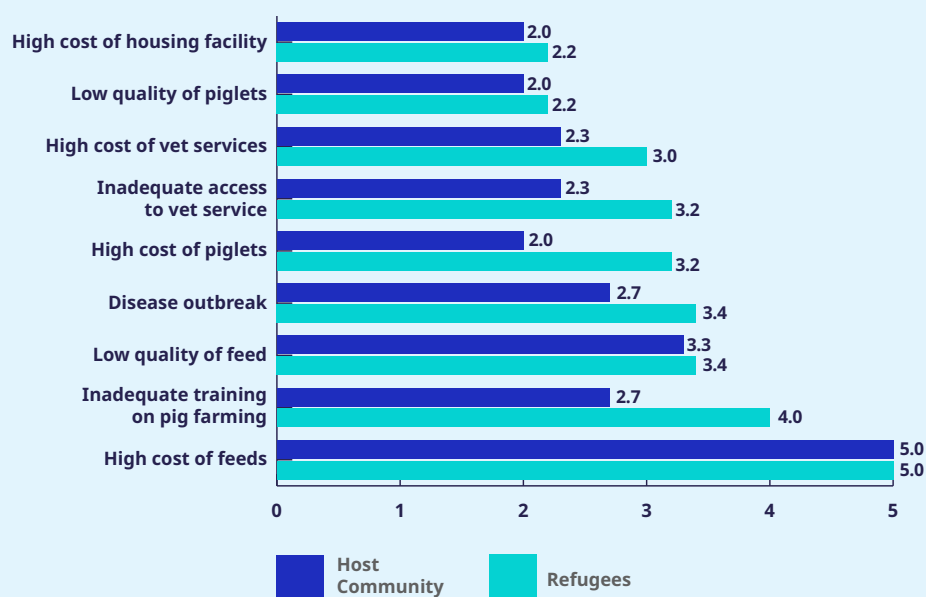
- a) **High feed expenses which undermine farm profitability.** Commercial feeds are expensive due to the following: (i) about 75% of the raw materials are imported; and (ii) high transportation and logistic costs. Feeds, whether commercial or locally available resources, become more expensive due to improper feeding practices and lack of knowledge on pig nutrition management. Information on feeds and nutrition is not readily available to farmers. This situation is aggravated by seasonal changes in the environment causing fluctuations in feed

► Table 19. Satisfaction rating of services received by pig farmers

Services	Satisfaction rating	
	Refugees	Host Community
Extension services	2.0	3.3
Training on pig farming	2.0	2.5
	80% have not availed	33% have not availed
Training on piggery management	2.0	3.0
	60% have not availed	33% have not availed
Market/buyer information	2.6	3.7
Marketing related services	3.0	3.7
Feed preparation	3.0	2.0
	80% have not availed	
Price information	3.0	3.7
	20% have not availed	
Financial management	None has availed	2.0
Food safety	None has availed	2.5
Enterprise management	None has availed	2.3
Providers	<ul style="list-style-type: none"> ► Breeder/commercial farms (Sunset Agro Industry, Kulung Farm) ► Local veterinary office 	<ul style="list-style-type: none"> ► Local veterinary office ► Agrovet ► Bihani feed industries
Rating scale	5 – Very satisfied 4 – Moderately satisfied 3 – Satisfied 4 – Fairly satisfied 5 – Not satisfied	

Source: AIMS field interview 2021

► Figure 34. Rating of factors that affect pig farming business of refugees and host community



quantity, quality and price. The cost of feed has the largest effect of all inputs on the profitability of pig farmers.

- b) **Lack of access to appropriate extension services resulting in limited knowledge of good husbandry practices, disease prevention, and control.** Outreach of government extension services is very limited and quality needs improvement. The quality of technical advice from input suppliers varies depending on depth of knowledge and experience.
- c) **Risk of water and air pollution.** More intensive production along with deficient manure storage and treatment management can raise the environmental risks associated with pig production.
- d) **Lack of access to financial services deter refugees from engaging in pig farming.** Amount of loan provided by self-help groups is not sufficient to start a profitable pig farming business.
- e) **Lack of entrepreneurial skills.** Pig farmers have limited enterprise management skills. In many cases, pig raising is seen as a side activity rather than a business enterprise. Extension services are generally more focused on the technical aspects of pig raising rather than on the soft skills.
- f) **Refugees do not have access to livestock insurance.** Host community farmers, on the other hand, have weak appreciation of the benefits of livestock insurance due to low awareness and limited understanding.

▶ 9. Recommendations and interventions

The following tables outline the key constraints within each value chain, their root causes, and the proposed interventions to address them based on the market systems approach.

To work both on the demand and supply sides of labour maker, 'push' and 'pull' interventions are proposed below. Targeted push interventions aim

developing the skills and capacities of the target group to engage with the market, and pull interventions focus on diversifying the market opportunities available to the refugees and the host community.

9.1 Vegetable subsector

Constraint 1	Root Causes	Activities
Poor quality seeds and associated difficulties among farmers to make informed seed choices during purchase	<p>At supply level: (i) deterioration of source seed due to continuous use without maintenance; (ii) improper drying, storage, and packaging of seeds among seed growers and intermediaries; (iii) weak quality management; and (iv) weak adaptation of seeds to the different agro-ecological conditions in the country.</p> <p>At distribution/marketing level: (i) seed packets lack information to help farmers evaluate quality and suitability; (ii) lack of monitoring among government authorities to validate the truthfulness of claims in the label; and (iii) weak appreciation among farmers on the importance of knowing sources of seeds</p>	<p>Activity 1: In partnership with SEAN, raise awareness among farmers about the benefits of using improved seeds, emphasizing quality parameters and seed regulation. Sensitize farmers on the importance of documenting which seeds performed poorly (push).</p> <p>Activity 2: Explore possibility of refugee and host community farmers to directly source seeds from reputable domestic seed companies (push).</p> <p>Activity 3: Explore viability of refugee and host community farmers to engage in collective seed production through contract farming with domestic seed companies (push).</p> <p>Activity 4: Train agrovets how to improve drying, storage, and packaging practices and how to assess seed quality and provide advice to farmers (pull).</p> <p>Activity 5: Work with SEAN in labelling and monitoring of seed sold in the market. Explore how to improve traceability of seeds (pull).</p> <p>Activity 6: Support seed enterprises with good quality seeds in the development of promotional tools that will support point-of-purchase knowledge transfer and reinforce use of improved seeds (pull).</p>

Constraint 2	Root Causes	Activities
Limited access to good quality fertilizer and inadequate soil nutrition management	Subsidized fertilizer is distributed mainly via cooperatives (making it difficult for refugees to obtain). Farmers also lack access to proper and regular soil analysis and technical know-how on proper fertilizer management and application.	<p>Activity 1: Link refugee and host community farmers with organic fertilizer producers in the district. Promote bulk purchase of fertilizer through their self-help groups to promote economies of scale and increase their bargaining position. Support self-help groups in the development of business model and how to run it as a business (push).</p> <p>Activity 2: Link refugee and host community farmers to government's mobile soil testing services (push).</p> <p>Activity 3: In partnership with organic fertilizer producers, train farmers on proper soil nutrient management and application with OSH integrated (push).</p> <p>Activity 4: Assist organic fertilizer producers in upgrading quality or adapting their products to results of the soil testing and analysis (pull).</p> <p>Activity 5: Develop capacity of organic fertilizer producers to provide training and advice to customers (pull).</p> <p>Activity 6: Assist fertilizer enterprises in the development of promotional tools that will support point-of-purchase knowledge transfer and reinforce use of organic fertilizer (pull).</p>
Constraint 3	Root Causes	Activities
Low technological capacity and lack of access to providers/services to improve agronomic practices to reduce incidence of pests and diseases	Poor agronomic practices by farmer and limited outreach of government extension services, especially for refugees.	<p>Activity 1: Subsidize registration of farmers to the GeoKrishi, Smart Krishi, and similar digital apps (push).</p> <p>Activity 2: In collaboration with cooperatives with collection centres and district extension staff, complement technical advice from GeoKrishi app with formal training on GAP, IPM, and climate smart technologies. Integrate OSH in training contents (push).</p> <p>Activity 3: Subsidize pilot implementation of GAP, IPM, and critical climate smart technologies to showcase benefits (push).</p> <p>Activity 4: Support GeoKrishi and other apps in integrating OSH information in their app (pull).</p> <p>Activity 5: Strengthen capacity of cooperatives and the district agriculture extension staff to deliver training on GAP, IPM, and climate smart technologies (pull).</p> <p>Activity 6: Sensitize district offices and cooperatives on the benefits of refugee inclusion in the economy (pull).</p> <p>Activity 7: Orient traders and agrovets on GAP, IPM, and climate smart technologies for them to be better able to provide advice to their customers (pull).</p>

Constraint 4	Root Causes	Activities
Lack of resources and skills to pursue year-round production and optimize land utilization	Refugees do not have access to government support for tunnel production and lack know-how on protected cultivation	<p>Activity 1: Facilitate the formation and/or strengthening of an existing self-help group. Provide organizational development support with a focus on building it as a collective enterprise (push).</p> <p>Activity 2: Train core group of progressive farmers on protected cultivation system with OSH and basic labour standards integrated (push).</p> <p>Activity 3: Support the establishment of plastic tunnels including land lease support for 3 years and the development of a business and production plan (push).</p> <p>Activity 4: Assist in the development of a business model that will enable the group to scale up number of plastic tunnels and, consequently, participating farmers (push).</p> <p>Activity 5: Support initial rounds of scaling up of plastic tunnels (push).</p> <p>Activity 6: Support the district offices in upgrading training modules and modalities and the integration of farm business management topics (pull).</p> <p>Activity 7: Advocate for the inclusion of self-help groups in the government programs on protected vegetable cultivation (pull).</p>
Constraint 5	Root Causes	Activities
Lack of postharvest facilities and access to technologies parallel to lack of incentives to adopt good postharvest practices.	There is a general lack of focus on low-cost postharvest technologies in many of the existing extension programs. Lack of capital to acquire improved technologies	<p>Activity 1: In partnership with collection centres and large-scale processors (see marketing intervention), train farmers/self-help groups on postharvest practices (push).</p> <p>Activity 2: Support farmers/self-help groups in the acquisition of basic tools and facilities to implement good postharvest practices at the farm level (push).</p> <p>Activity 3: Train collection centres and collectors on good postharvest practices (pull).</p> <p>Activity 4: Assist collection centres and large processors in the development of postharvest practices training module for potential and existing suppliers. Support the pilot rollout of the training (pull).</p> <p>Activity 5: Support collection centres in updating business plans and operations manual, e.g., explore low-cost storage technologies such as evaporative cooling (pull).</p> <p>Activity 6: Sensitize intermediaries on the benefits of good postharvest practices and possible adjustment on price structure based on estimated reduction on postharvest losses (pull).</p>

Constraint 6	Root Causes	Activities
Individual selling of small quantities of vegetables resulting to diseconomies of scale, weak bargaining power, and high transaction costs.	Lack of access/knowledge of benefits of collectively organizing and selling.	<p>Activity 1: Organizational development support to target groups including assistance in the development and operationalization of business plans, operations manual, financial systems, etc. (push).</p> <p>Activity 2: Foster dialogues and meetings between target groups and potential partners/buyers. Support in the crafting of mutually beneficial agreements (push).</p> <p>Activity 3: Support collection centres willing to partner with target groups in upgrading their operations, management and entrepreneurial skills (pull).</p> <p>Activity 4: Support collection centres in development of new markets and partnerships with new buyers (pull).</p> <p>Activity 5: Work with market authorities in the development of schemes on how refugee groups can legally get stalls.</p>
Constraint 7	Root Causes	Activities
Lack of access to capital.	Refugee and host community farmers lack access to adequate collateral.	<p>Activity 1: Intensify financial literacy education for refugees to encourage income, remittances, and loans to be invested productively (push).</p> <p>Activity 2: Subsidize 75% of insurance premium if refugees are not eligible to access government subsidy (push).</p> <p>Activity 3: Work with banks (e.g., Laxmi Bank, Muktinath Bikas Bank, Prabhu Bank Ltd) in the development of financial products other than collateral loans (pull).</p> <p>Activity 4: Support collection centres in the development of business models and operations system for financial services.</p> <p>Activity 5: Advocate for inclusion of refugees in crop insurance program or alternatively, through self-help groups or collection centres with host community.</p>
Constraint 8	Root Causes	Activities
Limited farm enterprise management and marketing skills	<p>Farmers generally do not have access to training and other business development services.</p> <p>The very few BDS providers in the area generally cater to commercial farms and/or work with development programmes.</p>	<p>Activity 1: Facilitating provision of entrepreneurial skills, through local BDS providers, for example, through the ILO's Start and Improve your Business (SIYB) – training entrepreneurship trainers in local organizations (push)</p> <p>Activity 2: Work with local BDS providers to support the development of business model to target refugee and host community farmers (pull)</p>

- a) To address **constraint 1**, the project recommends improving access of refugee and host community farmers to good quality seeds and diversify income through seed production

Use of good quality seeds can minimize the risks of income loss. Seeds that are designed to resist certain pests and diseases or extreme weather

conditions can contribute to the use of fewer or more precisely applied agricultural inputs.

To ensure sustainable access to quality seeds, it is necessary to build an intervention model that assists to develop markets for good seeds, which require both demand and supply side interventions. Most of the proposed recommendations

below are directed at the distribution node since there are ongoing programs on improvement of vegetable seed production. The push interventions are intended to raise the understanding and appreciation of the benefits of using improved seeds among the target groups parallel to facilitating their access to good seeds. It is also aimed at assisting target groups to diversify their income streams through engagement in seed production via contract farming. The objectives of the pull interventions are to improve the marketing system for vegetable seeds and, at the same time, develop a robust demand for improved seeds to sustain the change process and seed production businesses of target groups should they wish to pursue the market opportunity.

- b) **Constraint 2** can be tackled by facilitating access of refugee and host community farmers to good quality fertilizer and promote adoption of proper fertilizer application and management.

Promotion of fertilizer use must be complemented with extension services to ensure that fertilizers have the correct formulation to meet local soil needs, are applied in the correct amount and at the optimal point in the planting cycle, and are used alongside complementary inputs such as good quality improved seeds. Without proper application, fertilizer use can actually decrease profitability by creating a significant added cost without a corresponding increase in crop yields.

The push interventions will help target groups to reduce cost of fertilizer use through improvement of procurement modality and access to services that will promote judicious use of fertilizer. The pull interventions will ensure the availability of good quality fertilizer at affordable prices and the necessary technical/knowledge services.

- c) Regarding **Constraint 3**, the project proposes to strengthen capacity of refugee and host community farmers to implement integrated pest management (IPM), good agricultural practices, and climate smart technologies.

Adoption of GAP, IPM, and climate smart technologies can potentially address many of the production related constraints faced by farmers. It will lead not only to improvement in terms of yield

and productivity but also the safety and health of workers.

The push interventions are designed to build capacity of target groups to access and adopt sustainable practices and improve productivity. Recognizing that technologies and farming conditions constantly evolve, the pull interventions aim to create diversity of extension provision, from government extension officers to value chain-based providers, to give target groups greater choice of sources of information, knowledge, and skills to support the long-term sustainability of their farm enterprise.

- d) For **Constraint 4**, the project should seek to build the capacity of refugee and host community farmers to engage in year-round vegetable production through adoption of protected vegetable cultivation system

With protected vegetable cultivation (plastic tunnels/greenhouses), refugee and host community farmers can plan production cycles to overcome seasonality, water scarcity and severe infestation that are common in open field cultivation. In other words, farmers can grow high value crops all-year round with better protection against unfavourable weather conditions, pests and diseases resulting in high quality produce. It also promotes the adoption of integrated pest management, which can significantly decrease the use of chemical pesticides and, thus, contribute to improving occupational safety and health of farmers.

The push interventions will enable target groups to adopt protected cultivation system. The pull interventions are intended to address broader systemic constraints (e.g., exclusion from government programs) that constrain the ability of target groups to adopt protected cultivation systems and access the necessary resources.

- e) On **Constraint 5**, the project recommends to upgrade postharvest practices and promote the benefits of good postharvest practices across all actors in vegetable chains relevant to target groups.

Appropriate production practices, careful harvesting, and proper packaging, storage, and transport all contribute to good produce quality and food safety. To efficiently and effectively use the

postharvest facilities, it is important that actors across all functions in the chain observe proper transport, handling, and packaging to ensure that vegetables remain in good condition at the various stages.

The push interventions will enable target groups to adopt good postharvest practices. The pull interventions are aimed at making good postharvest practices as the norm across all functions in the chain. Reducing postharvest losses will allow for better margins to be made especially at the upstream nodes of the chain, which will contribute to improving the economic situation of farmers. It may also motivate intermediaries and processors to provide differentiated prices for good quality vegetables.

- f) **Constraint 6** can be addressing by fostering mutually beneficial vertical relationships between target groups and buyers (e.g., collection centres, large scale processors, supermarkets) to create diversified markets while strengthening presence in current markets.

The promotion of collective marketing is an important strategy for increased and gainful participation of refugee and host community farmers in the vegetable value chains. In view of lower transaction costs and more effective capacities, buyers such as large processors often prefer to work with

organized farmers rather than individuals, despite the increased bargaining power that groups enjoy. Initially, it may be better for target groups to be affiliated with collection centres (e.g., Mansarobar) and jointly explore the possibility of supplying to large scale processors and supermarkets. To reduce risk of pole vaulting among target groups, a certain percentage of their harvests can be allocated to serve existing markets. Pull interventions will be necessary to support downstream actors to engage with the target groups and expand markets for their products to generate economic opportunities relevant to the target groups.

- g) Finally, the project suggests tackling **Constraint 7** by facilitating access of target groups to financial services.

The financial products needed will depend on the business model/s that target groups would want to pursue. It is important though that target groups are enrolled in the crop insurance program. The pull interventions are designed to help financial service providers in the development of appropriate products for target groups that are mutually beneficial for all parties involved. Banks are generally more open in working with collection centres to reach farmers and, as such, partnership with the centres may be crucial.

9.2 Poultry subsector

Constraint 1	Root Causes	Activities
Inadequate technical skills and husbandry knowledge.	Poor access to/availability of extension services for refugee and host community poultry farmers	<p>Activity 1: In partnership with paravets and district livestock extension officers, train target groups on good husbandry practices with OSH integrated (push).</p> <p>Activity 2: Subsidize registration of target groups to poultry digital apps (push).</p> <p>Activity 3: Support target groups in the acquisition of basic facilities necessary to comply with basic biosecurity measures (push).</p> <p>Activity 4: Build capacity of paravets and livestock extension officers to deliver practical training on good husbandry practices (pull).</p> <p>Activity 5: Support paravets in the development of business model for the delivery of training. Assist in the development of market for training services (pull).</p> <p>Activity 6: Support GeoKrishi and similar companies in developing ICT based poultry extension app that will include warning on disease outbreak in areas near their farms (pull).</p> <p>Activity 7: Strengthen capacity of district livestock offices to conduct surveillance, early detection and response to poultry diseases (pull).</p>
Constraint 2	Root Causes	Activities
Lack of entrepreneurship skills and business linkages.	Existing extension services focus primarily on technical aspects of poultry farming with minimal attention on growing the business or improving profitability, and poor linkages with buyers.	<p>Activity 1: Provide seed money or link with MFIs/banks for small loans to new entrants for construction of poultry house (push).</p> <p>Activity 2: Foster linkages between target groups and traders/poultry suppliers/hatcheries/feed mills (push).</p> <p>Activity 3: Develop a core group of trainers among refugees or existing BDS providers. Financial sustainability scheme for the training may be anchored on loans provided by self-help groups (push).</p> <p>Activity 4: Support learning events and competitions to promote uptake of training (push).</p> <p>Activity 5: Support poultry traders/suppliers/hatcheries/feed mills in improving the buyback scheme currently being implemented (pull).</p> <p>Activity 6: Assist buyers in developing their markets (pull).</p>
Constraint 3	Root Causes	Activities
Majority of the poultry farmers have no livestock insurance.	Refugees are not covered by the government program and many of the host community farmers are not aware of the government's program on livestock insurance and/or do not fully appreciate the importance of having one.	<p>Activity 1: Conduct awareness campaign on livestock insurance in partnership with livestock insurance companies (push).</p> <p>Activity 2: Subsidize 75% of premium if refugees are not eligible for government support (push).</p> <p>Activity 3: Advocate for inclusion of refugees in the government insurance support program (pull).</p>

- a) To tackle **Constraint 1**, the project recommends upgrading husbandry practices of refugee and host community farmers.

The focus of the intervention is on improving productivity via animal health and prevention of diseases. Areas for upgrading could include: health and hygiene, basic biosecurity practices, vaccination protocol, disease diagnosis, poultry nutrition and feeding methods, and housing.

The push interventions are envisioned to jumpstart the upgrading of husbandry practices of target groups parallel to incentivizing potential providers to engage with the former. The pull activities are aimed at building the markets for these services to ensure availability and accessibility even after the programme ends. The pull intervention also includes building the capacity of government and private sector providers to anticipate and respond to disease outbreak to prevent the virus' spread and minimize impact.

- b) For **Constraint 2**: Support and strengthen refugees' capacities to start and grow poultry businesses parallel to fostering linkages with buyers.

This is partially aimed at imparting skills on business planning, record-keeping, enterprise budgeting, and marketing. The need for improved farm

management skills is crucial to maintain business profitability and sustainability.

It is also recommended that expansion of number of poultry farmers should be guided by market information. The project should pursue this by exploring the possibility of direct contracts on growing/buy back agreement with hatcheries and/or feed mills.

The push interventions focus on providing the means for target groups to engage in poultry farming, including the entrepreneurial aspects of operating a business. The pull interventions are aimed at improving the procurement system and ensuring that markets remain robust so that target groups can equitably benefit from their participation in the chain.

- c) To address **Constraint 3**, facilitate access to livestock insurance.

A livestock insurance can help the target groups to increase their resilience to weather shocks and diseases. This intervention should include advocacy efforts for greater inclusion of refugees in existing programs and on the importance of holding insurance. Additional activities can focus on providing subsidies to help the target groups overcome initial barriers to obtaining it.

9.3 Pig subsector

Constraint 1	Root Causes	Activities
High feed expenses which undermine farm profitability.	Expensive because about 75% of the raw materials are imported; high transportation and logistics costs; and lack of knowledge on pig nutrition management.	<p>Activity 1: In partnership with district livestock offices and pig breeder farms, train farmers on proper feeding and nutrition management (push).</p> <p>Activity 2: Provide farmers with a “menu” of low-cost nutritious forage and silage-based diets synchronized with crop harvesting season (push).</p> <p>Activity 3: Link target groups to collection centres and vegetable farmers for direct supply of fruits and vegetable rejects (push).</p> <p>Activity 4: Link target groups to rice and maize mills for direct procurement of rice bran (push).</p> <p>Activity 5: Develop capacity of self-help groups (of refugees and host community) to engage in the bulk purchase and retail distribution of silage and forage crops to members (push).</p> <p>Activity 6: Strengthen the capacity of district livestock offices and pig breeder farms to provide training and technical advice to farmers (pull).</p> <p>Activity 7: Support district livestock offices and pig breeder farms in the development of menu of low-cost nutritious forage and silage-based diets, which they can distribute to their clients (pull).</p> <p>Activity 8: Assist collection centres and vegetable farmers in establishing a hygienic collection system for fruit and vegetable rejects for re-selling to pig farmers (pull).</p>
Constraint 2	Root Causes	Activities
Lack of access to appropriate extension services resulting in limited knowledge of good husbandry practices, disease prevention, and control.	Outreach of government extension services is very limited and quality needs improvement.	<p>Activity 1: In partnership with district livestock offices, feed mills, and pig breeders, provide farm-based training to target groups on good husbandry practices and biosecurity measures, with OSH integrated (push).</p> <p>Activity 2: Introduce natural farming technologies especially pig housing and beddings to reduce odour and waste pollution. Support establishment of model pig farms to serve as venue for training and showcase benefits (push).</p> <p>Activity 3: When herd size increases significantly, explore the viability of biogas digesters, which can replace Liquefied Petroleum Gas (LPG) to generate electricity for deep-well water pumps, feed mixers and some other electric equipment (push).</p> <p>Activity 4: Explore the viability of establishing a mini slaughterhouse compliant with Good Manufacturing Practices to support retail sales within the refugee camp and nearby areas (push).</p> <p>Activity 5: Strengthen the capacity of district livestock offices, feed mills, and pig breeder farms to provide training and technical advice to farmers (pull).</p> <p>Activity 6: Explore the market for organic pork. If there is sufficient demand: (i) introduce organic farming/natural farming technologies throughout the rearing cycle; and (ii) assist fresh houses, retailers, and exporters/processors in penetrating the markets (pull).</p>

Constraint 3	Root Causes	Activities
Lack of entrepreneurial skills and business linkages.	Pig raising is often perceived as more of a side-activity rather than business enterprise, and extension services focus on technical aspects.	<p>Activity 1: Provide seed money to self-help groups to enable them to provide start-up loans. An alternative will be to link target groups or self-help groups to banks/MFIs (push).</p> <p>Activity 2: Link target groups to traders/feed mills/breeder farms/ fresh houses for possible contract farming or buy back agreement with input support (push).</p> <p>Activity 3: Encourage communal farming and collective marketing to promote economies of scale and reduce transaction costs. Provide organizational development support and assistance in the development of business model (push).</p> <p>Activity 4: Develop a core group of trainers among refugees and existing BDS providers. Financial sustainability scheme for the training may be anchored on loans provided by self-help groups (push).</p> <p>Activity 5: Support learning events and competitions to promote uptake of training (push).</p> <p>Activity 6: Work with banks/MFIs in the development of financial products (pull).</p> <p>Activity 7: Support buyers in the improvement of contract farming/buy back schemes (pull).</p> <p>Activity 8: Support buyers in the development of their markets. Upgrade food safety compliance (pull).</p>

Constraint 4	Root Causes	Activities
Refugees do not have access to livestock insurance	Refugees are not covered by the government program and many of the host community farmers are not aware of the government's program on livestock insurance and/or do not fully appreciate the importance of having one.	<p>Activity 1: Conduct awareness campaign on livestock insurance in partnership with livestock insurance companies (push).</p> <p>Activity 2: Subsidize 75% of premium if refugees are not eligible for government support (push).</p> <p>Activity 3: Advocate for inclusion of refugees in the government insurance support program (pull).</p>

- a) For **Constraint 1**: Improve feeding practices and nutrition management to reduce feed costs.

This is aimed at helping target groups adopt the most cost-effective feeding regimen using a combination of commercial diets (e.g., for newly weaned pigs) and silage- or forage-based diets (farrow to finish). Feed cost efficiency can also be fostered through streamlining of feed procurement practices.

The push activities will enable the target groups to buy feed materials at lower cost and implement improved feeding practices. The pull activities are aimed at providing target groups the support network that will help strengthen their capacity

to grow pigs at competitive costs and improved profitability.

- b) Improving pig husbandry practices of target groups will address **Constraint 2**.

The implementation of good husbandry practices and biosecurity measures can reduce the risk of occurrence of economically devastating diseases as well as improve efficiency of smallholder pig farming. Activities in this intervention should focus on building the capacities of and access to district livestock offices and other support actors in the value chain. Additionally, working directly with farmers, including the establishment of model farms to showcase benefits of improved practices and spur wider systemic change. To avoid

potential complaints on environmental pollution, organic and natural farming technologies can also be promoted. The establishment of a biodigester can also be explored when scale of production increases.

- c) Regarding **Constraint 3**: Support and strengthen refugees' capacities to start and grow pig farming businesses as well as foster linkages with buyers and financial services providers.

Like in the poultry value chain, this is aimed at imparting skills on business planning, record-keeping, enterprise budgeting, and marketing. The need for improved farm management skills is crucial to maintain business profitability and sustainability.

Additionally, campaigning to increase herd size and number of pig farmers among refugees should also be done in phases to align with growth trends, market absorption, and carrying capacity

of ecosystem. This should be supported with regular snapshot market assessment to reduce risk of market saturation as well as identify market opportunities. Scaling up the number of pig farmers will also provide existing refugee and home community pig raisers a market for their sows and piglets.

- d) Finally, for **Constraint 4**, the project should facilitate access to livestock insurance.

Just as in the poultry value chain, a livestock insurance can help the target groups to increase their resilience to weather shocks and diseases. This intervention should include advocacy efforts for greater inclusion of refugees in existing programs and on the importance of holding insurance. Additional activities can focus on providing subsidies to help the target groups overcome initial barriers to obtaining it.

▶ 10. Conclusion

For decades, Nepal has hosted refugees in its eastern Province 1. These refugees rely primarily on subsistence farming, characterized by low productivity and income. Moreover, these vulnerabilities are also shared by the communities that host them. In light of these circumstances, the United Nations High Commissioner for Refugees (UNHCR) and the International Labour Organization (ILO) collaborated to conduct a Market Systems Analysis in Nepal's Province 1.

The field research and subsequent report employed the ILO-UNHCR approach to inclusive market systems (AIMS), which places refugees and host communities at the forefront of analysis while examining the market system as a whole. The report identified three value chains through the sector selection and subsequent value chain analysis: vegetable, piggery, and poultry. Each sector faces its unique set of constraints and bottlenecks that currently inhibit wider levels of inclusiveness and productivity. However, as the findings of this report demonstrate, each value chain also possesses a high potential and level of opportunities for interventions that address the root causes of these constraints to create decent jobs and greater social inclusion of refugees.

Across all three value chains, a general lack of knowledge on both technical and entrepreneurial topics was identified as a key cause of a variety of bottlenecks. Further constraints across the sectors were commonly linked to a lack of access to high-quality and affordable inputs as well as other factors like livestock insurance.

To address the root causes of these bottlenecks, the project proposed a series of recommendations based on the market systems approach. Rather than adopting a strategy of "one-size-fits-all" or direct delivery of aid to produce immediate alleviations of the challenges, these recommendations emphasize recommendations that ultimately seek to modify the incentives and behaviour of market actors across the system. With activities ranging from linking farmers with product buyers or input suppliers, establishing model farms to demonstrate best practices, or building the capacities of various support actors, the findings from this report seek to support durable and large-scale change in the improvement of refugee and host community livelihoods.

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