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Dottorato di ricerca per il Sistema Agro-alimentare

Ph.D. in Agro-Food System

Cycle XXXVIII

S.S.D. AGR/01

Rural Capacity Building and its role in supporting the integration and competitiveness of Agrifood chains. A comparative analysis of three case studies: Italy, Canada, and Ghana.

Coordinator:

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Matriculation n.: 5214057

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LIST OF ABBREVIATIONS

AAFC – Agriculture and Agri-Food Canada

AFS – Agrifood System

AVC – Agrifood Value Chain

EVC – Egg Value Chain

FAO – Food and Agriculture Organization of the United Nations

FGP – Feed Ghana Program

ICT – Information and Communication Technology

MoFA – Ministry of Food and Agriculture (Ghana)

PHL – Post-Harvest Losses

RPL – Recognizing Prior Learning

SETs – Sector Engagement Tables (Canada)

SMEs – Small and Medium-sized Enterprises

TVET – Technical and Vocational Education and Training

UNDP – United Nations Development Program

ABSTRACT

SMEs in the agrifood sector, involving interconnected actors whose competences are key to rural development and food security, displayed socio-economic resilience in Ghana, Italy, and the Canadian egg agrifood chain. Despite their hard work, they struggle with challenges that hinder progress in the egg agrifood chain, primarily due to costs, regulations, structural constraints, and poor investment. However, impacts vary across these case studies.

The project investigates the role of capacity building in enhancing the integration and competitiveness of egg agrifood chains in three countries: Ghana, Italy, and Canada. The study was conducted in two major phases, employing both primary and secondary data sources through a mixed-methods, comparative case study approach to link empirical data with a contextual understanding of the objectives of this research survey. Due to the limited availability of primary data, the first phase of the methodology relied on survey data collected from agrifood SMEs in Ghana. The second phase employed a comparative case study approach, relying on secondary data sources to assess context-specific drivers and cross-cutting patterns across Ghana, Italy, and Canada.

The empirical findings from Ghana indicate that the sector is dominated by SMEs engaged in production, trading, and food service, with traders playing a key role in the egg supply chain, acting as essential intermediaries connecting producers with consumers. These traders gather, package, and transport eggs to both rural and urban markets. Additionally, the regression analysis confirms that employee training programs and community engagement significantly reduce post-harvest losses, thereby improving the efficiency of the egg agrifood chain. Furthermore, the findings show that most SMEs (68% of respondents) are members of business associations and benefit from collaboration and improved market access. Based on the outcome of the Recognizing Prior Learning (RPL) assessment of knowledge and skills, training needs are highest in areas such as proper storage and handling, record keeping, poultry health, and biosecurity management; consequently, a tailored capacity-building pathway was developed and recommended as a measure to enhance training and skills development. The significant challenges identified through the survey include insufficient capital, limited access to credit facilities, and other operational and structural difficulties.

Compared with Italy and Canada, formalized chains, cooperation, and industry integration help strengthen their position in the global egg market. In Ghana, the egg agrifood chain primarily operates informally and is fragmented, indicating poor linkages and cooperation among value chain

actors. Multiple systemic challenges and an influx of an unskilled workforce, especially in production, undermine Ghana's egg industry. In Italy and Canada, challenges such as high production costs and compliance pressures exist, yet these are addressed through institutional support, funding, and innovation schemes. Ghana's policies aim to boost agriculture through programs like RFJ, FGP, and GPP. Yet, these efforts are fragmented, short-lived, limited in skill-building, and overly reliant on external aid, despite providing temporary support. The agrifood sectors in Canada and Italy benefit from comprehensive regulations, training, and robust institutional frameworks, all of which drive their competitiveness success.

This research recommends that government policies support the industrial requirements of the agrifood system. We also need to adapt lessons from Italy's cooperative model and Canada's supply management to strengthen cooperative SMEs, enhance institutional coordination, prioritize training and skill development in the industry, and implement measures to improve access to credit. Based on these findings, the study introduces an integrated capacity-building framework for Ghana's egg agrifood chain that combines cooperative organization, structured skills development, and enabling infrastructure as key pillars to improve value chain integration and competitiveness. The agrifood chains will be better integrated and more competitive through these strategies, thereby supporting rural growth and food security.

Keywords: Capacity Building, Agrifood Value Chains, SMEs, Human Capital, Social Capital, Value Chain Integration, Competitiveness, Comparative Analysis

CHAPTER ONE

Introduction

1.1 Background

Rural communities, especially in sub-Saharan Africa and other regions, are mainly composed of small-scale farmers with low productivity, an unproductive labor force, varying levels of poverty, a fragile food security system, and poor physical and social infrastructure, collectively posing challenges to the UN Sustainable Development Goals (SDGs). Therefore, it is necessary to find sustainable ways to boost rural vitality by involving residents in development projects to improve their capacity (Koomen, 2011).

Generally, most of what we eat moves through private-sector value chains managed by small- and medium-sized businesses that buy commodities directly from smallholder farmers and then process, package, transport, and sell food products to urban and rural consumers (IFPRI, 2019). Many agricultural raw materials produced by farmers are received and processed by agrifood SMEs (Reardon et al., 2019); this context highlights the strong link between the agricultural and food industries and the need for competitiveness across the agrifood chains. Strengthening the capacity of agrifood SMEs across the value chain can improve competitiveness and contribute to rural development and food security.

The agricultural industry provides the primary raw materials for the food sector; these agricultural products can then increase in value through processing and marketing. Consequently, the key participants in each food value chain include primary producers, input suppliers, and post-harvest service providers. For instance, agrifood SMEs in Ghana are mostly family-run and employ fewer than 10 people. They mainly focus on post-harvest activities, agrifood processing, packaging, and distribution. Most agrifood products in local markets are made from maize, rice, cocoa, palm oil, shea butter, smoked fish, and various other local fruits. Additionally, some of these SMEs are involved in input supply, such as seeds, agrochemicals, and fertilizers.

It is worth noting that the supply chains for each product included these segments and their commercial and social interactions, as well as their environmental, nutritional, and socio-economic outcomes (Ericksen, 2008). These actors, notably the Agrifood SMEs through their commercial and social interactions, have provided strategic prospects towards attaining SDGs, notably Goals 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Well-Being), 8 (Decent Work and Economic Growth), and 9 (Industry, Innovation, and Infrastructure) to foster economic growth.

Agriculture and the agrifood industry also offer significant opportunities in shaping the concept of rural development. The EU Commission's perspective (on rural development) from a territorial approach looks at agricultural supply chains and food systems as an integral part of wider territorial environments, characterized by a specific combination of human, natural, and cultural resources, as well as specific productive and institutional challenges and sustainability issues (European Commission, 2016). Therefore, rural capacity building will require an analysis of the assets and resources available to rural people, as well as the structural processes employed along the agrifood chains, to achieve valued outcomes.

1.2 Problem Statement

Although agriculture and the food industry are closely connected, the development of the food industry may not always benefit agriculture, especially in an economy where the food industry is highly dependent on imported agricultural products rather than domestic ones (Seung-Yong, 2012). Again, the food industry cannot be developed without giving agriculture precedence. This raises concerns about key capacity challenges in the agricultural sector and the need to strategically integrate agricultural production into food systems.

Given the complex interactions among actors in the agrifood system and society, the activities of agrifood SMEs influence assessments of the agrifood chain's competitiveness. Furthermore, these interactions are crucial for integrating sustainable and competitive agrifood chains across firms and sectors, and they also affect livelihoods, economic productivity, and the environment.

Arguably, the agri-food industry's performance in achieving desirable, sustainable outcomes beyond the rural economy depends on the knowledge and skills of Agrifood SMEs across the value chain, from farm to table. Therefore, capacity building among these actors will involve assessing the composition of social and human capital to enhance competitiveness along the agrifood chain.

The agri-food industry is a major economic force, significantly driving employment and a country's economic growth. Canada and Italy rank among the ten largest exporters of agri-food products worldwide. Canada's strong position in the global market stems from its reputation as a trusted supplier of safe, high-quality food and its dedication to environmental stewardship. Canada mainly exports unprocessed agricultural commodities for processing elsewhere and then re-imports them as finished products, according to the Canada Chamber of Commerce. Additionally, the agri-food sector remains vulnerable to extreme weather events and ongoing labor shortages, which have severely impacted trade infrastructure. Access to broadband internet becomes a barrier, especially in remote rural areas. This disrupts supply chain transparency and hampers the use of advanced

technology to increase the productivity of Canada's agri-food sector in these rural regions, as highlighted in the Canada Chamber of Commerce report.

The Italian agri-food industry ranks third in the European Union by production value and is renowned as the country with the most Geographical Indications (GIs). Italian agrifood products remain highly sought after on the global market due to their high quality and safety. The industry is primarily characterized by small and medium-sized, often family-owned businesses that focus on enhancing the uniqueness of their products and differentiating them in the food market. However, these small and medium-sized enterprises (SMEs) are exposed to risks associated with being unprepared to adopt and deploy digital technologies (EU Commission, 2020) to improve productivity, especially amid adverse business conditions.

On the other hand, Ghana remains a major importer of agrifood products because the country's food industry cannot meet the growing diversity of demand. Poor physical and digital infrastructure has impeded business operations within the agrifood industry. There are also reports of high post-harvest losses, irregular raw material supply due to seasonality in agricultural production, and intense competition in agrifood import markets, all of which pose a significant threat to the sustainability of local agrifood SMEs.

In the wake of these challenges, these agrifood SMEs, consisting of highly interconnected multiple actors whose competencies play a crucial role in achieving rural development goals, have demonstrated socio-economic resilience in the agrifood industry and function to create jobs for the rural population, reducing poverty by raising rural incomes, and maintaining a steady food supply throughout the rural economy.

Conversely, various literature reports have established that these agrifood SMEs are not able to reach their potential capacity because of

- declining agricultural productivity due to inadequate investment in agricultural human capital, especially with smallholder agricultural producers, and/or a lack of interest in adopting innovation in agriculture (Abdulai et al., 2023; Ayim et al., 2020; Sackey Teye & Quarshie, 2021).

- the need to meet the current demands of the rapid population growth rates with changes in consumer preferences (FAO, 2024).

- evidence of food insecurity due to climate change, conflict regions, natural disasters, etc (Ghana Statistical Service, 2022)

- the nature and composition of the business of these SMEs (i.e., low capital base, use of traditional technologies, and limited access to credit facilities) [Farrelly & Mitchell, 2023]

Against this background, understanding how capacity-building processes influence the functioning of agrifood chains is essential for enhancing the sector's competitiveness and sustainability. While agrifood SMEs play a vital role in connecting producers, processors, traders, and consumers, their performance is heavily influenced by the skills, knowledge, and collaborative relationships developed within the value chain. However, there is limited empirical research examining how human and social capital contribute to the integration and competitiveness of agrifood chains, especially in developing economies. Addressing this gap, this study explores the role of capacity building in strengthening agrifood SMEs and improving value chain performance across diverse economic contexts.

Therefore, the main objective is:

- to identify the role of capacity building in supporting the integration and competitiveness of agrifood SMEs.

To achieve this, the following specific research questions were raised:

1. What are the roles of agrifood SMEs along the agrifood chains?
2. How do human and social capital influence the activities of the agrifood SMEs?
3. What are the economic-environmental challenges facing the activities of the agrifood SMEs?
4. What sustainable policies and support measures can be adopted to improve the capacity of agrifood SMEs?

Generally, the concept of capacity building has a broader development perspective, encompassing all institutional interventions in the agrifood sector. Hence, this research focuses on a specific analytical concept, namely capacity building, as the process by which agrifood small and medium-sized enterprises (SMEs) enhance their knowledge, technical skills, managerial abilities, and collaborative networks to improve their performance within agrifood systems. The study specifically examines capacity building through the interconnected dimensions of human and social capital, which influence agrifood actors' ability to adopt improved practices, coordinate activities across the value chain, and respond to market and institutional conditions. By emphasizing these dimensions, the research offers a clearer analytical understanding of how improvements in knowledge and skills, and cooperative relationships can strengthen the integration and competitiveness of agrifood chains in various rural contexts.

1.3 Relevance of the Study and the Gap in the Literature

The expected increase in global population is likely to intensify pressure on limited resources, cause environmental harm, increase unemployment, heighten political instability, and raise poverty levels. Therefore, a large population is likely to remain food insecure in terms of quality, safety, and availability, which contradicts the SDGs (8) objective of promoting good health and well-being. The most impacted region is expected to face a downward spiral in rural economic growth.

The developmental role of agrifood SMEs in employment creation, poverty reduction, and rural income generation is discussed in detail in Chapter Two. Similarly, social and human capital assets have been shown to influence socioeconomic development, as most of the literature indicates. These assets can enhance productivity within an economy. Furthermore, reports indicate that a deep understanding of social capital could provide competitive advantages and is essential for a firm's success. Since social capital resources are derived from social networks, establishing connections and relationships with key stakeholders such as customers, suppliers, competitors, business partners, and local communities ultimately influences the firm's performance. Since the performance of agrifood SMEs depends largely on actors' skills and the strength of their collaborative networks, this study analyses human and social capital as key dimensions of capacity building.

The goal of this study is to explore how rural capacity-building can improve the integration and competitiveness of agrifood chains, with a focus on the potential role of social and human capital in promoting socio-economic growth. The research identifies the knowledge and skills used by agrifood SMEs in these chains and employs a suitable framework to assess their strengths, weaknesses, and capacity gaps. As a case study, the research will examine agrifood SMEs in Ghana, Italy, and Canada operating within the poultry industry's egg value chain. This approach aims to deepen understanding of how rural capacity building enhances the integration and competitiveness of agrifood SMEs across different rural contexts globally. Since Ghana is an emerging economy where SMEs are crucial to the rural agrifood sector, they face challenges in skills development, infrastructure, and access to financial services. These issues limit their productivity and competitiveness compared to rural economies in Italy and Canada. Therefore, the insights gained will help Ghana benefit from Italy and Canada's institutional and technological practices through knowledge sharing, supporting policy reforms in the agrifood sector.

Poultry is the dominant livestock subsector in Ghana and a major source of animal protein, yet domestic broiler production remains uncompetitive due to high import penetration and structural

constraints (USDA, 2022; USDA Foreign Agricultural Service, 2024). As a result, production has increasingly shifted toward the egg value chain, which offers a more affordable protein source for consumers and a viable pathway to strengthen local agrifood SME participation. This transition makes the egg agrifood chain a strategic context for analyzing capacity-building needs and competitiveness.

There have been numerous research surveys on the poultry industry in the past, documented in literature; most of which include assessing economic efficiency in small-scale broiler production (Dziwornu & Sarpong, 2014); assessing postharvest losses in the egg value chain (Mensah et al., 2021); examining the choice of marketing outlet among poultry farmers (Bannor et al., 2022), and many others. On aspects of capacity building in Ghana, Quaye et al (2024) explore how the capacity to adopt new technologies and market linkages influences SME competitiveness; Amoako (2025) explores factors that enhance the growth of SMEs in Ghana, highlighting factors like access to finance, managerial support, product quality, and training as key to SME survival.

However, research on capacity building among agrifood SMEs in Ghana remains limited, particularly in studies that combine quantitative analysis with qualitative case-study approaches to value-chain dynamics (Creswell & Plano Clark, 2017; Yin, 2018). Additionally, there has been an inadequate examination of the knowledge and skills that agrifood SMEs possess. To address this knowledge gap, this study explores how capacity building can improve the competitiveness of agrifood chains. Since many rural populations rely on raising layer birds for eggs as their livelihood and income, engaging these producers in capacity-building training will enhance their skills and knowledge, helping them operate more efficiently and sustainably.

Therefore, the results of this research contribute to the literature by emphasizing the relationship between capacity building and the competitiveness of agrifood chains as pathways to rural development and food security from an international perspective. In addition to identifying structural differences among the agrifood sectors of Ghana, Italy, and Canada, this study advances the literature by synthesizing these experiences into a capacity-building framework that links human capital development, institutional coordination, and enabling infrastructure. By integrating empirical findings from Ghana's egg value chain with lessons from more institutionalized agrifood systems, the research proposes a policy-oriented model to strengthen the integration and competitiveness of agrifood SMEs in Ghana.

Furthermore, the findings support policy analysis and recommendations in the agricultural and agrifood sectors, providing insights for potential development actions at the community and national levels. Overall, this research offers insights that may help policymakers, regulators, donor

agencies, NGOs, and potential investors design sustainable interventions to improve the integration and competitiveness of agrifood chains. Finally, it is expected that the information provided on agrifood SMEs, along with the ideas and recommendations generated, will encourage further research in this field.

1.4 Organization of the Study

Following this introduction, Chapter Two outlines the functional structure of agrifood chains and the key actors involved. It highlights the vital roles that agrifood small and medium-sized enterprises (SMEs) play in employment creation, market linkages, and food security. The chapter also discusses the economic and environmental challenges faced by these SMEs, providing contextual motivation for this research.

Chapter Three examines the nature of agriculture and the agrifood industry in Ghana, Italy, and Canada, with a focus on overall industry performance. This is complemented by an analysis of each country's policy framework for agriculture and the agrifood sector.

Chapter Four discusses the general concept of capacity building and emphasizes the context of rural capacity development in Ghana, Italy, and Canada. In line with the research objectives, this chapter illustrated how human and social capital influence the performance of the agrifood chain. It also introduces the theoretical and conceptual frameworks that underpin this study.

Chapter Five describes the methodological approach adopted for this survey, while Chapter Six presents and discusses the empirical findings. Chapter Seven provides a comparative assessment of the egg agrifood chain across the selected countries. Finally, Chapter Eight concludes and offers recommendations based on the findings of this research.

CHAPTER TWO

Agrifood SMEs and the agrifood chains

2.1.1 The functional components of the agrifood chains

According to FAO (2021), the agrifood systems have three main components, namely:

(i) Primary agricultural production of food and non-food products and food of non-agricultural origin (e.g., Synthetic meat).

(ii) Food distribution, linking production to consumption through food supply chains and transport networks.

(iii) Household consumption.

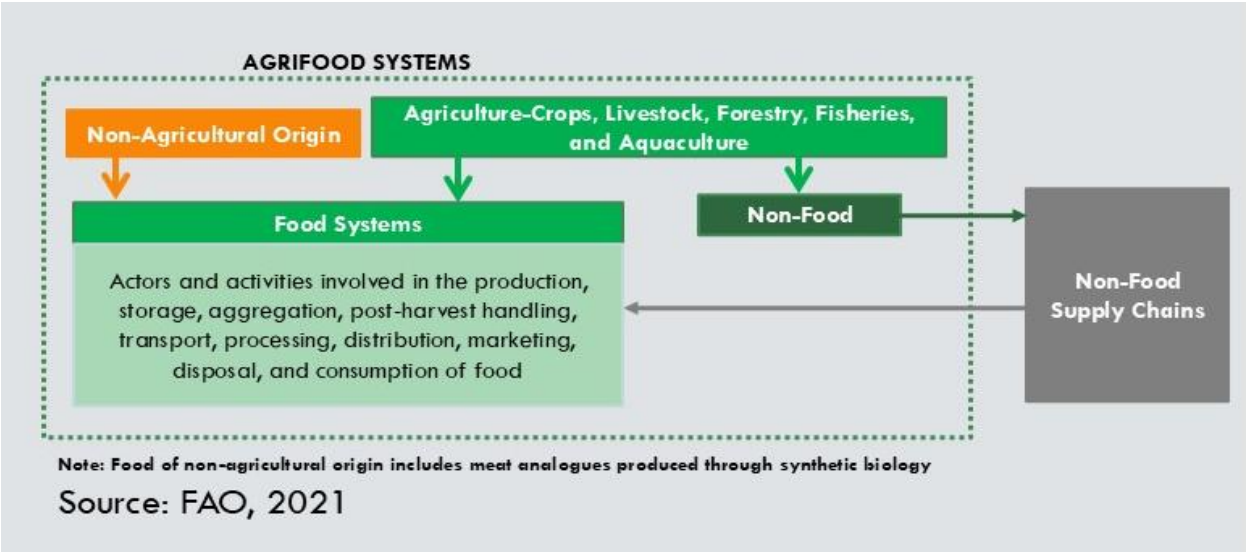
Along with the above components are the respective key actors, including primary producers; those providing input supply, post-harvest, storage, transport, and food processing services; food distributors, wholesalers, and retailers; and households and individuals as final consumers (FAO, 2021).

In this study, it is crucial to distinguish between agricultural and food-processing companies because they operate at different stages of the agrifood value chain and have distinct economic roles. Agricultural companies are primarily engaged in primary production, such as crop farming and livestock raising, where raw agricultural commodities are produced. These firms operate in the upstream part of the agrifood system and supply the fundamental biological inputs needed for food production. On the other hand, processing companies operate in the downstream segments of the agrifood chain, focusing on transforming raw agricultural products into processed or semi-processed foods through activities such as cleaning, grading, preservation, packaging, and manufacturing. Although both types of firms may be classified as agrifood SMEs, their functions differ significantly in production methods, value addition, technological needs, and market focus. Recognizing this difference helps clarify the structure of the agrifood chain and enhances understanding of how various actors contribute to value creation from farm to table.

The production of raw foods is supported by the management of agricultural inputs and, in some cases, by the employment of hired labor on larger farms. Furthermore, production depends on climate conditions, land tenure, government subsidies, input prices, and the agricultural technologies used. For example, in Ghana, the Planting for Food and Jobs (PFJ), launched by the government, provided farmers with subsidized fertilizers and seeds to boost farm-level production and increase farmers' revenue. It is also noteworthy that agrifood SMEs receive and process a significant amount of raw materials produced by these rural farmers. This direct relationship with

producers is undoubtedly the foundation of the integration that links the agricultural and agrifood industries.

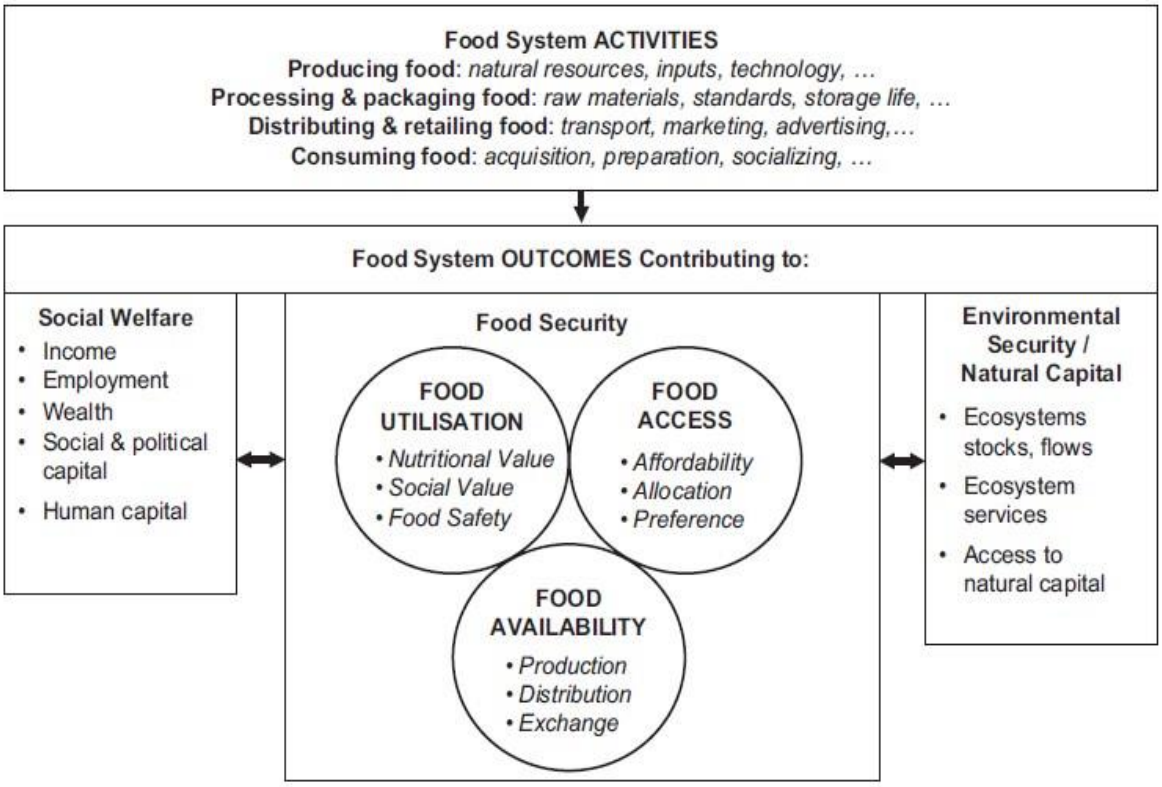
Figure 2.1a Conceptual Framework for Agrifood Systems



Additionally, value-added activities take place during the processing and packaging of raw food materials into finished products (Ericksen, 2008). These involve a series of steps and transformations necessary to turn an agricultural product into a ready market item. However, the factors influencing these activities also vary significantly from those affecting farm-level production.

Following the activities of the distribution and retail networks (through both vertical and horizontal integration among key actors), improved transportation routes enable food to travel from one place to another and be made available on the market. Again, these aspects of agrifood chains are influenced by transportation infrastructure, trade regulations, government transfer programs, storage requirements, and the market in which they operate (Ericksen, 2008). According to Ericksen (2008), household consumption includes what people decide to eat once the agrifood product is readily available on the market. However, the decision to choose what to consume is also influenced by a household's income level, cultural or traditional preferences, social values, education, and health status.

Figure 2.1b Components of food systems



Source: Ericksen (2008)

2.1.1 Relevance of SMEs in the Agrifood System

The agrifood system can be viewed as a broad concept that encompasses the agrifood supply and economic activities of all participants (Seung-Yong, 2012) in the agricultural and agrifood industries, from farm to fork, including the various institutions and policies that influence their business operations.

Most rural communities are primarily composed of small-scale farmers with low productivity, an unproductive labor force, varying degrees of poverty, a fragile food security system, and poor physical and social infrastructure. However, some of these communities are also endowed with diverse and differentiated natural and cultural systems that support the competitiveness of the agricultural and agrifood industries.

From these resources, agrifood SMEs draw on distinct recipes and traditions, such as traditional production and processing techniques in the culinary arts, which add value to agriculture and the agrifood industry. According to the EU Commission report (2020), these recipes certainly enable the production of highly differentiated quality products with social and environmental benefits (European Parliament, 2021). In Italy, SMEs produce a range of distinct food products, including fresh and dried pasta, as well as various cheeses such as Parmigiano Reggiano and Pecorino

Romano. In Ghana, food products like the *Sobolo* (Hibiscus Drink) and Shito (Ghanaian Hot Pepper Sauce), a smoky, spicy condiment made with dried fish, shrimp, oil, and chilli peppers, are produced by SMEs. Multinational agrifood industries, however, rarely replicate such traditional practices.

In terms of sustainability, SMEs play a vital role in biodiversity conservation, local economies, and climate resilience. Thus, through traditional food processing methods and responsible resource use, they can prioritize environmental impact more than multinational agrifood industries, which tend to prioritize efficiency over environmental impact (Lapitan, 2025). Therefore, SMEs serve as the conduit through which distinct knowledge, practices, values, and behaviors are transmitted and preserved across generations. Notably, traditional farming techniques (e.g., irrigation methods, cultivation and harvesting practices of some crops), food preparation methods, and social norms are blended with other resources in the food culture.

With the above, it is evident that their position in the rural economy is of immense significance. This includes improved rural income levels through employment opportunities and enabling farmers to access market outlets for their produce. It is also reported that these SMEs have made considerable investments in agrifood supply chains, thereby improving the socioeconomic welfare of the rural populace (Reardon et al., 2019). Moreover, since they are in contact with the local population, they understand the local population's livelihood needs and dietary habits, which subsequently enables them to provide a variety of affordable local food products (Ilie et al., 2022) to meet the rural population's preferences and income levels.

Through the activities of these local agri-food industries, some rural communities have demonstrated high resilience and strength during economic recessions, demographic shifts, and natural disasters (Fleming et al., 2018). For example, non-farm employment opportunities provided by SMEs to young people have helped reduce youth outmigration in rural areas (Ilie et al., 2022) and support vulnerable populations within these communities.

2.1.2 Definitions and Key Features of SMEs

Generally, small and medium-sized enterprises (SMEs) are businesses that meet revenue, asset, or employee thresholds. Each country has its own definition of what constitutes a small and medium-sized enterprise (Investopedia, 2024). SMEs are usually classified (as shown in Figure 2.2a) by the number of employees, turnover, or capital. However, other key factors, such as legal status and management complexity, may also be considered (van Manen et al., 2018). According to an official European Commission (EC) report, SMEs are defined as enterprises with fewer than 250 employees

and either an annual turnover of up to EUR 50 million or a balance sheet total of up to EUR 43 million. Within the SME population, micro-SMEs employ fewer than 10 staff, small SMEs employ 10 to 49 staff, and medium-sized SMEs employ between 50 and 249 staff (Katsinis et al., 2024).

Figure 2.2a Criteria for defining SMEs

Enterprise Category	Employees	Turnover	Balance sheet total
Micro SME	0 to < 10	< €2 million	< €2 million
Small SME	10 to < 50	< €10 million	< €10 million
Medium-sized SME	50 to <250	< €50 million	< €43 million

Source: Commission Recommendation of 6 May 2003 concerning the definition of micro, small, and medium-sized enterprises (2003/361/EC), Official Journal of the European Union, L 124/36, 20 May 2003

Meanwhile, the Business Development Bank of Canada (BDC) defines SMEs in Canada as businesses with fewer than 500 employees, which accounts for 99.8% of businesses in the country. The BDC clarified that a small business typically has 1 to 99 paid employees, while a medium-sized business has 100 to 499. As of December 2022, there were 1.22 million SMEs in Canada, which have provided close to 8 million jobs across various sectors (BDC, 2024).

The Ghana Statistical Service (GSS) defines small and medium enterprises as any business entity with fewer than 10 employees for very small enterprises, and any firm with more than 10 employees for small and medium enterprises. Additionally, the Ghana Enterprises Agency (GEA) stated that SMEs consider employee numbers and fixed assets, including plants and machinery, to be no more than 10 million Ghana Cedis (equivalent to 600,000 euros). Most of these agrifoods SMEs are independent small businesses with relatively low logistics costs, limited capitalization, and a reliance on local technology. Furthermore, their business activities tend to be less diverse, labor-intensive, and heavily reliant on a casual, low-skilled workforce with on-the-job training, and generate low returns on capital (van Manen et al., 2018).

Many SMEs serve local open-air markets, supermarkets, schools, and hotels, while a few participate in export markets with products such as dried fruits, cocoa-based goods, and others. Those involved in export markets have shown some progress in terms of quality and safety compliance, whereas SMEs serving the domestic market often rely on informal quality checks. Additionally, most have limited access to credit facilities, as many financial institutions consider their businesses high risk. As a result, they depend on family loans, personal savings, and microfinance for capital. Despite this, their activities are heavily influenced by the seasonality of the agricultural production cycle.

Consequently, while many focus on post-harvest activities, a few operate along input supply chains for products like seeds, agrochemicals, and fertilizers.

Figure 2.2b Summary of SMEs definition in Ghana

Enterprise Size	No. of Employees	Revenue (including fixed Assets and Machinery) in Million Cedi's
Medium	Fewer than 50	≤ 10
Small	Fewer than 30	≤10
Very small	Fewer than 10	≤10
Micro	Fewer than 6	≤10

Source: GCB Bank Plc (2023)

To add to the context above, the FAO (2024) defined Agrifood SMEs as profit-driven enterprises involved in agricultural value chains, either directly or by providing enabling services to value chain actors, with revenues, assets, or the number of employees.

2.2 Agrifood SMEs have created employment opportunities along the Agrifood chains

Regardless of the nature and size of business activities, there is evidence of their vital role in rural development, including the creation of employment along the supply chain from food production through processing and transportation to consumers. Timmer (2005) argued that supporting the agri-food sector through SMEs is a more effective strategy for poverty reduction. These companies are also more likely to hire vulnerable groups, such as women and young people (Dolislager et al., 2020), and to absorb the labor surplus resulting from the rapid growth of the young population. This will require developing a non-agricultural rural sector by strengthening SMEs' role in the agrifood sector.

According to the FAO (2023) report on employment in the agrifood sector, 1.23 billion people are employed in the sector, of whom 857 million work in primary agricultural production and 375 million in the off-farm segments of agrifood systems. Approximately 3.83 billion people, representing nearly half of the world's population, rely on the agrifood system for their livelihoods (Davis et al., 2023), with 2.36 billion residing in Asia and 940 million in Africa. Again, of the 1.23 billion people employed in the sector, the largest share, 793 million, is in Asia, followed by nearly 290 million in Africa. Data from the FAO's Rural Livelihoods Information System (RuLIS) database also show that youth (people aged 15 to 35 years) constitute about half of all workers in the agrifood system and are mainly concentrated in food processing and services. Additionally, the report reveals that 62 percent of employment in Africa is in agrifood systems, which also include relevant trade and transportation activities, whereas the percentages in Asia and the Americas are 40 and 23, respectively.

A brief analysis of a report by Dolislager et al. (2020), which used national data from six countries (Ethiopia, Malawi, Niger, Nigeria, Tanzania, and Uganda) and some selected countries in Asia and Latin America, revealed that employment in agrifood SMEs (either wage or self-employment) across rural areas accounted for 24% in Africa, 18% in Asia, and 21% in Latin America. Meanwhile, the share of off-farm employment not directly linked to the food sector was 34% in Africa, 43% in Asia, and 50% in Latin America. This increase was attributed to people moving into service-sector jobs as development reaches these rural regions. The report also showed that urban agrifood SME employment was 31% in Africa, 27% in Asia, and 22% in Latin America. Further disaggregation of food system employment into wage and self-employment showed that self-employment accounted for 83% in rural Africa, compared to 65% in urban Africa. However, the share of own-farming employment of full-time equivalent (FTEs) was 39% in Africa, as rural households tend to have diversified employment. Meanwhile, farm wage labor was 3% in Africa, 13% in Asia, and 12% in Latin America, reflecting differences in agricultural development and off-farm opportunities.

It is still projected that the food economy in West Africa will reach USD 480 billion by 2030, with the non-agricultural sector expected to account for 49% of value added (Koffi, 2020). There is no doubt that demand for labor is growing across activities such as processing, marketing, and other services, including food-away-from-home. Consequently, the labor-intensive nature of these SMEs creates opportunities for decent and permanent jobs for youth and women. Additionally, due to rising demand for diversified diets (and changing consumption patterns), many African countries are experiencing rapid growth in subsectors such as poultry and fish (Liverpool-Tasie et al., 2021; Liverpool-Tasie et al., 2017; Gona et al., 2018). For instance, the poultry industry and the maize value chain in Nigeria are reported to employ around 1 million people directly. Moreover, in Nigeria, urban maize traders efficiently use third-party logistics services to transport approximately 80% of the country's maize (Liverpool-Tasie et al., 2017; Liverpool-Tasie et al., 2021).

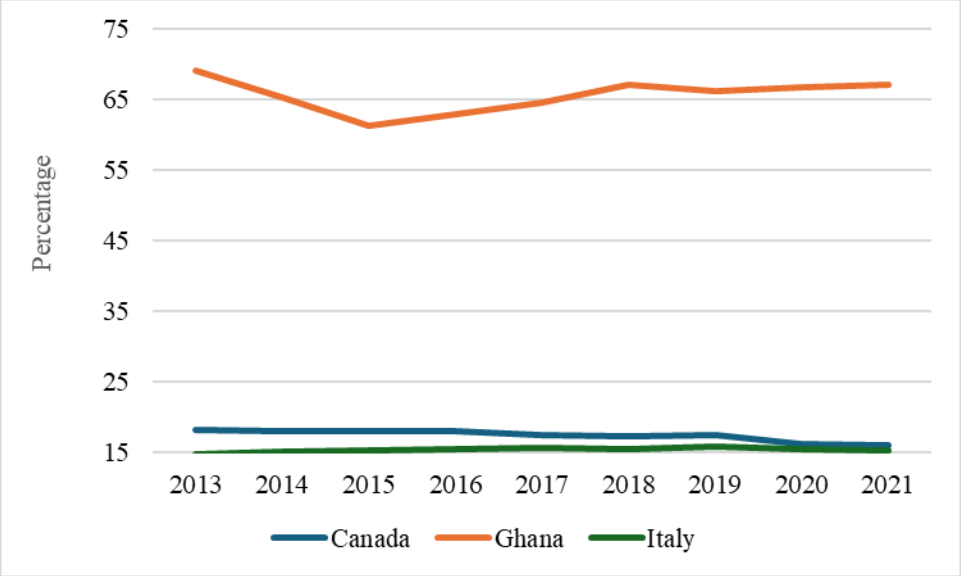
It is also valuable to recognize that SMEs are a significant source of innovation, growth, and employment in Europe (Confindustria Toscana Servizi, 2021). SMEs make up over 99% of businesses in the European Union (EU), making them a central part of the EU’s economy. A report from the European Commission (EC) added that SMEs are the driving force behind the EU’s industrial ecosystem (Katsinis et al., 2024). In that report, SMEs account for 99.8% of all enterprises in industrial ecosystems as non-financial business entities. With 25.8 million SMEs employing 88.7 million people, they play a significant role in the EU’s employment and value creation. Conversely, the most common SME size is the micro-enterprise, accounting for 94% of

SMEs in 2023. In terms of employment, micro-enterprises make up 46% of total SME employment, followed by small SMEs at 30% and medium-sized SMEs at 24%. The share of the agrifood industry (including plant and animal production and food processing) within the EU industrial ecosystems is 2.6%, compared to 25% in construction, 23% in retail, and 14.5% in tourism. Within the agrifood industry, micro-enterprises account for 87.9% of employment, with shares of 17.9% for micro-SMEs, 19.6% for small-SMEs, and 20.4% for medium-SMEs.

Italy ranks second in the EU for its extensive industrial base of enterprises specialized in food and beverage manufacturing. It mostly leads the European fruit and vegetable processing and preserving industry, boasting the highest turnover and consolidated manufacturing expertise, with over 1,600 specialized enterprises (Eurostat, 2022). In 2023, the agrifood sector employed over 4 million workers (Eatable Adventures, 2023), while in Canada, the agriculture and agri-food sector employed 2.3 million (Agriculture and Agri-Food Canada [AAFC], 2024).

2.2.1 Agrifood System Employment

Figure 2.3a Share of agrifood System employment in total employment

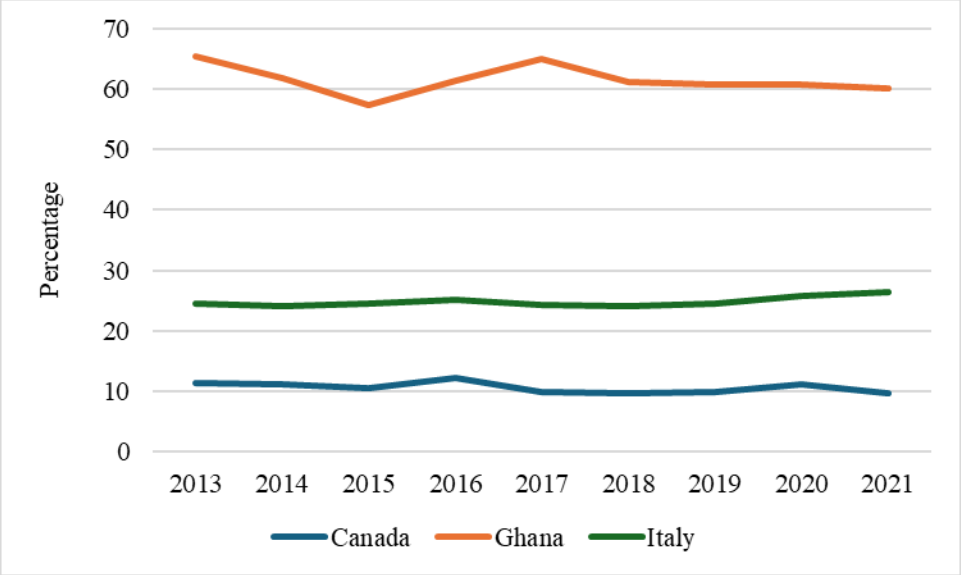


Source: FAOSTAT

The Figure above (2.3a) shows that Ghana has a higher proportion of people employed in the agrifood sector than Canada and Italy. This aligns with reports indicating that in Africa, more than 62 percent of employment is in the agrifood system (FAO, 2023). Additionally, employment Figures in Canada's and Italy's agrifood sectors are gradually declining, suggesting a decrease in interest in agrifood jobs. Delving further into the analysis, agricultural-related employment in the agrifood system (as shown in Figure 2.3b) remains higher than non-agricultural employment in Ghana. Nevertheless, the reverse was evident in Canada and Italy, which recorded higher and

steady employment rates in non-agricultural agrifood employment within the agrifood system (Figure 2.3c).

Figure 2.3 b Share of agricultural employment in total AFS employment

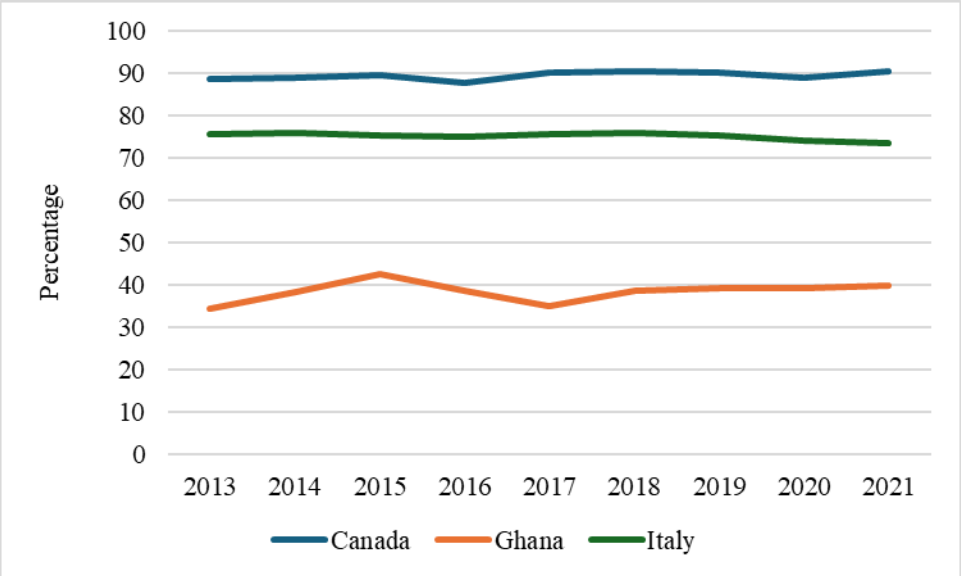


Source: FAOSTAT

This can be attributed to the extent of innovation used to enhance post-harvest activities across the agri-food chain. Moreso, agrifood SMEs in developed economies are a significant source of innovation, growth, and employment.

In general, the share of the population employed in agriculture has declined, while jobs have been created in upstream and downstream value chains and other sectors (FAO, 2023).

Figure 2.3c Share of non-agricultural AFS employment in total AFS employment



Source: FAOSTAT

2.3 Agrifood SMEs have created supplier linkages for small-scale farmers and helped elevate rural incomes

Rural households' farming activities underpin the food system (FAO et al., 2020), making their role along the food supply chain particularly important. As mentioned in Chapter 1, most of the agricultural raw materials produced by farmers are received and processed by agrifood SMEs (Reardon et al., 2019). Therefore, the agricultural industry provides the primary raw materials the food industry requires, underscoring the connection between the two.

A smallholding, or smallholder, is a small farm operating under a small-scale agriculture model (Babu et al., 2009). However, many reports in the literature have defined it as an array of factors, including size, food production techniques or technologies, family involvement in labor, and economic impact (Khalil et al., 2017). Generally, the FAO defines smallholders as small-scale farmers who manage areas ranging from less than one hectare to 10 hectares (HLPE, 2013). The reference population comprises food producers, including farmers, herders, foresters, fishermen, and aquaculture producers, who produce food products. There are more than 600 million smallholder farms worldwide, working on less than two hectares of land, which are estimated to produce 28-31% of total crop production and 30-34% of the food supply on 24% of the gross agricultural area (Shroff, 2022). Whereas the EU had about 10 million agricultural holdings in 2022, the majority of which were less than 5 ha in size (Rossi, 2022).

According to IFAD's field report, an estimated 3 billion people (about 40 percent of the global population) live in rural areas of developing countries. Chiefly, this population depends on small, family farms for their income and sustenance. These small farms can play an important role in reducing the risk of rural poverty and providing additional income and food (Eurostat report, 2022). Moreover, smallholder farms account for about 80 percent of production in sub-Saharan Africa and parts of Asia (IFAD, 2021). Unfortunately, there is clear evidence that, despite these smallholder farmers' efforts, they are plagued by varying degrees of poverty and hunger.

The role of smallholder farmers in tackling food security challenges does not overshadow the important role of Agrifood SMEs along the food supply chain; farmers undoubtedly interact with various actors, such as product traders, logistics companies, processors, and retailers, when they connect with markets. These SMEs buy commodities directly from smallholder farmers and then process, package, transport, and sell food products to both urban and rural consumers (IFPRI, 2019).

Supporting the role of Agrifood SMEs in reducing poverty among smallholder farmers, regions across East and Southern Africa have seen supplier connections for millions of smallholder farmers, boosting their incomes (TechnoServe, 2017). The Solutions for African Food Enterprises (SAFE) project, which operated from 2012 to 2017 in Ethiopia, Kenya, Malawi, Tanzania, and Zambia, provided technical and business support to 127 food processors and created stable market opportunities for over 800,000 smallholder farmers, who support an estimated 4 million family members. In addition to strengthening the African food processing sector, SAFE helped processors establish over 119 market linkages.

According to another report, 95 percent of the total small farm supply in Africa is received by SMEs, either directly or through other SME wholesalers (Reardon et al., 2019b). Indeed, these SMEs have invested significantly in creating markets for farmers in Africa and have provided strategic opportunities to achieve Sustainable Development Goals 1 (End Poverty) and 2 (No Hunger), as well as to improve the general welfare of smallholder farms.

The FAO implemented a project titled "Strengthening Linkages between Small Actors and Buyers in the Root and Tuber Sector in Africa" in seven African countries, including Cameroon, Benin, Ghana, Côte d'Ivoire (Ivory Coast), Malawi, Uganda, and Rwanda. The project aimed to improve the livelihoods of small producers engaged in the roots and tubers value chain in the selected countries by promoting linkages to domestic and regional markets (FAO, 2019).

In Ghana, the project focused on cassava-growing areas in selected districts. It successfully enhanced the skills of 157 value chain actors in contract negotiation and good manufacturing practices. Moreover, individual farmers with limited access to major market outlets can now sell their fresh cassava roots to buyers. Forty-six (46) farmers secured loans ranging from USD 4,000 each from microfinance institutions to invest in processing equipment. Lastly, yields have increased from 12 metric tons to 18–20 metric tons per hectare. This yield increase is primarily due to the introduction and planting of improved cassava varieties, as well as farmers' adherence to good agronomic practices throughout the project.

On the other hand, smallholder farms in developed countries enjoy better conditions, such as access to capital, advanced technology, and supportive policies, allowing some smallholders to grow larger. However, they are still much smaller than corporate farms (Rossi, 2022). For instance, the agricultural and food sectors are key parts of the Canadian economy, with export growth reaching 103% over the past 10 years (Mitacs, 2022). Other reports indicate that nearly half of Canadian agrifood products are exported annually, valued at $92 billion in 2024 (Government of Canada, 2025a), so Canadian farmers undoubtedly benefit from this export market.

Also, it is a priority for the Canadian government to support SME agrifood producers in gaining access to global markets and expanding trade relationships with the largest economies (e.g., China). For this reason, the government, through the Agri-Marketing Program, has disbursed funding to SME agrifood producers and farmers' organizations to boost business operations, gain access to export markets, and help them charge more for their products (AAFC, 2024).

The government of Canada emphasizes the role of the Canadian agrifood sector in connecting farmers, suppliers, and processors to deliver fresh, nutritious, and local food, while driving economic growth, creating jobs, and strengthening communities. The report revealed the government's commitment to investing $12 million in Southern Ontario's agrifood sector to build a stronger and more sustainable industry. The Canadian Food Innovation Network (CFIN) has 6,000 members from across the food value chain, connecting the Canadian food ecosystem to fresh insights, ideas, and technologies that help businesses grow and increase their innovation capacity (Government of Canada, 2025b).

There are indications that the connection between agrifood SMEs and smallholder farms has had a significant economic impact on the industry and the livelihoods of those involved. For example, in Nigeria, the increased demand for meat, fish, and poultry has boosted the need for feed and feed milling, with feed production increasing by 600% over a decade, from 300 thousand to 1.8 million tons (Liverpool Tasie et al., 2017). The feed was mainly made from maize brought to mills by traders. This surge in demand also led SMEs to provide value chain finance to farmers, giving feed on credit to fish and chicken farmers and wholesalers. This has established a strong business connection among farmers and other key players in Nigeria's maize-feed-chicken system.

Once again, organic honey producers in Southwest Ethiopia who participate in contractual supply have seen their annual income increase by approximately $426.7 to $472.8 compared to selling their product on the local market (Meshesha, 2011). Contract farming has also provided small-holder farmers with a reliable, stable market, ensuring steady income. Taremwa et al. (2023), based on a survey of the impact of contract farming among smallholder dairy farmers in Rwanda's Eastern Province, reported that contract farming has a significantly positive effect on farmers' income. Farmers who adopted contract farming earned an average of $135 more than those who did not.

2.4 Food Security

2.4.1. Global Perspective

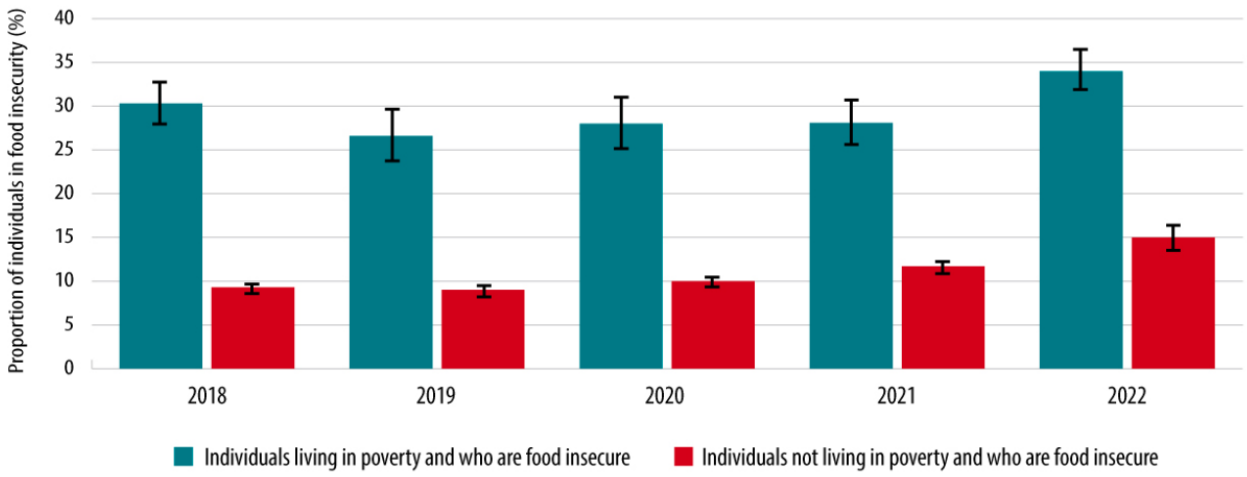
Historically, a series of shocks (including war, natural disasters, political and economic instability, and the recent COVID-19 pandemic) have posed significant challenges to food security worldwide, particularly in Africa (Committee on World Food Security, 2013). Indeed, Africa faces the highest

levels of malnutrition, with about 20 percent of its population (257 million people) undernourished (FAO et al., 2022). Similarly, over 20 million people and at least 10 million children in Africa experienced severe food shortages due to crop failures and four consecutive dry seasons (UNICEF, 2022). Meanwhile, a research survey on food poverty and insecurity (particularly economic access to food and consumption of healthy diets) found that moderate and extreme food insecurity affect nearly 9% of the population in Europe and North America (Marchetti & Secondi, 2021).

In another 2021 report, global hunger increased significantly, with the African continent heavily affected: 702-828 million people were affected by hunger (Ordu & Ntungire, 2023). Other studies indicate that domestic wars and conflicts have worsened food insecurity across sub-Saharan Africa (Wudil et al., 2022). While FAO confirmed that between 691 and 783 million people faced hunger in 2022, and Africa continues to be the region with the highest estimated proportion of the population facing hunger (i.e., 20.4 percent) compared to 8.1 percent in Asia, 6.2 percent in Latin America and the Caribbean, and 7.3 percent in Oceania (FAO et al, 2024).

According to the Human Rights Watch (2023), about 22 percent of people in Italy are at risk of food poverty or food insecurity. Worsening pre-existing problems with social exclusion and fair resource distribution, grocery and unprocessed food prices increased by 8.2 percent between June 2021 and June 2022. Likewise, an analytical report based on microdata from the Italian Household Budget Survey, conducted by ISTAT to identify and measure different levels of food poverty and insecurity, found that 22.3% of the Italian population faces these risks. However, regional variations exist, ranging from 14.6% in Umbria to 29.6% in Abruzzo (Marchetti & Secondi, 2021).

Figure 2.4 Proportion of Individuals in food insecurity by poverty status, Canada (2018-2022)

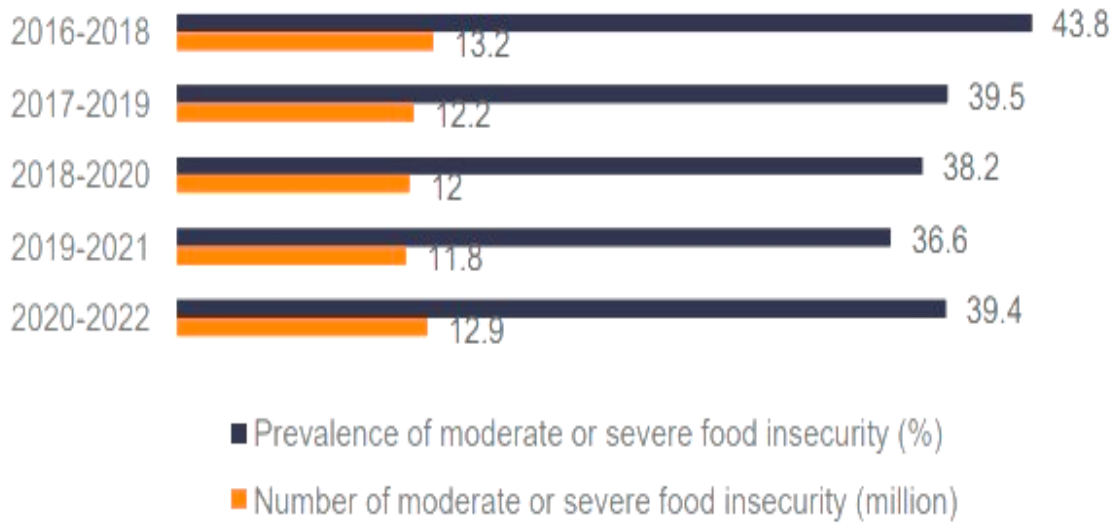


Source: Statistics Canada, 2024

In 2022, 16.9% of Canadians faced food insecurity, up from 12.9% in 2021 (StatsCAN, 2024). The share of households experiencing food insecurity rose by 5.3 percentage points from 2018 to 2022 (StatsCAN, 2024). Figure 2.4 indicates that food insecurity was more common among those living in poverty (34.0%) compared to those not in poverty (15.0%), with increases of 3.6 and 5.8 percentage points, respectively. Newfoundland and Labrador had about 47.6% of its population living in poverty and experiencing food insecurity, while Quebec had the lowest food insecurity rate at 9.3%.

According to a CARE Ghana (NGO) survey, the number of individuals experiencing food insecurity increased by 47%, encompassing issues related to access, availability, and utilization. In other words, the number of people in food crises rose from 560,000 to 823,000 in 2022. The report further stated that 12.9 million people (39.4%) in Ghana were affected by moderate or severe food insecurity, as shown in Figure 2.4b. The rise in numbers was primarily due to food price inflation, which averaged 34% (higher than the overall inflation rate of 29%), resulting in over 850,000 Ghanaians falling into poverty (CARE, 2023).

Figure 2.4b Moderate or Severe Food Insecurity in Ghana



Source: CARE, 2023

The impact of food inflation was even more severe for lower-income individuals, who spend a larger portion of their income on food, the report added. The highest levels of food insecurity were found in the four northern regions, especially in the Upper East (73.7%), Upper West (61.8%), Northeast (65.6%), and Savannah (58.8%). At the same time, the Greater Accra Region had the lowest at 27.2%.

2.4.2 Role of Agrifood SMEs in Food Security

Many scholars have emphasized that Agrifood SMEs play a vital role in key aspects of food security as defined by FAO (2006), including food availability, access, utilization, and stability. They do this by ensuring the availability and accessibility of nutritious food along the supply chain. Since most SMEs operate mainly in rural communities, they can produce a variety of affordable food products to meet local dietary needs and income levels. Additionally, they provide employment opportunities and generate cash for purchasing food. Through their activities (such as post-harvest handling, food processing, distribution, storage, and transport), they help ensure a stable supply of affordable, quality, and safe food over time, which is fundamental to food security.

It is worth noting that, due to significant investments by these SMEs in the agrifood sector, the sector has significantly evolved over the decades. It has shifted from the sale of loose, unpackaged, and unbranded products to packaged, branded products in small shops, kiosks, food service outlets, and supermarkets, thereby improving accessibility and convenience for consumers. This shift is particularly evident in developed economies, where these businesses use innovative techniques along the agrifood supply chains.

For example, in Tanzania, the sale of nutritious maize meal has dominated both the urban and rural food markets. Additionally, SMEs produce and package high- and ultra-processed foods, such as chips, donuts, and cookies, which compete with products from large enterprises in Tanzania (Reardon et al., 2021a). Similarly, in Ethiopia, consumers increasingly bought processed teff products (teff pancakes/injera) from SMEs. Besides, dairy SMEs in processing, logistics, and wholesale are the mainstay of Uganda's milk supply (Van Campenhout et al., 2021).

Both Canada- and Italy-made agrifood products are widely recognized globally for their high quality and safety standards. About half of Canada's primary agricultural output is exported as either raw commodities or processed food and beverage items. This industry has established a strong presence in both local and international markets, largely thanks to the significant contributions of agrifood SMEs. Food retailers, wholesalers, and other food service entities are vital links in connecting producers with consumers. The industry, characterized by highly interconnected actors, mostly family-owned SMEs, particularly in Italy, emphasizes enhancing the distinctiveness of its products to meet rigorous quality and safety requirements. These factors highlight their crucial role in food security.

The Food and Agriculture Organization of the United Nations (FAO) estimates that around 37% of food produced in sub-Saharan Africa is lost at various points along the value chain (EIB, 2023). In

Kenya, for instance, a report indicates that about 56% of horticulture products go waste before reaching the market. Arguably, agrifood SMEs have made significant efforts to ensure consumers have access to a steady supply of high-quality, affordable food products. As a result, investments by food-processing SMEs have reduced food waste throughout the supply chain. Currently, some processing SMEs in Kenya can rent (or have) cold storage facilities to support their food businesses (EIB, 2023), whilst others have reduced waste, such as with dry tomatoes and dry and smoked fish (Reardon et al., 2021). On the other hand, transport agrifood SMEs have reduced transport costs, enabling them to produce teff products at lower prices for consumers in Ethiopia. Likewise, in Nigeria, the rise in the number of fish-smoking and drying SMEs has reduced the seasonality of fish in the region.

In response to the increasing global food insecurity, Canada has committed to investing in green agribusiness, climate-smart projects, and nature-based agricultural solutions in Africa. Consequently, the Canadian government has pledged $100 million through the African Development Bank (AfDB) to support the growth of small and medium-sized agrifood enterprises (Global Canada Affairs, 2022). These SMEs are crucial to bolstering Africa's food security and creating employment opportunities, as they produce, process, and transport approximately 90% of the region's food.

2.5 Economic-environmental challenges facing the activities of the agrifood SMEs

In the wake of the burgeoning global population, the subsequent rise in food demand, and changes in consumer preferences, these factors are expected to exert intense pressure on limited resources, resulting in environmental degradation, increased unemployment, and higher poverty rates. Moreover, the incidence of climate change, natural disasters, and conflicts in regions has also posed a threat to food security and the attainment of SDGs, including 1 (No Poverty), 2 (Zero Hunger), 3 (Good Health and Well-Being), 8 (Decent Work and Economic Growth), and 9 (Industry, Innovation and Infrastructure). Indeed, considering the above situation, coupled with inadequate investment in human capital along agrifood chains, has severely affected the competitiveness of agrifood SMEs.

To identify the challenges affecting the activities of these SMEs along the Agrifood chains, it is essential to explore the internal components of the agricultural and agrifood systems, how they interact, and their overall impact on the environment, nutrition, and socioeconomic outcomes (see Figure 2.5). Earlier in this literature, it was noted that the agrifood system is a broad concept encompassing complex interactions with resources throughout the agrifood chain (from farm to fork). For instance, Figure 2.5 below illustrates that the agrisystem encompasses agricultural production, food supply chains, consumer behaviour, and diets, and shows how these elements

connect with supporting systems, such as the environment, transportation, and energy systems, to achieve sustainable outcomes (FAO, 2023). It also highlights that the overall agricultural and agrifood industry relies on the state of natural, human, social, and produced capital, and on their effects, for the competitiveness of agrifood chains.

Therefore, based on the above context, the main economic and environmental challenges impacting the activities of agrifood SMEs can be categorized as natural, human, social, and produced (built and financial) capital challenges. These challenges, however, are not exhaustive, and other potential issues may also exist.

2.5.1 Natural Capital Challenges

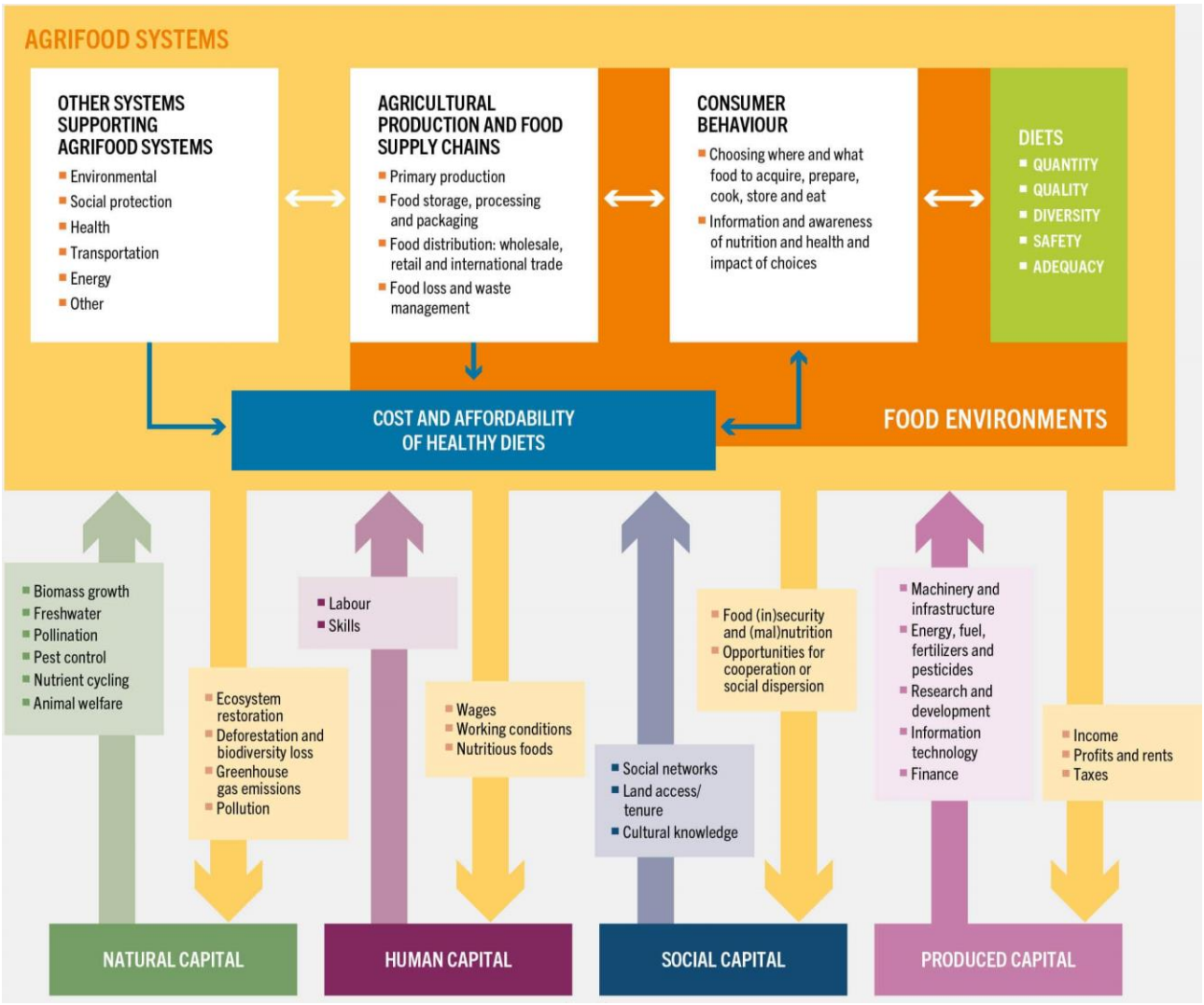
Natural capital refers to the stock of renewable and non-renewable natural resources that provide benefits to people (FAO, 2023). These resources include biomass growth, pollination, nutrient recycling, pest control, and freshwater, all of which support activities within the agrifood system. However, some factors have negatively affected this flow of natural capital, including extreme weather events (floods, droughts, rising temperatures, etc.), which threaten agricultural production and increase costs for agrifood SMEs. Additional factors include soil erosion, water scarcity, and pollution of soil and water resources. For instance, illegal small-scale mining in Ghana has harmed the environment, exacerbated water scarcity, and damaged farmland and crops such as cocoa (Aikins, 2024). Similarly, the Canadian Prairies are among the world's most variable and drought-prone agricultural regions (Stewart et al., 2023), posing significant challenges to local agricultural productivity.

The increased demand for food and energy crops by humans is predicted to contribute to the ongoing intensification of European agriculture through the Common Agricultural Policy (CAP). However, it also poses environmental and sustainability challenges (EEA, 2022). For example, the CAP has promoted more intensive agriculture, increased chemical use per unit area, and led to the abandonment of less productive regions, among other impacts (Emmerson et al., 2016). These practices may have diminished both the quantity and quality of habitats for many plant and animal species, as well as disrupted ecosystem processes essential to agricultural productivity at scales from local to large. Addressing the rising food demand driven by global population growth remains a major challenge in the agrifood sector, especially as efforts to minimize environmental impacts increase. Additionally, food producers compete for scarce resources such as land, water, and energy, further degrading the natural environment (Tilman et al., 2001).

As revealed by Emmerson et al. (2016), the ecological network of interacting organisms, including the biodiversity elements that the agricultural ecosystem harbours, provides a range of beneficial

ecosystem services that support the production of food and other commodities in agroecosystems. Unfortunately, practices such as intensive farming have led to significant biodiversity loss and soil degradation. Equally, the loss of biodiversity driven by intensive farming is judged to be of a similar scale to that expected from climate change (Tilman et al., 2001). Intensive farming practices, including increased use of fertilizers, pesticides, and machinery, as well as structural adjustments to farmland, contribute to declines in biodiversity (Flohre et al., 2011a). Excessive fertilizer use is reported to alter soil composition, leading to nutrient imbalances and reduced microbial activity. Similarly, the use of pesticides has also affected beneficial insects, birds, and other wildlife that act as pollinators, whose activities are essential for crop reproduction (Pure Greens, n.d).

Figure 2.5 Inner details on the agricultural and agrifood system



Source: FAO (2023)

2.5.2 Human Capital Challenges

Human Capital, as an economic term, refers to assets (such as skills development, education, training, and empowerment) that improve individual productivity (Davis et al., 2021). That is the stock of habits, knowledge, skills, competence, and attributes embodied in the ability to perform labour to produce economic value (Goldin, 2014). In this research survey, we note that human capital encompasses the skills and capabilities of agrifood SMEs that enable them to manage their businesses sustainably and competitively along the agrifood chain. Human capital provides labour and skills to support the integration and competitiveness of agrifood systems, in return for wages and decent working conditions. In many research publications, labor and skills shortages are reported as significant concerns in the agricultural and agrifood sectors. The industry's evolving nature compounds this challenge as it strives to meet food security objectives and sustainability goals. Additionally, the sector's negative public perception, characterized by relatively low wages and limited career prospects, has exacerbated the situation.

Meanwhile, industry demand for labor is driven by the interplay of farm structural adjustment, technological advances, and changes in consumer preferences for attributes such as animal welfare, environmental footprint, and food quality (Ryan, 2023). Therefore, the effective integration of the agricultural and agrifood sectors to ensure a sustainable and competitive sector will, on one hand, significantly depend on technical skills, entrepreneurial and digital skills, and the knowledge of financial, marketing, and regulatory and environmental compliance aspects of the agrifood system embodied among the actors along the agrifood chain.

Regrettably, evidence shows a declining trend in total employment in the sector, with an increasing reliance on temporary and seasonal workers sourced through migration (especially in other developed economies such as Italy and Canada). Additionally, the industry is characterized by an aging workforce (e.g., 25% of Canadian farmers will be 65 or older in 2025; 95% of Ghanaian farmers are between 55 and 65 years), coupled with relatively low education levels, few new entrants, and limited appeal of careers in the sector for young, qualified individuals (Ryan, 2023). Further to this report, data show that about 2.5 million workers have left the agricultural sector across the European Union over the last decade, with this decline associated with declines in the number of farms and in larger farm holdings (Schuh et al., 2019).

2.5.3 Produced Capital Challenges

These forms of capital encompass human-made goods, which, in other literature, are classified as built capital and financial assets (also known as financial capital) utilized to produce goods and services consumed by society (FAO, 2023). Examples (as shown in Figure 2.5) are Machinery and Infrastructure, Energy, fuel, fertilizers and pesticides, Research and Development, Information

technology, Finance, and other elements that facilitate the production of goods and services. Therefore, along each segment of the agrifood chain, the resources mentioned above play a significant role in the business activities of agrifood SMEs, in return for incentives such as revenue, profits, rents, and taxes.

They also affect the competitiveness of these SMEs within the broader agricultural and agrifood industries. For instance, a rise in input prices significantly influences the profitability of these SMEs. Similarly, fluctuations in commodity prices, exchange rates, and consumer demand can generate uncertainty and instability in their operations. Elevated input costs have a notable impact on small-scale farms, mainly because of their limited bargaining power relative to the rest of the value chain (Fi-Compass, 2020). As a result, any increase in input prices raises production costs across the agrifood chain, which is invariably reflected in higher market food prices. Ghana remains particularly vulnerable to shocks in international crude oil prices. The country has been a net importer of crude oil to satisfy its growing energy needs, especially in the agri-food sector (Ussif et al., 2024). Consequently, higher fuel prices tend to reduce agricultural productivity by increasing production expenses. Additionally, inadequate physical and digital infrastructure has hindered business operations along the agri-food supply chain.

Fulmer (2009) considered infrastructure to be the physical elements of interrelated systems that provide the commodities and services needed to enable, sustain, or enhance living conditions. Against this background, we may consider the infrastructure that provides structural support systems in the agricultural and agrifood sector, which serves as a critical basis for assessing the sector's competitiveness (Nurre et al., 2012).

Most studies have shown that adequate, well-functioning infrastructure is essential to support the integration and competitiveness of the agricultural and agrifood industry (NEPAD, 2002). The presence of well-functioning infrastructure will reduce costs along the agrifood chains. Notably, the delivery of inputs in the industry and the distribution (and or storage) of agrifood products and services to various markets. Therefore, along the agrifood chain, essential infrastructure elements (such as transport, energy, information technology, water systems, processing, storage, and distribution systems, as well as market infrastructure) enhance the industry's profitability and competitiveness. Given the non-durable, perishable nature of these agrifood products, transport infrastructure is particularly relevant to supporting the integration and competitiveness of the agricultural and agrifood sectors.

UNIDO (2024) also emphasized that infrastructure development in agribusiness directly impacts agricultural productivity by linking smallholder farmers to domestic, regional, and global markets, ultimately fostering sustainability and competitiveness and increasing the overall productivity of the agrifood industry. For instance, the UNIDO report stated that a safe and efficient transportation system is needed to produce, distribute, and sell agrifood products. However, inadequate transportation networks and storage facilities contribute significantly to food loss and waste. This subsequently leads to substantial post-harvest losses, negatively affecting food security, farmers' incomes, and the industry's competitiveness.

Along with the above, access to finance is also a significant resource needed to help SMEs in the agrifood chains modernize their production and service delivery sustainably and competitively. Although Italy is one of the EU's largest agricultural producers, the industry faces a longstanding structural weakness that has hindered its access to financial support (Fi-compass, 2020). Admittedly, the industry is predominantly composed of small enterprises, with limited integration into the value chain due to input costs. In addition, most managers of these businesses have little or no formal accounting training, which further impedes their ability to access credit. Accordingly, low generational turnover, coupled with inadequate financial support, has significantly limited these agrifood SMEs' propensity to invest in new digital technologies and innovative practices to improve their productivity and competitiveness along the agrifood chain.

2.5.4 Social Capital Challenges

Many scholars have defined social capital from different perspectives; however, the literature suggests that Social Capital refers to the interactions among people in a group as a resource that can generate socio-economic prosperity. Thus, social networks among people with shared norms, values, and understanding facilitate cooperation within and among various groups (FAO, 2023). Such relationships facilitate the flow of information and knowledge among economic agents along agrifood chains, reducing transaction costs and providing input for economic activities. For example, information on access to land, sourcing raw materials for production, employment opportunities, and knowledge of innovative practices. It serves as an alternative mechanism for social information sharing and resource allocation, and significantly and positively impacts business performance (Xie & Wang, 2016). Social capital is a key resource for family-run businesses (Wu et al., 2020).

In line with the above descriptions, other scholars argued that social capital allows entrepreneurs' networks to exchange essential resources and drive product innovation (Bayraktar, 2024). As a result, it also enhances entrepreneurial innovation, competencies, and competitive advantages

(Corvino et al., 2019). Additionally, Sallah and Caesar (2020) added that social capital motivates business growth, increases sales, and enables competitiveness. Referring to the positive impact of social capital described above, we can argue that weak social capital may hinder access to information, reduce cooperative efforts, and limit access to finance, leading to lower incomes and reduced resilience among economic agents along agrifood chains. Consequently, this leads to income disparities and greater vulnerability to market risks, thereby affecting the industry's competitiveness.

In some cases, the presence of substantial social capital does not always yield the same expected outcome. For example, a study to evaluate the effect of social capital on farmers' adoption of subsidized input supplies, namely hybrid seedlings and fertilizer, in Ghana by Diana et al. (2023); the result revealed that social capital in the form of a strong social network among cocoa farmers has a significant effect on adoption of subsidized seedlings, to an extent where it allows farmers to bypass subsidy qualification criteria for access to seedlings imposed by the government. The reason is that farmers relied on information shared on social networks that promoted the benefits of hybrid seedlings, thereby reducing the perceived risk of using them. Conversely, according to their report, fertilizer adoption is less dependent on social capital as its application is less risky to farmers. Thus, these farmers can easily switch from using fertilizer to not using fertilizer.

2.5.5 The Role of Government and Other Stakeholders

Farmers and agrifood SMEs are responsible for their own production and marketing decisions, as well as the efficiency and cost-effectiveness of their business operations (Md. Mustafizur et al., 2024). On the other hand, government policies are crucial in creating an environment conducive to business growth (Geza et al., 2022). Thus, government policies may also catalyze the integration and competitiveness of the agricultural and agrifood sectors, enabling actors across the agrifood chain to operate effectively. These policies include trade and market interventions, subsidies, laws and regulations, general services support, and behavioral policies (FAO, 2023), which significantly influence agrifood systems.

For example, Governments generate price incentives or disincentives through trade and market interventions, such as import tariffs or quotas, export bans or subsidies, and other market price regulations (domestic price-fixing policies) to control demand for a targeted commodity. Moreover, subsidies can significantly influence which commodities are produced and marketed, as well as the inputs used and their application methods (FAO, 2023). These policies are often regulated by structured laws and regulations that affect the business activities of agrifood actors along agrifood

chains. For instance, the government can restrict imports of certain commodities by imposing non-tariff barriers to protect local industries.

Above all, government and private-sector stakeholders provide other support measures to support operations along the agrifood chains. Notably, financial incentives (such as access to credit facilities and Insurance), financing for research and development, and infrastructure development and maintenance, knowledge transfer services (such as training, technical assistance, and other extension services), inspection and control measures, and agrifood products marketing services (Md. Mustafizur et. al., 2024; FAO, 2023). According to Cull and Hartarska (2023), one way to boost the agricultural and agrifood sectors is access to loans and insurance. With this, farmers and other economic agents along the agrifood chain will be able to invest in their businesses for commercial purposes and manage risks across each segment of the agrifood system.

We can assert that these support measures will enhance production and better utilize resources, while their absence could create challenges within the agrifood chains. Additionally, establishing market linkages will connect farmers with marketplaces, processors, and consumers. Ultimately, this supports value chain integration and promotes collaboration among actors across segments of the agrifood system (Kumar et al. 2023 & Babu et al. 2016), helping build a resilient and competitive agrifood system.

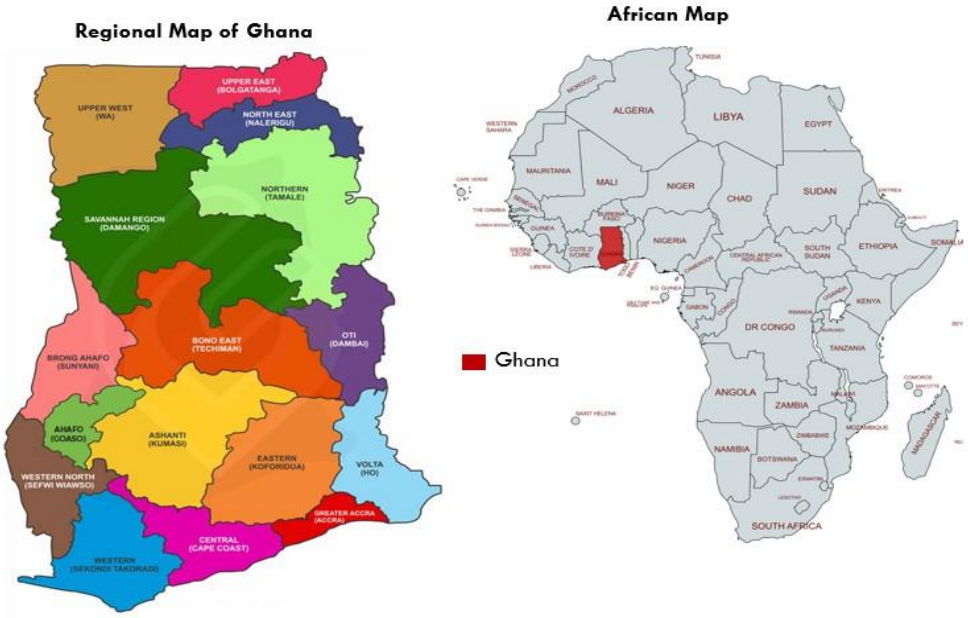
Other reports revealed that strict regulations, bureaucratic procedures, and intense competition have created significant challenges in the Italian agricultural and agri-food sectors (Iacovazzi Law Firm, 2023). Despite these obstacles, the Italian agri-food industries benefit from tax incentives, grants, and subsidies offered by both the government and the European Commission (EC). These incentives are part of broader measures supporting the aims of the Common Agricultural Policy by encouraging an innovative, competitive, resilient, and diversified agricultural sector (EC, 2023). According to the commission's report, the commission approved a €910 million Italian scheme under the Recovery and Resilience Facility (RRF) to support agro-industrial development through direct grants and subsidized financing for about 500 active companies in the agri-food industry, particularly those involved in processing and marketing agricultural products. The main aim of this scheme is to improve market orientation, enhance competitiveness, and promote research, technology, and digitalization within the agro-industrial sector (EC, 2023).

CHAPTER THREE

The Agrifood Sector

3.0 Brief Country Analysis, Ghana

Figure 3.1 Regional Map of Ghana and African Map

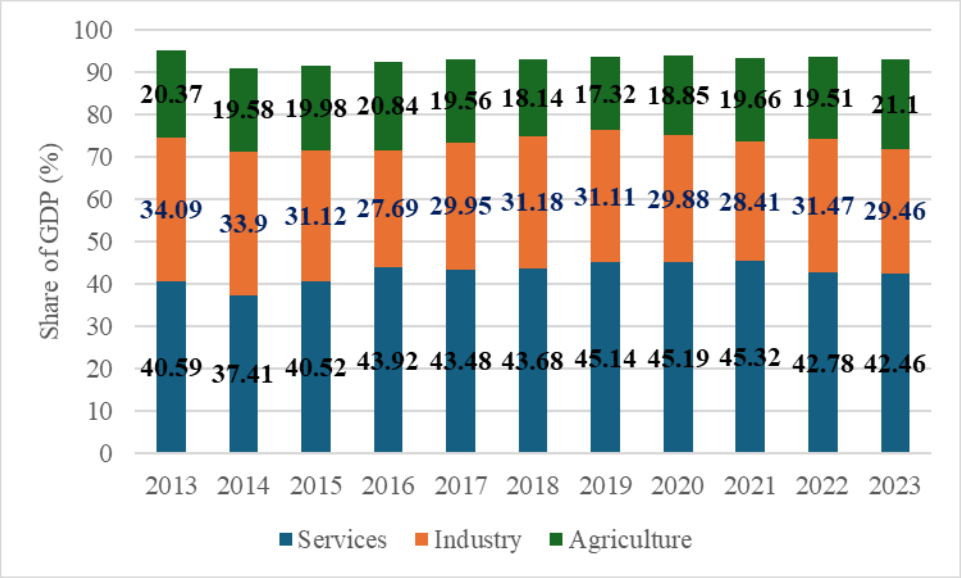


Source: Mapchart

Ghana, located in West Africa, gained independence from Britain in 1957. Between 1966 and 1981, Ghana was governed alternately by military and civilian regimes, often due to economic instability. However, it was not until 1993 that the military government transitioned the country to a new constitutional order, initiating the Fourth Republic. This period brought significant economic policy reforms and steady economic growth, leading to greater social and political stability. Although tribal conflicts persisted, the social-political situation has improved each year.

Ghana has a total land area of 239,567 km2 (92,497 sq mi), spanning diverse ecosystems, from coastal savannas to tropical rainforests, with nearly 34 million people across sixteen (16) regions, of which 41% live in rural communities. The country borders the Gulf of Guinea and the Atlantic Ocean to the south, Côte d'Ivoire to the west, Burkina Faso to the north, and Togo to the east. It is a lower-middle-income nation with a diverse resource-based economy, including industrial minerals and agricultural products, with cocoa as a primary commodity. The country is also a major producer and exporter of petroleum and natural gas (Ministry of Finance, 2014). Ghana became Africa's largest gold-producing country after overtaking South Africa in 2019, with exports valued at $15.6 billion in 2023. It is also the second-largest cocoa producer (after Côte d'Ivoire). Ghana is rich in diamonds, manganese ore, bauxite, and oil. In 2023, the country's GDP was $76.36 billion, with agriculture accounting for 21.1%, industry approximately 29.46%, and the services sector about 42.46% (O'Neill, 2025), as shown in Figure 3.2 below.

Figure 3.2 Share of economic sectors in the GDP from 2013 to 2023, Ghana



Source: Statista (2025)

Despite the growing prominence of the services sector and industry in contributing to GDP and labor absorption, the economy remains heavily dependent on agriculture (UN Ghana, 2021). In 2022, the service sector provided more employment opportunities than any other sector. The sector employed 41.39% of the total population; the agricultural sector, 39.74%; and the industrial sector, 18.86%. Employment in Ghana increased in 2023, with about 14.3 million people employed, up from about 14 million in 2022 (GSS,2024). The total unemployed population in Ghana was estimated at approximately 592,000 in 2024, slightly higher than the previous year, when around 582,000 people were unemployed (Sasu, 2024). As of 2023, nearly three million people in Ghana lived in extreme poverty, with the poverty line set at 1.90 U.S. dollars a day. This represents a decrease from the previous year, when more than 3 million people lived in poverty. However, it is expected that the trend will continue to decline to about 2.8 million people living on a maximum of 1.90 U.S. dollars per day (Sasu, 2024).

3.1 Agrifood Sector – Ghana

Ghana is endowed with vast arable land, making it a rich agricultural country. Agriculture and agribusiness account for a significant share of the economy and of smallholder farmers' livelihoods (World Bank, 2017). The agriculture sector accounts for about 19% of GDP, employs about 33.5% of the country's workforce, and is dominated by smallholder farmers (Stephen A., 2022). Almost 90% of smallholder farmers cultivate less than 2 hectares of land. There are also some relatively large farms and plantations, particularly for rubber, oil palm, bananas, pineapples, and coconuts, as well as rice, maize, and cocoa to a lesser extent. Ghana's primary cash crops are cocoa, oil palm, pineapple, mango, cassava, tomato, banana, citrus, cashew, and vegetables (MoFA, 2021).

Table 3.1 Economic Indicators and Trade Structure of Ghana

Category	Indicator	Details / Value (Year)
Economic Indicators	Population (million)	33.8 (2023)
	Rural Population (% total)	41% (2023)
	GDP (US$ billion)	76.37 (2023)
	GDP per Capita (US$)	2,260.30 (2023)
	Agricultural Land (% land area)	55.4% (2022)
	Value of Exports	US$ 3 billion (2022)
	Value of Imports	US$ 2.6 billion (2022)
Trade Structure	Main Export Markets	Switzerland (22.6%), India (16.6%), China (12.3%)
	Main Export Products	Cocoa beans and products; edible oils; animal and vegetable fats; meat, fish, seafood; beverages; cereals
	Major Crop Production	Cocoa (2nd largest); Cassava (4th); Yam (2nd)
	Main Import Products	Rice, wheat, soybean meal, chicken
	Main Import Markets	China, Brazil, Netherlands, Turkey, Canada

Source: Author's compilation based on national statistics and international databases (2022–2023)

Generally, the agricultural sector, mostly subsistence-based, is composed of 74% crop production, 18% livestock, fishery, and poultry, and 8% forestry. In 2020, Ghana was the second-largest producer of cocoa in the world, the fourth-largest producer of cassava, and the second-largest producer of yams after Nigeria (GIPC, 2022). The country's main export crop, cocoa products, generated US$2.85 billion in export revenue in 2021, accounting for about 19% of total export earnings (GIPC, 2022). Ghana has an international reputation for high-quality cocoa beans, which command a 3-5 percent market premium, according to the World Bank (2017) report. Its biggest export partner is Switzerland, accounting for 22.6%, followed by India (16.6%), China (12.3%), the United Arab Emirates (8.4%), South Africa (7.92%), and 86 other countries worldwide (Stephen, 2022).

Since the agri-food sectors face infrastructure and facility challenges, the country tends to export low-cost, simple, or unprocessed farm produce and import processed food products to meet rising demand. Imports of agricultural and related products are estimated at $2.6 billion annually, with leading suppliers including China, Brazil, the Netherlands, Turkey, and Canada. Food imports include bulk, intermediate, and consumer-oriented goods such as rice, wheat, soybean meal, and poultry (ITA, 2023). In 2020, chicken accounted for 84% of total imported meat, totaling 284,278 tons, compared to 72,138 tons of local production (GIPC, 2020). Interestingly, estimates indicate that frozen chicken imports from the European Union have increased by more than 450% over the

past 10 years, making the country the third-largest importer in Africa (Stephen, 2022). This also underscores a high reliance on the international market (GIPC, 2020).

It is worth noting that only 20% of agricultural products are processed locally, while the rest are imported. The main reasons for this gap in the domestic food processing sector are low production and productivity, high costs, and poor quality of local raw materials. Farrelly Mitchell (2022) reported that, because most processing firms are located near ports, these companies prefer to import raw materials rather than source them locally. This is because processors obtain their raw materials from smallholder farmers in rural areas, who produce small surpluses of various crops, which are then connected by poor feeder roads. Therefore, transportation costs impact their profitability.

3.2 Agricultural and Agrifood Policies – Ghana

3.2.1 Post Independence (1957 – 1983)

The country initiated a state-led industrialization program to transform traditional farming by establishing large-scale, government-owned, mechanized farms with significant public investment. The agricultural sector was viewed as a pathway to industrialization. This approach followed the creation of new large-scale state farms and Workers and Farmers' Brigades (Songsore, 2003). The Agricultural Development Corporation (ADC) was established to promote agricultural advancement through modernization. The policy also aimed to satisfy the population's nutritional needs and earn foreign exchange. As a result, special attention was given to cereals, fish, rice, sugar, and cocoa. Although the project initially appeared to focus on state-owned enterprises, individual farmers were encouraged to join cooperatives to access machinery and modern methods through extension services (Yaro et al., 2016). However, the policy failed to achieve the desired results due to obstacles such as limited capital, political interference, poor planning and management, and a rigid, centralized system of control (Gyasi, 1996).

After the overthrow of the government in 1966, the policy was replaced by an export-market-oriented approach. Unlike the previous model, which prioritized state ownership, this new strategy focused on privatizing commercial farms from 1966 to 1971. Then, a military coup in 1972 led to a change in leadership. The new government built upon existing projects and promoted large-scale private investment in plantation agriculture. Importantly, unlike earlier policies, traditional small-scale farming was recognized as a vital part of the agribusiness sector. Consequently, smallholder farms entered into contract farming (Daddieh, 1994). Following these developments, Commodity Development Boards were established to support smallholder farmers. For example, the Cocoa Marketing Board managed the marketing, research, and development of cocoa, coffee, and shea nut production.

One of the most well-known agricultural programs was "Operation Feed Your Industries," which ran from 1972 to 1974. Its main goal was to provide raw materials to industries that were already operating below capacity. Subsequently, a partnership between large-scale farms and smallholder farmers boosted the production of export crops and raw materials for Ghanaian industries. The policy employed three models: the plantation model, the outgrower model, and clusters of medium- and large-scale commercial farms. The plantation model, typically run by a single company, focused on cultivating a single crop over large parcels of land. The outgrower model involved contract farming among multiple farmers, guided and supervised by a leading company that sometimes used its own land. Clusters of commercial farms developed because neighboring land was suitable for high-demand crops, leading to large land leases or sales to wealthier farmers. The government relied on a system of high direct and indirect taxes on agricultural products, along with control over marketing, input supply, and storage, all managed through public administration with limited private-sector involvement. In this context, it was clear that the post-independence agricultural economy prioritized large-scale, capital-intensive production.

3.2.2 Liberalization and promotion of export crops (1980s–2000s)

As a result of the economic crisis in the 1970s, the Government of Ghana (GOG) and the World Bank implemented an Economic Recovery Program (ERP) in 1983, followed by Structural Adjustment Programs (SAPs). The agricultural sector was one of the key priority areas under these programs. Policies aimed at removing subsidies, disbanding marketing boards, supporting the production of export crops, reforming land tenure to attract foreign direct investment, and liberalizing trade across all sectors. One notable outcome was the significant increase in cocoa production and exports between 2000 and 2006, as reported by Coulombe and Wodon (2007). Similarly, fruit and vegetable crops classified as non-traditional exports, especially pineapple and pepper (FAO, 2006), experienced substantial growth, with a 13% increase from 2000 to 2007. Ghana alone accounted for 10% of pineapple exports to the European market in 2004 (Yaro et al., 2016). Further analysis reveals that the SAPs supported earlier models, including plantation and outgrower systems under private ownership. As a result, both small- and medium-scale farmers became more integrated into the global supply chain.

3.2.3 Agricultural modernization (2000 to present)

Agriculture remains a top priority for the government, as it is a key driver of growth, employment, food security, and poverty reduction. During this period, there were significant modernization efforts focused on rural transformation, land reform, expanded irrigation, increased mechanization, the adoption of improved technologies, value addition to traditional crops such as cocoa, the expansion of cash crop production, and enhanced support for the private sector. The government

also provided subsidies for agricultural inputs, such as fertilizers, and launched free mass spraying campaigns to boost cocoa production (i.e., 2000–2002 and 2005–2007). This revitalized the cocoa sector, doubling output from 340,563 tons to over 740,000 tons between 2002 and 2005.

These were as a result of the strategies incorporated into several agricultural policy frameworks, strategic plans, and programs, managed by the Ministry of Food and Agriculture (MoFA) and include the Accelerated Agricultural Growth and Development Strategy (AAGDS, 2001), Food and Agriculture Sector Development Policy (FASDEP I & II) and the National Aquaculture Development Plan, all of which were integrated into the National Medium Term Development Frameworks (Ghana Poverty Reduction Strategy, GPRS I & II) to foster agricultural growth and development. Overall, these policies had a positive impact on the agricultural sector, resulting in significant growth from 3.4% in 2002 to 5.1% in 2008 (Appiah-Kubi, 2011).

3.2.4 Youth in Agriculture Program (YIAP)

As part of broader efforts to modernize and diversify agriculture, the youth presented a promising prospect for this development. To make farming a more attractive enterprise and viable career path, and to address youth unemployment, the Youth in Agriculture Program (YIAP) was launched in 2010 by the MoFA.

According to MoFA, the country's aging farmer population poses a threat to the sector's sustainability. The average age of farmers in Ghana is 55 years, with a life expectancy range of 55 to 60 years. Therefore, there is a need to provide incentives that attract youth to the agricultural sector. Another critical issue is the negative perception among young people that farming is labor-intensive and yields very low economic returns. Furthermore, as the country's food import bill for rice, cooking oil, frozen chicken, and meat continues to increase, there is a need to implement effective strategies to reduce reliance on imports in the food economy. Considering the issues raised above, youth are a key element for a sustainable agrifood sector. Their energy, large numbers, and willingness to adopt new ideas, concepts, and technologies offer significant opportunities to enhance agricultural productivity.

The Youth in Agriculture Program has four (4) components: Crops / Block Farm, Livestock and Poultry, Fisheries / Aquaculture, and Agribusiness. The program is facilitated through the provision of tractor services, agro–inputs, and technical support from Agric. Extension staff of MOFA, as well as supporting the marketing of farm produce.

The main objectives include

- Making youth accept farming as a commercial business venture
- Generate appreciable income to meet farmers' domestic and personal needs.
- Youth will improve their standard of living through enhanced income.

- Youth will be motivated to stay in rural areas, as inputs will be delivered at their farm gate, on a credit basis and interest-free.
- Produce enough food crops, meat, and fish using modern methods.

Despite these efforts, overcoming the preference for white-collar jobs and offering meaningful incentives remain crucial to making agriculture attractive to Ghana's youth (Opoku, 2025). Some challenges remain in attracting and retaining young people in farming, including the perception that farming is hard work with low rewards, competition from other sectors, and issues related to land ownership and access to finance.

3.2.5 Planting for Food and Jobs (PFJ)

As part of efforts to promote agricultural transformation in Ghana, the government, through the MoFA, with support from the African Green Revolution Alliance (AGRA), launched a new flagship program, The Planting for Food and Jobs (PFJ), in April 2017. Having identified one of the sector's significant problems (the poor adoption of modern farm practices and technology), the program promoted good agronomic practices, motivated farmers to adopt certified seeds and fertilizers through a private-sector-led marketing framework and facilitated market access for outputs via an E-Agriculture platform. The primary objective is to enhance agricultural productivity, ensure food security, and create employment opportunities within the agricultural value chain, particularly for young people. In addition, the program focused on five staple crops (maize, rice, soybeans, sorghum, and vegetables) and targeted 200,000 farmers across Ghana's 216 districts (PFAG, 2019; World Bank, 2017). According to the Secretariat of the Peasant Farmers Association of Ghana (PFAG), which conducted an in-depth assessment of the Program from the beneficiaries' perspective, a few challenges, among them include:

- The late arrival of inputs for farming, such as chemical fertilizers, occurred after the planting season had ended. This was due to poor procurement and financial measures. A study conducted by Ansah et. al (2020) suggests that the lack of funding for Planting for Food and Jobs hinders the intended development goals, primarily due to extension officers' inability to effectively assist local farmers with Planting for Food and Jobs projects, which is attributed to a funding shortfall.
- There were reported cases of political interference at the local level, hijacking, diversion, and smuggling of fertilizers, which hindered the objectives and effectiveness of the program.
- Market access is the primary incentive for farmers' readiness to adopt and scale up production. The inability to design activities and strategies that increase market absorption leads to unprofitable farming ventures.

- Poor storage and post-harvest management led to high losses, reducing the viability of agriculture as a commercial profit-making activity capable of attracting the youth and consequently reducing unemployment.
- The E-Agriculture pillar of the PFJ utilizes ICT to profile and create a database of farmers, serving as a means to deliver services to farmers and enhance stakeholder relationships. However, results from the field survey showed that, apart from registration, there was little or no profiling of farmers who use ICT, as promised under the PFJ. Additionally, there was little or no sharing of market information between agricultural extension agents (AEAs) and farmers via the e-platform, as the AEAs themselves had limited knowledge of such possibilities.

Similarly, a research survey by Jemima (2024) has demonstrated that the challenges facing food and job planting stem from insufficient financial resources, a budget that is too small to implement the plan effectively, management problems caused by excessive politicization of the program, and other factors.

Despite the challenges above, a few reports of developments emerged from various surveys. For instance, Tekuni et al. (2021) asserted that the Planting for Food and Jobs initiative continues to address concerns about food shortages, reduce the importation of essential food items, and boost exports to nearby countries, thereby strengthening the cedi. Additionally, Pauw (2022) developed an impact assessment methodology for PFJ, and the model results indicated that maize and rice production levels were approximately 40% higher than they would have been without PFJ implementation, which significantly increases Ghana's food and calorie availability. Additionally, a study conducted by Tanko et al (2019) examined the impact of Planting for Food and Jobs (PFJ), Ghana's government agricultural strategy, on the well-being and productivity of rice farmers in the country's northern region. The study used survey data collected from project participants engaged in farm production during the 2018 growing season, including both beneficiaries and non-beneficiaries. The results reveal that the initiative has had a positive impact on the welfare and productivity of rice farmers in Northern Ghana, despite negligible income gains.

3.2.6 Other supporting programs managed by MoFA

- **West Africa Food System Resilience Program (FSRP2)**

  The Government of Ghana (GoG), through the Ministry of Food and Agriculture (MoFA), in collaboration with the Economic Community of West African States (ECOWAS), participated in the second phase of the West Africa Food System Resilience Program (FSRP2) under the World Bank Multi-Phase Programmatic Approach (MPA). This initiative aimed to strengthen regional food system risk management, enhance the sustainability of the

productive base in targeted areas, and develop regional agricultural markets. FSRP2 will help improve the capacity of vulnerable households, families, communities, and food systems within the country to face uncertainty and the risk of shocks, withstand and respond effectively to them, and recover and adapt sustainably.

Phase 1 of FSRP included Burkina Faso, Mali, Niger, and Togo. Phase 2 now includes Chad, Ghana, and Sierra Leone. The program was scheduled to end in December 2030. Ghana implemented the program for five years (with an expected completion date of December 2026) with funding of US$100 million. The implementation of FSRP2 was especially vital for Ghana's food and nutrition security because of the uncertainty surrounding COVID-19's impacts on the agricultural value chain.

- **Savannah Investment Program (SIP)**

  The Savannah Investment Program (SIP) was designed within the context of the Ghana Medium-Term Development Framework (2018-2021), the Coordinated Program of Economic and Social Development Policies (2017-2024), and Agenda for Jobs: Creating Prosperity and Opportunity for All (2018-2021), which purports to transform Ghana's economy and society. SIP became effective in February 2020 and was implemented over five years (2020-2025).

  The primary objective of the project was to reduce meat imports by increasing commercial broiler production, enhancing the competitiveness of the poultry industry, and improving nutritional security. The project was expected to help improve breeds of small ruminants as part of the Government's Rearing for Food and Jobs program. This will be achieved through increased private sector investment and enhanced productivity and output of maize, soybeans, poultry, and small ruminants (including goats, sheep, and local chickens). At least 20,000 hectares of maize and soybeans are expected to be cultivated throughout the project.

- **The Savannah Agricultural Value Chain Development Program (SADP)**

  The SADP aimed to build on the successes of the Savannah Zone Agriculture Productivity Improvement Project (SAPIP) and the Savannah Investment Program (SIP), which have increased maize and soybean production from 80 hectares in 2018 to 14,000 hectares in 2021. The program was expected to enhance these achievements and further expand rice, soybean, and maize production by an additional 8,000 hectares by 2026. It was implemented in nine districts across five regions of the country, serving as a platform to implement the Planting for Food and Jobs (PFJ) initiative, which addresses key challenges in food security and the poultry and livestock feed industries. This support enabled medium-scale commercial farmers and their outgrowers to increase the cultivation of rice, soybeans, and

maize under the PFJ, which links to the poultry value chain through Rearing for Food and Jobs (RFJ). This integrated approach aimed to promote large-scale production and create market outlets for smallholder farmers, particularly women and young people.

- **The Modernizing Agriculture in Ghana Program (MAG)**

  The MAG was a five-year, 135 million Canadian dollar (CAD$) initiative funded by Global Affairs Canada, launched in 2017 and extended by two years to 2023. During that period, the program has provided budget support and technical assistance to the Government of Ghana to enhance farmers' production and productivity by implementing a comprehensive, market-oriented farming approach. This included strengthening and modernizing agricultural extension services at the national, regional, and district levels, complemented by demand-driven research.

- **European Union Ghana Agriculture Program (EU-GAP)**

  The 11th European Development Fund (EDF) National Indicative Program (NIP) is a bilateral development financing arrangement between the Government of Ghana (GoG) and the European Union for the period 2017 – 2023, totaling €323.0 million in grants. It covered three (3) thematic areas - Governance, Agriculture, and Social Protection. The agriculture program has a total budget of €160 million, representing about 50%, but was reduced to €147 million for budget support.

  The EU-GAP was launched in the Savannah Ecological Zones of Ghana, covering 14 districts. The global vision of the EU-GAP was: “An inclusive, productive local economy providing sustainable livelihoods for the target population in the Joint Program Area in the context of climate change.” The goal was to deliver essential infrastructural investments and strengthen integrated business models along the value chains of Cashew, Groundnut, Mango, Rice, Sorghum, Soybeans, and Vegetables. These value chains are intended to promote inclusive and sustainable economic growth.

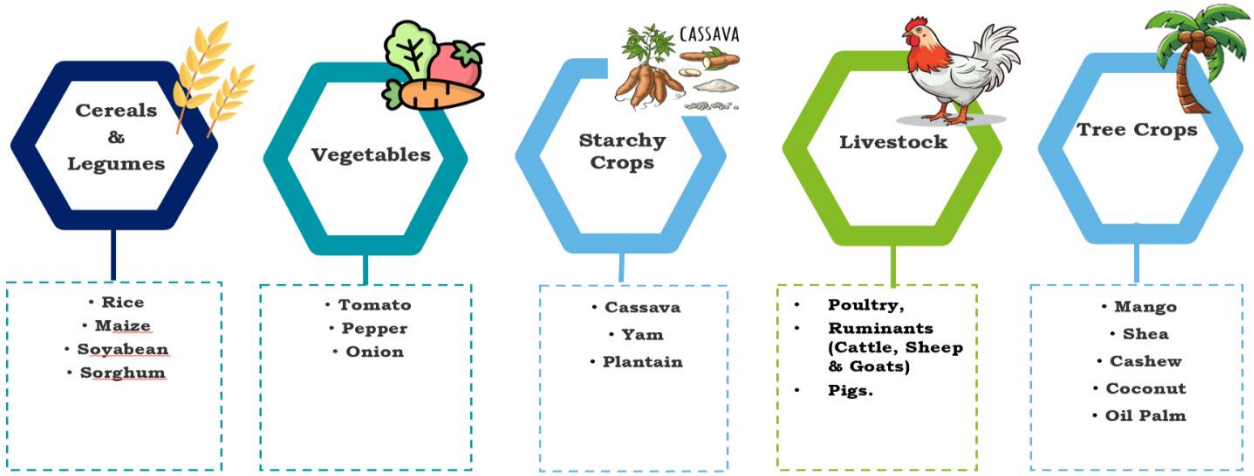
3.2.7 Feed Ghana Program (FGP)

In April 2025, the current government, whose term began in January 2024, launched the Feed Ghana Program with the support of the Ministry of Food and Agriculture. The overarching goals are to increase agricultural productivity and production to reduce imports and increase exports; enhance value addition; increase raw material supply to agro-industries; enhance food security and improve nutritional outcomes; and create sustainable employment opportunities. In view of the above objectives, twenty-two (22) priority commodity value chains were selected as shown in Figure 3.3

Each priority area has a set of support measures aligned with the program's objectives. For instance, for cereals, legumes, vegetables, and starchy crops, there will be increased access to irrigation and boreholes, high-quality agro-inputs, investment in land development, greenhouses and backyard gardening, market linkages, and trade facilitation. The above support measures are expected to increase production and productivity in these priority areas. Similarly, in the livestock sector, poultry farmers will be supported with day-old Chicks (DoCs), vaccines, battery cages, feed, and other related support. In contrast, other livestock operators will be offered improved breeds, feed, vaccines, and other related provisions.

Considering the above context, there is a proposal to establish innovative hubs, named Farmers' Service Centres (FSCs), to improve farmers' access to agro-inputs and services, such as mechanization services, extension Services, veterinary Services, market linkages and aggregation (warehouses and silos), and a credit-in-kind System. In addition, agricultural production zones called farm banks will be established to provide access to secured, developed land (especially for youth and women), with shared infrastructure such as mechanization services, irrigation, and reliable market access. These farm banks will include the development of both public and private land, with possible in-kind payment for private land development.

Figure 3.3 Priority Commodities of FGP



Source: MoFA (2025), Feed Ghana Program

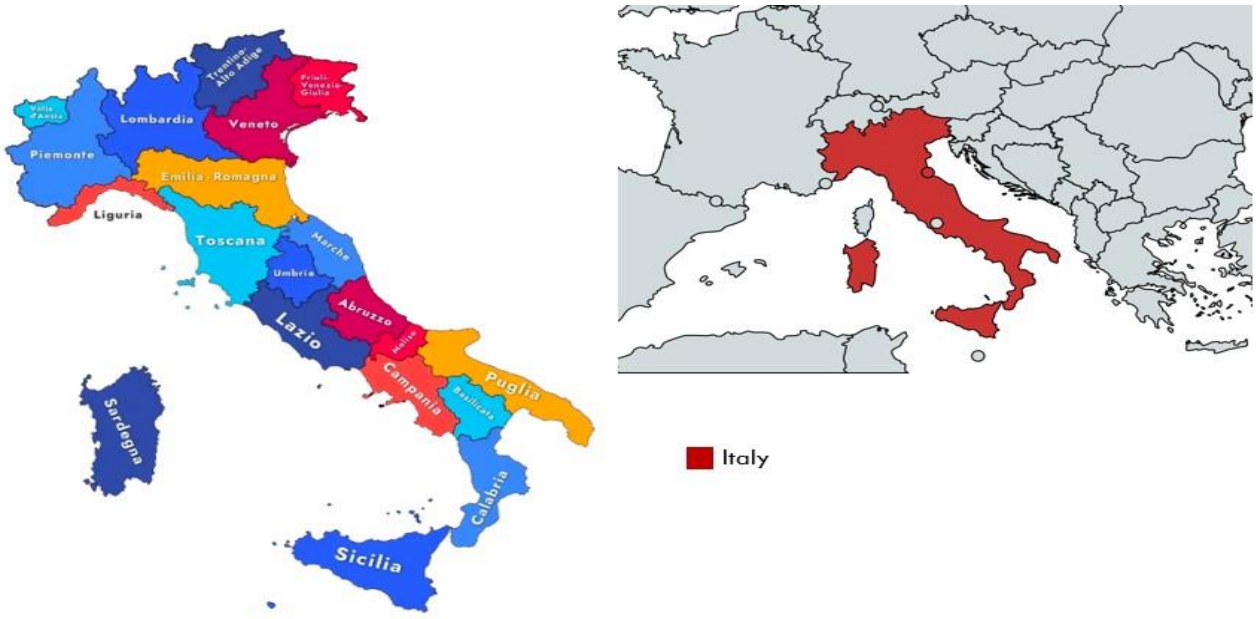
Meanwhile, the target tree crop growers will also have access to improved planting materials, strategic land expansion, and improved access to credit facilities. This is to increase the supply of raw materials for the agro-processing industries and further enhance processing capacity. To meet these objectives, agro-productions enclaves (AgPE) will be developed covering over 300 ha of contiguous arable land, with agro-industrial facilities such as FSCs, agro-processing, warehouses, silos, feeder roads, and irrigation infrastructure.

The target groups for this program include farmers who are members of an active farm-based organization (FBO) or a Cooperative, as well as institutions such as security services, religious organizations, and corporate institutions, and the Youth Employment Agency (YEA). The Ministry of Food and Agriculture and related departments will be equipped with operational logistics and infrastructure offices, labs, farmhouses, and other provisions to enhance capacity development and strengthen the workforce of MoFA, the Department of Agricultural Development (DAD), and the Regional Agricultural Directorates (RAD) to help them deliver on their mandate with respect to the objectives of the Feed Ghana Program. In line with the FGP, the finance ministry, in their press briefing, revealed a budget allocation for Agriculture for the Economic Transformation Agenda amounting to GH¢1.5 billion (US$143 million) to support various priority areas (2025 citizens budget, Ministry of Finance-Ghana)

3.3 Brief Country Analysis, Italy

Italy is a country in Southern and Western Europe (Ascoli & Pavolini, 2016). It consists of a peninsula that extends into the Mediterranean Sea, with the Alps on its northern land border.

Figure 3.4 Regional Map of Italy



Source: Mapchart

Italy shares land borders with France to the west, Switzerland and Austria to the north, Slovenia to the east, and the two enclaves of Vatican City and San Marino. It is the tenth-largest country in Europe by area, covering 301,340 km2 (ISTAT, 2014), with twenty (20) regions and further divided into provinces. Approximately thirty-five percent (35%) of the Italian territory is comprised of mountains (Riganti, 1991), and the surrounding seas around the peninsula further contribute to a highly diverse climate.

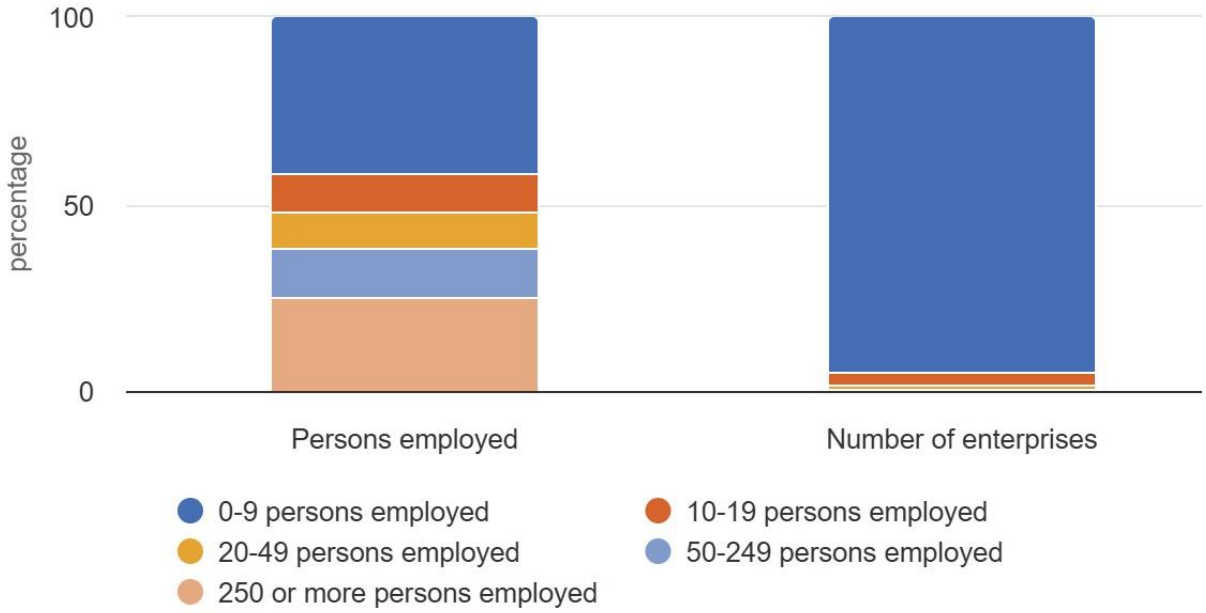
Italy has a well-developed economy: it holds the eighth-largest nominal GDP in the world, has the second-largest manufacturing sector in Europe, and plays a significant role in regional and, to some extent, global economic, military, cultural, and political affairs. Italy has long been a renowned global center of art, music, literature, cuisine, fashion, science, and technology, and has been the source of numerous inventions and discoveries. Italy is a founding and leading member of the European Union, the Council of Europe, the Eurozone, and the Schengen Area. It is part of many other international organizations and forums such as the G7, G20, and OECD. Additionally, the country is well known for its creative and innovative businesses, a competitive agricultural sector, and influential, high-quality industries in automobiles, machinery, food, design, and fashion (Martin Prosperity Institute, 2011; Aksoy & Ng, 2014; Wikipedia). Therefore, it is also described as one of the most industrialized nations and a leading trading country (Dadush, 2015).

The Italian economy is characterized by a relatively small number of multinational corporations and many dynamic small and medium-sized enterprises, clustered in industrial districts, which serve as the backbone of Italian industry. This has led to a niche-market manufacturing sector, often focused on exporting luxury products. The manufacturing sector competes globally through its high-quality products. Italy was the world's ninth-largest exporter in 2023. Its closest trade relationships are with other EU countries, and its top export partners in 2019 were Germany (12%), France (11%), and the US (10%), according to the Central Intelligence Agency (2021).

According to the European Commission (2025), in Figure 3.5, the highest proportion of employees (41.8%) worked in micro companies with up to nine employees. These companies accounted for 95% of enterprises in the country, with more than four million (4.357.946) such businesses. Twenty-five percent (25%) of employed persons worked in large companies with more than two hundred fifty (250) employees. Thirteen-point five percent (13.5%) of employed people worked in medium-sized companies with fifty (50) to two hundred forty-nine (249) employees. Ten-point two percent (10.2%) of employed people worked in small companies with ten (10) to nineteen (19) employees, and 9.5% of employed people worked in small businesses with twenty (20) to forty-nine (49) employees.

Again, Italy is the third-most populous member state of the European Union, with nearly 59 million inhabitants, of whom 28% live in rural areas (World Bank, 2024). Interestingly, despite the strong economic performance, there is evidence of economic disparities between the northern and southern regions and the municipalities.

Figure 3.5 Number of enterprises and persons employed by firm size



Source: European Commission (2025), Labor Market Information: Italy

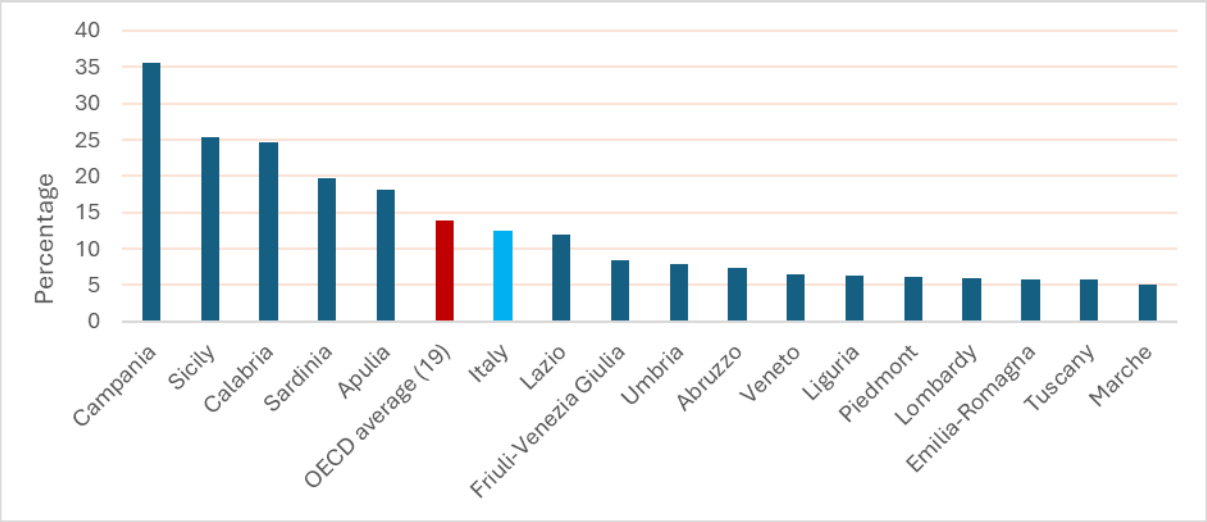
For example, Italy's unemployment rate shows significant regional differences. In 2023, the highest unemployment rates were recorded in southern Italy, particularly in Campania, Calabria, and Sicily, ranging from 16.1 percent to 17.8 percent. Conversely, northern areas perform better in terms of employment, with Trentino-South Tyrol having a rate below 3 percent.

Regarding the unemployment rate among EU member states, Spain recorded the highest at 11.2% in November 2024, while Italy's rate was 5.7%, ranking 13th among the twenty-seven EU countries. Overall, the average unemployment rate across the EU was 5.9% (ISTAT, 2025; Europe-data, 2025). These Figures show that unemployment in northern Italian regions is much lower than the EU average, whereas it is significantly higher in southern regions.

According to ISTAT (2024), in 2023, absolute poverty affected 2,235,000 households (8.5 percent of the total, an increase of over two percentage points since 2014) and 5,752,000 individuals (9.8 percent of the population). This indicates that these households and individuals could not afford essentials because their incomes were below the level required for necessities such as food, shelter, education, and healthcare (Carbonaro, 2023). In another report, Eurostat (2023) showed that 63% of Italian households struggle to afford essentials, compared to the European average of 45.5%. The report later revealed that Italy is one of the European countries with the most widespread economic difficulties, surpassing France, Poland, Spain, and Portugal (ANSA, 2023).

In Figure 3.6 below, the southern regions have recorded higher relative poverty rates, with Campania (35.53%) the highest, and lower rates reported in both northern and central areas (e.g., Marche 5.13%, lowest).

Figure 3.6 Relative poverty rate (%), 2022, by regions



Source: European Union statistics on income and living conditions (OECD, 2024)

3.3.1 Agrifood Sector – Italy

Table 3.2 Economic Indicators and Trade Structure of Italy

Category	Indicator	Details / Value (Year)
Economic Indicators	Population (million)	59 (2024)
	Rural Population (% total)	28% (2024)
	GDP (US$ trillion)	2.37 (2024)
	GDP per Capita (US$)	40,226 (2024)
	Agricultural Land (% land area)	44.0% (2022)
	Value of Exports	€50.5 billion (2021)
	Value of Imports	€48.3 billion (2021)
Trade Structure	Main Export Markets	EU (71%), US (14%)
	Main Export Products	Wine, bakery and pastry products, sparkling wine, apples, processed foods, grapes, cocoa preparations, olive oil, tomatoes, cheeses
	Major Sector Performance	9th exporter of agri-food products; 2nd in organic exports; 3rd in EU production value
	Main Import Products	Cereals (especially wheat), tropical fruits and nuts, soybeans, sugar cane
	Main Import Markets	Germany, Spain, France, and other EU countries
	Certified Products	845 (PDO & PGI)

Source: Author's compilation based on national statistics and international databases (2021–2024)

Porter (1990) claimed that a nation's competitiveness depends on the capacity of its industry to innovate and upgrade. Italy's agricultural and food sectors have benefited significantly from various innovative systems. Given that, the industry has become one of the most competitive sectors in the Italian economy. At the height of its innovation, the agri-food industry benefits from strong domestic rivals, aggressive home-based suppliers, and demanding local customers. Further to the above, a nation's values, culture, economic structures, institutions, and histories all contribute to competitive success (Porter, 1990), and Italy is no exception in this regard.

Despite the agriculture sector's strong performance in the Italian economy, it contributed about 2% to GDP over the past decade. In 2023, agriculture contributed 1.86 percent to GDP, industry 22.94 percent, and the service sector 64.96 percent (O'Neill, 2025). Additionally, a report from the European Commission (2025) reaffirmed that Italy's agricultural sector and agri-food system are significant contributors to the country's economy, accounting for around 2% and 15% of GDP, respectively. The same report revealed that Italy has approximately 1.1 million farms covering about 12.6 million hectares of the country's agricultural land. Most Italian farms are small and family-owned, averaging 11 hectares. About 53% of the Italian population lives in rural or intermediate areas, with agriculture and forestry as key economic drivers (EC, 2025).

Furthermore, an ISTAT publication (2025) indicated that Italy's agricultural added value increased to 42 billion euros, making Italy the EU leader in 2024. Besides, the same year's production value of agricultural output at current prices ranks France first with 88.4 billion euros (-7.7% compared to 2023), followed by Germany with 75.4 billion euros (-0.9%), Italy with 74.6 billion euros (+2.2%), and Spain with 68.4 billion euros (+4.3%). In another publication by ICE Agenzia (2023) on Italy's food industries, the report outlined key aspects of Italy's agricultural and food economy. Details that provided a helpful guide for this analysis are below.

Italy remains one of the world's leading countries in the agri-food industry, with an industry value of €549 billion in 2021. This accounts for 15% of the country's total economy and serves a consumer market of 59 million people. The industry includes agriculture, fishing and forestry, food and beverage manufacturing, wholesale, retail, and Ho.Re.Ca.

The Italian agri-food industry ranks third in the European Union by production value and is renowned as the country with the most GIs (Geographical Indications). The industry has 845 agri-food products (in 2022) with Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI) status recognized by the EU. These products have specific characteristics, linked to their geographical origin and traditional know-how, that make Italy a unique country. In 2021, the Italian organic market reached €3.96 billion, ranking among the most significant markets in the European Union and the second-largest exporter of organic products worldwide. The country has dedicated 16.7% of its agricultural area to organic crops, whereas in other countries such as Spain and Germany, the Figure is 10.8%, and in France it is 9.6%. The industry boasts the highest number of organic producers and processors among the EU countries, with about 86.144 operators.

Italy produces primarily grains, soybeans, meat, and dairy products in its northern regions, while the south specializes in fruits, vegetables, olive oil, wine, and durum wheat. Italian agrifood products

remain highly in demand globally due to their high quality, safety, and prestige. The export value in 2021 was € 50.5 billion, up 11.3% from 2020, whilst the import value was €48.3 billion. The EU remains the largest destination market for made-in-Italy agri-food products, accounting for 58.3%, followed by the US (17.4%). The country is the world's ninth-largest exporter of agrifood products (CREA, 2024). The main export products include Wine, Dry pasta, Bakery and pastry products, Sparkling wine, Apples, Mature Cheese, Prosciutto, Roasted coffee, Grapes, Cocoa and other cocoa preparations, Live Plants (including their roots), Olive oil (Virgin and extra virgin), Peeled tomatoes & tomato pulp, and Fresh cheeses. The industry is mainly made up of small and medium-sized, often family-owned businesses that focus on making their products more unique. The country also takes pride in top-tier entrepreneurship. Italy ranks second in the EU, with one of the largest industrial bases of companies specializing in food and beverage production, with 53,379 operators.

In summary, the agrifood industry's strong performance is attributed to the availability of premium-quality products, a resilient export-driven sector, an unrivalled domestic consumer market driven by Italy's food-based culture, a skilled workforce, a dynamic and innovative R&D Ecosystem, rich biodiversity, and highly specialized providers throughout the supply chain.

3.3.2 Agricultural and Agrifood Policies – Italy

Agricultural policies are managed through the Ministry of Agriculture, Food Sovereignty, and Forests (MASAF) and its decentralized offices. The Ministry develops and coordinates government policies on agriculture, forests, food, and fisheries at the national, European, and global levels. As a national priority, the Department of Competitiveness, Agri-food Quality, Horse Racing, and Fisheries is responsible for product quality and for promoting Made in Italy products through various policy initiatives across its key areas. These areas include agrifood supply chains, food labelling, plant protection, fishing, and aquaculture.

Moreso, the National Recovery and Resilience Plan (NRRP) from the Italian government, as part of the Next Generation EU program and with support from the European Commission further gave significant support to the agriculture and agrifood sectors through various investment schemes including Logistics development for the agri-food, fishing and aquaculture, forestry, floriculture and nursery sectors; Agrisolar Park; Innovation and mechanization in the agricultural and food sector; Revolving Fund for Supply Chain Contracts (FCF) to support supply chain contracts in the agri-food, fishing and aquaculture, forestry, floriculture and nursery sectors; and Investments in the resilience of the irrigation agro-system for better management (PNRR, 2021). According to the Ministry (MASAF), the allocated resources to support the NRRP amounted to 6.53 billion euros.

In addition, the Department of European and International Policies and Rural Development under the ministry is responsible for market policies in the agricultural and agri-food sectors and manages relations with the European Union during the development and implementation of EU legislation by the Council, the Parliament, and the Commission.

Among the key policies is the Common Agricultural Policy (CAP), the EU's agricultural policy. It implements a system of agricultural subsidies and other programs through a framework that national and regional levels adhere to. The agriculture sector plays a key role in ensuring a stable food supply, safeguarding farmers' incomes, protecting the environment, and enhancing the socio-economic well-being of rural communities. On those basics, the EU established and implemented the CAP as a set of guidelines to sustain the future of European Agriculture through a partnership between society and the agricultural sector, according to MASAF.

Common Agriculture Policy (CAP)

Excerpts from a report on the Overview of the Common Agricultural Policy (CAP) in Ireland and the potential regional and sectoral implications of future reforms (2018) highlighted the CAP for this review.

The Common Agricultural Policy (CAP) is one of the most significant EU policies, comprising income and market support schemes for agriculture and rural areas. It was established under Article 33 of the Treaty of Rome (1957), which created the European Economic Community (EEC). Initially designed as a unified policy, it aimed to ensure affordable food for EU citizens and a decent standard of living for farmers. As one of the earliest integrated EU policies, the CAP remains the EU budget's most significant expenditure area. For example, in 1985, it accounted for approximately 73% of the EU budget; by 2017, this share had dropped to 37%, and by 2021, it fell further to less than 25%, according to a European Commission report on CAP spending.

The report also highlights key concerns in the agrifood sector that have prompted policy action. Farming is distinct from other industries because it depends more heavily on weather and climate conditions. As a result, agriculture is highly vulnerable to climate change, with activities such as crop planting directly affected by environmental factors. Increased agricultural production can lead to higher greenhouse gas emissions, significantly contributing to climate change. Another concern is the time lag between consumer demand and farmers' capacity to supply food, since growing crops or producing milk takes time. Additionally, global food prices and farmers' incomes are highly volatile. Family farms earn considerably less than non-agricultural workers. These uncertainties, along with environmental impacts and other factors mentioned earlier, underscore the vital role of policy in supporting the agricultural and agrifood sectors.

The main objectives of CAP, according to the European Commission (EC, n.d), are as follows:

- to guarantee a stable supply of affordable food by supporting farmers and improving agricultural productivity.
- to ensure a fair standard of living for EU farmers.
- to encourage the sustainable management of natural resources and help tackle climate change.
- to preserve rural areas and landscapes across the EU.
- to support the rural economy by promoting jobs in farming, agri-food industries, and associated sectors.

The CAP acts by providing:

- **Income supports:** Direct payments to ensure income stability, to remunerate farmers for adopting environmentally friendly practices, and for delivering public goods not generally paid for by the markets (e.g., taking care of the countryside)
- **Market measures:** These are measures that the EU can take to deal with difficult market situations, such as a sudden drop in demand due to health scares, or a fall in prices as a result of a temporary oversupply on the market.
- **Rural development measures:** these are national and regional programs addressing the specific needs and challenges facing rural areas.

The main Pillars include

Pillar 1 – Agricultural production support and common organization of markets**.** The European Agricultural Guarantee Fund (EAGF) primarily finances direct payments to farmers and measures that regulate or support agricultural markets. The EU entirely finances pillar 1.

Pillar 2 – Rural development policy. The European Agricultural Fund for Rural Development (EAFRD) finances the EU's contribution to rural development. Pillar 2 is financed through co-funding.

CAP REFORMS

CAP has been identified as a problematic area of EU policy for reform since its inception in 1962; substantial reforms over the years have shifted the CAP from a production-oriented to a compliance-, performance-, and results-oriented policy.

After the initial implementation of CAP and the introduction of price supports, farms became more productive. Nevertheless, issues arose in the production supply chain, prompting reforms that introduced numerous measures to better align production with market demand. One such measure was the Milk Quotas, the first significant reform introduced in 1984, which established a cap on milk production and had a significant impact on countries with relatively large dairy industries,

such as Ireland. The quota system involved setting limits on the amount of milk farmers could produce and sell without incurring penalties. Consequently, addressing the structural oversupply on the EU milk market of the late 1970s and early 1980s. So, it was a system to control rising milk production and stabilize prices as dairy farmers were guaranteed a price for their milk (considerably higher than on world markets), regardless of market demand, according to McEldowney (2015). Eventually, the milk quotas were phased out in March 2015 due to a considerable increase in dairy product consumption, and EU producers were unable to respond to the growing demand under the quota regime, as analysts had projected.

The second major reform, known as the MacSharry reform, took place in 1992. It was focused on shifting from market support, such as commodity price supports, to direct payments. Before this, farmers were supported by subsidies such as suckler cow premiums, geared towards sustaining high commodity prices, and by support payments allocated based on the number of animals farmed. Support for commodity prices was gradually reduced and replaced with direct payments. These payments are a crucial part of CAP's first pillar, which purports to sustain farm incomes and promote environmentally friendly farming practices. Direct payments, such as basic income support for farmers, are often linked to conditions, such as compliance with environmental regulations and meeting standards to receive support (Regulation (EU) No 1307/2013, 2013).

As a result of the direct payment, farmers enjoyed enormous incentives to increase production. Nevertheless, in 2003, the new CAP reform, decoupling, was introduced to reduce the link between direct payments and production. In other words, farmers receive support based on factors other than what they produce, such as farm size or environmental practices. This is to avoid overproduction of certain products and ensure that farmers respond to genuine market demand, as affirmed by the European Commission in a report on coupled income support.

Another reform also took place in 2013, aiming to promote competitiveness, sustainable practices, innovation, and the growth of rural areas, and to better link financial resources to the productive use of land. This reform sets out the framework for the CAP, agreed for the period 2014-2020. The main feature of the 2013 reform was the introduction of a mandatory "greening" payment. This payment scheme allows producers to receive additional funds per hectare if they adopt environmentally friendly farming practices, such as crop diversification, permanent grassland management, and Ecological Focus Areas (European Commission, 2013). Overall, these practices are designed to support climate action and biodiversity conservation. This scheme allows allocating 30% of total direct payments to producers who adopt various practices that benefit the environment.

Later in December 2021, a new reform for the period 2023-2027 (CAP 2023-27) was officially adopted and came into effect in January 2023. This reform is a modernized policy that shifts emphasis from compliance to performance and results-oriented policy, aiming for a more sustainable, fair, and flexible agricultural system. Other key aspects include CAP Strategic Plans developed by each EU country and a focus on ten key objectives. These objectives include ensuring fair income for farmers, increasing competitiveness, enhancing farmers' position in the food chain, addressing climate change, protecting the environment, preserving landscapes and biodiversity, supporting generational renewal, revitalizing rural areas, safeguarding food and health quality, and promoting knowledge and innovation. The CAP Plans support a wide range of interventions that address the specific needs of Member States and their territories. It is designed in line with the new result- and performance-oriented approach, with the purpose of delivering tangible results aligned with EU-level CAP-specific objectives while contributing to the European Green Deal.

Issues raised on CAP

The policy has been criticized on the grounds of its cost, its environmental and humanitarian effects (Glenny, 2008). Proponents claim that the CAP is an exceptional economic sector because it protects the rural way of life, even though it is recognized as contributing to global poverty (Green & Griffith, 2002). For example, in May 2007, Sweden became the first EU country to take the position that all EU farm subsidies should be abolished, except those related to environmental protection (Erlandsson, 2007). Other analysts argued that although the policy aims to promote family-owned and smallholder farms, the CAP rewards larger producers (Gebreselassie et al., 2019). The reason is that CAP has traditionally rewarded farmers who produce more; therefore, larger farms have benefited much more from subsidies than smaller farms. In that regard, large farms tend to get a larger share of the subsidies.

From other perspectives, a significant expansion in agricultural production was primarily driven by the CAP, which has incentivized farmers to use environmentally harmful methods to increase output, such as the unchecked use of fertilizers and pesticides. These practices inevitably have severe environmental impacts. However, a complete rethinking of the payment system in 2004 now places environmental concerns at the heart of farming policy. By tying payments to farmers to several strict environmental standards through the cross-compliance scheme, farmers will face reductions in their subsidies if they fail to meet these requirements.

Similarly, a 2024 study found that 80% of CAP subsidies in 2013 supported emissions-intensive animal products, a Figure that has not changed much since (Kortleve et al., 2024). Critics argue that these funds could have been better used to encourage a shift toward more sustainable, plant-based

food systems (Aalbers, 2024). According to Kikou (2016), the CAP also created conditions that led to overproduction, encouraging intensive animal farming and being at odds with animal welfare.

In addition, CAP price intervention has been criticized for artificially raising food prices across the EU (Montgomerie, 2015). High import tariffs (estimated at 18–28%) raise prices by restricting competition from non-EU producers. Similarly, it was argued that the CAP subsidies were intended to prevent developing countries from exporting agricultural products to the EU. The refusal of developed countries to remove agricultural subsidies consequently stalled the WTO Doha Development Round from achieving its intended objectives of increasing global development.

Some publications reported a lack of equity among the member states. For instance, some EU countries have larger agricultural sectors than others, notably France and Spain, and consequently receive more CAP funding (Zahrnt, 2009). The UK, as of 2009 ("Q&A: Reform," 2013), receives less than half of what France receives, despite having a similarly sized economy and population. Likewise, other countries receive more benefits or are net contributors than other member states.

3.3.3 CAP Strategic Plan – Italy

This review was made from excerpts from the publication ‘At a glance: Italy’s CAP Strategic Plan’ to share information on Italy’s current strategic plans aligned with the CAP 2023-27 focus areas including a transition towards an innovative, sustainable, competitive, resilient, and diversified agricultural sector, ensuring long-term food security; contribution to climate action, the protection of natural resources and the preservation/enhancement of biodiversity; and strengthening the socio-economic fabric of rural areas. The CAP plan further highlights an approach that encompasses all the main CAP-funded instruments, including direct payments, support for rural development, and sector-specific interventions.

Italy submitted its first proposal for a CAP Strategic Plan on December 31, 2021, following stakeholder consultations. Italy requested the first amendment to its plan, which the Commission approved on December 2, 2022. The Commission approved Italy’s subsequent amendment requests on October 23, 2023, September 30, 2024, and December 11, 2024. The priority areas in their proposal are listed below.

A fairer system of financial support to farmers

Italy plans to allocate EUR 17.61 billion of its budget to stabilize farmers’ income and ensure a fairer distribution of aid. As part of this initiative, the plan revealed a maximum ceiling of EUR 2,000 per hectare for basic income support to farmers, starting in 2023, with a focus on producers in rural and marginalized areas. Additionally, 10% of the income support will be dedicated to a redistributive payment on the first hectares of farms, reinforcing support for small and medium-

sized farms. The plan also includes sectoral interventions, rural development investments, and cooperation initiatives aimed at strengthening farmers' competitiveness and improving their position in the supply chain through better integrating various stakeholders and modernizing production facilities. For example, key sectors such as industrial tomato and durum wheat, which are of national interest due to their socio-economic and environmental impacts, are set to receive EUR 2.64 billion to enhance their competitiveness, quality, and sustainability, in addition to basic income support.

In addition, as part of their budget, about EUR 3 billion was set to help about 800,000 farmers coping with a growing number of climatic adversities and natural disasters by supporting their participation in risk management tools, such as insurance and mutual funds aimed at sharing the costs deriving from catastrophic events (frost, floods, and droughts).

Environment And Climate

In addressing environmental and climate issues, the plan supports the green transition of the agricultural, food, and forestry sectors. More than EUR 10 billion of the Plan’s budget was allocated to interventions to achieve climate and environmental goals. These interventions include establishing buffer strips along water courses, maintaining permanent grassland, or providing a minimum soil cover during sensitive periods. It is expected that, through such measures, over 80% of the agricultural area will meet good agricultural and environmental conditions (GAECs).

To support this development, Italy’s plan includes 34 voluntary schemes that compensate farmers for additional costs and income losses incurred in implementing more environmentally and climate-friendly practices, such as reducing fertilizer and pesticide use, adopting farming techniques that preserve biodiversity, and conserving soil. Additionally, as the country intends to increase its organic farming area to 25% of total agricultural land by 2027, approximately EUR 2 billion has been allocated to promote organic farming. This initiative also contributes to the European Green Deal's targets.

According to their plan, EUR 635 million will be allocated to promote integrated farming systems on nearly 497,000 acres (3.9%) of the country’s agricultural land, and over EUR 52 million will be used to improve the distribution of fertilizers and manure in the soil to significantly reduce water and air pollution. These practices are expected to be implemented on around 50,000 acres (about 0.5% of the country’s agricultural land).

Rural Vitality

As part of the plan to boost socio-economic activities in rural areas, particularly in agriculture and other sectors of the rural economy, the Plan proposes interventions to provide tools to support

entrepreneurship and start-ups, ensure workers' welfare, and combat labor exploitation. In view of that, the Plan allocated EUR 730 million to create more than 4500 new entrepreneurial opportunities in agriculture for the younger generation, women, and the unemployed. At the same time, a EUR 1.03 billion fund package was proposed to support young farmers, especially in innovation and digitalization, and to attract new farmers to the sector.

Under the eco-schemes and rural development interventions, one of the priority areas was ensuring a sustainable animal welfare system. Notably, this involves increasing space for animals and the time they spend outside the stables, as well as reducing antimicrobial use.

Knowledge Sharing, Innovation, And Digitalization

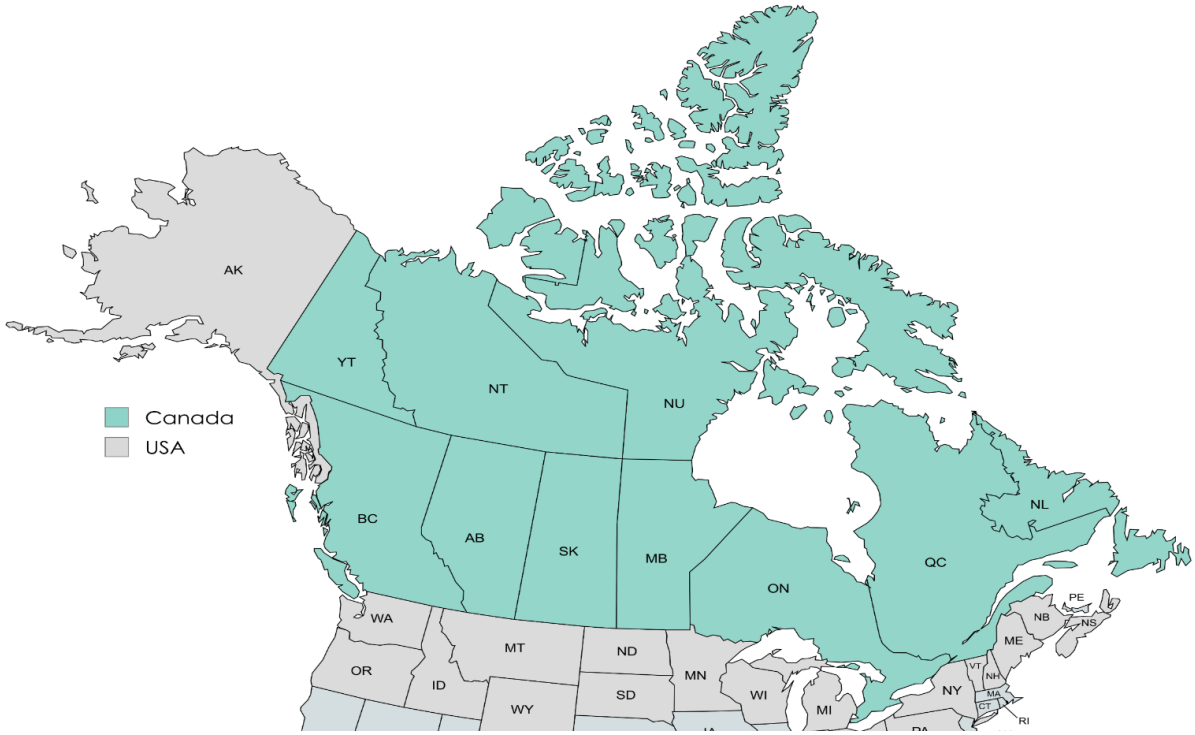
These were identified as factors supporting the modernization of agriculture and rural areas. In their proposal, it was estimated that about 461,624 people will benefit from advice, training, knowledge exchange sessions, or from participating in European Innovation Partnership (EIP) operational groups (e.g., networking for innovation), supported by the CAP to enhance economic, social, and environmental sustainability, climate performance, and resource efficiency.

3.4 Brief Country Analysis: Canada

Canada is a country in North America. It has ten federated provinces and three federal territories that extend from the Atlantic Ocean to the Pacific Ocean and northward into the Arctic Ocean, making it the world's second-largest country by total area, with the world's longest coastline. Its border with the United States is the longest international land border. Canada shares a land border with Greenland (Kingdom of Denmark) to the northeast, on Hans Island (Chase, 2022). The country has the world’s largest area of freshwater lakes (Battram, 2010).

Further to the above, the country has a highly developed mixed-market economy (Diekmeyer, 2020), and it ranks 9th in nominal GDP as of 2024, at approximately US$2.24 trillion (World Bank data). According to the United Nations Conference on Trade and Development (UNCTAD), Canada is one of the world’s largest trading nations with a highly globalized economy (UNCTAD, 2021). Global Affairs Canada reported that, as of 2023, Canadian exports totaled over $712 billion, while imports totaled $755 billion, with exports and imports to and from the US representing 77.1% and 49.6%, respectively. The performance in the trade sector was attributed to the country’s cooperation in multinational trade pacts, which play a significant role in its economy. The Trade Commissioner Service affirms that Canada is a signatory to fifteen (15) free trade agreements with fifty-one (51) countries (Trade Commissioner, 2025). Notable ones include the Canada–United States–Mexico Agreement (CUSMA), the North American Free Trade Agreement (NAFTA), the Comprehensive Economic and Trade Agreement (CETA) with the European Union, and others.

Figure 3.7 Provincial Map of Canada



Source: Mapchart

Again, the country is a member of the World Trade Organization (WTO), the G7, and the Organization for Economic Co-operation and Development (OECD).

Overall, the economy's growth has been driven by the manufacturing, mining, and service sectors. This growth has subsequently transformed the nation from a largely rural economy to an urbanized industrial one (Harris et al., 1987). Moreover, the country is reportedly among the few developed economies that are net energy exporters. It has vast offshore natural gas deposits and the fourth-largest oil reserves in the world (Lopez-Vallejo, 2016). Besides, Canada's main exports are zinc, uranium, gold, nickel, platinum, aluminum, steel, iron ore, coking coal, lead, copper, molybdenum, cobalt, and cadmium, according to the Observatory of Economic Complexity (OEC). Again, automobiles and aeronautics are among the most important manufacturing industries. Not only that, but the agriculture and fishing industries are also key contributors to the economy. As a result, it is among the largest suppliers of agricultural products worldwide, particularly wheat, canola, and other grains.

The country has a population of over 41 million, with about 18% living in rural areas. It features diverse population densities, with most people residing in cities and large parts of the country being sparsely populated. The Canadian economy is mainly driven by the service sector, which employs almost 80% of the country's workforce, followed by industry (19.21%) and agriculture (1.27%), according to O'Neill (2025). The unemployment rate dropped to 6.9% in June 2025 from 7% the

previous month (about 1,552,500 people), with the highest at 14.20% in 2020 and the lowest at 2.90% in 1966 (Trading Economics, 2025). In 2023, approximately 10.2% of Canadians lived in poverty, up from 9.9% in 2022. Among those aged 18 to 64, the poverty rate was higher in 2023 (11.6%) than in 2022 (11.1%). Quebec continued to have the lowest poverty rate in 2023 at 7.4%, though it increased by 0.8 percentage points from the previous year. Conversely, Nova Scotia and Saskatchewan had the highest rates at 12.9% each (Statistics Canada, 2025).

3.4.1 Agrifood Sector – Canada

According to the AAFC (2025), primary agriculture is conducted on approximately 189,874 farms covering 62.2 million hectares, which is 6.2% of Canada's land area. Much of this activity is concentrated across the Prairies, Quebec, and Southern Ontario. The country is a major player in the global agriculture and agri-food industry. Canada ranks as the seventh-largest producer of agri-food products worldwide, mainly producing wheat, barley, rapeseed, canola, and corn.

Additionally, it produces vegetables and fruits like berries, apples, and tomatoes. Canada exports large quantities of live animals and significant amounts of meat to the United States and imports various meat products. Its vast, fertile lands also support substantial exports of wheat, canola, and seafood. As a result, Canada is the eighth-largest food exporter globally, selling to over 200 countries (AAFC, 2025). Notably, most of these exports are unprocessed products. Three-quarters of Canada's agriculture and agri-food exports (77%) are headed to countries with which Canada has a signed or in-force trade agreement (AAFC, 2025).

In 2021, agriculture contributed approximately 1.6 percent to Canada's GDP, down from 1.84 percent the year before. That same year, 25.3 percent came from industry, and 66.64 percent from the service sector (World Bank data). Conversely, in 2024, the entire agriculture and agri-food system generated $149.2 billion (about 7%) of the country's GDP and employed about 2.3 million people (AAFC, 2025), indicating the sector's resilience. The agricultural and food industry is an export-driven sector and one of the most resilient and innovative parts of the Canadian economy. The export revenue from agricultural and food products was nearly US$69.2 billion in 2023, with imports totaling $48.2 billion, according to a USDA report.

The same report revealed that the United States is Canada's largest agricultural trading partner, accounting for 60.3 percent of Canadian exports and 56.8 percent of Canadian imports. At the same time, Canada was the United States' second-largest agricultural trade partner, including both exports and imports. For instance, in 2023, Canada accounted for 16.3 percent of U.S. agricultural exports and 20.6 percent of imports (USDA, 2025). Additionally, Canada’s agrifood and seafood exports to China have increased significantly (by about 78%) since 2012, according to Agriculture and Agrifood Canada. The domestic market has also played a significant role in the sector's

performance. Canadians spent $213.6 billion on food, beverages, tobacco, and cannabis products in 2024, making it the third-largest household expenditure category after shelter and transportation (AAFC, 2025).

Table 3.3 Economic Indicators and Trade Structure of Canada

Category	Indicator	Details / Value (Year)
Economic Indicators	Population (million)	41 (2024)
	Rural Population (% total)	18% (2024)
	GDP (US$ trillion)	2.24 (2024)
	GDP per Capita (US$)	54,282 (2024)
	Agricultural Land (% land area)	6.5% (2022)
	Value of Exports	US$ 69.2 billion (2023)
	Value of Imports	US$ 48.2 billion (2023)
Trade Structure	Main Export Markets	United States, China, European Union
	Main Export Products	Wheat, canola, seafood, live animals, meat, rapeseed, fruits, and vegetables
	Major Sector Performance	7th largest producer of agri-food products; 8th largest exporter
	Main Import Products	Cereals (especially wheat), tropical fruits and nuts, soybeans, sugar cane
	Main Import Markets	United States, Italy, Brazil, France, Mexico

Source: Author's compilation based on national statistics and international databases (2022–2024)

Indeed, Canadian products have a powerful brand worldwide. Subsequently, their market position stems from guaranteed quality and higher food safety standards, as well as their bountiful natural resources. According to Stephen (2023), Global consumers have a high degree of trust in Canadian products, translating into a willingness to pay a premium. Moreover, the country is building capacity to make Canada a global leader in innovative, sustainable, plant-based, value-added consumer goods. Retailers have also expanded their private-label programs to offer innovative products at more affordable prices, generating growth in private-label sales channels and export opportunities for Canadian agri-food products (Stephen, 2023).

In summary, the country's leading role in global competitive markets is due to abundant land and water resources, access to international markets, strong research and development capacity, strong stewardship of land, and a strong reputation as a trusted supplier of safe, top-quality food products (AAFC, 2024).

3.4.2 Agricultural and Agrifood Policies – Canada

The department under the Government of Canada responsible for the federal regulation of agriculture, including policies governing the production, processing, and marketing of all farm, food, and agri-based products, is Agriculture and Agri-Food Canada (AAFC), also known as Ag-Canada (Agriculture and Agri-Food Canada). In line with their responsibilities, they support

corporate and local agricultural producers and suppliers through a variety of programs and services. For example, Agri-Geomatics is one of their programs that develops products and services for internal and external users and facilitates program activities. Again, they collaborate with Canada's provinces and territories to promote Canadian products and support market growth through their market access and trade negotiation activities. The department also supports industry by advancing science and technology and helping producers mitigate risks (AAFC, 2023 & AAFC, 2024) through the Science and Technology Branch.

The Science and Technology Branch has the mandate to propose solutions and opportunities, based on scientific evidence, to support the competitiveness and sustainability of the agriculture and agri-food sector. It is also their mandate to provide scientific information to inform departmental and governmental decision-making processes, and to provide this information to parliament through the minister for agriculture and the agrifood sector.

The Science and Technology Branch is equipped with a national network of 20 Research and Development Centers and 29 satellite research locations with about 2,272 research scientists (AAFC, 2024). The overall goal of their activities is to address the significant scientific challenges facing agricultural production systems, including increasing agricultural productivity, enhancing environmental performance, improving attributes for food and non-food uses, and addressing threats to the agriculture and agri-food value chain (AAFC, 2024).

Sustainable Canadian Agricultural Partnership (Sustainable CAP)

Excerpts from the Agriculture and Agri-Food Canada report (2024) on the Sustainable Canadian Agricultural Partnership were used for this review.

Sustainable CAP is a five-year agreement from April 1, 2023, to March 31, 2028, involving the federal, provincial, and territorial governments to enhance the competitiveness, innovation, and resilience of the agriculture and agrifood sector. The agreement allocates $1 billion to federal programs and activities and $2.5 billion to cost-shared programs and activities jointly funded by federal, provincial, and territorial governments. It focuses on five key priority areas: building sector capacity and growth and competitiveness; climate change and the environment; science, research, and innovation; market development and trade; and resilience and public trust.

Federal Programs

a. AgriMarketing Program

The program aims to increase and diversify exports to global markets and seize market opportunities through industry-led promotional activities to differentiate Canadian products and producers, leveraging Canada's reputation for high-quality, safe food.

The program supports a wide range of agricultural sectors, including field crops, fish and seafood, food and beverage, horticulture, and livestock.

Under this program, beneficiaries are expected, among other objectives, to increase and diversify their exports to markets with which Canada has free trade agreements, thereby increasing the visibility of Canadian products with consumers in Canada and abroad.

b. AgriCompetitiveness Program

This program focuses on projects that enhance sector capacity, build public trust, and have a broad national scope within the agriculture industry. For example, supporting sector-led activities, such as producer-focused seminars and conferences, helps identify best practices and strengthens the sector's ability to assist agri-businesses in transitioning, adapting, and increasing profitability by fostering entrepreneurial skills and developing industry leadership.

c. AgriInnovate Program

The program provides repayable contributions to promote the commercialization, demonstration, and adoption of ready-for-market innovative technologies and processes, thereby enhancing competitiveness and sustainability in the agricultural and agri-food sectors.

d. AgriScience

AgriScience offers funding and support for pre-commercial science activities and research that benefit the agriculture and agri-food sectors and Canadians. This is expected to speed up innovation in these areas.

e. AgriDiversity Program

The main goal is to help underrepresented groups participate in the sector. Therefore, the program's beneficiaries are expected, among other things, to participate in activities that promote the benefits of a career in agriculture and to enhance the public's perception of agriculture and its role in the economy. Additionally, engage, train, and empower underrepresented and marginalized groups to enable them to succeed in the Canadian agriculture and agri-food sector.

f. AgriAssurance Program

The primary objective is to foster public trust in the safety of Canadian agri-food products and in how they are produced. For example, funds are provided to develop, verify, and integrate assurance systems to meet market and regulatory requirements for food safety, plant and animal health surveillance, animal welfare, environmental sustainability, traceability, market attributes, and quality standards.

Other support schemes within the Business Risk Management (BRM) programs provide agricultural producers with protection against income and production losses, helping them manage risks that threaten their farms' viability. Some examples include AgriInsurance, which provides cost-shared insurance against natural hazards to lessen the financial impact of production or asset losses, and AgriInvest, which offers cash flow to help producers manage income declines.

CHAPTER FOUR

The Concept of Rural Capacity Building

4.0 Understanding Social and Human Capital in Capacity Building

Interest in rural development issues continues to receive attention from different perspectives. The EU Commission's perspective, from a territorial approach, views agricultural supply chains and food systems as integral to wider territorial environments, characterized by specific combinations of human, natural, and cultural resources, as well as specific productive and institutional challenges and sustainability issues (European Commission, 2016). Under this context, there is growing interest in research investigation that characterizes the possible economic, social, and environmental benefits that can be produced by agri-food systems and rural activities (Belletti et al, 2021; Belletti et al., 2017) and the influence of effective governance and management solutions for higher sustainability and territorial cohesion (Demeterovà et al., 2020).

From another perspective, rural development can be examined as a simultaneous process of productive and institutional transformation aimed at reducing poverty and inequality in rural areas (Schejtman & Berdegué, 2004; Forster et al., 2021). To elaborate on this concept, productive transformation entails relevant changes to management mechanisms for specific local resources, particularly in the planning and implementation of sustainable production systems, competitive strategies, and marketing approaches. The aim is to enhance, renew, and reproduce various territorial resources, such as bio-cultural heritage, agrobiodiversity, and human and social capital. On the other hand, Institutional transformation emphasizes the central role of territorial actors as capable and co-responsible agents, promoting concertation among themselves and with relevant external actors to empower local stakeholders and enhance good governance.

Both concepts can be incorporated into capacity building. As Reimer (2002) revealed, capacity building requires an analysis of the assets and resources available to rural people, as well as the outcomes valued by the various actors. These assets include various forms of economic, human, social, and natural capital. Other reports included political, built, and cultural capital. Nonetheless, an important aspect of this framework is assessing the structural processes that produce those outcomes across different asset and resource arrangements.

According to IFAD's field report (2021), an estimated 3 billion people (about 40 percent) of the global population live in rural areas of developing countries. This population primarily depends on small family farms for their income and sustenance. These smallholder farmers account for about 80 percent of production in sub-Saharan Africa and parts of Asia (IFAD, 2021). Unfortunately, there is clear evidence that, despite these smallholder farmers' efforts, they are plagued by varying

degrees of poverty and hunger. It is also reported that 3.83 billion people, representing almost half of the world's population, depend on the agrifood system for their livelihoods (Davis et al., 2023), where 2.36 billion live in Asia and 940 million in Africa. Similarly, about 1.23 billion people are employed in the agricultural and agrifood sector (FAO, 2023).

The above ascertains the fact that the capacity of this rural populace to organize themselves might as well be their most important resource (FAO, 1998; Legatum Institute, 2015) towards achieving rural economic growth, which may be argued to be inevitably influenced by the composition of the existing human and social capital of the rural community. For instance, an existing workforce's skills and capabilities may lead a community to attract or target businesses for its socio-economic development (Jacob & Boerger, 2008).

Many authors have defined social capital through different lenses. However, the Oxford dictionary's literal definition is a network of relationships among people who live and work in a particular society, enabling it to function effectively. It has been argued that social capital is intangible, multidimensional, and takes various forms (Canada Commons, n.d). Coleman's (1988) theory of social capital focused on the structure of social relationships, particularly their role in the acquisition of human capital. In addition to the above theory, the Organization for Economic Co-operation and Development [OECD] (1998) asserted that human capital comprises the knowledge, skills, competencies, and other attributes embodied in individuals that are relevant to economic activity. Also, Li (2004) suggested that social capital refers to the social relationships people cultivate across various social settings, as well as the potential resources these relationships offer for pursuing social and economic goals. In other words, the theories elaborate on the relationships among various groups or organizations and on the valuable information, skills, and competencies for profitable activities in communities.

Besides, Bourdieu's theory (1993) is concerned with the capacity of social capital as a valuable source of support for people, communities, and nations. The above theories provide helpful context for the objectives of this research project. Moreover, these theories indicate that social partnerships, businesses, and communities play a key role in rural capacity building, thereby enabling socio-economic development and fostering SME growth. Admittedly, social partnerships, as a system for rural capacity building, remain the most relevant aspect of social capital for discussion (Gabriel, 2012), as the concept seeks to strengthen weak communities, accommodate their citizens, provide labor market opportunities, and boost economic resilience. In the above perspectives, Reimer (2002) added that social capital is more of a relational characteristic, seen as a social asset

embedded in social relations, which, on its own, is considered an asset and may be used to create additional assets. That is social capital, which can be referred to as social assets, either with respect to the source of investment or with the goods or services produced.

In most literature reports, considerable evidence shows that the accumulation of social capital has led to productive socioeconomic gains (Weaver & Habibov, 2012); nevertheless, variations in economic performance are reported across and within countries due to differing social structures that influence these outcomes. Therefore, a thorough understanding of social capital is essential for comprehending these disparities in rural economic growth. For instance, higher levels of social capital have enhanced employment opportunities and incomes, reduced poverty, increased savings and assets, and improved access to credit (Brisson, 2009; George & Chaze, 2009; Yusuf, 2008). Similarly, low levels of social capital are associated with prolonged welfare dependency and food insecurity (Henderson & Tickamyer, 2008).

Another example to consider is the differences in social structures between the North and the South of Italy, which have accounted for the discrepancy in firms' economic performance. Putnam (1993) added that these disparities explain why income levels in the North of Italy are higher than those in the South. The same is true of Ghana, where social capital is more substantial in Northern Ghana than in the South, owing to the North's historical experience of collective action (Grischow, 2008). Arguably, the existence of such substantial social capital did not always translate into higher economic gains. This is evident in the Northern part of Ghana, which remains the country's poorest region. This case aligns with Pichler and Wallace (2009) and Seo (2005), who asserted that social capital has little or no influence on the economic well-being of the studied population. As other researchers have found, social capital can have a detrimental impact on indicators of economic welfare, including economic mobility, employment, and productivity (Adato et al., 2006; & Barrett, 2008; Livermore & Neustrom, 2003).

Therefore, a crucial understanding of how social capital influences the economic growth of agrifood SMEs in our rural communities may be key to effective development policymaking in the agricultural and agrifood sectors. Tiepoh and Reimar (2004) point out that the flow of information and knowledge between economic agents often reduces economic transaction costs and provides input for the production process. Examples include sourcing raw materials for production, easy access to information about job opportunities, and facilitating the adoption of innovative processes.

Therefore, based on the concepts discussed above, human capital and social capital are considered the two key components of capacity building in this study. We can conclude that social capital is the network of relationships among actors within a specific rural community's agricultural and agrifood sector. This network enables the community to function effectively and sustain rural vitality. We can also affirm that the skills and capabilities of these actors are economically valuable in supporting integrated activities and market competitiveness. Consequently, factors such as education, technical skills, negotiation abilities, experience, problem-solving skills, and other elements of human capital, when combined with social capital, can boost economic outcomes when used effectively. Additionally, one could argue that the usefulness of these social networks and relations depends on the nature of the human capital embedded within them. Hence, the interaction between these two forms of capital plays a critical role in determining how effectively agrifood SMEs operate within value chains and respond to market opportunities and constraints.

Given the above perspectives, capacity building has become a vital concept in discussions of rural development, agrifood systems, and value-chain performance. Generally, it refers to processes through which individuals and organizations develop the skills needed to perform functions effectively and adapt to changing economic and institutional conditions (OECD, 2006; UNDP, 2009; Morgan, 2006). In agrifood systems, capacity building is often linked to enhancing the competencies of actors across the agrifood value chain segments, including agricultural production, processing, and distribution.

However, because the concept is used across many development contexts, it is sometimes interpreted very broadly, including a wide range of institutional, infrastructural, and policy interventions. To maintain clarity, this study adopts a more focused perspective. In this research, capacity building refers to the improvement of human and social capital among agrifood small and medium-sized enterprises (SMEs) within the agrifood value chain. This includes strengthening their knowledge and skills, as well as collaborative networks that enable actors to operate more efficiently within agrifood chains. By strengthening these capabilities, capacity building can improve value-chain coordination, reduce inefficiencies, and boost the competitiveness of agrifood systems.

Overall, we may further assert that the competitiveness of agrifood chains is linked to capacity building in each segment of the supply chain, where actors within the agrifood chains recognize their specific identity, interconnect their knowledge and capabilities, and influence and control certain actions of other actors in the business environment to enhance competitiveness in the market and boost economic growth in rural communities. This influence and control arise from coordinated

networks, shared norms, social trust, solidarity, and reciprocity embedded in social structures and interactions. The following sections explore how human and social capital influence capacity-building processes in Ghana, Italy, and Canada's agrifood sectors.

4.1 Rural Capacity Building, Ghana

This section discusses rural capacity building in Ghana, with a primary focus on strengthening human and social capital among smallholder farmers and agrifood SMEs. Capacity-building efforts in Ghana focus on training programs, agricultural extension services, and knowledge transfer methods to boost farmers' productivity and help agrifood actors participate more effectively in value chains. At the same time, the section emphasizes the importance of social capital, which includes networks, relationships, and cooperative structures that promote collaboration among actors in rural communities. Farmer associations, cooperatives, and community organizations help foster information sharing, access to resources, and collective action within the agrifood system. These dimensions in human and social capital support capacity building by improving the ability of agrifood SMEs to coordinate activities, improve operational practices, and better integrate into local agrifood value chains, though institutional limitations and resource constraints often restrict the success of these efforts.

The common characteristics of rural communities in Ghana include inadequate access to credit facilities, poor agricultural practices, insufficient potable water, inadequate educational infrastructure, and poor road networks. Others include a lack of a ready market for farm produce, inadequate healthcare infrastructure, inadequate housing, a lack of recreational facilities, poor telecommunications services, and insecurity (Gabriel, 2012). The nature of social structures and relations, particularly in rural Ghana, is historically rooted and provides the essentials for capacity building. Social capital is rooted in the country's traditions and culture, driven by a communal spirit (Gabriel, 2012), evident in festivals, funerals, naming ceremonies, and marriage ceremonies. Such a relationship is bonded to the network, trust, and norms of the community it represents.

In Ghana, every community has a traditional authority, including the Chief and his elders, whose primary function is to maintain social stability, cohesion, and order. Principally, the traditional authority, headed by the Chief, mediates between the state and the people and is assigned various responsibilities, ranging from judicial and adjudicatory functions to administrative/political and cultural/religious functions. Interestingly, the nature of this social structure has granted traditional authority legitimate power over its subjects and has made it the community's leading manager of its

natural resources. The traditional authority is the custodian over all lands held by his subjects in his traditional or geographical jurisdiction under customary tenure.

Table 4.1 Overview of the current rural perspective, Ghana

Key Challenges	• Illegal mining activities • Youth Out-Migration • Inadequate infrastructure (transportation, virtual connectivity) • Poor agricultural practices. Lack of a ready market for farm produce • Inadequate access to credit facilities	
Resources (Asset)	**Functional Role**	***CED initiatives**
Traditional Authority	• Manages natural resources • Mediate between the state and the people. • Judicial, administrative/political, and cultural/religious responsibilities.	• Open-air market centers • Health centers • Transportation hub • Water projects
Community Cultural Events (Festivals, funerals, marriage, and naming ceremonies)	• To address key socioeconomic issues within the community • Fundraising	• Voluntary donation by individuals, business entities, the Government, and Charitable Organizations • Product Marketing and Advertising • Sponsorships
Association of Local Professionals (farmers, fishermen, traders, local food processors, etc.)	• Financial support for SMEs. • Accessing a shared labour pool at no monetary cost.	• 'susu' fund • Communal labour activities
Government - • (Metropolitan, Municipal, and District Assemblies - MMDAs) • Microfinance and Small Loans Center (MASLOC)	• Carry out development projects to improve social welfare and reduce poverty. • Collaborate with other sector ministries like Agriculture. • Assists business start-ups and small businesses with fast, easy, and accessible microcredit and small loan facilities to grow and expand their businesses as well as to enhance job and wealth creation.	• Assembly's common fund • Extension services • Farm demonstration program • Marketing and e-agriculture support programs • Credit Facilities to SMEs.
NGOs	• Collaborations, Partnerships and coordinate projects to improve rural livelihoods.	• Capacity building programs

Source: Author **CED-Community Economic Development*

The majority of land in Ghana is controlled by chiefs, with the remaining land in the hands of the government and some individuals. Subsequently, they strategically use their position to support socio-economic development for the benefit of their people. For example, in most communities,

chiefs and their subjects established an open-air market center, a vibrant hub for economic activities that provides people, especially the unemployed, with avenues for profitable ventures.

Moreover, they play functional roles in facilitating cooperation and coordination in all communal activities. For example, in an article by Lyon (2003) on group marketing, crop storage, and road maintenance in southern Ghana, Lyon noted the important role that chiefs and elders played in maintaining unity among marketing committees and discipline among communal road workers (Lyon, 2003a).

Further to the above, we also have groups based on a common language and socio-economic activities, such as associations of farmers, fishermen, hunters, local food processors, traders, and craftsmen. Mostly, such associations use the 'susu' fund, a form of an indigenous rotating credit system that manages common-pooled resources, notably finances, to support each member of the group (Gabriel, 2012). This has been the primary source of financial support for start-ups and existing small and medium enterprises (SMEs) within the communities. In farming communities, the communal spirit is expressed through communal labor groups (known locally as 'Nnoboa Kuo') that help farmers access a shared labor pool at no cost.

In this context, we can view these elements ('Nnoboa Kuo' and 'Susu' fund) as a form of social capital, seen as productive assets and resources embedded in social structures and relations that facilitate economic actions and performance (Helliwell & Putnam, 1995). Similarly, during festivals or community events, social capital manifests itself in ways that address key community issues, such as the rehabilitation of schools and health centers, the construction of market centers to boost trade, and investment in businesses.

As part of the social structure, national government representatives are present in local government at the metropolitan, municipal, and district assemblies (MMDAs), through which development projects are implemented at the rural level to improve social welfare in areas such as public health, basic education, sanitation, and infrastructure. The MMDAs use the assembly's common fund, which receives budget support of at least 7.5% of the country's GDP each year. Again, specialized departments of local government can carry out individual programs and sometimes collaborate with other departments in interrelated development projects. The Ministry of Food and Agriculture (MoFA) at the local level has given keen attention to improved agricultural extension services, the formation of farmers' associations, the establishment of demonstration farms, encouragement of farmers to build better storage facilities, and considering promising marketing avenues, among others, in its programs (Gabriel, 2012). An example of a government initiative under the MoFA is the flagship program, Planting for Food and Jobs (PFJ), which supports farmers with subsidized

improved seeds, fertilizers, extension services, market access, and e-agriculture services. The Microfinance and Small Loans Center (MASLOC), also assists business start-ups and small businesses with fast, easy, and accessible microcredit and small loan facilities to grow and expand their businesses as well as to enhance job and wealth creation.

Ghana has no rural development plan or policy framework for rural community development. Instead, the government, through its ministries, relies mainly on national development and poverty-reduction programs to advance rural development and improve livelihoods, as mentioned above. Without a doubt, the potential outcomes of these projects have not fully materialized at the local level. As a result, rural communities remain disadvantaged in their ability to benefit from the government's socioeconomic and political investments (Zadawa & Omran, 2020; Alinola, 2007). On the other hand, government programs focus primarily on rapid urbanization and on providing for the growing urban population (Bolay, 2020; Satterthwaite & Mitlin, 2014).

Subsequently, the government and other international development agencies engage NGOs as a conduit to develop less-endowed regions (Allen & Thomas, 2000; Porter, 2003), mostly in rural communities (Bawole & Hossain, 2015). Since most of their activities are geared toward improving rural livelihoods, they provide substantial input in capacity-building processes in areas such as agriculture, food security, skills training, education, water and sanitation, gender issues, and so on. Their activities are carried out mainly in collaboration with traditional and local authorities to preserve the culture, norms, and traditions embedded in the communities where they operate. Also, strong collaboration between NGOs and traditional authorities (TAs) would enable NGOs to circumvent certain traditions to achieve their goals (Bite & Krumetra, 2017). For example, World Vision International, working in northern Ghana, has improved living conditions by effectively collaborating with community leaders and social groups. In addition, Cooperative for Assistance and Relief Everywhere (CARE) International is also well-known for supporting and building the capacities of smallholder farmers through extension programs.

The important aspect of these social resources mentioned above (including traditional authority, local associations, communal events, local government, NGOs, and community members) is their effectiveness in leveraging networks, trust, and norms rooted in social structures to facilitate capacity-building in these rural communities. We may reiterate that a community with a higher form of social capital, including strong networks and trust in the social structure, is expected to accelerate economic growth. However, there are glaring variations in economic growth due to how social capital is used across communities. Unfortunately, in some scenarios, the ethics of these social relationships are betrayed, resulting in a conflict of interest in which the parochial interests of

a few individuals prevail over the collective interests of the rural populace. Consequently, this affects the social welfare outcomes.

One key example is the issue of illegal-scale mining activities commonly known as ‘galamsey’. Some communities are experiencing worsening social conditions due to ‘galamsey’. According to a report by Felicia and Shikshya (2021), the unregulated gold wealth attracted thousands of Chinese miners to Ghana, who began mining for gold illegally, causing devastating effects on the economy, the environment, communities, and women’s security. This is due to their collaboration with corrupt government leaders and traditional authorities, and, to some extent, to the complicity of locals. Illegal small-scale mining in Ghana destroys the environment, makes people ill, exacerbates water scarcity, and damages farmland and crops, including cocoa (Aikins, 2024). Furthermore, it highlights how capacity building can be hindered when the tenets of social capital are not adequately considered. Poor collaboration, partnerships, and networking among NGOs, the state, and other development practitioners hinder NGO operations (Adjei et al., 2012). It is also argued that many NGOs violate their non-profit motive by enriching themselves through livelihood interventions (Chant & McLlwaine, 2009; Forkuor & Agyemang, 2018). As a result, their roles in rural development do not always lead to the expected social welfare outcomes.

Without a doubt, the youth component of the rural population is the key source of sustainable human capital. Rural Ghanaian youth pursue both non-agricultural and agricultural employment trajectories (Dwumah et al., 2023). The energy and numbers of youth provide the core basics for building resilient human capital to boost socio-economic activities in these communities. MoFA (2023) revealed that 95% of farmers across the country are between 55 and 65 years old, with the youth in agricultural activities representing less than 5%, of whom 12% use some form of technology in agriculture (Heifer International, 2021). Additionally, there has been a steady decline in youth participation in the agricultural sector. Therefore, pursuing robust, long-term, sustainable agricultural programs is challenging. A research publication that investigated the Youth Employment Paths in a Ghanaian Rural Community mentioned the reasons why youth have little interest in agricultural-related activities, among the reasons included the downgrading of farming and rural life, government neglect of small-scale agriculture and rural infrastructure, as well as access to land (Dwumah et. al, 2023).

4.2 Rural Capacity Building, Italy

This section examines how rural capacity building in Italy is strongly supported by well-developed institutional frameworks, training systems, and cooperative structures within the agrifood sector. A key part of this process is developing human capital, which includes the technical knowledge, professional skills, and management abilities that farmers and agrifood SMEs need to uphold high standards of production, food safety, and sustainability. Training programs, vocational education, and technical advisory services help agrifood actors adopt modern production techniques, improve product quality, and adapt to changing market demands. The section also emphasizes the importance of social capital, particularly through strong cooperative networks, producer organizations, and industry associations. These networks promote collaboration, knowledge sharing, and coordination among actors throughout the agrifood value chain. By strengthening relationships and institutional linkages, social capital facilitates information sharing, market access, and collective action within the sector. Overall, the development of human and social capital helps build capacity, enabling agrifood SMEs in Italy to operate within integrated value chains and remain competitive in both domestic and international markets.

Table 4.2 Overview of the current rural perspective, Italy

Key Challenges	• Scarcity of infrastructure • Virtual connectivity (Digital Capacity) • Depopulation (Youth Out-Migration and Aging) • Technology adaptability • Weak economic potential • Social marginalization.	
Resources (Asset)	**Functional Role**	**CED initiatives**
Natural and Cultural Capital (Biocultural resources &Agrobiodiversity)	Provides recipes to produce highly differentiated quality products	
Larger SMEs base	Support the overall Italian Economy.	
Government • (National Strategy for Inner Areas (SNAI) • EU (ESR, ERDF, EAFRD)	To adopt strategies for the inner areas' development	• Promoting local cultural and natural capital. • Sustainable tourism • Innovative agrifood systems • Business diversification, • Renewable energy supply chains and energy saving • Craftsmanship and traditional know-how

Source: Author

Rural communities in Italy are often defined in contemporary literature as Internal areas (Fontefrancesco, 2020), Inner peripheries (De Toni et al., 2020), or Inner areas (Materiali UVAL, 2014), characterized by abundant natural resources and heritage. It is, however, evident that there is

much untapped natural and human capital in these areas, offering strategic opportunities to rehabilitate and revitalize socioeconomic growth in these inner areas. In the Materiali UVAL report (2014), the Inner Areas are defined as territories that are substantially far from centers offering essential services and are thus characterized by depopulation and degradation.

Moreover, these areas are characterized by a shortage of public and private services and infrastructure, distance from the main urban centers, and economic marginalization (Monaco & Tortorella, 2015; De Vincenti, 2018). In other words, there is limited access to essential services such as education, health, mobility, and virtual connectivity (internet access). However, depending on localities and environmental contexts, these rural areas face challenges related to growth, jobs, sustainability, and accessibility (Mathews, 2007).

For centuries, the agricultural sector has played a key role in the country's socioeconomic landscape. In 1871, over 70 percent of the active population worked in agriculture; this Figure decreased to around 40 percent in 1951 (Bravo, 2001), to about 5 percent in 2019 (ISTAT, 2019), and to 4 percent in 2022 (ILO, 2024). The decline is attributed to depopulation in the internal areas, aging, and impoverishment (Cagliero & Novelli, 2012; Fonte Francesco, 2015); consequently, farmers are unable to make new investments or manage existing ones. In their report, De Toni et al. (2021) also emphasized low economic potential, depopulation, population aging, weak territorial cohesion, and social marginalization.

Conti and Sivini (2023) also revealed that in agriculture, the last census data showed a decrease in farms led by young managers (under 40 years old), from 11.5% to 9.3% between 2010 and 2020. Likewise, there was also a decrease in the total number of farms (from 1.615.590 to 1.133.023 units) and in the Utilized Agricultural Area, UAA (-2.5%) between 2010 and 2020 (ISTAT, 2023). Again, the report highlighted a limited budget for development projects in small municipalities, as it depends on resources from higher administrative levels, such as provincial, regional, or national governments.

The Italian territory is characterized by a polycentric system, with towns, rural areas, and municipalities linked by a solid network of relations. Larger towns and cities attract people because of their wealth of public services (Materiali UVAL, 2014). The inner areas are particularly highly diversified due to the dynamics of the varied, differentiated natural systems. They are areas with significant environmental resources, including water, agricultural systems, and forests. Beyond that, these inner areas are known for their cultural resources, including archaeological sites, historic settlements, abbeys, and small museums. The resources mentioned earlier form the core basics of agrobiodiversity of these rural areas**,** which provide distinct recipes from local genetic resources and

related traditions of cultural heritage or biocultural resources specific to an inner rural area (e.g., typical production and processing techniques, landscapes, art, and rituals, etc.) and have value for agriculture and food (FAO, 2019). These distinct recipes certainly provide the means to produce high-quality products with social and environmental benefits. In addition, these inner areas are characterized and influenced by a community of public and private actors (e.g., farmers, peasants, artisans, processors, traders, territorial bodies, associations, etc.) that explore opportunities, pursue different interests, address common challenges, and determine actions and policies (Forster et al., 2021). Hence, the social energy of the local population and the production systems within these rural areas (notably agricultural, tourism, and manufacturing) also play a significant role in their economic development. Most important are the skills and competencies of these actors and local communities employed to achieve growth (Gabellini, 2021).

Capacity building generally involves collective initiatives and strategies involving different actors, such as citizens, entrepreneurs, and public institutions, to enable a given society to cope with crises by developing greater capacity to respond to change (Qu et al., 2023; Bock et al., 2016). Despite this territorial capital's presence, socioeconomic growth remains highly varied across these inner areas due to weaknesses in social structures, reflecting challenges in capacity-building. For example, the Materiali UVAL (2014) report revealed that weak negotiation power (due to a lack of funding) on the part of the local administration has led some public and private bodies to exploit these communities by extracting resources and amassing significant wealth at their expense, without generating local benefits. On the contrary, in some inner areas where the local administrations are competently resourced with good policies and practices, they have, on the other hand, exerted their influence in dealing with external bodies in related development interventions towards achieving capacity building in these inner areas, such as providing incentives for employment and well-being of the community, as well as protecting the natural environment.

Similarly, Putnam (1993) asserted that the level of economic performance in the Central-North regions of Italy was higher than that in the South, citing that citizens in the Central-North regions are more engaged in public issues, they trust one another, and abide by the law. They also have leaders who have demonstrated commitment to their communities' needs. Their social and political networks are well organized horizontally rather than hierarchically or vertically. In this context, social capital embedded in norms and networks of civic engagement is seen as a precondition for economic development and effective government. On the other hand, in the Southern regions, social and cultural engagement is quite scanty, citizens feel powerless and exploited, and public affairs are

seen as the sole responsibility of the politicians. In effect, the representative government is less effective than in more civic communities.

In another instance, in a research publication on the effect of social capital on economic performance in the context of Italian regions, Guido and Giorgio (2006) empirically analyzed Putnam's propositions that central and northern Italy has developed faster than southern Italy because it was better endowed with social capital; and that the endowments of social capital across the Italian regions have been highly persistent over centuries. Among the variables investigated, low labor productivity in the South may be due to social norms that encourage shirking (Ichino & Maggi, 2000). Moreover, it could reflect the impact of low social capital on the credit market (Guiso et al., 2004), the performance of local government (Putnam, 1993), and the functioning of the judiciary (World Bank, 2005).

The report further notes that the Italian economy relies more than those of other OECD countries on small business activity. The distribution of firms across regions is far from uniform: Italian firms are concentrated in the center and north of Italy. Also, it was emphasized that a lack of trust can adversely affect entrepreneurship through several channels. Amin (1994) showed that the structure of the social relationship network within which firms operated in Italy similarly affected their performance. In summary, their results revealed that informal constraints, such as differences in trust, reciprocity, and cooperative habits, have led to significant differences in economic outcomes across areas with identical formal institutions. The result aligns with North's (1991) assertion that informal constraints, such as sanctions, taboos, customs, traditions, and codes of conduct, can structure political, economic, and social interactions.

Nonetheless, the extra-local environment, such as regional, national, or European funding, provides support mechanisms for capacity-building initiatives. As mentioned earlier, the Italian inner areas are endowed with significant development potential, representing unused environmental, economic, and social capital that could be leveraged to match employment opportunities. The development of these inner areas is thus central to the National Strategy for Inner Areas (SNAI). The SNAI is one of the most comprehensive policies in the European Union, launched by the Italian government in 2012, and serves as a laboratory for integrated rural development and institutional innovation (European Network for Rural Development [ENRD], 2018). SNAI adopts strategies to reverse the processes that have led to the socio-economic and structural fragility of these inner areas. In this respect, it purports to improve the prerequisites for development by triggering local development processes, supporting initiatives geared towards promoting local cultural and natural capital and sustainable tourism, innovative agrifood systems, business diversification, renewable energy supply

chains, energy savings, craftsmanship, and traditional know-how (Cotella & Brovarone, 2021). This policy is also supported by national and European funds such as the European Social Fund (ESR), European Regional Development Fund (ERDF), European Agricultural Fund for Rural Development (EAFRD), and the new National Recovery and Resilience Plan (PNRR) launched in 2021 is, in addition, dedicating funding to improve the resilience of inner areas through its missions and components under the Next Generation EU (Presidenza del Consiglio dei Ministri, 2021; Ministry of Economy and Finance, 2021).

4.3 Rural Capacity Building, Canada

Table 4.3 Overview of the current rural perspective, Canada

<table>
<tr><td>Key Challenges</td><td colspan="2">• Demographic changes (aging population, outmigration)
• Infrastructure (transportation, technology, and communication)
• Technology adaptability
• Climate change</td></tr>
<tr><td colspan="2">Resources (Asset)</td><td>Functional Role</td></tr>
<tr><td colspan="2">Strong Social Capital
High level of community participation</td><td rowspan="3"></td></tr>
<tr><td colspan="2">An extensive local and indigenous knowledge system</td></tr>
<tr><td colspan="2">Cultural and Environmental Stewardship</td></tr>
<tr><td colspan="2">Government - Rural Economic Development Strategy
• Connect to the Innovate program
• Our Food Future
• Infrastructure investment plan</td><td>Provide the prospects for businesses to function competitively and sustainably.
• Extension of high-speed Internet access
• Promoting a smart food community using information technology and partnerships to increase access to affordable, nutritious food
• Infrastructure Projects in priority areas like rural and northern communities, social infrastructure, trade and transportation infrastructure, green infrastructure, and public transit infrastructure.</td></tr>
</table>

Source: Author

Section 4.3 explains how rural capacity building in Canada is supported by strong institutional frameworks, technological innovation, and well-structured agrifood systems. A key part of this process is developing human capital, which includes advanced technical skills, managerial expertise, and specialized training within the agrifood workforce. Government programs, agricultural research institutions, and industry organizations play a major role in providing training and encouraging the adoption of modern technologies and sustainable farming practices. These efforts help farmers and agrifood SMEs increase productivity, meet regulatory standards, and stay competitive in global markets.

The section also highlights the importance of social capital in enhancing collaboration throughout the agrifood value chain. Networks among farmers, industry associations, government agencies, and research institutions promote knowledge exchange, innovation, and coordinated decision-making. These relationships support information sharing and collective efforts to tackle sector challenges such as labor shortages and environmental sustainability. Together, developing human and social

capital helps build capacity in Canada's agrifood sector, enabling actors to adopt innovative practices, improve value chain coordination, and maintain a competitive and resilient agrifood system.

Figure 4 .1 below summarizes key assets and challenges for rural and remote Canada. According to the State of Rural Canada report (2024), rural and remote communities are often geographically isolated, with high service-delivery costs; reliant on natural resources for sustenance; and have limited social and physical infrastructure and capacity (CRRF, 2024). That is limited access to technology, communication systems, health and education services, supplies, and human resources. In the report, only 37 percent of rural households currently have access to high-speed internet, compared to 97 percent in urban areas (ISED, 2024).

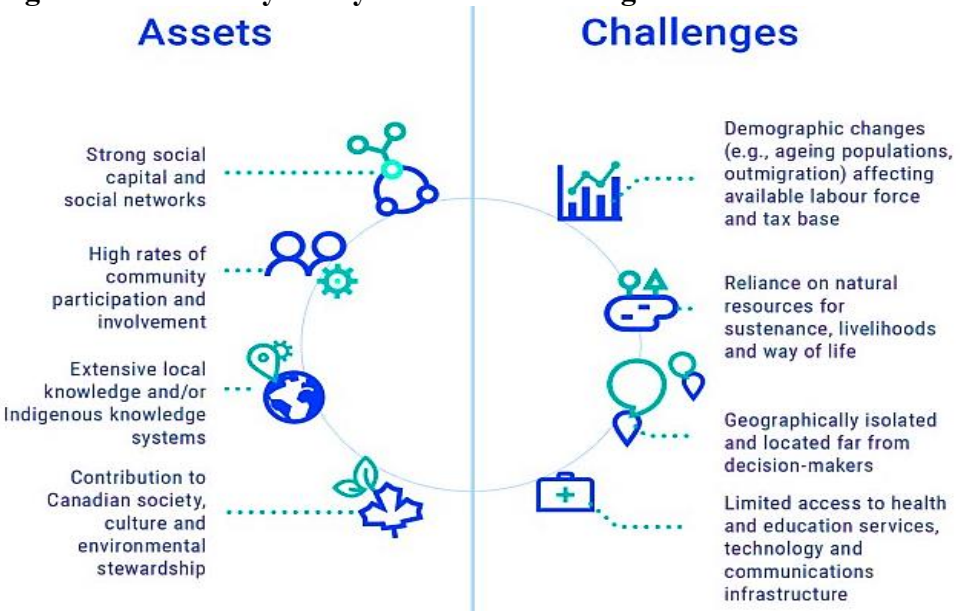
In addition, demographic changes, including population decline and aging, and youth out-migration, negatively impact the rural labour force, tax base, business opportunities, and virtually all aspects of community life. Rural incomes tend to lag behind those of urban communities, and unemployment levels tend to be higher. Rural, northern, and coastal communities are on the front lines of climate change and face increased risks from extreme weather events and natural disasters, including wildfires, drought, and floods. For example, the Canadian Prairies are among the most agriculturally productive regions in the world, yet they have highly variable, drought-prone climates (Sauchyn, 2010) that challenge agricultural production. Droughts are accompanied not only by an increase in crop-destroying pests, such as grasshoppers, but also by wildfires that threaten homes, animals, and farm buildings (IPCC, 2014).

Beyond these challenges, rural and remote communities often have strong social capital and networks, extensive local and/or Indigenous Knowledge, and high rates of community involvement, which foster resilience and pride (Vodden & Cunsolo, 2021).

According to the OECD report (2010), Canada has the largest rural areas, with almost 20 percent of the population living in rural, remote, Indigenous, coastal, or northern communities, and these communities contribute about 30 percent of Canada's GDP (ISED, 2024). Also, it is reported that about 220,000 rural businesses represent nearly 17% of Canada's employers (ISED, 2021), and SMEs (1 to 10 employees) make up 77.3% of Canadian businesses, employing 63.6% of the total private labor force (ISED, 2024). These rural areas are home to residents, businesses, and organizations that are often highly dependent on natural resources and ecosystems for cultural purposes, livelihoods, transportation, and well-being (Vodden & Cunsolo, 2021). There is a wide diversity in geography, culture, economy, and demographics across these rural regions. For this

reason, such diversity influences the capacity of these regions to operate competitively and sustainably in relatively different ways.

Figure 4.1 Summary of key assets and challenges for rural and remote communities.



Source: Vodden, K. and Cunsolo, A. (2021)

More so, rural and remote communities make critical contributions to Canadian society, culture, and environmental stewardship. Rural areas supply food, water, and energy for rapidly growing urban centers and sustain industries that contribute to Canada's economic prosperity (FCM, 2018). Generally, Rural Canadians work in agriculture, mining, oil and gas, forestry, fisheries, and aquaculture. The social structure of these rural communities includes forestry workers, farmers, entrepreneurs, community leaders, associations, businesses, academics, municipalities, Indigenous groups, and provincial and territorial Ministers.

In Riemer's (2002) report on Understanding social capital in rural Canada, it was emphasized that social capital manifests itself in four categorical relations: market, bureaucratic, associative, and communal. Each relationship is distinguished by its norms, rules of engagement, institutions, and control mechanisms. It further defined social capital as social assets embedded in social relations, which, by itself, is considered an asset and/or may be used to create an asset. The four (4) social relations above provide relatively coherent ways in which people organize themselves to accomplish tasks, legitimize their actions, distribute resources, and structure their institutions.

The survey report indicated that among the 19 NRE (New Rural Economy) sites investigated, the most represented category is Market-based social relations, due to a larger number of small businesses with seasonal and resource-based characteristics. Associative-based relations are next, and communal-based relations are the lowest. Again, there is evidence of interrelationships among

market, bureaucratic, and association-based relations, as these relationships are rooted in enterprises and enterprises in geographical proximity.

Through the sector minister, the Canadian government has expressed a commitment to work in partnership with rural leaders, Indigenous organizations, official language minority communities, municipalities, provinces, and territories to focus on the most important socio-economic issues. Therefore, the government, through the Federation of Canadian Municipalities, has initiated a Rural Economic Development strategy to address these challenges. Among the few developments in records is the Connect to Innovate program, which extends high-speed Internet access to more than 900 rural and remote communities and 380,000 households. That includes 190 Indigenous communities across Canada. Another initiative is Our Food Future, which promotes a smart food community using information technology and partnerships to increase access to affordable, nutritious food by 50 percent, create new circular food businesses and collaborative opportunities, and increase economic revenue by 50 percent by reducing or transforming food waste.

Canada is the most trade-dependent nation among the G7, and the trade sector relies on transportation networks and supporting infrastructure to get goods to market. Therefore, there are ongoing investments in infrastructure in priority areas like rural and northern communities, social infrastructure, trade and transportation infrastructure, green infrastructure, and public transit infrastructure. The above projects, being part of the infrastructure investment plan, are undoubtedly meant to help protect and improve the environment and social welfare for all Canadians (ISED, 2024).

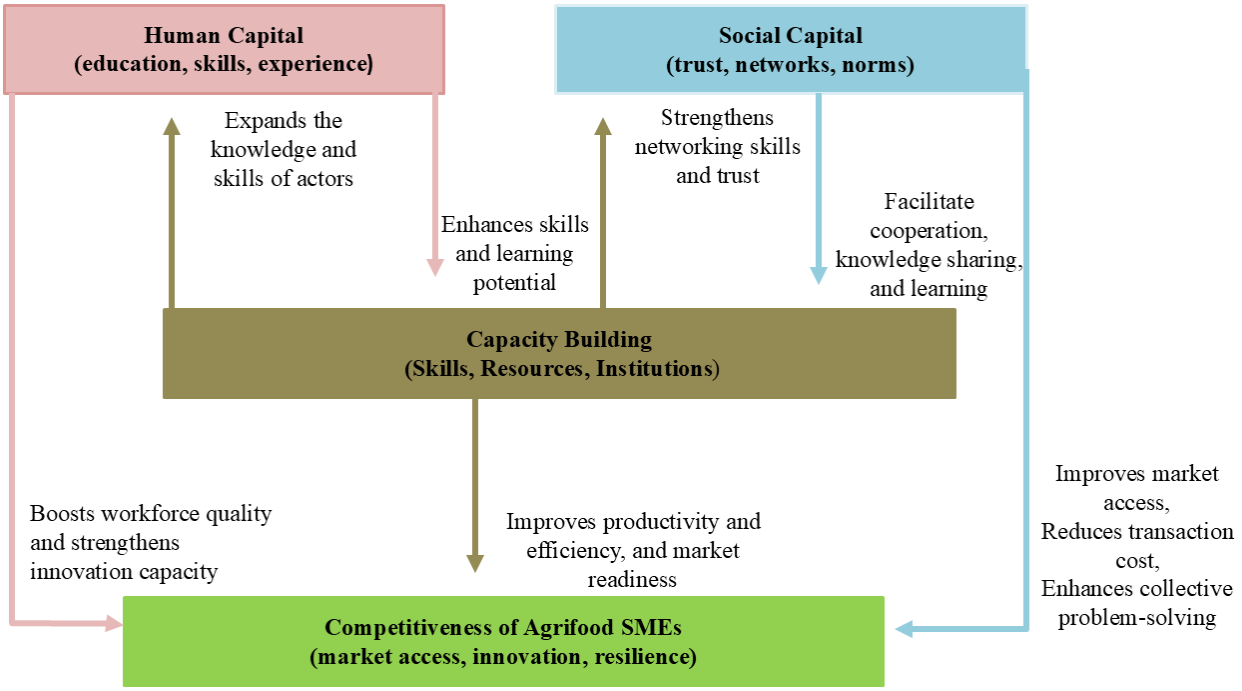
4.4 How human and social capital influence the activities of the agrifood SMEs

Figure 4.2 illustrates the general relationship between human capital, social capital, and the competitiveness of agrifood chains. The Figure highlights how improvements in skills, knowledge, and collaborative networks can enhance the efficiency and performance of agrifood value chains.

As we move along the agrifood chains, complex commercial and social interactions occur among actors across sectors and firms within a limited competitive market space. Thus, we may argue that the competitiveness of each segment of the agrifood chain depends on the composition of human and social capital, which together enable an economic entity to perform effectively. Therefore, an analysis of these features and the structural processes through which agricultural and agrifood SMEs can use these capitals to achieve valued socioeconomic outcomes is of immense significance for productivity, innovation, and sustainability within a given rural economic space, as shown in Figure 4.2 below.

In economic terms, human capital refers to the assets that enhance an individual's productivity (Davis et al., 2021). According to Perry (2021), the human capital includes Education, Work experience, Intelligence, Hard skills, and Situational knowledge. These human capital elements enhance SMEs' skills and learning potential, enabling them to adapt to training and skills development programs within capacity-building pathways. As a result, it boosts workforce quality and strengthens the capacity for innovation.

Figure 4.2 An illustrative diagram on how human and social capital influence the competitiveness of agrifood chains



Source: Author

On the other hand, social capital refers to the networks of relationships and connections between individuals and groups that facilitate the flow of valuable resources, such as knowledge, shared experiences, and information, to these actors, thereby enhancing socioeconomic growth and survival (Blacksmith, 2023). Again, social capital facilitates cooperation, knowledge sharing, and learning among agrifood SMEs to achieve socioeconomic objectives such as improving market access, reducing transaction costs, and enhancing collective problem-solving. Overall, training and skills development through capacity building in agrifood chains will improve productivity, efficiency, and market access.

Conversely, human capital and social capital are interdependent, as they mutually facilitate one another (Zhou & Liu, 2017). There are reports that individuals with strong cognitive abilities and strong social connections are better equipped to identify, access, and utilize resources and

opportunities available within their social networks, thereby fostering learning, training, and skills development, which also enhances human capital (Yanyan et al., 2024) and overall productivity. Lin (2001) clarified that social capital is a resource embedded in social relations, which actors access and use in their actions. Thus, the value of social capital depends on its utilization by human capital to establish a foundation for common goals. These assets, viewed as of economic value, enable businesses to perform and thrive by empowering them to meet diverse demand preferences and address arising challenges through innovative offerings and services.

The background of this project helps to understand how these capitals influence the activities of Agrifood SMEs. Agrifood SMEs are generally seen as highly interconnected entities with diverse knowledge and skills, which offer added advantages and significance in the competitive market. Utilizing these assets (such as skills and capabilities) to leverage the valuable resources embedded in the complex social and commercial relationships among actors in agrifood chains creates a platform for economic prosperity. This presents a broader perspective on the significant role of human and social capital in capacity building.

In previous sections, the enormous contributions of these SMEs to the agricultural and agrifood sector were outlined in detail, highlighting their role in achieving rural development and food security objectives. Inadequate investment in human capital along the agrifood chains has led to capacity constraints, resulting in low productivity throughout these chains. Moreover, the effects of rapid population growth, along with changing consumer preferences and climate change hazards, necessitate that the agricultural and agrifood sectors become more commercially oriented and driven by information skills (Franzel, 2023). Additionally, the impact of digital technology has raised significant concerns across these sectors (World Bank, 2019). Therefore, the requirements for human capital will also need to be adjusted to meet the evolving demands of the agricultural and agrifood industry, given the disruptive factors affecting agrifood SMEs' business operations.

According to Franzel (2023), improving rural livelihoods will also require investment in these actors' skills, abilities, knowledge, social and personal attributes, and experience, enabling them to operate productively and sustainably within the broader agrifood system. These skills include relevant technical agricultural skills in crop and livestock production, business skills in marketing and recordkeeping, and functional skills such as empowerment, leadership, and innovation; these skills are also key to successful agricultural and rural development policies.

Other literature report that to transform the overall agrifood system into a more productive, sustainable, inclusive, and equitable system, we need to invest in the people behind it, notably smallholder producers (Davis et al., 2021). This further explains the distinctive nature of human capital relative to the other capitals (built, social, or natural) as an autonomous variable and an empowering force. Human capital functions simultaneously with other capitals to run an effective knowledge-intensive agrifood SME. With improved human capital, greater innovation and resilience are evident within the sector's business arena (Davis et al., 2021).

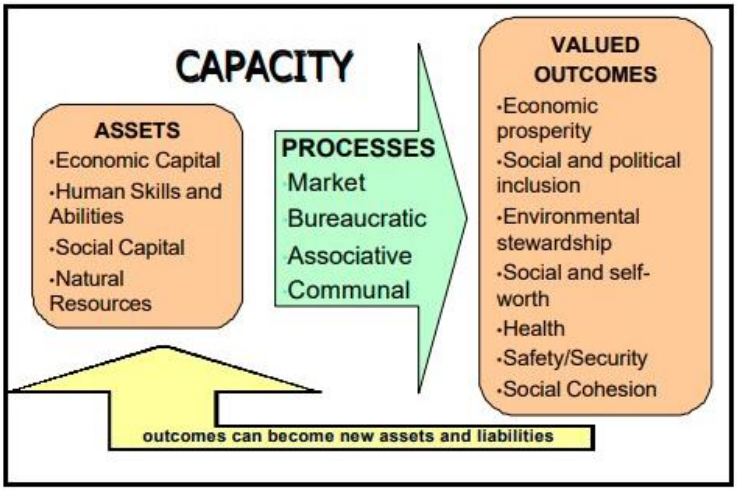
Human capital is described in the literature as the driving force behind the efficient development of agribusiness and rural development (Dragan et al., 2023). Again, the term human capital, as used by other authors, encompasses educational, labor, cultural, behavioral, and intellectual capital (Yakimova & Streltsova, 2020). As mentioned earlier, it can adapt to technological and innovative changes and modern challenges, making it a key factor in increasing productivity in agrifood SMEs (Zepeda, 2001; Diebolt & Hippe, 2019).

As the literature asserts, high levels of human capital, including a skilled and adaptable workforce, can be leveraged to achieve a competitive advantage in the marketplace. Moreover, such a workforce, with diverse skills and knowledge, can enhance creativity and innovation in SMEs' business activities within agrifood chains. We may also note that this, combined with a high level of work experience among the workforce, positively impacts business growth by increasing efficiency and revenue. Subsequently, agrifood SMEs can reduce costs across supply chains by improving workforce performance. These improvements are often achieved through employee training, engagement, and motivation.

In summary, the functional operations of agrifood SMEs, as well as the information and resources required for effective self-management, depend on the nature of social capital. This is because social capital enables access to vital information, resources, and support through partnerships, collaborations, and community linkages. Strong social networks encourage knowledge sharing, reduce transaction costs, and foster innovation, thereby enhancing SMEs' capacity to respond effectively to market demands and challenges. The utilization of this knowledge, information, and opportunities, nevertheless, also relies on human capital and its constituents.

4.5 Theoretical Framework on Capacity Building

Figure 4.3 New Rural Economy Capacity Model



Source: Reimer, 2002; Lyons and Reimer, 2006

There are extensive reports on capacity building from various perspectives; nevertheless, one report that aligns with the objectives of this study is Reimer and Tachikawa's (2008) Capacity and Social Capital in Rural Communities. In this publication, they used the New Rural Economy Capacity Model in Figure 4.3 to explore how different types of social networks and relationships can transform these existing assets into new assets and outcomes. From their perspective, social capital, as a core element of capacity-building, is a tangible asset with relational qualities that facilitate exchanges and transactions and organize activities to achieve economic outcomes. The framework was applied to analyze data from the field sites of the New Rural Economy (NRE) project, which was an extensive, multi-phase research initiative conducted from 1997 to 2008 under the auspices of the Canadian Rural Revitalization Foundation (CRRF).

The framework focuses on the processes by which rural people produce their valued outcomes from the assets available to them and further emphasizes the types of social relationships required to achieve these outcomes. In the process, it underscores the importance of social capital and social cohesion alongside economic capital, natural resources, and human skills. This has opened new insights into the strengths of rural people and identified new opportunities for action and policies

They identify the different ways in which individuals manage their relationships to accomplish tasks, justify their actions, distribute resources, and enforce deviations. These include market, bureaucratic, associative, and communal relations. Market relations are those based on the exchange of goods and services among relatively free actors. Bureaucratic relations rely on a rational division of labour and the structuring of authority through general principles and rules. On the other hand, Associative relations are mainly based on shared interests, in which individuals come together to

achieve common goals and express concerns. In contrast, Communal relations are founded on a strongly shared identity, such as when members are identified by birth, ethnicity, ancestry, or other ascribed characteristics.

They measured social capital by *its availability* (in the form of enterprises, organizations, associations, groups, networks, and family relations found in the rural sites) and by its *use* (the extent to which reference actors use the above (institutions and networks) to pursue economic objectives. For example, measuring social capital in Market Relations, the *availability* of social capital includes the number of enterprises and commercial businesses. To measure the use of social capital, they used the extent to which reference actors use commercial enterprises, the Internet, private services, and market-based social support in their daily activities. With this, Capacity was computed by summing across the items with each site (for availability) and averaging across individuals (for use).

Further analysis of the data shows differences in the availability and use of social capital. In other words, various sites have different capacities regarding the availability and use of different types of relationships. They also reported that the different types of relations mentioned above are differently linked to economic outcomes. For instance, market-based relations are strongly associated with income and employment, whereas bureaucratic relations are strongly associated with government transfers and education but negatively associated with employment. However, associative-based social capital is positively related to most outcome variables. Lastly, they stressed that these relations can provide conditions to enhance the other. For instance, in a situation with weak market relations, reference actors can work through associative or communal ones.

The analysis has provided an in-depth understanding of social capital as a foundation for capacity building. It points to the above social capital relations as avenues for achieving economic goals. Nevertheless, the limitations of this analysis include the absence of a comprehensive assessment of the skills and knowledge component of human capital, which operates alongside the above relations in social capital to pursue socioeconomic goals.

According to other reports, capacity building is defined as a process through which individuals, organizations, and institutions improve their abilities to perform functions effectively, solve problems, and achieve sustainable development outcomes (OECD, 2006; UNDP, 2009; Morgan, 2006). Building on the foundational definitions provided by the OECD (2006) and UNDP (2009), this study views capacity development as an ongoing, internal process that goes beyond technical training.

From this perspective, capacity development entails enhancing human skills, institutional structures, and collaborative relationships that enable actors to adapt to changing economic and social

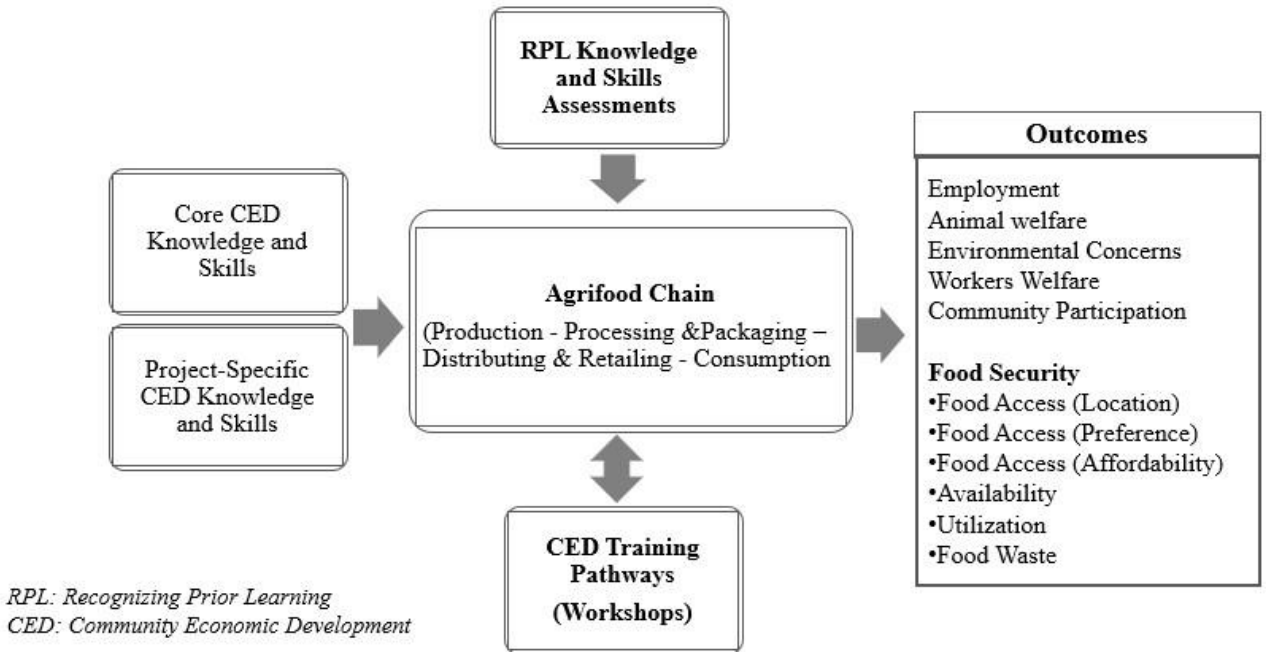
conditions. This interpretation aligns with Morgan's (2006) view of capacity as a collective "emergent property" of systems that allows organizations and networks to operate, adapt, and maintain performance over time.

Applying this theoretical perspective, the current study examines the interaction between human capital and social capital within agribusiness SMEs involved in the egg value chain. Consequently, the framework supports a mixed-methods approach that captures both individual skills (evaluated through the Recognizing Prior Learning (RPL) framework) and the broader structural and relational factors that affect the performance of Ghana's egg agrifood chain.

4.6 Conceptual Framework on Capacity Building

Building on the theoretical discussions presented above, this study develops a conceptual framework to examine how capacity-building processes influence the integration and competitiveness of agrifood chains. Capacity building in this study is conceptualized as the ability of agrifood SMEs to mobilize and coordinate strategic assets, including human, social, financial, natural, and built capital, through relational structures such as market, associative, bureaucratic, and communal relations to improve performance across the agrifood value chain.

Figure 4.4 Adopted Capacity Building Model



Source: Author's elaboration

This adopted framework posits that human capital and social capital are the primary drivers of capacity building among agrifood SMEs, while tools such as Recognizing Prior Learning (RPL) are used to assess existing knowledge and skills, identify skill gaps, and guide targeted training interventions that enhance value-chain integration and competitiveness. Human capital contributes by improving knowledge and skills in management and technical areas across the entire agrifood

value chain. At the same time, social capital strengthens collaboration and coordination among value-chain actors through networks, associations, and institutional linkages. These two dimensions interact to enhance the competence of agrifood SMEs and improve the functioning of the agrifood value chain, particularly in contexts where SMEs dominate the value chain activities. Together, improved skills and stronger collaborative relationships enable actors to adopt better operational practices, reduce inefficiencies such as post-harvest losses, and improve coordination across the value chain.

Figure 4.4 illustrates the adopted capacity-building model. Within this model, human and social capital are operationalized through core and project-specific knowledge and skills. The core knowledge and skills serve as a foundation for any initiative and encompass leadership, communication, community engagement, collaboration, and research and data analysis. Project-specific knowledge and skills are context-specific technical skills needed for a particular activity, such as the specialized knowledge required to run an egg-producing business. Together, these skill sets function within the broader industrial system to generate sustainable socioeconomic outcomes.

Overall, the model illustrates how improvements in human capital and social capital contribute to capacity-building processes within the egg agrifood chain. These processes influence value-chain performance and ultimately enhance the competitiveness of agrifood systems. In the context of this research, the conceptual framework guides the empirical analysis of how capacity-building initiatives affect agrifood SMEs operating within Ghana's egg value chain and provides a comparative perspective on agrifood systems in Italy and Canada.

4.6.1 The concept of Recognizing Prior Learning (RPL)

Recognizing Prior Learning (RPL) is a structured process for identifying, assessing, and validating knowledge and skills gained through informal and non-formal learning experiences, such as work practice, community involvement, and lifelong learning (as shown in Figure 4.5). Thus, it is a reflective process designed to identify the knowledge and skill sets needed to undertake specific activities. Unlike traditional education systems that primarily rely on formal academic credentials, RPL provides mechanisms to recognize abilities developed outside formal education. This process enables the official recognition and integration of practical experience and tacit knowledge into capacity-building strategies (OECD, 2023). In other words, the RPL acknowledges that learning occurs in many ways, not just in traditional classrooms, and recognizes individuals' existing knowledge and skills as equivalent to formal learning outcomes (Bray, 2025).

In many sectors, especially agriculture and rural industries, a significant portion of technical and managerial knowledge is gained through experience rather than formal training. Maurer (2021,

2022) emphasizes that in many lower- and middle-income countries, vocational skills are mainly developed through experiential learning within local production systems. In such settings, RPL serves as a link between informal knowledge systems and formal recognition frameworks by confirming the competencies of individuals with extensive practical expertise but without formal credentials. This recognition can enhance access to training programs, institutional markets, and financial services that often require documented proof of skills.

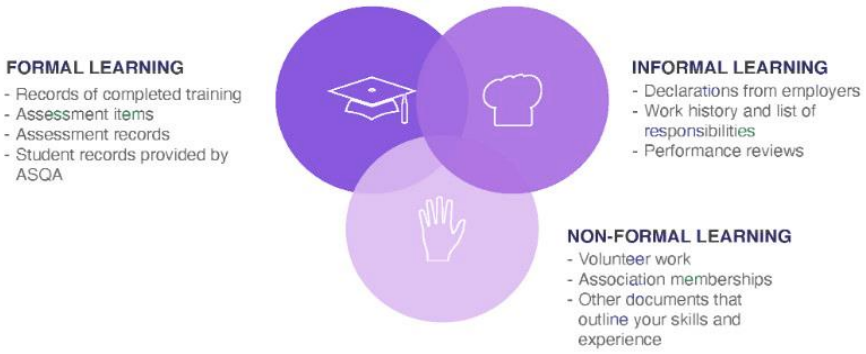
In rural development contexts, RPL is increasingly used to map skills and identify capacity gaps within communities and organizations. Research on rural community development in Canada shows that RPL-based competency assessment processes can help identify the skills of rural actors and pinpoint areas where training interventions are needed (Vodden & Cunsolo, 2025). By acknowledging existing capabilities within communities, RPL helps ensure that capacity-building programs build on current knowledge rather than replacing it with external training models.

The concept of RPL is closely linked to the broader theoretical framework of human capital and social capital discussed in this study. Human capital refers to the knowledge, skills, and abilities that individuals possess, while social capital refers to the networks, relationships, and collaborative structures that facilitate cooperation among actors within economic systems. RPL strengthens human capital by identifying and validating individuals' existing competencies within agrifood value chains. At the same time, the recognition of shared expertise and practical knowledge among actors can support stronger collaboration and trust, thereby reinforcing social capital within the value chain.

This research uses RPL as a competency assessment framework to evaluate actors' knowledge and skills within the egg agrifood chain. Employing a structured competency scale (Basic, Intermediate, and Advanced), the RPL assessment helps identify existing expertise among agrifood SMEs and highlights areas where additional training or institutional support may be needed. This process provides a structured basis for designing targeted capacity-building interventions to strengthen human capital within the value chain. This approach allows researchers and policymakers to identify areas where additional training and skill development are required to enhance the integration and competitiveness of agrifood SMEs within the egg value chain.

Based on this conceptual foundation, the study applies an RPL-based competency assessment to evaluate the knowledge and skills of actors within the egg agrifood chain. The methodological approach used to implement this assessment is described in Chapter 5.

Figure 4.5 Recognizing an Individual's Prior Learning



Source: Bray (2025)

Figure 4.6 RPL Competence Assessments Process

Source: Dr Gary (RPL Coordinator, Rural Development Institute-Brandon University)

**CED-Community Economic Development*

CHAPTER FIVE

Methodology

5.1 Research Approach

This study adopts a mixed-methods research approach to investigate how capacity-building processes influence the integration and competitiveness of agrifood SMEs within the egg value chain. Mixed-methods research combines quantitative and qualitative techniques to provide a more comprehensive understanding of complex socio-economic phenomena. This approach is particularly suitable for research examining both firm-level performance indicators and broader institutional and policy environments.

The methodological framework draws on the principles of mixed-methods research described by Creswell and Plano Clark (2017), which emphasize integrating quantitative and qualitative data to strengthen the validity and explanatory power of research findings. The study also applies elements of case study methodology, following the analytical approach proposed by Yin (2018), to examine institutional and structural differences across agrifood systems in different national contexts.

The research design, therefore, integrates quantitative analysis of survey data collected from agrifood SMEs, qualitative analysis of institutional and policy environments, and cross-national case comparisons of agrifood systems. This integrated approach allows the study to link empirical evidence from SMEs to broader institutional conditions that affect agrifood chain development.

5.2 Research Design

The study employs a two-phase mixed-methods design consisting of quantitative analysis followed by qualitative comparative analysis. The first phase focuses on collecting and analyzing primary data from agrifood SMEs operating in Ghana's egg value chain. This phase examines the characteristics of SMEs, operational practices, and capacity-building activities influencing agrifood chain performance. Quantitative methods are used to analyze relationships between capacity-building variables and operational outcomes such as post-harvest losses.

The second phase involves a comparative case study analysis of agrifood systems in Italy and Canada. This phase relies on secondary data sources, such as government reports, policy documents, industry statistics, and academic literature. The comparative case study allows the research to explore how institutional frameworks, policy environments, and sectoral structures affect capacity-building processes and agrifood chain performance across different economic contexts. The comparison also helps place the empirical findings from Ghana within a broader international agrifood system.

Table 5.1 provides an overview of the two study phases, highlighting the geographic focus, methodological approaches, data sources, and anticipated analytical outputs. This framework shows

how the mixed-methods empirical analysis in Ghana is supplemented by a comparative assessment of agrifood systems in Italy and Canada.

Table 5.1 Overview of the Two-Phase Mixed-Methods Research Design

Phase	Focus & Geography	Methodology & Citations	Data Sources	Key Output
Phase 1: Empirical Case Study	**Ghana** (Rural Egg Value Chain)	Mixed-methods convergent design integrating quantitative regression analysis with qualitative competency assessment (Creswell & Plano Clark, 2017; Yin, 2018)	Primary Survey (n=25), RPL Competency Assessments	Regression estimates of factors influencing post-harvest losses; identification of competency gaps in human capital and training needs
Phase 2: Comparative Analysis	**Italy & Canada** (Institutionalized Systems)	Comparative case study analysis examining structural and policy differences across agrifood systems (Yin, 2018)	Secondary data, Policy reports, Industry statistics (2020-2025)	International benchmarking of agrifood chain structures; development of a policy-oriented capacity-building framework

Source: Author's elaboration

5.3 Case Study Strategy

Following Yin's case study methodology, the research employs a comparative case study strategy to examine the egg agrifood chain in three national contexts: Ghana, Italy, and Canada. Case study research is particularly well-suited to investigating complex socio-economic systems in which contextual factors are significant. In this study, the case study approach allows for a detailed analysis of the relationships among capacity building, institutional settings, and agrifood chain competitiveness.

The case study design enables the research to analyze sectoral structures and institutional arrangements within agrifood systems, identify policy frameworks that support agrifood SMEs, and compare capacity-building initiatives across countries. Rather than establishing causal relationships across countries, the comparative case analysis aims to identify institutional practices and policy approaches that may offer insights into strengthening agrifood chain development in emerging economies.

5.4 Study Context and Case Selection

5.4.1 Case Selection: The Egg Value Chain

The egg value chain was selected as the primary case for this research due to its importance within both rural livelihoods and national food systems. Poultry production, particularly egg production, provides an accessible source of animal protein and supports employment opportunities within agrifood supply chains. In many developing economies, egg production provides an accessible entry point for small and medium-sized enterprises (SMEs) due to its relatively low capital requirements

and ability to generate regular income for rural households. At the same time, the egg agrifood chain involves multiple interconnected actors, including input suppliers, poultry farmers, traders, distributors, and retailers, making it a suitable context for examining the role of skills development, knowledge exchange, and collaborative networks. In Ghana, the egg agrifood chain plays a key role in rural economies but faces several structural challenges, including fragmented supply chains, limited access to finance, inadequate infrastructure, and weak coordination among value chain actors. These conditions provide a suitable context for examining the role of capacity building in strengthening agrifood SMEs.

5.4.2 Rationale for Case Selection (Italy and Canada)

Italy and Canada were selected as comparative cases because they represent more institutionalized agrifood systems with stronger policy frameworks, coordinated supply chains, and established industry governance structures. Comparing these systems with Ghana allows the research to explore how institutional environments influence agrifood chain performance.

Italy and Ghana share a similar structure of SME dominance in the egg agrifood chain. However, Italy has a long tradition of agricultural cooperatives, so the sector illustrates a cooperative-led, SME-centered system operating within the EU regulatory environment. On the other hand, Canada's egg agrifood chain sector is built around a policy-driven and supply-managed system mainly regulated by the Egg Farmers of Canada (EFC), through which the sector operates under a quota marketing system to stabilize farm incomes, regulate production, and ensure consumer price stability (Egg Farmers Canada, 2020). Moreover, Italy and Canada, through different mechanisms, have provided training, skills development, and knowledge transfer; facilitated access to credit; and strengthened market linkages in agrifood chains.

Therefore, these countries have demonstrated distinct yet complementary pathways to strong policy frameworks, rural capacity-building, and the integration of SMEs into competitive agrifood chains. Lessons from these models are expected to provide relevant policy recommendations to revive Ghana's egg agrifood chain.

5.4.3 Justification for Cross-Country Comparability

Although Ghana, Italy, and Canada differ significantly in economic development, institutional capacity, and technological progress, choosing these three contexts is justified because they all engage in agrifood production systems and have small and medium-sized enterprises along the egg value chain. The comparison does not aim to compare the structural conditions of these economies but instead to explore how different institutional and policy environments influence the capacity-building processes and competitiveness of agrifood SMEs.

Ghana represents an emerging agrifood system characterized by fragmented value chains, limited infrastructure, and heavy reliance on small-scale enterprises. In contrast, Italy and Canada illustrate more institutionalized agrifood systems where policy frameworks, cooperative structures, and industry coordination mechanisms are more influential in supporting value chain integration.

By examining these diverse contexts, the study adopts a comparative analytical perspective to identify structural differences, policy approaches, and institutional arrangements that affect agrifood chain performance. This approach allows the research to draw lessons and policy insights that can help improve strategies to boost the competitiveness and integration of agrifood SMEs in developing countries like Ghana.

5.5 Sampling Strategy (Phase 1)

The survey employed a multi-stage sampling strategy to identify agrifood SMEs operating in Ghana's egg value chain. In the first stage, purposive sampling was used to select the study area, Koforidua, the regional capital of Ghana's Eastern Region. Purposive sampling was considered appropriate because the research required respondents with direct experience in egg production, marketing, and distribution. This approach enabled the study to obtain detailed insights into the operational dynamics of SMEs within the egg agrifood chain. The city was selected because it hosts a moderate level of poultry production activities and functions as an important regional service hub for agrifood products. Farm produce from surrounding rural areas is aggregated, processed, and distributed through this urban center, making it a strategic location for examining the interactions between producers, traders, and food service operators within the egg value chain.

Koforidua’s geographic position also highlights both capacity constraints and opportunities within the agrifood sector. While infrastructure limitations, such as storage and transport, affect value chain efficiency, the city also provides opportunities to improve farmers’ skills, market access, and technology adoption by strengthening linkages between rural producers and urban markets.

In the second stage, convenience sampling was used to identify layer farms operating within the study area. Subsequently, snowball sampling was employed to identify other economically active agrifood SMEs within the trading (wholesaling and retailing) and food service segments of the egg value chain. These segments represent the main actors involved in the local egg distribution system (Opoku-Mensah et al., 2023). Snowball sampling enabled the study to reach additional participants through referrals from initial respondents familiar with other actors in the value chain.

The final sample included twenty-five (25) agrifood SMEs, such as smallholder egg producers, intermediary traders, and food service providers. To ensure respondents had sufficient operational

experience, only SMEs that had been in business for at least five years and employed no more than 250 workers were selected.

Although the sample size is relatively small, it offers valuable insights into the operational characteristics, training practices, and collaborative relationships of SMEs involved in the egg agrifood chain. The findings should therefore be seen as exploratory empirical evidence aimed at enhancing understanding of capacity-building dynamics within the sector rather than as statistically representative results for the entire agrifood industry.

5.5.1 Sampling Limitations and Constraints

The sampling strategy adopted in this study was primarily influenced by practical and contextual constraints associated with data collection in the Ghanaian agrifood sector. Due to the absence of a comprehensive and up-to-date registry of agrifood SMEs operating along the egg value chain, it was not possible to construct a fully randomized sampling frame. Consequently, the survey relied on a purposive, network-based sampling approach, targeting SMEs actively engaged in key segments of the egg value chain, including production, trading, and food service.

Access to respondents was facilitated through local business associations, producer groups, and existing industry contacts. While this method allowed the researcher to gather relevant insights from actors directly involved in the value chain, it may limit the sample's ability to represent the broader population of agrifood SMEs in Ghana. Informal operators or firms outside established networks could be underrepresented in the survey data.

In addition, logistical constraints, such as the geographical dispersion of enterprises, time limitations, and resource availability, influenced the final sample size. These factors are common challenges in empirical research involving small and medium-sized enterprises in developing-country contexts. Despite these limitations, the selected sample captures key actors within the egg agrifood chain and provides valuable empirical insights into the functioning, challenges, and capacity-building needs of agrifood SMEs in Ghana.

5.6 Data Collection Methods

5.6.1 Primary Data Collection

Primary data were collected through a structured survey questionnaire administered to agrifood SMEs in Ghana’s egg value chain. The survey captured information on several key dimensions of SME operations, including the demographic characteristics of business owners and managers; the organizational characteristics of SMEs; financial conditions and access to credit; the adoption of technology and ICT; participation in training and capacity-building programs; collaboration among value chain actors; and operational challenges affecting agrifood businesses.

The survey included both closed-ended questions for quantitative analysis and open-ended questions to capture qualitative insights into SME experiences within the sector.

5.6.2 Recognizing Prior Learning (RPL) Assessment

In addition to the survey questionnaire, the study conducted a Recognizing Prior Learning (RPL) assessment to evaluate the existing knowledge and skills of actors within the egg value chain. The RPL framework assesses competencies in operational areas such as poultry husbandry management, egg handling and storage, record keeping, and biosecurity practices. Competency levels were evaluated using a three-point scale (basic, intermediate, advanced) to identify knowledge gaps and training needs among SMEs. The assessment results were used to develop a tailored capacity-building pathway for actors within the egg agrifood chain.

Potential Sources of Survey Bias

As with most survey-based studies, the empirical component of this research may be subject to certain biases. First, the use of self-reported information from SME owners and managers may introduce response bias, as respondents may overestimate or underestimate aspects such as financial performance, training practices, or operational challenges. Second, since participation was voluntary, self-selection bias may occur, with more active or better-organized enterprises being more likely to participate.

In addition, the predominance of informal SMEs in Ghana makes it difficult to capture the entire population of value-chain actors, as some enterprises are not connected to formal networks or associations and may therefore be excluded from the sample. To reduce these risks, the survey used clear and neutral questions, and responses were cross-checked where possible through follow-up discussions and secondary information sources.

5.6.3 Secondary Data Collection

Secondary data were collected to support the comparative analysis of agrifood systems in Italy and Canada. Sources included government policy documents, industry reports, statistical databases, international development reports, and academic literature on agrifood systems and SME development. Key sources included the Ghana Statistical Service, the Ministry of Food and Agriculture, FAO, FAOSTAT, the World Bank, IFAD, USDA, and industry organizations such as Egg Farmers of Canada. These sources provided contextual information on institutional frameworks and sectoral performance across the selected countries.

5.7 Variables and Measurement

To examine the relationship between capacity-building factors and operational performance, the study uses post-harvest losses in the egg value chain as the dependent variable. Post-harvest loss was selected as a key indicator of value-chain performance because it reflects inefficiencies in

handling, storage, and transport, as well as management practices, across different stages of the chain, thereby reducing productivity and increasing costs, ultimately reducing sectoral revenue. This, in turn, makes the sector less competitive. Mensah et al. (2021) reported that losses cut marketable output and income.

The independent variables represent key dimensions of human and social capital within agrifood SMEs. These variables include the respondent's age, years of business experience, employee training programs, access to credit, use of information and communication technology (ICT), community engagement, collaboration with suppliers and buyers, and membership in business associations. These variables capture aspects of capacity building that influence SME performance and integration within agrifood supply chains.

In Table 5.2 below, the independent variables are in the first column, with descriptions of the variables, measurements, and a priori signs; the second, third, and fourth columns, respectively, contain the dependent variables. The a priori expectation sign (negative or positive) of each of the model's variables represents the hypothesis for each.

Table 5.2 Description of variables used in the regression model

Variable	Description	Measurement	Priori Sign
(Dependent Variable)			
Post-harvest Losses	Quantity loss per actor in a segment	Number of Crates of eggs lost	
Independent Variables			
Age	Age of respondent	Years	+
Experience (Exp1)	Years of business operation	Years	-
Employee Training Program (ETP)	Whether the respondent has offered or engaged in a training program before	Dummy; 1 = yes, 0 = no)	-
Access to Credit (Acr.)	Whether respondents have access to credit	(Dummy; 1 = yes, 0 = no)	-
Use of ICT (Uict)	Whether respondents use ICT	(Dummy; 1 = yes, 0 = no)	-
Community Engagement (CEng.)	Number of times participating (and/or sponsoring) in sociocultural and religious events	Number	-
Collaboration (Col1)	Number of suppliers/buyers	Number	-
Membership Association (Assoc.)	Whether a respondent is in any business/farm-based association	(Dummy; 1 = yes, 0 = no)	-

Source: Author, 2025

The selection of variables was adapted from existing literature, including an assessment of post-harvest losses to support innovation in Ghana's egg value chain (Mensah et al., 2021), an evaluation of profit efficiency and its determinants in layer production (Yevu et al., 2021), and an analysis of the factors affecting post-harvest losses in tomato production (Aidoo et al., 2014). These surveys

provided a strong foundation for exploring how human and social capital influence the performance of the agrifood chain and for analyzing its performance across different sectors, contexts, and locations.

5.8 Data Analysis Procedures

Quantitative survey data were analyzed using descriptive statistics to summarize the characteristics of SMEs operating in the egg value chain. To examine relationships between capacity-building variables and operational outcomes, the study applied regression analysis. Regression models are widely used in applied economic research to estimate relationships between dependent and explanatory variables (Wooldridge, 2016; Gujarati & Porter, 2009; Stock & Watson, 2020). The regression model is based on several standard assumptions, including linearity between the dependent and explanatory variables, independence of observations, and the absence of severe multicollinearity among the explanatory variables. These assumptions allow the model to estimate the direction and magnitude of relationships between the selected variables and post-harvest losses in the egg value chain.

The empirical regression model is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \ldots + \varepsilon$$

where Y represents post-harvest losses, and X represents the explanatory variables related to SME capacity building. Human capital variables measure skills and knowledge, while social capital variables capture collaboration and networks. These are expected to influence efficiency within the egg agrifood chain. The use of a regression model, therefore, allows the study to assess the extent to which these factors influence the magnitude of losses experienced by agrifood SMEs along the egg value chain.

Qualitative responses from open-ended survey questions were analyzed using thematic analysis. Responses were reviewed and categorized by recurring themes of operational challenges, institutional barriers, and capacity-building needs within the agrifood chain.

5.9 Comparative assessment of the case study (Phase 2)

The second phase of this research employed a comparative case study analysis to examine the institutional and structural differences between Ghana's emerging egg value chain and the more established agrifood systems of Italy and Canada (Yin, 2018; Bryman, 2016). This phase complements the empirical findings from Ghana by situating them within a broader international context. Comparative case study analysis is widely used in social science research to explore how different institutional environments shape sectoral performance and policy outcomes.

Following the principles of case study research proposed by Yin (2018), the comparative analysis focuses on identifying patterns and institutional differences across the selected cases. Unlike the

first phase of the study, which relied on primary survey data, this phase used secondary data sources, including government reports, policy documents, industry statistics, and relevant academic literature. These sources provide insights into the governance structures, policy frameworks, and operational characteristics of the egg agrifood sectors in Italy and Canada.

The analysis examines several thematic dimensions relevant to the research objectives. These include the competitiveness of the egg industries, the economic and environmental challenges affecting agrifood SMEs, the nature and extent of capacity-building initiatives, and the policy frameworks supporting rural capacity development within the egg value chain. By examining these themes across the selected countries, the study identifies structural factors that influence the integration and competitiveness of agrifood chains.

It is important to note that the objective of this analysis is not to establish direct causal relationships between capacity-building initiatives and sectoral outcomes across countries. Instead, the comparison aims to contextualize the empirical findings from Ghana and to identify institutional practices and policy approaches that may offer useful insights for strengthening agrifood chain development in emerging economies.

Overall, this second phase of the research complements the firm-level evidence obtained from the Ghana survey by providing a broader perspective on how institutional arrangements, policy environments, and industry structures shape the development and competitiveness of agrifood systems.

5.10 Validity and Reliability

Several strategies were used to improve the reliability and validity of the research findings. First, the study combines multiple sources of evidence, including survey data, institutional reports, and academic literature. This data triangulation increases the credibility of the research.

Second, the use of established measurement variables derived from previous studies enhances the reliability of the regression analysis. Finally, the mixed-methods research design allows the integration of quantitative and qualitative evidence, improving the robustness of the study’s conclusions.

5.11 Ethical Considerations

The study adhered to standard ethical guidelines for social science research. Participation in the survey was voluntary, and respondents were informed of the research's purpose before completing the questionnaire. The confidentiality and anonymity of participants were protected throughout the research process, and the data collected were used solely for academic purposes.

5.12 Limitations of the Study

Although this study contributes valuable insights, it has some limitations. First, primary data were collected only in Ghana, whereas the comparative analysis of Italy and Canada relied primarily on secondary data sources. This restricts the ability to make direct empirical comparisons across all three countries and creates differences in the depth of empirical evidence among the case studies.

Second, the study specifically concentrates on the egg value chain. While this sector offers a relevant context for exploring the dynamics of agrifood SMEs and the importance of capacity building in developing the value chain, the results may not fully reflect conditions in other agrifood sectors.

Finally, the comparative framework is primarily analytical rather than statistical. The analysis emphasizes institutional arrangements, policy environments, and value chain organization across the three countries rather than direct quantitative comparison. Despite these limitations, the comparative approach enables the study to identify contextual lessons and policy insights that may help strengthen agrifood systems and capacity-building strategies in developing economies.

CHAPTER SIX

Findings and Discussion

This chapter presents findings from the first phase of the project, based solely on primary data from 25 SMEs in the Ghanaian egg value chain. Although the study examines the performance of egg agrifood chains across Ghana, Italy, and Canada, the findings primarily reflect the Ghanaian context. The conclusions of the second phase, which rely on secondary sources, offer comparative insights for Italy and Canada (in Chapter 7). The survey's results are organized into key thematic areas aligned with the research objectives. These themes include general information on SMEs, human resources, financial data, food security, agri-food chain performance, animal welfare, operational support, key challenges, and Recognizing Prior Learning (RPL) knowledge and skills assessment.

6.0 Summary of Empirical Findings from the Survey Case Study

RQ1 – Roles of Agrifood SMEs along the Agrifood chains

The findings reveal that agrifood SMEs are engaged in production, trading, and food service, with 44% of traders dominating the egg agrifood chain, compared to 16% of producers. That SMEs link producers to consumers, mostly through channels operated by traders. These traders undertake key activities such as egg aggregation, packaging, and transport to both rural and urban markets. In addition, most businesses (40%) have not registered for their business, reflecting on the informal nature of the industry, which limits access to formal credit and government (policy) support.

Agrifood SMEs generate employment opportunities across the chain; however, on a small scale. That is 76% of businesses employ only two (2) employees, with women dominating the workforce. Similarly, women make up the majority of business owners (88%) across the chain. Overall, the limited workforce size constrains scalability in the egg agrifood chain.

The findings showed losses across all segments: egg producers accounted for 67%, traders for 26%, and food service providers for 7%, reflecting weaknesses in handling, storage, and logistics. As a result, the losses incurred reduce profit efficiency across the egg value chain.

Although basic animal welfare practices were observed, biosecurity measures remain weak, exposing egg producers to disease outbreaks. Government support for industry was minimal, with 96% of respondents receiving none. Likewise, the integration of ICT into the chain of operations is limited, as 64% of respondents do not use it.

RQ2- The influence of Human and Social capital on the activities of the agrifood SMEs

On average, most respondents had secondary (9) and primary education (8), with fewer attaining technical (6) or tertiary education (2). Limited levels of education constrain financial literacy, ICT adoption, and the propensity to adopt innovations in the agrifood chain.

Besides, basic competence was demonstrated in record keeping (19 respondents), communication (21 respondents), community engagement (14 respondents), collaboration (13 respondents), proper storage and handling (24 respondents), and logistics/transportation (11 respondents). Nevertheless, few had limited technical and leadership skills, which affected efficiency, product quality, and the chain's overall competitiveness. Further analysis discovered that 68% of respondents belong to business associations and benefit from collaboration and market access. Likewise, 52% of businesses obtain their start-up capital from family and friends, reflecting the influence and control that arises from coordinated networks, shared norms, social trust and solidarity among people in a particular society to achieve socioeconomic goals.

Moreover, the regression analysis confirmed that employee training programs and community engagement significantly reduce post-harvest losses by 34 and 9.4 crates of eggs, respectively. These demonstrate significant benefits from investing in human and social capital.

Based on the outcome of the Recognizing Prior Learning (RPL) Knowledge and skills assessment, a tailored capacity-building pathway was designed according to priority gaps identified across the egg agrifood chain. In other words, the highest training needs are in proper storage and handling, record keeping, poultry health, and biosecurity management; these constitute the first phase of the capacity-building training pathway.

RQ3 – Economic Environmental Challenges facing the Egg Agrifood Chain

It was discovered that agrifood SMEs face critical challenges, including inadequate capital and limited access to credit facilities, suggesting systemic financial barriers that restrict reinvestment in new technologies and storage infrastructure. Moreover, competition from other egg traders, coupled with high taxes and price volatility, further reduces profit margins and creates income instability. Operational difficulties, such as poor transportation networks, breakage and spoilage, limited access to primary markets due to poor road networks, and storage facility issues, intensify post-harvest losses. Consequently, the egg agrifood chain in Ghana is weakened by interrelated financial, infrastructural, and market challenges that impede efforts to improve overall integration and competitiveness.

RQ4 - Sustainable Policies and Support Measures

The overall poultry-egg agrifood chains sector in Ghana is supported by both government and donor-supported policies, with such programs as Rearing for Food and Jobs (RFJ), Feed Ghana Project (FGP), Savannah Agriculture Value Chain Development Project (SADEP), Ghana Broiler Revitalization Project (GHABROP), and the Ghana Poultry Project (GPP), which have provided input subsidies, training, credit access, and market linkages to strengthen SMEs. These interventions have enhanced productivity, access to resources, and inclusion, particularly for

women and young people. Nevertheless, the country's trade-related policies, including fluctuating import tariffs, inconsistent subsidies, and temporary bans on poultry imports, have yielded limited results as the import markets continue to rise, reducing the competitiveness of domestic producers.

The findings revealed that while these programs temporarily alleviate resource and operational constraints, they primarily emphasize increased production without adequately strengthening the skills and knowledge of the actors along the chain. Moreover, the benefits, including training and skill development schemes, are often concentrated in donor-supported areas. Lastly, the findings suggest that despite government and development partners' support, the policy environment remains constrained by inconsistent policy implementation, limited skills development, and overreliance on external support.

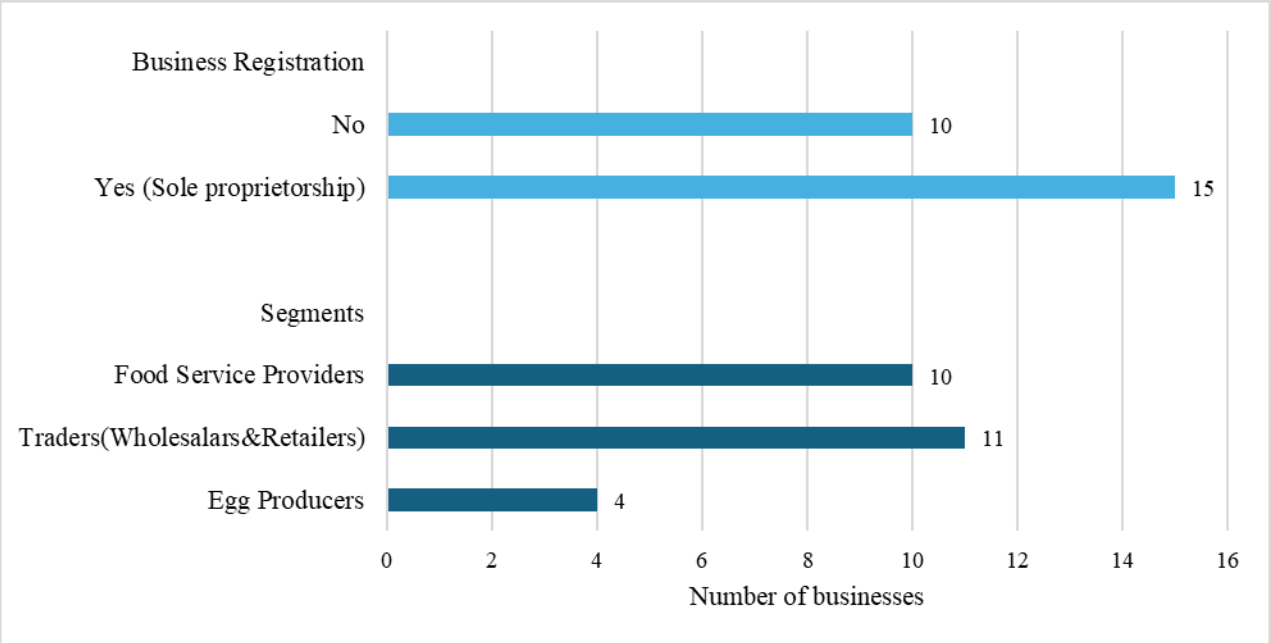
6.1.1 General Information on SMEs

As noted earlier, 25 SMEs participated in the survey. In reference to Figure 6.1, most responses were from traders (wholesalers and retailers) who accounted for 44% of the sample. This was followed by food service providers, who represented 40% of the respondents, while egg producers accounted for the remaining 16%. Nevertheless, only 15 SMEs (60% of respondents) had formally registered their businesses, with the majority operating under sole proprietorship. The remaining SMEs have not registered their businesses but are nonetheless active participants in the agrifood chain market.

Information gathered from the literature reveals that SMEs play a key role in linking producers to consumers, mostly via channels operated by traders who act partly as wholesalers and retailers across the chain segments (and are mostly women) (Opoku-Mensah et al., 2023). There is enough evidence to support the claim that these traders are the economic backbone of the egg industry. They undertake key activities like egg aggregation, packaging, and transporting eggs to both rural and urban markets.

Further analysis of the data reveals that female managers/owners dominate the egg value chain, accounting for 22 respondents (88%), as illustrated in Figure 6.2. Both the trading and food service segments were also primarily managed by women, with 40% of respondents in each segment. Although the egg production segment received fewer responses, the data indicated an equal gender distribution, with two respondents (8%) from each group. In other reports in the literature, it was asserted that males dominate the production segment, while the downstream processing and trading activities are dominated by females (Opoku-Mensah et. al, 2023; Mensah-Bonsu et. al, 2019; Baagyere et. al, 2023)

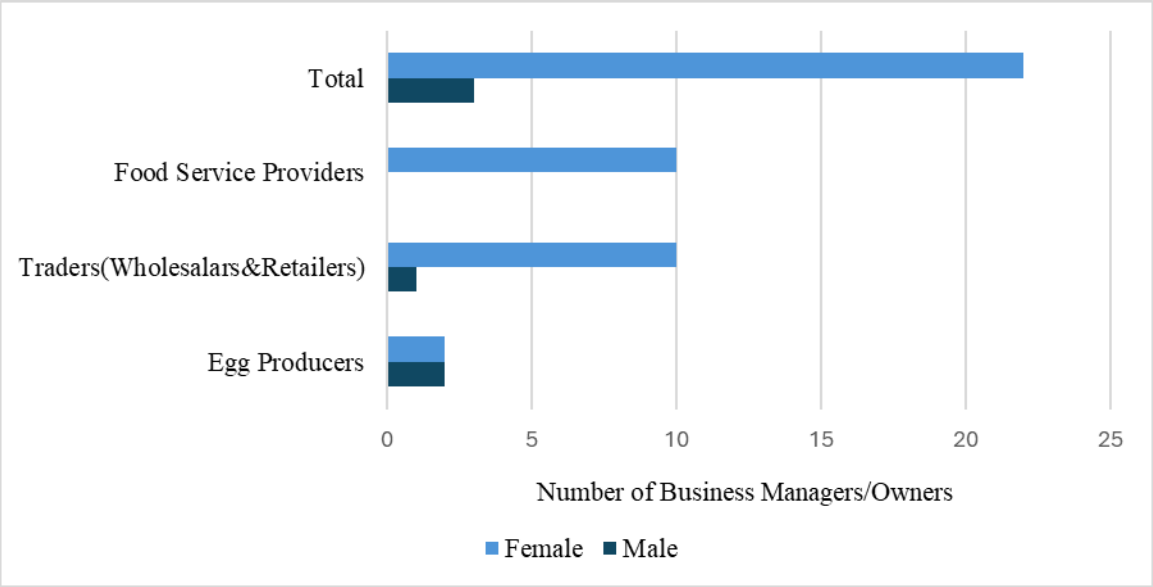
Figure 6.1 Distribution of SMEs in the Egg Value Chain



Source: Author, field data (2025)

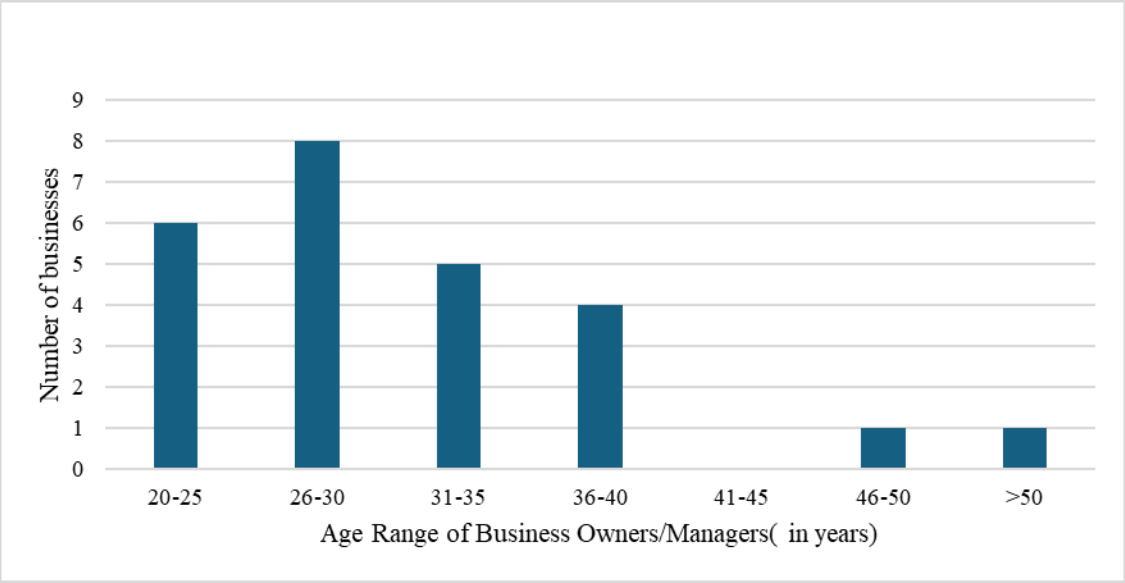
Regarding age distribution (shown in Figure 6.3), respondents ranged from 20 to 52 years of age, with an average age of 31. The largest age group was 26–30 years, accounting for 32% of the sample, followed by 20–25 years, which accounted for 24% of respondents.

Figure 6.2 Gender Distribution of Business Owners/Managers



Source: Author, field data (2025)

Figure 6.3 Age Distribution of Business Managers/Owners

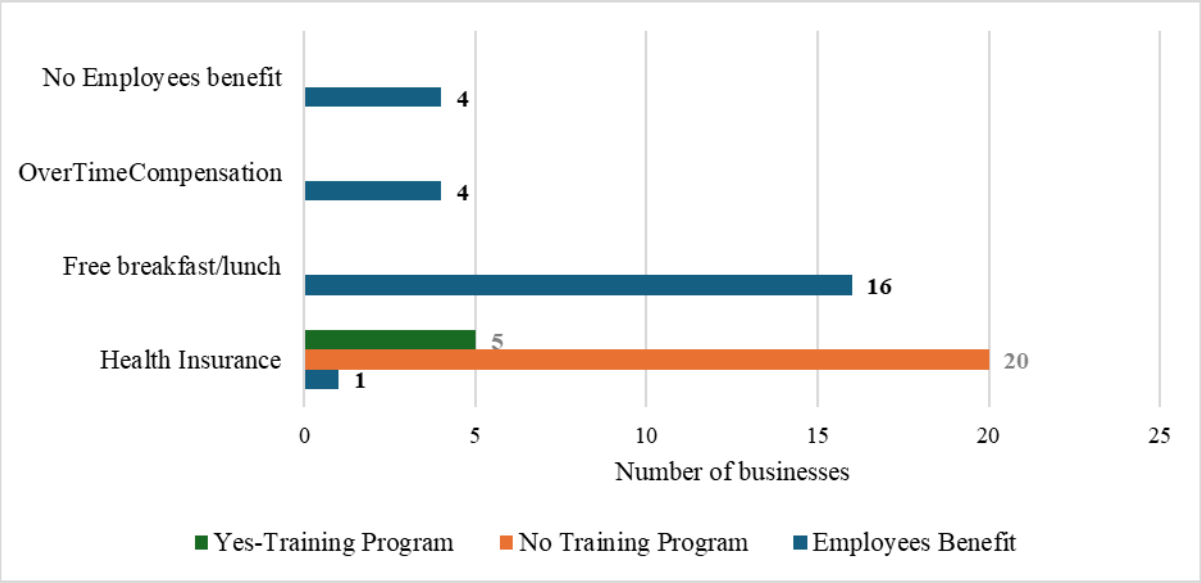


Source: Author, field data (2025)

6.1.2 Human Resource Information

Figure 6.4 below illustrates the welfare packages offered by the SMEs to promote employee well-being and enhance motivation within the agri-food chain workforce. Most businesses reported offering welfare packages, including free breakfast or lunch (64%), health insurance (20%), and overtime compensation (16%). Conversely, 80% of respondents indicated that they had neither engaged their employees in capacity-building activities nor offered any skills training programs.

Figure 6.4 Employees' Benefit and Training Program

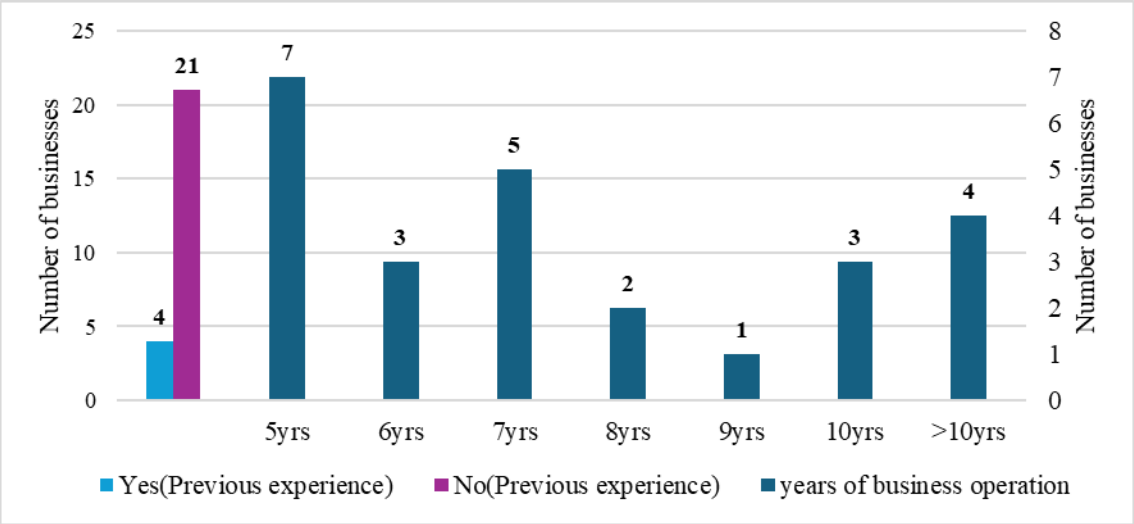


Source: Author, field data (2025)

Besides, the data (Figure 6.5 below) shows that 21 out of 25 respondents had no prior experience before starting their businesses. Additionally, most respondents (7 out of 25) have five years of experience in the agrifood chain, followed by five (5) respondents with seven (7) years of

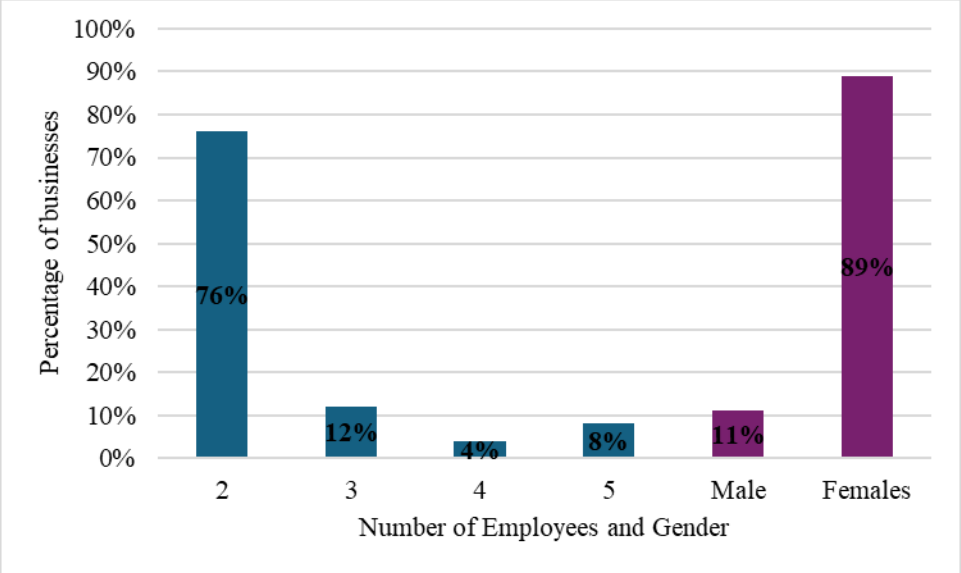
experience. This indicates that most respondents gain relevant skills on-site (through informal training) over the years of working in the related chain segment.

Figure 6.5 SMEs Experience (in years)



Source: Author, field data (2025)

Figure 6.6 Gender and Number of Employees Distribution in the Agrifood Chain



Source: Author, field data (2025)

The survey findings indicate that 76% of the respondents employed only two (2) workers, while 8% reported having five (5) employees, which was the highest number recorded. Moreover, the overall agri-food chain workforce was found to be female-dominated, with women representing 89% of the total employees captured in the survey, as shown in Figure 6.6.

The smaller workforce confirms that these SMEs operate at a micro-scale, highlighting limitations in expanding operational capacity that could constrain growth and competitiveness in the agrifood chain. Moreover, the findings emphasize the vital role of women in leadership and participation

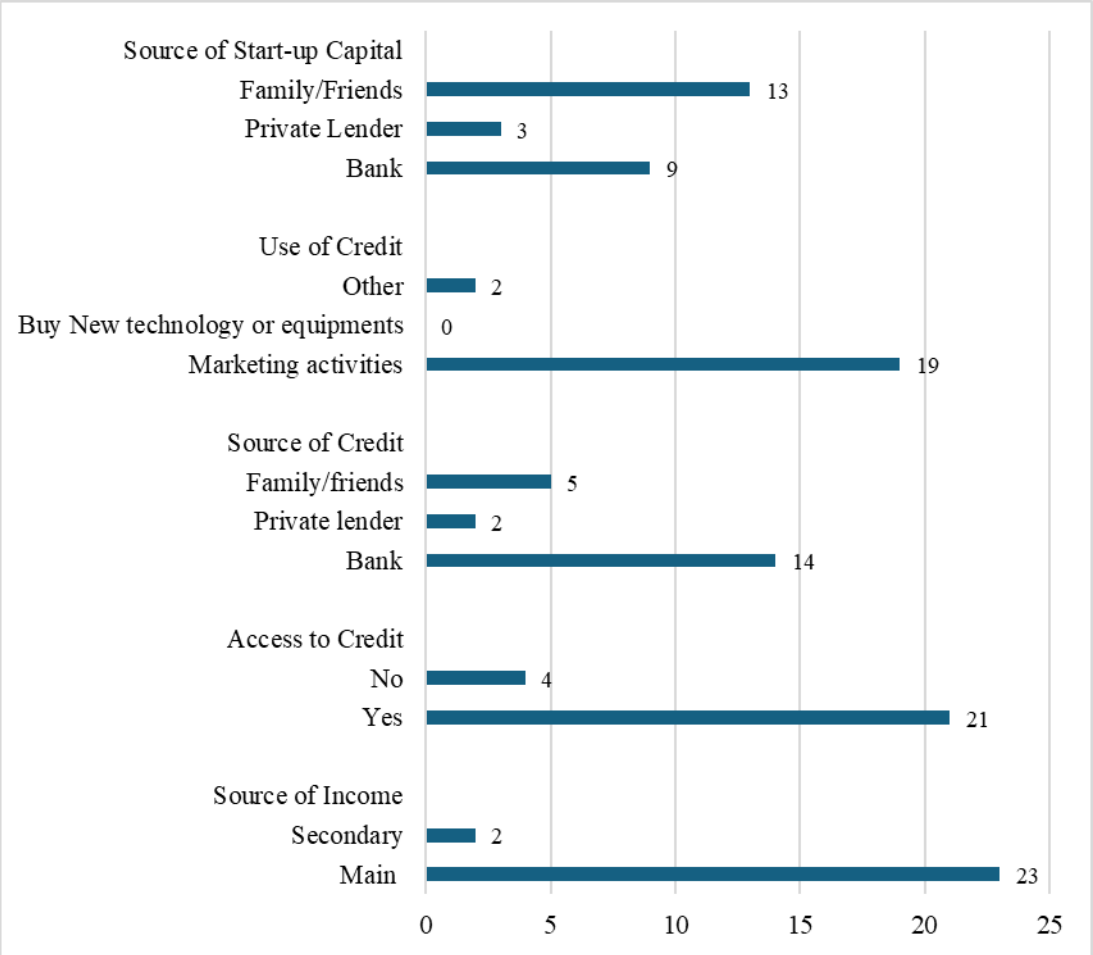
within the agrifood chain. This also presents opportunities to support vulnerable women in rural communities.

6.1.3 Financial Information

Also, in Figure 6.7, many SMEs (13 out of 25 respondents) obtained their start-up capital from family and friends, followed by bank funding. For most respondents (23 out of 25), these business activities also served as their primary source of income and livelihood. Regarding credit access, 21 respondents reported having secured a credit facility, with most sourcing it from banks (14 out of 21), while five (5) relied on family and friends. It was observed that most respondents used credit primarily for marketing-related activities, with no one allocating it to acquiring new technologies or equipment.

The findings suggest a strong reliance on informal financing and limited reinvestment in modern technology to scale up production, constraining efforts to innovate and improve efficiency in the egg value chain.

Figure 6.7 Financial Information

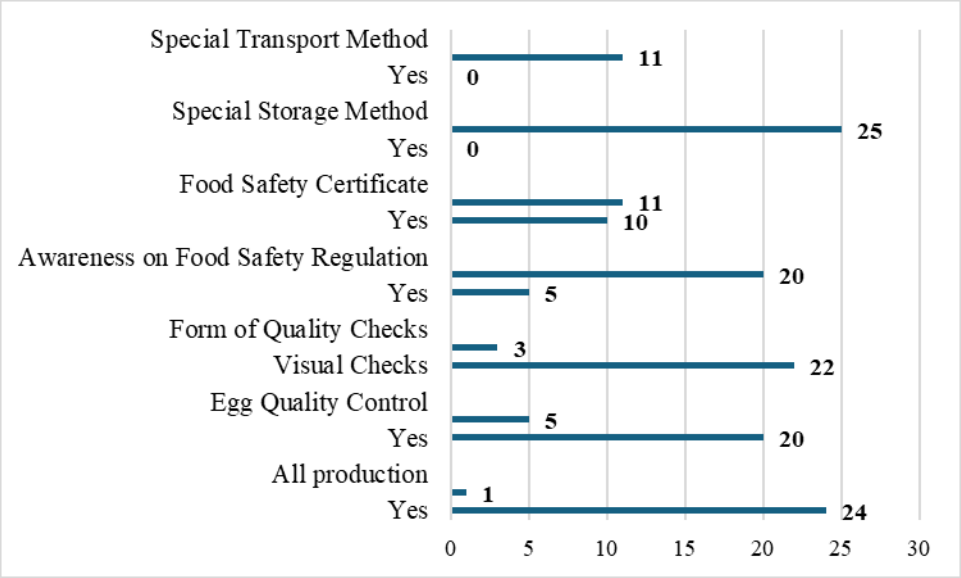


Source: Author, field data (2025)

6.1.4 Food Security

Figure 6.8 below shows that nearly all SMEs (24 out of 25 respondents) operate year-round, reflecting strong participation in the value chain, which is crucial for food availability. Twenty (20) respondents observe some form of egg quality control, but five do not. These checks are mostly visual inspections, with no technical or scientific assessments reported. As a result, other unseen hazards are not identified in the supply chain. Additionally, only five (5) out of 25 respondents are aware of food safety regulations, indicating weak institutional links, poor enforcement, and inadequate extension services. Overall, the findings suggest that SME activities pose a risk to food safety and utilization, hindering efforts to achieve sustainable food security in the egg agrifood chain.

Figure 6.8 Related Food Security Indicators



Source: Author, field data (2025)

6.1.5 Agrifood Chain Performance

Table 6.1 illustrates the extent of post-harvest losses captured across different segments of the egg value chain. The results reveal that egg producers experienced the highest losses, with a mean loss of 38.1 crates and a total of 153 crates, representing 67% of all reported losses. Traders (wholesalers and retailers) accounted for 26% of the total loss, and the food service providers recorded the least losses, contributing only 7% to the total. In general, the total reported post-harvest loss across the value chain amounted to 227 crates of eggs per month.

Moreso, Egg producers stated farm sizes ranging from 63 to 3,000 birds, with a mean of 1,478 and a cumulative total of 5,913 birds. It was discovered that the egg traders handled between 20 and 800 crates, averaging 298 per month and totaling 3,280 per month. Lastly, Food service providers managed between 10 and 80 crates, with a mean of 34 crates and a total of 340 crates per month.

In summary, the findings suggest that firm size directly influences the extent of post-harvest losses. Since producers recorded higher losses in the supply chain (67%), this signals a reduction in the quantity of eggs available to downstream segments (traders and food service providers), reflecting inefficiencies in production segments and adversely affecting the stability of chain performance. Again, the magnitude of losses, especially at the production and trading segments, highlights gaps in storage, packaging, and transportation systems. In effect, there is a reduction in the number of eggs available to consumers, and costs along the chain increase, limiting reinvestment in infrastructure (technology) and innovation.

Table 6.1 Post-harvest losses in the egg value chain (Number of Crates) per month

Chain Segments	Maximum loss	Minimum Loss	Mean Loss	Total Loss	% of Total Loss
Egg Producers	90	0.5	38.1	153	67
Traders (Wholesalers&Retailers)	16	1	5.4	59	26
Food Service Providers	4	0.5	1.5	15	7
Total				227	100

Source Author's calculations from field data (2025)

Table 6.2 SMEs Size Distribution

Firm Size	Min	Max	Mean	Total
Egg Producers (No. of birds)	63	3000	1478	5913
Traders(No. of Crates)	20	800	298	3280
Food Service Providers (No. of Crates)	10	80	34	340

Source Author's calculations from field data (2025) NB: 1 crate = 30 eggs

6.1.6 Animal Welfare

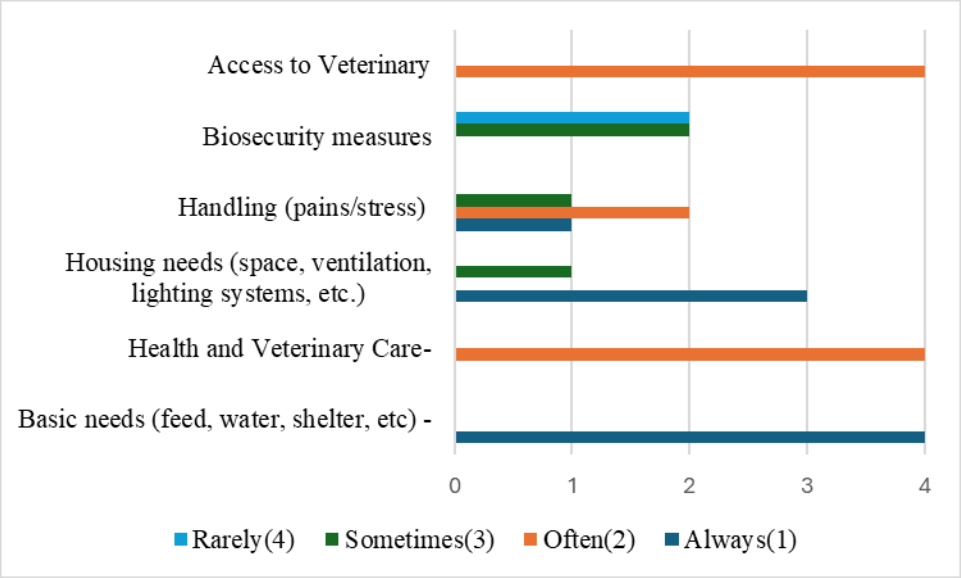
Survey results on animal welfare practices (shown in Figure 6.9) show mixed compliance across different dimensions. Basic needs such as feed, water, and shelter were consistently met, with all respondents indicating "always." Also, provisions for housing conditions (adequate space, ventilation, and lighting systems) were largely met, with three (3) respondents reporting "always," and one (1) stated "sometimes."

On the other hand, reports on handling practices suggest that birds may occasionally be exposed to stress or poor handling, as only one (1) respondent indicated "always," two (2) stated "often," and one (1) responded "sometimes." Regarding Biosecurity measures, two (2) respondents indicated "sometimes," and two (2) indicated "rarely." This means these measures were applied less consistently. These findings reflect lapses in handling and biosecurity measures, which may reduce efficiency through stress, reduced egg output, or increased disease outbreaks.

Similarly, access to veterinary care was not reliably assured; all four (4) respondents recounted this only as "often" rather than "always." This highlights a gap that may increase disease risks, mortality

rates, and related post-harvest losses. On housing systems, equal proportions of producers used caged (two respondents) and deep-litter (two respondents) systems, suggesting variation in production practices.

Figure 6.9 Animal Welfare Practices

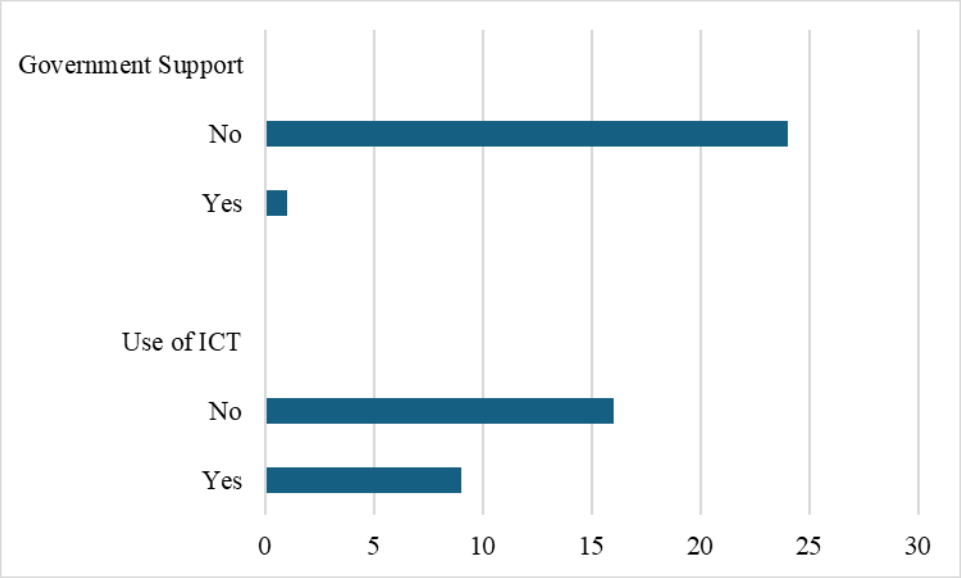


Source: Author, field data (2025)

6.1.7 Enabling Environment for Agrifood SMEs

The findings reveal minimal external support to SMEs within the egg value chain, with only one (1) respondent (4%) confirming receiving government support in the form of feed supply, while the overwhelming majority (96%) indicated no such assistance, as indicated in Figure 6.10 below. This highlights a critical gap in state-led interventions aimed at strengthening the sector.

Figure 6.10 Govt Support and use of ICT



Source: Author, field data (2025)

Regarding technology adoption, 9 respondents (36%) reported using ICT tools in their operations, while the majority (64%) did not. Hence, limited ICT integration suggests that many SMEs rely on traditional management and marketing practices, potentially constraining efficiency, record-keeping, and access to broader markets.

Basically, the absence of adequate government support limits access to subsidies, training programs, and related infrastructure support that could reduce losses and improve efficiency in the agrifood chain. Similarly, the limited use of ICT tools impedes the flow of market information and financial management, consequently affecting the competitiveness of the agrifood chain.

6.1.8 Factors that influence post-harvest losses

Table 6.3 summarizes the results of the multiple regression analysis. The coefficient of determination (R2) was 0.63, indicating that 63% of the variation in the quantity of egg crates lost in the egg agrifood chain is explained by the variables specified in the model. However, the adjusted R2 (0.45) suggests reduced model explanatory power, which may indicate a relatively small sample size or that some variables in the model were less relevant. The F-statistics were statistically significant at the 5% level, indicating that the explanatory variables collectively had a significant influence on post-harvest loss performance among the observed agrifood SMEs. The model estimation follows standard econometric procedures for cross-sectional regression analysis as discussed in Greene (2018) and Wooldridge (2016).

Table 6.3 Regression estimates of factors influencing postharvest losses in the egg agrifood chain

Variable	Coeff.	Std Error	t	P>t
Constant	67.383	31.043	2.171	0.045
Age	0.808	0.522	1.549	0.141
Experience	-0.871	1.021	-0.853	0.406
Employee Training Program	-34.059	10.118	-3.366	**0.004*** **
Access to Credit	-5.175	10.285	-0.503	0.622
Use of ICT	8.771	8.892	0.986	0.339
Community Engagement	-9.377	4.917	-1.907	**0.075***
Collaboration	2.590	4.254	0.609	0.551
Member Association	-9.947	9.191	-1.082	0.295

Source: Author, 2025

R Square (R^2) 0.634 ; adjusted R^2 =0.452; F= 3.474;p = 0.016 (significant at 5%); Significance; 1% = ***, 5% = **, 10% = *. 1 crate of eggs = 30eggs

The regression results provide indicative evidence of the factors influencing post-harvest losses; however, given the sample size and survey-based data, the results should be interpreted with caution. The above estimates indicate that employee training programs and community engagement have a significant negative effect on postharvest losses, with increases in these variables leading to

subsequent decreases of 34 crates of eggs for employee training programs and 9.4 crates of eggs for community engagement. These align with the claim that training programs and community engagement may reduce losses.

On the contrary, Training was found to be positively associated with post-harvest losses in an assessment of post-harvest losses to support innovation in the egg value chain in Ghana (Mensah et al., 2021), suggesting a mismatch between training information and the needs of egg agrifood actors. It is worth noting that age, experience, access to credit, use of ICT, collaboration, and membership of an association were found to be insignificant in post-harvest losses in the egg value chain.

The empirical findings from the survey provide support for the theoretical framework presented in Chapter Four, particularly the role of human and social capital in strengthening agrifood chain performance. The regression results indicate that employee training and skills development contribute to reducing post-harvest losses, suggesting that improvements in human capital can enhance operational efficiency among agrifood SMEs. Similarly, the relatively high participation of SMEs in business associations underscores the importance of social capital in facilitating information exchange, collaboration, and market access among value chain actors. These results reinforce the argument that capacity-building processes, through the development of both human skills and collaborative networks, play a crucial role in improving the integration and competitiveness of agrifood chains.

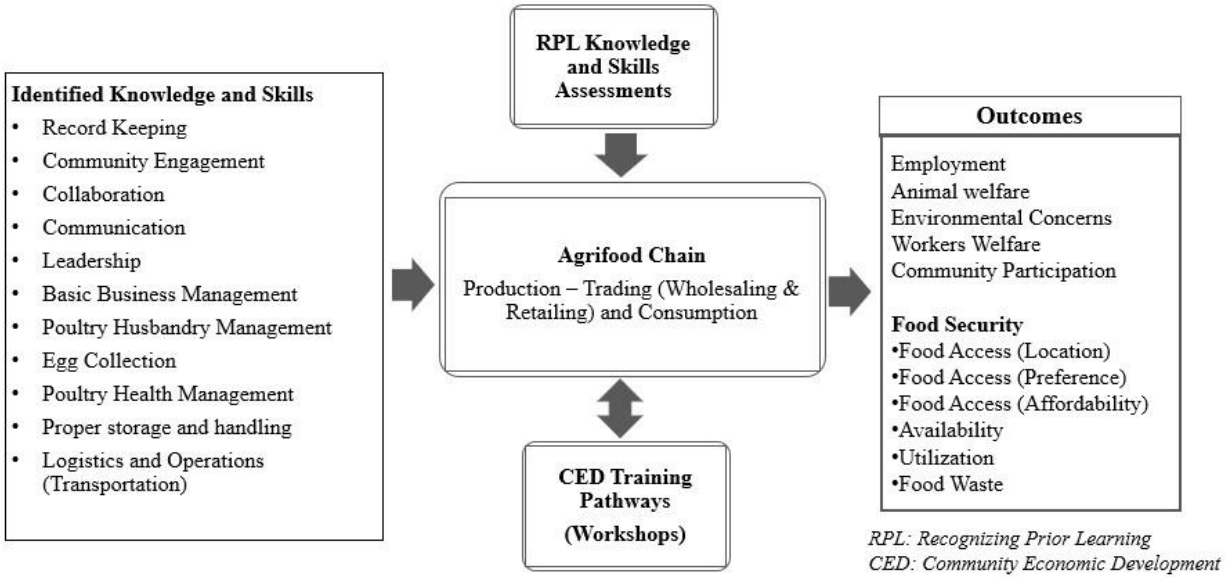
6.2 RPL - Knowledge and Skills Assessment in the Egg Agrifood Chain

The core knowledge and skills identified across various segments of the egg value chain included record-keeping (human capital), community engagement (social capital), collaboration (social capital), communication (human capital), leadership skills (human capital), and basic Business management (human capital). The project-specific skills (classified as human capital) included poultry husbandry management, poultry health management, proper storage and handling and logistics and operations. Human capital is the individual-level knowledge and skills that improve efficiency, productivity, and management capacity of the agrifood chains. The social capital emphasizes connections, trust, and cooperation within groups, associations, or communities.

Essentially, the knowledge and skills outlined below (in figure 6.11) are regarded as critical throughout the egg agrifood chain because they are directly connected to productivity, efficiency, product quality, reduced losses, and support the integration and competitiveness of the entire egg agrifood sector. Therefore, without strengthening these areas, the chain cannot operate effectively or sustainably. This context is further supported by levels of education, which influence how well

agrifood SMEs can acquire, apply, and upgrade these skills. These skills are used across various segments of the egg agrifood sector to achieve socio-economic, nutritional, and environmental outcomes that support rural development and food security objectives.

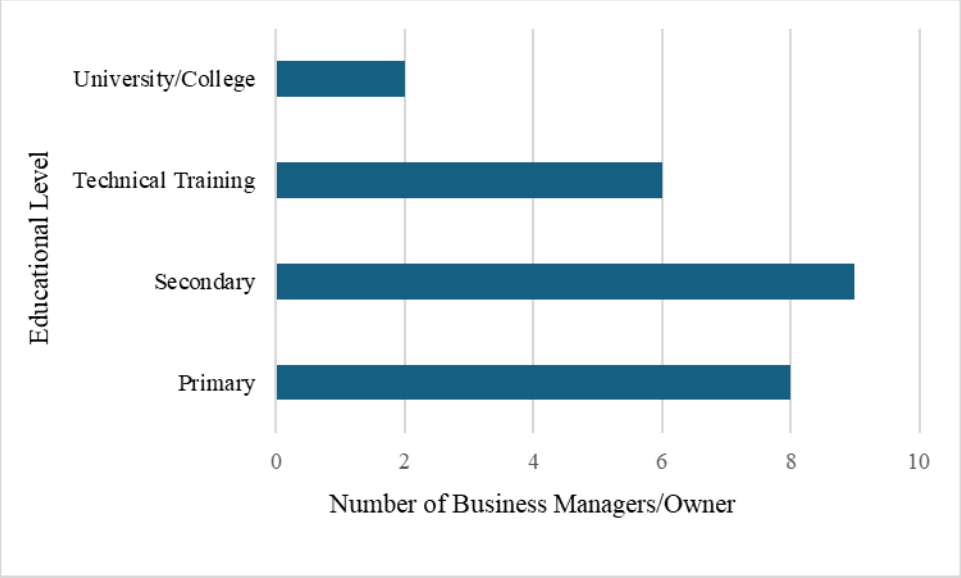
Figure 6.11 Adopted Conceptual Capacity-building Model



Source: Author, field data (2025)

As illustrated in Figure 6.12, most respondents had attained secondary education, representing nine (9) business owners/managers. This was followed by those with primary education (8 respondents), while six (6) respondents reported having received technical training, and two (2) had completed university or college education.

Figure 6.12 Educational Level of Business Managers/Owners



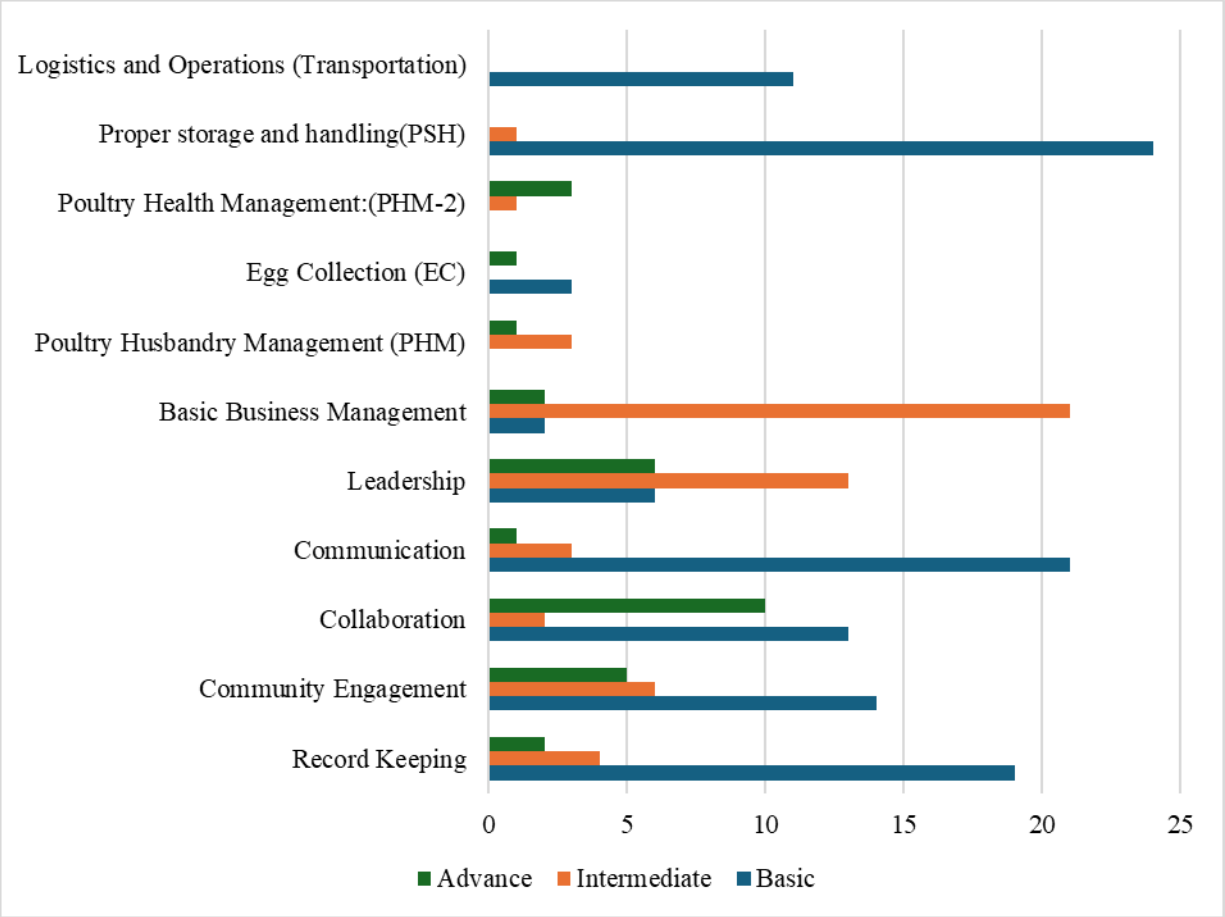
Source: Author, field data (2025)

With fewer people holding university/college qualifications, this reflects limitations in the chain's adoption of modern technology and engagement with formal financial institutions, as knowledge of advanced management, finance, and technology is limited. The presence of a large number of managers/owners with technical training indicates potential strengths in equipping SMEs with relevant practical skills in production and handling. Hence, the survey's outcomes suggest the need to scale up related vocational and technical programs in the sector.

Unfortunately, the dominance of primary and secondary education in the egg value supply chain may not be sufficient for complex record-keeping, business and financial management, or support for innovative technologies. Therefore, these gaps underscore the need for well-structured, targeted capacity-building interventions to complement formal education.

The survey results (shown in Figure 6.13) provide a clear overview of knowledge and skills across the aspects critical to the efficient functioning of the egg agrifood chain. Many of the respondents demonstrated only basic knowledge in areas such as record keeping (19), communication (21), community engagement (14), collaboration (13), proper storage and handling (24), and logistics/transportation (11).

Figure 6.13 RPL - Knowledge and Skills Assessment



Source: Author, field data (2025)

Skills in Leadership and business management were relatively stronger at the intermediate level, with 13 and 21 respondents, respectively, signifying some management competencies within the egg agrifood chain. Meanwhile, very few respondents proved advanced skills. Notable exceptions include collaboration (10), leadership (6), community engagement (5), and poultry health management (3). Moreover, technical areas such as poultry husbandry, egg collection, and poultry health management demonstrated minimal advanced expertise, which may undermine productivity, disease control, and product (egg) quality. In addition, gaps in storage and handling knowledge contribute to post-harvest losses, as evidenced among producers and traders.

The Advanced level of collaboration and the high membership rate (68%) show potential for collective action and cooperative ventures. Figure 6.14 illustrates that out of the 25 surveyed SMEs, 17 business owners/managers (68%) stated belonging to a membership association, while 8 (32%) indicated no affiliation. Therefore, association members may be able to access inputs, facilitate knowledge sharing among members, and gain new skills and opportunities that non-members cannot.

Conversely, weak communication and community engagement at substantial levels constrain knowledge sharing, networking, and market linkages. Similarly, Limited knowledge of transportation logistics reduces the efficiency of moving eggs to markets, increasing the risk of breakage and spoilage.

Figure 6.14 Number of Business Managers/Owners in Membership Association

Source: Author, field data (2025)

Based on the above information and the role of capacity building in supporting the egg agrifood chain's performance, the skills were prioritized to address the most essential skills gaps across the chain, as demonstrated in Table 6.4. Proper storage and Handling were ranked 1, with the highest

significance, since only 24 respondents demonstrated basic skills. Post-harvest losses due to breakage, spoilage, and poor handling are also significant challenges in the egg value chain, directly weakening efficiency throughout the chain. The next skill, in terms of priority to address, is record-keeping (ranked 2), with 19 respondents having only basic knowledge. Without accurate record-keeping, agrifood SMEs cannot track operational activities for performance and financial management. This weakens the business growth in agrifood chains. Weaknesses in Poultry health and biosecurity management (ranked 3) affect the stability of supply across the chain due to a higher risk of disease incidence, mortality, and lower productivity. The data showed few respondents with intermediate, PHM (3), and advanced PHM-2 (3) knowledge of both skills.

Other skills with secondary priorities but of equal importance to chain performance are basic business management (mostly intermediate -21 respondents), leadership (intermediate -13 respondents), Collaboration (mostly basic -13 respondents), and logistics and operations (only 11 respondents with basic knowledge).

6.2.1 Recommended Capacity Building Pathway

Based on the results of the RPL knowledge and skills assessment outlined above, a customized capacity-building training pathway for agrifood SMEs in the egg value chain was developed and recommended to enhance skills across the chain. The selection of skills for each phase was made according to the ranking described above, and the educational backgrounds of business owners and managers were considered to ensure the effectiveness of each training stage. Overall, this progressive training pathway will enhance SMEs' capacity to adopt innovation and sustainable practices to build resilient agrifood systems.

Table 6.4 Tailored Capacity Building Pathway for the Egg Agrifood Chain

Phase 1	**Objectives**	**Target groups /sub-target groups**	**Type of Training /Outcomes**
Foundational Skills	Strengthen the basic knowledge that most respondents already have.	Agrifood SMEs with mostly primary & secondary education	
Proper Storage & Handling (Rank 1)			Egg handling techniques, packaging, and techniques for reducing breakages/spoilage
Record Keeping (Rank 2)		Egg producers, Traders and Food service providers.	Training in simple bookkeeping
Poultry health (PHM-2 and Biosecurity Management (PHM) (Rank 3)		Egg producers	Practical sessions on husbandry management guide, vaccination, and hygiene routines. Building veterinary service partnerships
Phase 2			

Strengthening Intermediate Skills	Enhance specialized technical expertise to minimize losses and enhance productivity.	Agrifood SMEs with secondary/technical training	
Basic Business Management (Rank 4)		Egg producers, Traders and Food service providers.	Step-by-step modules on pricing, budgeting, profit tracking, and business planning
Leadership & Collaboration (Rank 5)			Team management, cooperative group leadership, and decision-making
Phase 3			
Advanced/Technical & ICT Integration	Equip agrifood SMEs with strategic and innovative skills for competitiveness	Agrifood SMEs with technical training & university education. Motivated secondary-level SMEs can be included.	
Use of ICT in Agrifood Chains		Egg producers, Traders and Food service providers.	Introduction to WhatsApp groups for coordination, mobile apps for sales, and simple accounting software
Advanced Poultry Health Management		Egg Producers	Disease diagnostics, feed formulation, and record-based health monitoring.
Market Access & Logistics and Operations (Rank 6)		Egg producers, Traders and Food service providers.	Training in cooperative marketing, transport pooling, and value addition (egg grading, packaging).
Training delivery methods	• Demonstrations with visuals & roleplay • Peer learning groups • Hands-on training using pictorial logbooks, simple tally sheets • Pictorial Manuals & use of local language • Real Case study examples • Mentorship by experienced actors in the egg agrifood chain		
Expected Outcomes	• Minimizing post-harvest losses through better handling and storage • Improved productivity and efficiency through enhanced technical and managerial skills. • Enhanced the adoption of ICT and innovation to support competitiveness • Create stronger resilience and a sustainable egg agrifood chain.		

Source: Author * (Rank 1 – highest significance)

6.3 Challenges affecting the agrifood Chain

Table 6.5 presents the significant challenges identified by SMEs operating within the egg value chain, which remain relevant to improving the competitiveness of the agrifood chain. Inadequate capital emerged as the most critical challenge, with 11 respondents rating it as “very important” (Mean = 1.00, Rank = 1st). Likewise, limited access to credit facilities was ranked second, reflecting the persistent financial constraints facing SMEs. The dominance of inadequate capital and

access to credit facilities highlights systemic financial barriers that limit investment in technology, storage, and value addition, thus weakening efforts to scale up productivity.

Table 6.5 Challenges affecting the agrifood Chain (from Survey data)

Identified Challenges	Very important(1)	Quite important (2)	Not Relevant(3)	Mean Score	Ranking
Inadequate capital	11			1.00	1st
Inadequate access to credit facilities	6			1.00	2nd
Competition from other egg traders	22	1	1	1.13	3rd
High tax	17	2	1	1.20	4th
Price Volatility	14	3	2	1.37	5th
Transportation challenges	4	3		1.43	6th
Breakage and Spoilage	3	1	1	1.60	7th
Difficult access to the main markets due to the poor road network	2		1	1.67	8th
Problems with the storage facility	2	3	1	1.83	9th

Source: Author's calculations based on field data (2025)

Competition from other egg traders was the third most crucial challenge, followed closely by high taxation and price volatility. As a result, profit margins are reduced, making SMEs vulnerable to income instability. Also, high taxation further exacerbates cost pressures, reducing incentives for expansion.

Operational challenges, including transportation difficulties, breakage and spoilage, and poor road networks that limit access to main markets, were also stated. While storage facilities were ranked as the least important, they nonetheless play a critical role in minimizing post-harvest losses. The findings indicate that these operational challenges hinder the efficient movement of eggs from producers to consumers, contributing to losses and reduced market access.

To gain a comprehensive understanding of challenges across the egg value chain, Table 6.6 below presents a broad overview of the effects of economic and environmental challenges on Ghana's poultry-egg industry, based on related academic reports. Many challenges were observed, screened, and grouped into categories, including Production-Technical-related, Systemic issues, Policy/Governance, and Economic-marketed-related challenges, all of which had a significant bearing on enhancing the integration and competitiveness of the poultry-egg value chain.

Table 6.6 Identified Challenges across the Egg agrifood chain

Category	Specific Challenge	Evidence/Indicator	Impact on SMEs
Systemic Issues	Weak institutional support[10]	• Limited number of Veterinary staff and veterinary clinics in rural areas. • Irregular contacts between producers and veterinary staff[10,14].	Unqualified farm operators take charge of veterinary activities, resulting in low production.

Systemic Issues			
	Limited logistics	Extension services lack the logistics to train and educate farmers on the technicalities of poultry production[10].	Limited access to updates on production activities.
	Limited training in Information and Communication Technology[10].	Most Extension officers in Ghana have little or no knowledge of Information and Communication Technology (ICT)[10].	Difficult to access and share new developments in the industry[10].
	Inadequate access to credit facilities and Inadequate capital[4].	About 83% and 56% of egg markets in the northern region reveal that inadequate access to credit and inadequate capital, respectively, are among their most limiting constraints[4].	SMEs are unable to procure the required inputs and equipment and expand their agribusiness operations for increased incomes and improved livelihoods[4].
Production-Technical Related	Low levels of technical know-how and skills in poultry (inexperienced and unqualified laborers).	• Limited knowledge in the administration of drugs and feed formulations. • Absence of recordkeeping • Poor housing management practices[10].	• It is difficult to track the records of daily activities. • Increasing risk of disease outbreak Low production output[10].
	Limited storage and processing facilities & Unreliable power supply[7,10].	Most poultry farms in Ghana lack storage facilities such as refrigerators or cold rooms for storage of processed poultry products[10.]	It disrupts the storage and supply of processed products to the market.
	Limited use of modern techniques in production.	Most producers do not use modern husbandry techniques that produce the highest performance[12] Examples Poor quality hatcheries, inefficient production systems[13].	Low production output performance.
	Losses due to egg breakage[4].	Egg breakages were identified as the most limiting constraint facing the egg marketers in the northern region (with a score of 99%)[4].	Reduces the profit margins associated with the daily sales[4].
	Inadequate biosecurity systems[14]	About 16% of poultry producers in the Kasoa district of the Central Region cited disease infections as the main obstacle to	High incidence of chronic respiratory illnesses (62.2%) in the district[14]. No biosecurity

Production-Technical Related	Inadequate biosecurity systems[14]	their operations[14]. About 37.8% of the district's poultry producers have only partially implemented biosecurity measures[14].	enforcement measures[15].
	Incidence of Diseases	Common diseases are Avian influenza and Newcastle disease[15]. In 2021, the Government spent a total amount US$2.7 million on poultry farms that were impacted by avian influenza[15].	Reduced productivity and economic loss
Economic/Marketing	Location of Production farms and Poor transport infrastructure[4].	Product locations are not often in proximity to consumers or urban centers[10]. Lack of good roads connecting producers to other actors[7,10]. Poor road conditions in the area are one of the major causes of egg breakages among 53% of egg marketers in the northern region[4].	The quality of products is affected during transport or storage through marketing channels. Loss of profit margin during handling and transportation of the eggs from production areas to the market centers for sale.
	Seasonality of supply	Supply of poultry products is often limited to the time of consumption, mostly in festive seasons or occasions[10].	Low stock volume to meet constant supply.
	Lack of value addition compared to imported poultry products.	The locally produced chicken lacks value in terms of packaging and is mostly not appealing to buyers[10]. Ghanaian consumers chose ready-to-cook products, which are processed, more convenient, and, hence, attractive[1].	Inability to meet consumer preference[14]. Unable to attract higher revenue from the products.
	Operational cost (High cost and access of inputs -like feed, market transaction cost)[7,2,14].	Cost of access to feed may be higher for poultry farms located in rural areas[1]. In the Ashanti region high cost of feed was a prevalent constraint among producers, and the cost of fresh eggs for wholesalers and retailers [2].	Rural farms produce about 82.8 percent of their feed requirements on-farm, while their urban counterparts produce about 80.5 percent[1].

Economic/Marketing	Operational cost (High cost and access of inputs -like feed, market transaction cost)[7,2,14].	Per the market price analyses of feeds, 50 kg of maize, which was sold at the farm gate at GH₵120 Ghanaian cedis (US$11.11) has increased astronomically to GH₵500 to 600 Ghanaian cedis (US$46.30 – US$55.56), making it difficult for farmers to purchase[15].	
	High transportation costs[4].	98% of the egg marketers in the northern region indicated that the high cost of transportation is a major constraint hindering their chicken egg business[4].	This affects their profit margins and incomes.
	Weak market coordination	Limited market information[4,10]. Unreliable market prices[7]. Poor linkages between input suppliers and marketers[14].	Unstable income flow, Inconsistency in supply, An increase in transaction costs.
	High levels of imported poultry products	Competition of imported poultry products[14]	The price gap between imported products and locally produced products reduces market share and profitability for local SMEs.
Policy / Governance	Weak system of agricultural policy implementation[10].	• High importation of poultry products • Introduction of import tariffs on inputs (35%) and subsidies[11].	Access to subsidized inputs through the Rearing for Food and Jobs Program Price of locally produced chicken, 27–30% higher than the imported ones[11]. making it lose its competitive advantage[11].

Source: Author's compilation

1. Amanor-Boadu, V., Nti, F. K., & Ross, K. (2016). Structure of Ghana's chicken industry in 2015.
2. Opoku-Mensah et.al (2023). Market margin analysis and constraints in fresh egg value chain in the Ashanti Region, Ghana.
4. Baagyere, et. al (2023). Organization and performance of chicken egg marketing in Northern Ghana.
7. Oppong-Kyeremeh et. al (2022). Contract farming as a marketing strategy to improve the poultry agribusiness in Ghana. Provides Ghana-specific evidence on contract marketing (incl. non-formalized practices).
10. Asogwa, J. H. I. (2023). Drivers and barriers for poultry production: the case of Ghana.
11. Onumah, E. E., & Ayeduvor, S. (2023). Dynamics of the poultry market in Ghana.
12. Opoku-Mensah, S. "Performance and Efficiency Measures of Layer Production Enterprises in the Ashanti Region of Ghana,"
13. R.K. Bannor et. al (2023), Agricultural insurance and risk management among poultry farmers in Ghana: an application of discrete choice experiment
14. Arthur, S. O.(2024). Bottlenecks and Prospects of Poultry Production in Kasoa, Awutu Senya District, Ghana.
15. Richmond, (2023). https://www.thepoultrysite.com/articles/overview-of-ghanas-struggling-poultry-sector

On the whole, it was observed that, among other factors, key human capital indicators such as technical skills and knowledge of poultry management systems are limited, especially at the production level. The report found that many small- to medium-sized farms are operated by inexperienced and unqualified workers, with feeds not properly formulated, daily operational records not kept, and feed wastage and limited knowledge of animal welfare and other biosecurity measures. These issues have increased the risk of disease outbreaks and reduced productivity.

Additionally, most operators along the chain have experienced significant egg breakage due to poor handling and management. A limited number of veterinary personnel and infrequent interactions between operators and veterinary staff have led some operators to handle veterinary activities themselves, resulting in incorrect vaccine administration and negatively impacting industry performance. Furthermore, extension officers are reported to have limited ICT training, hindering their ability to effectively share relevant industry developments. Weak market coordination and irregular contact with veterinary and extension personnel indicate low levels of social capital across the poultry-egg chain, ultimately undermining the chain's overall competitiveness.

6.4 Sustainable policies and support measures

Policies play a significant role in determining the success or failure of the agricultural and agrifood sectors; therefore, their design and implementation should balance competing objectives, such as enhancing domestic production, ensuring food security, and promoting sustainable development (Zamani et al, 2025). Over the past decades, various domestic policies have been implemented to enhance the competitiveness of the poultry agrifood chains. Among these measures are initiatives to combat poultry diseases, subsidies for feed production, training and extension services, and the distribution of input resources, among others. To strengthen the government's commitment to the industry, it has consistently organized mass vaccination campaigns, supported local vaccine production, and enhanced disease surveillance (Sumberg et al., 2017).

Given the above context, this section presents a summary of policies and support measures (implemented by the Ghanaian government with support from development partners), the impact of these initiatives on SMEs, and identifies gaps in capacity-building dimensions. The section also included a brief impact analysis of shifting trends in tariffs, subsidies, and import bans on the industry's overall performance.

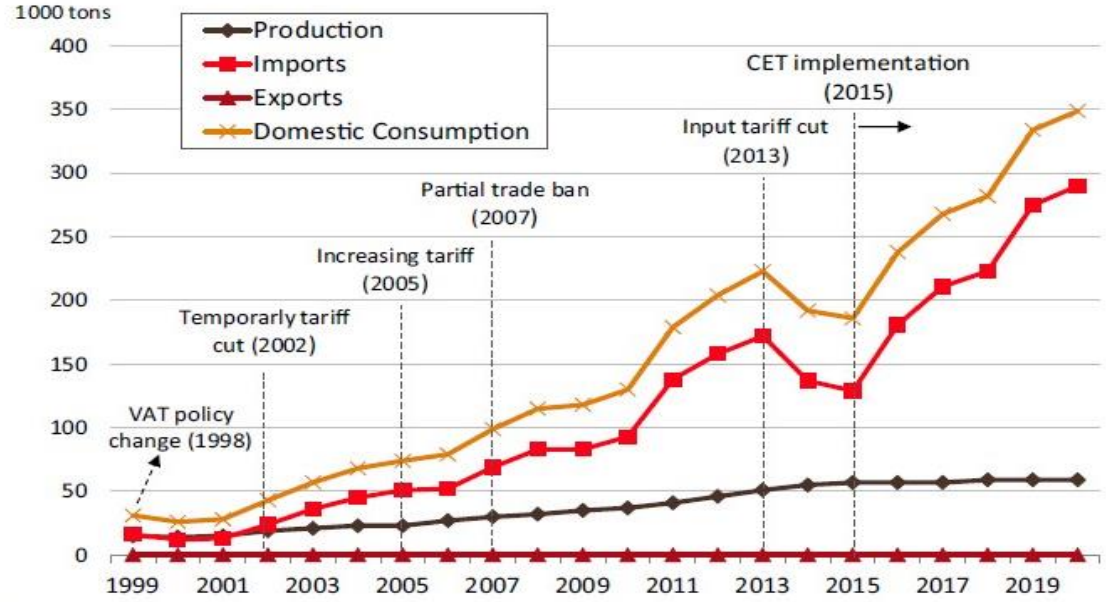
6.4.1 Trade-Related Policies & Import Measures

As elaborated in Chapter 3 of this project, Ghana has implemented a variety of programs and policies to boost the competitiveness of the agriculture and agrifood industry. However, these measures are more focused on trade liberalization and on enhancing competitiveness through cost-

reduction strategies (Naggujja et al., 2020). Figure 6.15 below illustrates trends in production and consumption of poultry products in response to changes in tariffs and import bans.

The Figure above shows fluctuations in import tariffs over 10 years, from a 12.5% Value Added Tax (VAT) in 1998, reduced to 10% and eventually abolished in 2002 under a trade liberalization policy (Zamani et al, 2025). In 2003, a brief 40% import tariff was introduced but was soon repealed (Sumberg et al., 2017). The country adopted the 20 percent Common External Tariff (CET) in 2005, which was later increased to 35 percent in 2015 (Naggujja et al., 2020). By 2013, the government removed customs duties on key inputs for poultry production, including feed, drugs, and vaccines (Netherlands Enterprise Agency, 2019), but this had minimal impact.

Figure 6.15 Trends in poultry products production, imports, exports, and consumption in Ghana (In 1000 metric tons).



Source: Zamani et al, (2025)

The Ghanaian government has also sometimes imposed short-term, partial import bans during Avian Influenza outbreaks. This ban affected imports from the Netherlands, Germany, Russia, Denmark, and the UK. However, the policy had only a marginal effect on imports, as alternative suppliers easily filled market shortages according to Zamani et al. (2022). Overall, despite these measures, trends in the import of poultry products continue to rise, rendering local producers at a competitive disadvantage in the market.

Table 6.7 Summary on Policy and Support Initiatives

Program/Policy	Support measures	Impact on SMEs	Capacity Dimension
Rearing for Food and Jobs (RFJ) – Layer model[18] Implemented by MoFA	- 50% subsidies on pullets, vaccines, and battery cages, etc - Provision of Extension	Increased productivity	Resource access

Coverage: 2019 to 2023.	Services. - 1200 women, including small- to medium-sized producers, selected.		
Savannah Agriculture Value Chain Development Project (SADEP)[16] Implemented by: MoFA Funding: $29 million grant from the African Development Bank. Coverage: 2023 - 2027	- Provision of farm inputs to produce climate-resilient rice, maize, and soybean (these are key ingredients in poultry feed) - Provision of 30,000 layers for women to start commercial poultry production - Supporting processing facilities, improved storage, and market linkages.	Reinforced feed availability	Resource access
Ghana Broiler Revitalization Project (GHABROP)[21] Implemented by: MoFA Funding $56 million by USDA Launched in 2015 Expected Coverage: 10-year	- Reducing the import of poultry products by 60% by increasing local production. - Improve value addition in the poultry value chain	Short-term benefits: increased capacity, market share, and income.	Resource access
Ghana Poultry Project[17] (GPP) Funding: USDA Implemented by ACDI/VOCA, TechnoServe Coverage: 2015-2021	-17,721 poultry actors were trained in Poultry husbandry practices. -500 extension personnel were trained on husbandry education and vaccination. -3,318 individual loans totaling US$15.3 million for 16,836 individuals -formed 18 poultry outgrower schemes -Input market strengthening, finance access, and market linkages	More than 17,721 trained people A $15.3 million loan facility was mobilized for the industry chain actors.	- Human Capital - Institutional Support - Social Capital - Resource access

	-Launched the Eat Ghana Chicken campaign	Boost local consumption of locally produced poultry products.	
Feed Ghana Project (FGP)[19,20] 'Nkokɔ Nketenkete' Project (Poultry farm-to-table) model Budget allocation GHC 1.5b (US$136 m) Implemented by MoFA Launched April 2025	- Integrate 55,000 households into the poultry value chain. - Supply DoCs, vaccines, battery cage, feed, etc - Skills Development and Digital Innovation -Farmer Association Strengthening	Increased domestic capacity to reduce dependency on imports. Deploy ICT solutions for disease tracking, production monitoring, and market access. Provide support for governance, financial management, leadership development, and advocacy capacity	-Resource access -Human capital

Source: Author's compilations

16. https://www.trade.gov/market-intelligence/ghana-poultry-industry-inputs
17. USDA-Ghana Poultry Project Ends, Critical Activities Continue - ACDI/VOCA
18. https://mofa.gov.gh/site/programmes/pfj/70-pfj/pfj-modules/328-rearing-for-food-and-jobs-rfj
19. https://mofa.gov.gh/site/index.php/feed-ghana
20. https://thebftonline.com/2025/07/07/reviving-the-poultry-sector-the-critical-role-of-govt/
21. Zamani et al, (2025). Aligning policy for success in developing countries: evidence from the poultry sector of Ghana

Taking everything into account, a review of the literature reports on the above policies and support initiatives discloses that the poultry industry, among other agrifood industries, generally benefits

from a combination of government policies (such as Rearing for Food and Jobs, GHABROP, Feed Ghana Project) and donor-driven and private institutions development initiatives (Ghana poultry project). This means the sector can leverage financial, technical, and infrastructural support to improve performance across the agrifood chains.

Furthermore, programs such as SADEP, RFJ, and FGP temporarily ease operational burdens on SMEs by providing access to subsidized resources, such as feed, chicks, battery cages, and vaccines, which might otherwise hinder their performance in the industry. Additionally, initiatives like the GPP offer training and promote entrepreneurship among industry participants, with a focus on the inclusion of youth and women, thereby building long-term human and social capital among chain actors. Nonetheless, many programs such as SADEP, RFJ, and GHABROP tend to emphasize increasing production without adequately strengthening the skills and knowledge of chain actors. Moreover, the benefits, including training and skill development schemes, are often concentrated in donor-supported areas.

Lastly, changes in import tariffs, subsidies, and trade restrictions (Zamani et al., 2025) create inconsistencies in policy frameworks, leading to uncertainty and limiting investment confidence among agrifood chain actors. In effect, despite the measures outlined above, the industry still faces capacity challenges in production, human capital, and institutional and resource support, thereby weakening the economic competitiveness of the poultry agrifood chains.

6.5 Synthesis of Mixed-Methods Findings: Linking Local Evidence with Global Agrifood Models

The integration of quantitative regression results with qualitative insights from the Recognizing Prior Learning (RPL) assessment provides a comprehensive understanding of competitiveness within Ghana's egg agrifood chain. By combining these methods, the study explains not only the statistical relationships that affect value-chain performance but also the underlying mechanisms that shape SME efficiency (Creswell & Plano Clark, 2017).

The regression analysis shows that participation in training programs is associated with a reduction of approximately 34 crates of post-harvest losses per SME, highlighting the importance of skills development in improving operational efficiency. The RPL findings clarify this relationship by showing that the largest efficiency gains occur when SMEs move from basic to intermediate competency levels, particularly in egg storage and biosecurity practices (Maurer, 2021).

The findings also demonstrate the interaction between human and social capital. Community engagement and collaboration among SMEs are associated with an average reduction of 9.4 crates of post-harvest losses, suggesting that relational coordination strengthens the benefits of individual skills. This dynamic mirrors the Italian *Distretti Agricoli* model, where competitiveness emerges

from locally embedded networks that support information sharing and collective action (Morgan, 2006; Rana et al., 2020).

However, the RPL assessment indicates that approximately 96 percent of SMEs operate at a basic competency level in storage and logistics practices, revealing a structural constraint within the sector. This pattern reflects what Maurer (2021) describes as a "competency trap," where enterprises remain locked in low-productivity practices due to limited access to structured capacity-building opportunities. Without the enabling institutional environment highlighted by UNDP (2009), including standardized training systems, certification frameworks, and cold-chain infrastructure, individual training interventions are unlikely to generate sustained improvements.

These findings indicate that improving competitiveness in Ghana's egg value chain requires coordinated improvements in human capital, social capital, and institutional support. This interpretation aligns with the OECD (2006; 2023) capacity development framework, which emphasizes the cumulative nature of workforce upskilling and institutional coordination. These insights provide the empirical foundation for the Integrated Capacity-Building Model developed in Chapter Eight, which translates the study's findings into a coordinated framework for strengthening value-chain integration and competitiveness in Ghana's egg agrifood sector.

CHAPTER SEVEN

Comparative Assessment of the Egg Agrifood Chain

This chapter constitutes Phase Two of the research project, utilizing secondary data sources to provide a comprehensive analysis of the egg agrifood industry in Ghana, Italy, and Canada. An in-depth comparative study was conducted to examine key dimensions of the sector, including the competitiveness of the egg industries, the economic and environmental challenges affecting the egg agrifood chains, and the nature and extent of capacity-building initiatives implemented to support agrifood SMEs. The chapter concludes with a comparative assessment of the policy frameworks that underpin rural capacity building within the egg agrifood value chain across the three countries.

7.0 Summary of Comparative Analysis

Industry Overview

Ghana's poultry sector is a significant source of animal protein, with egg production growing steadily as a result of a shift from broiler to layer farming. Small and medium-scale enterprises dominate production but face high feed, energy, and input costs, as well as weak infrastructure and limited processing capacity. Marketing systems remain largely informal. Despite these challenges, egg consumption has increased to approximately 235 eggs per capita (2020), driven by affordability and rising urban demand.

Italy ranks among the top four egg producers in the EU, with over 12.6 billion eggs annually valued at €1.4 billion. The industry is characterized by strong vertical integration, cooperatives, and compliance with EU environmental and welfare regulations. Nearly 40% of production is processed into value-added products, including powdered and liquid eggs. Sustainability and organic production are growing trends, supported by the EU and cooperative initiatives.

The Canadian egg sector is valued at $1.9 billion and operates under a supply management system coordinated by the Egg Farmers of Canada (EFC). This system ensures price stability, production control, and market balance. The industry is technologically advanced, environmentally regulated, and well-integrated across provinces, with an increasing share of enriched, free-run, and organic housing systems.

Competitiveness and Trade

Italy and Canada show high competitiveness through innovation, cooperative models, and strong institutional frameworks. Ghana's competitiveness is domestic-focused and constrained by fragmented value chains, weak policy enforcement, and limited market access. Average production between 2014 and 2023 was 747,200 tons (Italy), 569,758 tons (Canada), and 49,032 tons (Ghana). Italy and Canada actively trade processed egg products, while Ghana remains minimally involved in international trade.

Economic and Environmental Challenges

All three countries face production cost pressures, but with varying intensity. For instance, Italy and Canada face high energy and feed costs, stringent environmental regulations, and barriers to technology investment. Meanwhile, Ghana's overall industry contends with severe financial and infrastructural constraints, high vulnerability to climate change, weak biosecurity, and limited innovation.

Policy Frameworks

The Italian egg sector operates under the EU-aligned regulatory and cooperative systems that ensure food safety, sustainability, and competitiveness. In comparison, Canada operates under a supply management system to ensure stable incomes, stable consumer prices, and long-term sustainability. On the other hand, Ghana has demonstrated potential interventions, such as the Ghana Poultry Project and the Feed Ghana Project, to support agrifood SMEs. But these interventions are short-term, mostly donor-driven, and suffer from limited enforcement, funding, and coordination.

Capacity Building Across Distinct Agrifood Systems

The comparison of Ghana, Italy, and Canada shows that capacity-building processes in agrifood systems vary across economic contexts. In Ghana, the egg agrifood chain is characterized by fragmented market structures, limited institutional coordination, and skill gaps among agrifood SMEs, which makes capacity-building efforts focus mainly on strengthening human capital through training, technical skills, and managerial knowledge. In contrast, Italy and Canada benefit from more structured institutional environments in which training systems, cooperative networks, and supportive policies promote the development of both human and social capital, thereby enabling stronger collaboration, innovation, and value-chain coordination. These differences highlight that improving skills development, institutional support, and cooperative relationships is essential for strengthening capacity building and enhancing the competitiveness of agrifood SMEs in emerging economies.

7.1 Brief Analysis of the Egg Industry

7.1.1 An overview of the Egg Industry in Ghana

Among livestock, poultry products are the most popular source of animal protein in Ghana (USDA, 2022). The number of Live chickens in Ghana increased considerably from around 47.8 million heads in 2010 to nearly 89 million in 2022, giving Ghana a significant lead in the livestock industry (Sasu, 2025). There are well-structured commercial poultry farms (particularly layers and broilers) operated as small-scale (50-5,000 birds), medium-scale (5,000-10,000 birds), and large-scale (10,000 birds) agribusiness enterprises (Birol et al., 2010).

According to MoFA, Ghana heavily imports meat (chicken, beef, and others) to compensate for the shortfall, at a cost of over US$375 million annually. Chicken meat imports account for over 80 percent of the country's total meat imports from high-income countries, including Belgium, the US, Brazil, Poland, and the Netherlands. The high import levels are driven by the high cost of production (feed and drugs), inefficiencies in production technology, inadequate processing facilities, and the availability of inexpensive imported products, all of which contribute to low productivity in Ghana's poultry sector (MoFA, 2020). Other operational challenges include rising energy prices, which have increased production costs by over 60% (MoFA, 2020). Additional reports cited poor quality hatcheries, limited knowledge in handling poultry products, lack of effective marketing techniques, weak input supplier-marketer linkages, and inadequate market infrastructure, among others (Boschloo, 2019). These constraints have created a significant gap between domestic production and the supply of poultry products in Ghana. The above issues result in higher domestic broiler meat prices, making it less competitive.

Subsequently, competition from imported chicken has exerted pressure on broiler production in Ghana, leading producers to shift from broiler (meat) production to layer bird (egg) production (Ashitey, 2017).

Alternatively, fresh eggs, the main product of layer birds, are comparatively cheaper and therefore more affordable for consumers than chicken meat (Adzitey & Nurul, 2011). This may have been the reason why egg consumption per capita reached 1.07kg in 2020 in Ghana, which was 1.90% more than the previous year, as reported by FAOSTAT (2023). From the above reference, the shift to egg production is expected to sustain their performance in the poultry sector. Layer poultry farming is preferred to broiler production because farmers obtain better prices for their products, as there is little competition with imported table eggs (Global Agricultural Information Network [GAIN], 2013).

FAO (2025) reaffirms that Ghana has seen substantial growth in egg production over recent years, aligning with broader trends observed across West Africa. This growth is driven by increased urbanization, rising incomes, and efforts to raise awareness of the nutritional benefits of eggs, such as those implemented by the Ghana National Egg Campaign Secretariat since 2017. Consumption surveys show an increase from 172 eggs per person per year in 2016 to 235 in 2020.

Over an 11-year period, Ghana's average egg production was 48,392 MT, peaking at 53,164 MT in 2019. Details of chicken egg production in Ghana from 2013 to 2023 are shown in Table 7.1. Similarly, Ghana imported $725K worth of eggs in 2023, mainly from the Netherlands, China, South Africa, Belgium, and Spain, according to Trend Economy data.

Table 7.1 Egg Production, Ghana

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Egg Production Qty (Mt)	42.000	43.296	46.602	47.410	46.500	51.416	53.164	50.503	50.494	50.449	50.482
% change in egg production		3.09	7.64	1.74	-1.92	10.57	3.40	-5.01	-0.02	-0.09	0.07

Source: FAOSTAT (2025)

The total egg imports to Ghana amounted to 2,195,460 kg (2,195 MT), according to data from the World Integrated Trade Solution. We may infer from the above information that the shift to layer birds for egg production could reduce reliance on imports and improve the industry's competitiveness.

According to the Ministry of Trade and Industry (MoTI), the demand for poultry products far exceeds local production. Therefore, the gap in animal protein consumption is not due to demand but rather a supply problem.

Generally, the country's egg industry performance is dominated by small- to medium-scale businesses across the agrifood chain. Nevertheless, concentrated mainly across regions with good agroclimatic conditions and proximity to primary feed ingredients (maize and soya) (Amanor-Boadu et al., 2016). In addition, SMEs provide key inputs (feeds, day-old chicks, equipment, and tools, etc.) and services required to operate across the agrifood chain segments. Although small- to medium-scale farms dominate at the production level, over 50% of local egg production comes from large-scale producers (Amanor-Boadu et al., 2016).

Moreover, due to the perishable nature of eggs, the supply chain is often shortened through bulk purchases, direct sales, informal contracts, and, in some cases, outgrower schemes. This seems to serve as a form of revenue security for these actors (Mensah-Bonsu et al., 2019).

7.1.2 An overview of the Egg Industry in Italy

Italy ranks fourth among egg producers, behind France (0.97 Mt), Germany (0.89 Mt), and Spain (0.86 Mt). The Italian egg industry produces over 12.6 billion eggs, corresponding to approximately 0.80 million tons of fresh product and around 1.4 billion euros annually (Amicarelli et al., 2023). Such egg volumes are produced by 41 million laying hens kept in various housing systems across over 2,600 farms, of which 1,444 are large companies, suggesting that many SME-level farms also exist (ISMEA, 2021; Amicarelli et al., 2023; Sicilia Agricoltura, 2022). Domestic egg production increased 6.8% in 2023, and per capita consumption stands at approximately 215 eggs per year, according to a publication on More About Chicken (2003a&b). Approximately 40% of eggs produced are sent to processing industries (primarily in the pasta and bakery product sectors), while

the remaining 60% are sold directly to consumers (Soressi, 2025). Those sent to processing centers are transformed into egg products, such as egg whites, yolks, egg mix, pasteurized liquids, or powder.

In compliance with Directive 1999/74/EC against producing eggs by keeping hens in battery cages, 49% of Italian farms adopt floor-management systems, 42% rely on enriched cages, 5% adopt an organic free range, and 4% a conventional open-run, with potential significance on the sustainability of the egg production (Turner et al., 2023).

This system is characterized by strong vertical integration and is managed by large companies such as AIA (Veronesi Group), Amadori, and Fileni. Substantial portions of the chain are integrated, meaning that pullet rearing, layer management, feed supply, packing, processing, and marketing to retailers are carried out by a single company or cooperative (Rossi, 2019).

The harvested Eggs are collected, sorted by quality and size, packaged, and distributed to consumers through large retailers, restaurants, the food industry, and direct sales from farms or local markets. (moreaboutchicken.com). There are growing trends in the consumption of barn, free-range, and organic eggs (Nannoni et al., 2025). Survey data revealed that 50% of Italians prefer outdoor farming and that 6 out of 10 consumers would pay an additional 10% for eggs from free-range hens (Sicilia Agricoltura, 2022).

7.1.3 An overview of the Egg Industry in Canada

In 2024, Canada produced poultry and egg products valued at $6.8 billion, accounting for 7.0% of cash receipts from farming. The egg sector in Canada generated $1.9 billion in farm cash receipts, representing 1.9% of total cash receipts from agricultural operations. There are approximately 1,270 registered egg producers across Canada, with 180 federally registered egg-grading stations and 12 federally registered egg-processing establishments. The table egg market accounts for approximately two-thirds of egg production, while the egg processing sector, which supplies the industrial, food service, and retail sectors, accounts for the remaining one-third. Processed eggs are produced from shell eggs by breaking them and separating the whole eggs, albumen, and yolks into liquid, frozen, or dried forms.

According to the Egg Farmers of Canada (2024), there are a total of 1,270 egg producers, the majority of which are small-sized or family farms. Most of these farmers operate using conventional housing (43.25%), enriched colony (36.94%), aviary/free run (13.51%), Organic (4.88%), and Free range (1.42%).

Egg Farmers of Canada is the national organization responsible for the production and marketing of eggs in Canada. They manage the supply of eggs, promote eggs, and develop standards for egg

farming in Canada through the supply management system. This system oversees production management, import control, and producer pricing.

7.1.4 Competitiveness of the Egg Industries

Overview

Tables 7.2 and 7.3 present excerpts from literature reports that indicate significant differences in scale, production systems, processing capacity, agrifood value chain integration, and trade in Ghana, Italy, and Canada. The findings reveal that both Italy and Canada are dominated by medium- to large-sized farms, with diverse housing systems and a well-developed processing segment, in which eggs are processed into pasteurized liquid, powdered, and other related products. The sector is supported by cooperative and producer organizations (Italy) and by institutions like Egg Farmers Canada, which enable efficient domestic supply and active international trade.

Ghana, on the other hand, relies primarily on smallholder farms with minimal processing and informal marketing channels. Ghana mainly markets fresh table eggs with limited value addition, and the marketing remains predominantly informal, with egg producers selling directly to traders, consumers, or institutions. However, Italy and Canada have well-structured, formalized marketing channels in which producers supply grading stations, wholesalers, supermarkets, processors, and niche markets.

Nature and Size of Firm

The Italian egg industry comprises 1,444 large farms and 1,156 small farms, reflecting a relatively balanced distribution between small and large farms, with sizes ranging from 100,000 birds (larger farms) to 25,000-100,000 birds (medium farms) to less than 5,000 birds (small farms). Meanwhile, Canada's industry predominantly consists of medium- to large-scale farms (1,270 registered farms) with an average farm size of 22,503 birds, ranging from the largest, housing up to 60,944 birds, to the smallest, at 17,064 birds. Ghana, on the other hand, is dominated by small-scale producers, which constitute 87.6% of the total 2,889 registered poultry farms, with the larger farms (>10,000 birds), medium-scale farms (5,000–10,000 birds), and small farms < 5,000 birds) forming the backbone of production.

Production and Trade Performance

The production averages recorded for the period between 2024 to 2023 were 747,200 tons in Italy, 569,758 tons in Canada, and 49,032 tons in Ghana, reflecting significant differences in industrial capacity. Except for Ghana, the other countries are substantially active in the international trade of processed egg products.

In the same period, Italy's average export volume of table eggs was 17,982 tons, while imports totaled 41,152 tons, indicating that Italy relies on imports to meet domestic demand despite high production. The processed egg sector is significant, with trade valued at US$125 million in exports and US$109 million in imports, demonstrating Italy’s active participation in both regional and global trade in processed egg products.

Canada exports a minimal quantity of table eggs (approximately 794 tons) compared with imports (nearly 20,609 tons), reflecting limited export potential and a focus on satisfying domestic demand. Processed egg products account for US$10.1 million in exports and US$11.4 million in imports, indicating moderate engagement in the international trade of value-added egg products.

Meanwhile, Ghana’s sector exports modest quantities of table eggs and imports negligible amounts of processed products. In summary, the above records highlight Ghana’s underdeveloped processing segment and limited international integration. However, the current growth potential lies in improved investments in infrastructure and marketing systems.

Integration and Competitiveness of the Agrifood Value Chain

Both agrifood SMEs in Italy and Canada leverage well-structured market linkages and institutional support. The Italian industry demonstrates high levels of integration through agricultural cooperatives and Protected Designation of Origin (PDO) branding. Cooperatives are vital for supporting agrifood SMEs, enabling collective processes, market and distribution, and PDOs guarantee authenticity and high-quality agrifood products. In Canada, partial integration is observed through innovation clusters, strategic collaboration with industry and research institutions, and strong specialization in high-value agrifood products (Pelletier et al., 2018). Ghana, on the other hand, demonstrates weak integration due to fragmented agrifood chains, with limited collaboration between producers and processors and low participation in regional and global value chains.

Regarding the competitiveness of the egg agrifood chains, Italian and Canadian agrifood SMEs have demonstrated strong performance, driven in Italy by branding, innovation, and export-oriented markets, and in Canada by the adoption of advanced technologies and sustainable production systems. These, together with regional and national regulatory frameworks, enhance the productivity of the egg agrifood chain. Meanwhile, the competitiveness of Ghana's egg agrifood sector is limited to domestic markets, as the industry faces operational challenges, heavy reliance on imports, and weak regulatory compliance.

Table 7.2 Comparative Analysis of Industry Structure

	Italy	Canada	Ghana
Production Size	Larger scale >100,000 birds Medium Size 25,000 – 100,000 birds Small scale <5,000 birds[a]	Average flock size 22,503, the largest size, 60,944, and minimum size 17,064 birds[e]	Larger scale >10,000 birds Medium Size 5,000 – 10,000 birds Small scale 50-5,000 birds[b,c]
Farm size	1,444 large farms 1,156 small farms[f].	1,270 farms Small farms form the majority[e].	2,889 farms (Small farms representing 87.6%)[d].
Housing systems	Battery cages, floor-management systems, enriched cages, organic free range, conventional open-run[g].	Conventional housing, Enriched colony, Aviary/free run, Organic and Free range[e].	Caged and deep litter
Processing	Egg whites, yolks, egg mix, pasteurized liquids or powder	Processed into whole eggs, albumen, and yolks, in liquid, frozen, or dried form[e].	Limited processing (mostly fresh table eggs) [h].
Market Channels	1. Producers – Grading stations-wholesalers – Retailers – Consumers 2. Producers – Cooperatives/Producer Organizations – Supermarkets – Consumers 3. Producers - Food industry (processed egg products) 4. Producers – Local Markets/Restaurants/Consumers (niche market)	1. Producers -Grading stations – wholesalers/Retail chains – Consumers 2. Producers – Processors (for liquid, frozen or powdered egg products) 3. Producers – farmers' Markets	Main Marketing channels[i]: Producer-Traders (Wholesalers and Retailers)- Consumers. Producer – Consumers Producers – Institutional buyers- consumers
Integration into Agrifood Value Chains	Strong Vertical Integration[j,k].	Moderate level of Vertical Integration	Weak integration due to fragmented agrifood chains.
Competiveness	Strong performance Regional branding and innovation	Strong performance Advance Technology, and sustainable production[e].	Somewhat competitive domestically; Presence of operational challenges in innovation, technology adoption and export performance

a. Nalesso et. al 2025, On-farm welfare of laying hens: animal-based measures at slaughterhouse and risk factors in Italian farms.
b. Netherlands Enterprise Agency (RVO). (2021). Ghana Food Manufacturing Study: An analysis of Ghana's aquaculture, fruits & vegetables, and poultry processing sectors.
c. Kusi et al (2015). The challenges and prospects of poultry farmers: The case of Dormaa-Ahenkro Municipal Area. Studies in Social Sciences and Humanities , 2 (4)
d. Amanor-Boadu, V., Nti, F. K., & Ross, K. (2016). Structure of Ghana's chicken industry in 2015. Department of Agricultural Economics, Kansas State University.
e. Egg Farmers of Canada. Annual Report 2024 (and 2023). Egg Farmers of Canada
f. Amicarelli et al., (2023). *Circular economy and sustainability in the Italian egg supply chain: Challenges and opportunities*
g. (Turner et al. (2023). Life cycle assessment of contemporary Canadian egg production systems during the transition from conventional cage to alternative housing systems
h. Soressi, M. (2025, April 23). Italy produces 12.5 billion eggs a year: +10% consumption at Easter. Il Sole 24 Ore
i. Opoku-Mensah et al (2023). Market margin analysis and constraints in fresh egg value chain in the Ashanti Region, Ghana. International, 11(12)
j. https://www.aboutamazon.eu/news/empowering-small-business/the-value-of-pdo-and-pgi-brands-opportunities-for-the-growth-of-made-in-italy
k. Sgroi F. (2022). Cooperation and innovation in Italian agribusiness between theoretical analysis and empirical evidence

Table 7.3 Comparative trade in Eggs and Egg products

Country	Product	Production Average (tons) (2014-2023)[3]	Import (tons)	Export (tons)
Italy	Table eggs (in shell)[2]	747,200	41,152t	17,982t
	Processed egg products[1]		US$109M[1]	US$125M[1]
Canada	Table eggs (in shell)3	569,758	20,609t (average 2014-2023) 47,219t(in 2023)[3]	794t (average 2014-2023) 2,334t(in 2023)[3]
	Processed egg products[1]		US$11.4 M	US$10.1 M
Ghana	Table eggs (in shell)[2]	49,032	68t	541t
	Processed egg products[1]		US$222K[1]	

Source: OEC (1) trade data, FAOSTAT (2) and AAC, 2023 (3)

7.2 Economic Environmental Challenges in Egg Agrifood SMEs

Table 7.4 presents a comparative assessment of the economic and environmental challenges faced by agrifood SMEs in Italy, Canada, and Ghana. A consistent pattern of cost-related, regulatory, and structural barriers was observed across the case studies. Though the nature and severity of challenges vary across economic contexts and governance frameworks.

Italian agrifood SMEs operate within the EU's well-regulated trade and sustainability frameworks, which impose strict sanitary, phytosanitary, and environmental standards aligned with the Common Agricultural Policy and Green Deal targets. These standards increase operational costs but also strengthen competitiveness in the agrifood chains. However, they create costs and administrative burdens, especially for smaller businesses with limited resources. This, in turn, restricts their competitiveness in the agrifood chains. Similarly, complying with welfare and traceability regulations (whether at the EU level or under industry standards and provincial rules in Canada) imposes high administrative and technological costs on agrifood SMEs operating in Italy or Canada. Financial constraints are partly alleviated through regional, provincial, and national funding mechanisms, as well as innovation incentives in both countries.

Further, the rising costs of animal feed, energy, and labour, often driven by global supply chain disruptions and energy price volatility, significantly impact the overall profitability of the egg agrifood sectors in Italy and Canada. Subsequently, restrict SMEs' capacity to reinvest in new technologies or adopt innovation.

The adoption of innovations and new technologies, with the potential to enhance productivity and sustainability, requires substantial capital investment and technical expertise. Examples include precision breeding technologies, automated feeding and monitoring systems, and digital communication tools.

Table 7.4 Comparative Analysis of Economic Environmental Challenges in the Egg Agrifood Chain

Issue	Italy	Canada	Ghana
Market Access and Trade Barriers	Operate under the EU Trade Framework with Stringent certification, sanitary, and phytosanitary standards and quality controls[1].	Moderate barriers; requires adjustment to meet Import controls and Tariff Rate Quotas[2].	High regional trade barriers and limited integration into global value chains[3].
Production cost and Financial constraints	High production cost[4,16]; Barriers exist in accessing capital[5]	Similar in the case of Italy[6,7,8]	High production cost[9]; Access to finance is a major constraint[10].
Innovation and Adoption of New Technologies	Economic and Capacity constraints limit the adoption of innovation and technology[11].	Similar in the case of Italy[12].	Severe Economic and Capacity constraints hinder innovation and the adoption of new technologies.
Climate & environmental risk	(under EU policy) adjusting to stringent environmental targets	(national and provincial framework policy) adjusting to meet environmental targets[13].	High Impact from heat stress, erratic rains, and drought
Biosecurity & disease risk	Manageable levels but involve cost to comply[14].	Similar in the case of Italy[15]	High risk due to gaps in infrastructure and limited services
Regulatory pressure ((welfare/traceability)	Strong EU-driven regulations and compliance system	Coordinated industry standards and provincial rules	Low level of formal regulation; Highly informal egg agrifood industry.

Source: Author's compilation

1. EU Animal Health Law (Regulation (EU) 2016/429) &Hygiene of Foodstuffs Regulation (Regulation (EC) No 852/2004)
2. https://agriculture.canada.ca/en/sector/animal-industry/poultry-and-egg-market-information/imports-and-exports/canadas-poultry-import-regime
3. https://agriwatchgh.com/reviving-ghanas-poultry-industry-call-to-action
4. https://www.wattagnet.com/broilers-turkeys/article/15535832/rising-costs-weaker-demand-worry-italys-poultry-sector
5. Rossi et al (2015). The capital structure choices of Agrifood firms: Evidence from Italian SMEs.
6. https://www.canadianpoultrymag.com/made-in-canada-system-keeps-egg-supply-stable-but-is-it-also-keeping-prices-high/
7. Bioenterprise Canada. (2024). A National Call to Action – Bioenterprise National Report. Bioenterprise
8. https://ised-isde.canada.ca/site/sme-research-statistics/en/research-reports/access-capital-canadian-growth-oriented-medium-sized-firms
9. Opoku-Mensah et.al (2023). Market margin analysis and constraints in fresh egg value chain in the Ashanti Region, Ghana.
10. Oppong-Kyeremeh et. al (2022). Contract farming as a marketing strategy to improve the poultry agribusiness in Ghana. Provides Ghana-specific evidence on contract marketing (incl. non-formalized practices)
11. Costa et al (2023). Industry 4.0 digital technologies enhancing sustainability: Applications and barriers from the agricultural industry in an emerging economy
12. https://www150.statcan.gc.ca/n1/pub/11-631-x/11-631-x2024005-eng.htm
13. https://agriculture.canada.ca/en/department/transparency/briefing-documents/aafc-transition-books/book-3-key-policies-programs-and-issues-agriculture-and-agri-food-sector-ministers-transition-book
14. Tilli et al, (2024), Supporting Measures to Improve Biosecurity within Italian Poultry Production
15. https://www.canadianpoultrymag.com/the-cost-benefit-of-biosecurity-12324/
16. https://freshdi.com/blog/eggs-italy-top-5-eggs-suppliers-in-italy-in-year-2025

Such adoption requires training, infrastructure development, and regular maintenance, the costs of which are beyond the means of many SMEs across the study areas. However, there are records of the use of new technologies and innovations among SMEs in Italy and Canada. Ghana, however, faces severe economic and capacity challenges in this regard.

Canadian agrifood SMEs also need to adjust to changing trade policies resulting from new regimes (for example, post-Brexit and EU trade impacts). The prevailing uncertainty complicates supply chains and limits market access. Therefore, SMEs adapt to import controls and tariff quotas to avoid higher tariffs. The regulatory framework further ensures consistent risk management related to biosecurity measures.

In summary, Italy and Canada primarily face challenges with costs and regulatory compliance within their respective agricultural and agrifood policy frameworks. In contrast, Ghana's agrifood sectors struggle with systemic issues in Production, finance, infrastructure, and the environment (as elaborated in Table 6.6 in Chapter 6).

7.3 Nature of Capacity Building for Agrifood SMEs

Table 7.5 Comparative analysis of Capacity Building

	Italy	Canada	Ghana
Areas of focus	• Food safety • Sustainability • Adoption of advanced technology • Market and Demand-Driven Innovation • Cooperative Organization	• Adoption of Technological innovation • Sustainable production systems • Training and skills development	• Business Management Skills • Production efficiency • Market linkages
Supporting Institution	• EU program • Public Institutions • Cooperatives	• Public–Private institutions (through Supply Management System)	• Public–Private • Development-Partner initiatives

Source: Author's compilation

Strengthening the egg agrifood sector through capacity building enhances rural economies, encourages adoption of innovation, and supports the shift toward sustainable agrifood systems. This fosters a resilient and competitive agrifood system through training and skill development programs, and resource support policies. Nonetheless, different countries adopt various strategies to achieve these objectives.

Italy's capacity-building measures, among others, focus on food safety, sustainability, the adoption of advanced technology, market- and demand-driven innovation, and the strengthening of cooperative organizations. Example value addition schemes involving cooperative organizations through quality assurance, branding, and traceability measures. These capacity-building initiatives are supported by EU programs, public institutions, and cooperatives, providing the funding and resources needed to improve market capacity and enable Agrifood SMEs to access premium market segments (Zarbà et al., 2022).

Besides, capacity building in Canada focuses on adopting technological innovation, sustainable production systems, and workforce training and skills development to address labor shortages.

Capacity-building initiatives are supported by key institutions, including the Egg Farmers of Canada (EFC), Agriculture and Agri-Food Canada (AAFC), and other industry associations. Most training involves the use of advanced equipment, adherence to environmental compliance standards, and efficient practices to align agrifood SMEs with international quality and sustainability standards (Egg Farmers Canada, 2024).

By comparison, Ghana's egg agrifood sector focuses on improving basic production efficiency, enhancing market linkages, and developing business management skills. Training and skill development encompass record-keeping, husbandry, and feed management, as well as cooperative training to reduce costs and enhance output. Other resource support programs include access to inputs (day-old chicks, battery cages, feeds) and financial support. Mostly, capacity-building initiatives are driven by development partners such as USDA, FAO, and government support programs managed by MoFA. For example, Ghanaian SMEs were among the beneficiaries of an FAO (2020) Project titled "Promoting Nutrition-Sensitive Food Systems through a Multistakeholder Approach." SMEs were trained in agribusiness management, food safety, and nutrition-sensitive practices. Also, capacity-building workshops (e.g., hatchery training, inclusion of women smallholders) were carried out by the Kwame Nkrumah University of Science and Technology (KNUST), in collaboration with Women in Poultry Value Chain (WIPVaC), with a focus on supporting women and smallholder farmers' success in the poultry industry (KNUST, 2023).

Hence, from the above context, Italy and Canada have demonstrated strong institutional support and certification systems that translate capacity building into high-yielding, competitive outcomes (innovation and export-oriented industries). Nonetheless, Ghana requires coupling training programs with financial and infrastructure support to scale up the competitiveness of the agrifood sectors.

7.4 Policy Frameworks for Rural Capacity Building in the Egg Agrifood Chain

After reviewing Ghana's policy environment supporting the integration and competitiveness of the egg agrifood chain, the findings show only a marginal effect on the industry's performance. These further trigger a broad comparative analysis of the policy frameworks within which egg agrifood SMEs operate in international rural economies. Besides, differences in climate, infrastructure, and market structures across these countries may not allow for a fair comparison of SMEs' output levels in terms of productivity, profit margins, and market share.

Nonetheless, policies also play a role in creating an enabling environment that boosts the competitiveness of agrifood SMEs by enhancing access to training and skill development, inputs, finance, market integration, and cooperative development. Thus, challenges across segments of the

supply value chain, whether in production or marketing, are strongly influenced by industry policies. Examples in Ghana include subsidizing inputs, imposing import tariffs, and implementing import restrictions.

Therefore, relying on available policy documents provides comparable evidence across Ghana, Italy, and Canada in evaluating the essential drivers of rural capacity building and competitiveness in the egg agrifood chain. This will identify the capacity-building gap within which Ghanaian agrifood SMEs operate and further enable policy recovery in Ghana, drawing on international rural contexts.

Several policy initiatives aim to strengthen Ghana's agrifood sector, including programs focused on improving productivity, expanding access to inputs, and building rural capacity. However, their implementation often faces challenges. Many of these programs set ambitious policy goals, but their actual impact varies on the ground. Issues such as limited institutional coordination, bureaucratic inefficiencies, and inconsistent funding frequently hinder the long-term success and sustainability of these efforts. As a result, even though capacity-building policies emphasize skills development, training, and value chain integration, many agrifood SMEs still face persistent obstacles, such as limited access to finance, weak infrastructure, and insufficient technical support. This gap between policy goals and real-world outcomes highlights the need for a more integrated and realistic policy framework that emphasizes institutional accountability, sustained investment in human capital, and better coordination among public and private stakeholders.

7.4.1 Italian Agricultural District Model

The Italian Agricultural District Model (Distretti Agricoli) is a territorial governance framework designed to strengthen the competitiveness of the agri-food sector through cooperation among farms, processing firms, local authorities, and research institutions within geographically defined areas. The model was formally introduced through Legislative Decree No. 228/2001, which aimed to modernize the agricultural sector and encourage collaboration among local actors in rural territories (Decreto Legislativo n. 228/2001).

A key objective of the district model is to address the structural fragmentation of Italian agriculture, characterized by numerous small- and medium-sized farms. By forming territorial clusters, agricultural enterprises can coordinate production activities, share infrastructure and logistics, and collectively access innovation and research support. This collaborative approach improves efficiency and strengthens the bargaining power of small producers within agri-food value chains (Musotti, 2015).

The operational mechanism of the district model involves cooperation agreements among local actors, facilitated by instruments such as district contracts, which enable groups of firms, cooperatives, and institutions to access public funding for investments in infrastructure, technological innovation, and value chain development. These contracts are typically supported by national and regional governments as part of broader rural development strategies (Decreto Legislativo n. 228/2001; Musotti, 2015). Over time, the Italian district system has evolved to include several types of clusters reflecting different territorial and production characteristics. These include Rural Districts, which integrate agricultural activities with tourism and cultural heritage; Quality Agri-Food Districts, which focus on high-value products certified under European quality schemes such as Protected Designation of Origin (PDO) and Protected Geographical Indication (PGI); and Food Districts (Distretti del Cibo) introduced in 2017, which emphasize sustainability, food security, and urban–rural integration (Sardone et al., 2025).

The district model has generated significant economic outcomes for the Italian agri-food sector. According to the Intesa Sanpaolo Agri-Food District Monitor, exports from Italian agri-food districts reached approximately €27.8 billion in 2023, demonstrating the important role these clusters play in promoting the international competitiveness of Italian food products (Intesa Sanpaolo, 2024). These districts have contributed to the strong performance of several high-value sectors such as olive oil, fruit production, and processed meat industries, while also supporting the global reputation of "Made in Italy" agri-food products (Intesa Sanpaolo, 2024).

Despite these positive outcomes, the district model faces several challenges. Regional disparities in economic development have led to uneven performance across districts in northern and southern Italy, while the predominance of small-scale farms continues to limit investment capacity and innovation in some regions (Musotti, 2015; Sardone et al., 2025). Nevertheless, the Italian Agricultural District Model remains an important example of how territorial cooperation and institutional coordination can strengthen rural economies and improve the competitiveness of agri-food value chains.

7.4.2 Canadian Sector Engagement Tables (SETs)

The Canadian Sector Engagement Tables (SETs) are a national governance framework designed to strengthen collaboration between government and industry in addressing strategic challenges in the agri-food sector. The framework was launched by Agriculture and Agri-Food Canada (AAFC) in 2021, replacing the earlier Value Chain Roundtables in order to create a more coordinated and outcome-driven platform for sector development (Agriculture and Agri-Food Canada [AAFC], 2025)

The SETs bring together industry leaders, policymakers, and other stakeholders to collectively address cross-cutting issues affecting the sector. The framework is organized into sector-specific tables (such as Animal Protein, Field Crops, Horticulture, Seafood, and Food Processing) and thematic tables that focus on broader challenges, including regulatory modernization, consumer demand, sustainability, and skills development (AAFC, 2025). A key feature of the SET model is the co-chair governance structure, where each table is jointly led by representatives from government and industry. This structure facilitates dialogue, coordination, and policy alignment across the agri-food system, helping to identify barriers to innovation, improve supply-chain resilience, and enhance global market access for Canadian agricultural products (AAFC, 2024).

Economically, the collaborative policy framework has supported strong export performance in Canada's agri-food sector. According to Agriculture and Agri-Food Canada's Departmental Results Report, Canada's agri-food and seafood exports reached approximately CAD 100.3 billion in 2024, exceeding earlier national export targets and demonstrating the sector's growing global competitiveness (AAFC, 2024).

Despite these achievements, some studies highlight challenges within the SET framework, including delays in translating discussions into regulatory action and the need for stronger risk-management strategies to address climate change and global market volatility (Canadian Agri-Food Policy Institute, 2025). Nevertheless, the SET model remains an important institutional mechanism for coordinating policy, industry collaboration, and innovation in Canada's agri-food sector.

7.4.3 Ghana – Policy Framework for the Egg Agrifood Chain

Ghana's recent agricultural transformation plan includes initiatives like the Feed Ghana Program (FGP) and its poultry-specific component, the *Nkoko Nketenkete* Project, which aim to boost domestic poultry production and reduce reliance on imported poultry products. These programs focus on improving access to inputs, strengthening hatchery and feed supply systems, and supporting both household and commercial poultry producers through capacity building and technical advisory services. While these initiatives show the government's dedication to revitalizing the poultry sector, the governance structure of the egg value chain remains largely fragmented compared to the institutional coordination seen in Italy's agricultural districts or Canada's sector engagement platforms. As a result, enhancing coordination among producers, traders, and supporting institutions is a key priority for making Ghana's egg agrifood chain more competitive.

Table 7.6 Comparative Governance Models: Italy, Canada, and Ghana

Feature	Italy – Agricultural Districts	Canada – Sector Engagement Tables (SETs)	Ghana – Poultry/Egg Value Chain Framework
Launch	2001, Legislative Decree No. 228/2001	2021, Agriculture and Agri-Food Canada	Feed Ghana Program and Nkoko Nketenkete Project
Governance Model	Territorial production clusters linking farms, firms, and institutions	National industry–government collaboration platform	Government-led agricultural programs involving SMEs and producer networks
Coordination Mechanism	District contracts supporting joint innovation and investment	Co-chaired policy tables addressing regulatory and market barriers	Coordination through farmer associations, intermediaries, and government support programs
Economic Outcome	€27.8B agri-food district exports (2023)	~€86B agri-food exports (2024)	Supports employment, rural income, and food security (not formally quantified)
Key Challenge	Regional disparities and small farm scale	Policy implementation delays and market volatility	Fragmented coordination and infrastructure constraints

Source: Author's compilation based on Decreto Legislativo n. 228/2001; Intesa Sanpaolo (2024); Musotti (2015); Agriculture and Agri-Food Canada (2024, 2025); Canadian Agri-Food Policy Institute (2025); Ministry of Food and Agriculture (MoFA) (2025).

Table 7.6 compares the governance structures supporting the agrifood sector in Italy, Canada, and Ghana. The agrifood governance models in these countries contribute differently to social capital, human capital, and capacity building. In Italy, Agricultural Districts promote territorial cooperation among farms, firms, and institutions, strengthening social capital through collaboration and enhancing human capital through shared knowledge and innovation. In Canada, Sector Engagement Tables (SETs) facilitate industry–government collaboration, supporting human capital development through skills initiatives and bolstering social capital through coordinated policy dialogue. In Ghana, programs such as the Feed Ghana Program and the Nkoko Nketenkete Project focus on training, advisory services, and input support, thereby improving human capital and technical capacity; however, farmer groups and SMEs help build social capital, while value chain coordination remains somewhat fragmented.

7.5 Summary report on policy frameworks

Ghana's policy framework for rural capacity building in the egg agrifood chain demonstrates the government's apparent effort to support the operations of agrifood SMEs. Some policies, such as the Ghana Poultry Project and the Feed Ghana Project, further demonstrate that the government and development partners recognize the importance of capacity building across the broader agriculture and agrifood sector. However, several limitations reduce the effectiveness of Ghana's current policy landscape, prompting a comparative assessment of other international rural policy frameworks.

Table 7.7 provides a comparative overview of key policy areas in the egg agrifood chain in Ghana, Italy, and Canada. It examines production systems, supply chain integration, regulatory frameworks, sustainability efforts, market and trade policies, and rural capacity building. The

analysis highlights both similarities and differences in policy strategies and identifies opportunities for improvement. It shows how targeted measures, such as Canada's supply-managed system and institutional coordination, and Italy's cooperative-driven, innovation-focused model, supported by strong regulatory frameworks and skills development systems, have enhanced the integration and competitiveness of the egg agrifood sector.

Across the three countries, SMEs play a crucial role in supporting agrifood value chains, although the level of institutional support varies greatly. All countries demonstrate a commitment to food security, quality standards, and food safety, acknowledging the importance of eggs for nutrition. They also implement various mechanisms to promote skills development, training, and knowledge transfer among agrifood SMEs. Additionally, each country faces increasing pressure to adopt sustainable practices across the agrifood value chain.

Evidence from Italy and Canada demonstrates that strong regulatory frameworks, institutional coordination, targeted training programs, and industry support for innovation and market infrastructure are essential for enhancing sector competitiveness. Italy's cooperative-based system promotes value chain integration and innovation, while Canada's egg industry functions under a supply management system overseen by the Egg Farmers of Canada (EFC), which stabilizes farm incomes and consumer prices through production quotas and marketing boards. These institutional models provide valuable insights for strengthening Ghana's egg agrifood chain.

However, Ghana's policy environment remains characterized by fragmented market structures, limited institutional coordination, and skill gaps among agrifood SMEs. As a result, capacity-building efforts mainly emphasize human capital development, particularly through training programs focused on improving technical and management skills among value-chain actors.

In contrast, Italy and Canada operate within more structured institutional environments, where cooperative networks, training programs, and supportive policy frameworks promote the development of both human and social capital. These structures encourage knowledge sharing, innovation, and collaboration, thereby enhancing value chain coordination and overall competitiveness.

Overall, the comparative analysis emphasizes the importance of skills development, stronger institutional coordination, and cooperative networks as essential elements of capacity building. Enhancing these aspects can play a crucial role in helping agrifood SMEs in emerging economies such as Ghana develop more competitive, resilient, and integrated agrifood systems.

Table 7.7 Egg Agrifood Chain Policies - Comparative analysis

Policy Areas	Key Policy / Regulation	Implementation Mechanism	Ghana	Italy	Canada	Comparative observations
Production Segment	- Subsidies - Input supply support (feed) - SME support	- Government Programs - Extension services	- Dominated by Small to medium scale - High cost of feed[15] - Manual Operations[15]	Mixed structure of small to large-sized enterprises and well mechanized and employing innovations[31].	- Supply-managed under the supply management system, with a quota-based approach[32]. - Dominated by medium- to large-sized farms. - Adopt advanced technology[33]	Italy, an innovative industry. Canada has an organized industry structure. Ghana operates under a huge capacity gap.
Supply Chain Integration	- Value chain coordination - Marketing infrastructure	- Farm-Based Organization - Cooperatives - Contract Farming	- Fragmented value chain[22] - High postharvest losses[4] - Weak coordination across the chain[22] - Fragmented and informal markets[22]	- Cooperative -driven (e.g. Legacoop Agroalimentare)[24] - Vertically integrated with large companies[23].	-Well integrated under the Egg Farmers of Canada (EFC) with a centralized market structure[26].	Highly integrated systems in Italy and Canada. Weak integration in Ghana.
Regulatory Framework	- Food safety - Labelling - Animal welfare	- National laws - EU regulations	- Weak Enforcement of regulation[34] - Informal standards dominate across the chain[34,35]	- Strong enforcement - EU Compliance certifications[30]	Observe centralized, strict enforcement across the chain[36].	Both Italy and Canada run strong regulations. Ghana operates under an enforcement gap.
Sustainability & Environmental Policies	- Environmental policies - Cage-free policies Waste management	- National regulations - Industry standards	Limited sustainability measures observed	- Cage-free adoption[38] - Sustainability measures exist across the chain in animal welfare and the environment[39].	- Reduction in carbon footprint - Sustainable strategies - Slow progress in cage-free adoption[37]	Both Italy and Canada have high levels of sustainability measures. Ghana, emerging with awareness of sustainability measures.
Market & Trade Policies	- Price stabilization - Import/export	- Supply management - Trade agreements	- High price volatility[27]	- Market-oriented industry[30]	- Prices are regulated by supply	Italy – Options for premium products

	regulation		- Import driven[14]	- Relatively unstable domestic price[29] - Some consumers pay a premium for organic egg products[28].	management system to ensure a stable domestic price[25]. - Adherence to trade agreements and a signatory to over 50 trade agreements[42]	Canada- Stable Ghana - Highly volatile market.
Rural Capacity Building	- Extension services - SMEs support - Knowledge transfer	- Government programs - NGOs - Industry initiatives	- Extension and training programs by the government and NGOs. - Technical support is still limited	- Extension programs and technical support facilitated by associations, for example Italian Breeders Association (AIA)[41].	Training and workshops are carried out by the Egg Farmers of Canada. - Example National Young Farmer Program[40].	Italy and Canada Presence of strong industry support. Ghana needs capacity building to revitalize the industry.

Source: Author's Compilations

2. Opoku-Mensah et.al (2023). Market margin analysis and constraints in fresh egg value chain in the Ashanti Region, Ghana.
4. Baagyere, et. al (2023). Organization and performance of chicken egg marketing in Northern Ghana.
14. Arthur, S. O.(2024). Bottlenecks and Prospects of Poultry Production in Kasoa, Awutu Senya District, Ghana
15. Richmond, (2023). https://www.thepoultrysite.com/articles/overview-of-ghanas-struggling-poultry-sector
22.https://www.graphic.com.gh/business/business-news/reviving-ghanas-poultry-industry-call-to-action
23.Cappelletti et al. 2025 An Organizational Model of a Food Production Chain: A Case Study in the Poultry Sector in Foggia (Italy) sustainability.
24.https://agtivate.org/wp-content/uploads/2024/09/CONCEPT-NOTE-.pdf
25.http://thecanadianencyclopedia.ca/en/article/supply-management-in-canada
26.https://www.ontario.ca/page/supply-management-systems-eggs-poultry-and-dairy
27.Netherlands Enterprise Agency. (2021). Ghana Food Manufacturing Study: An Analysis of Ghana's Aquaculture, Fruits & Vegetable, and Poultry Processing Sectors [Report].
28.Yeh, C.-H.; Menozzi, D.; & Mastroieni, C. (2020). Eliciting Egg Consumer Preferences for Organic Labels and Omega 3 Claims in Italy and Hungary. Foods, 9(9), 1212.
29.https://www.tridge.com/intelligences/egg/IT/price
30.https://www.eggsunlimited.com/italian-eggs/
31. ISMEA. (2023), ISMEA. (2023). Report on poultry and egg sector in Italy.
32. https://www.eggfarmers.ca/2020/01/supply-management-101/
33. https://www.canadianpoultrymag.com/egg-production-transformative-technologies/
34. Christiana et al 2022. Food Safety in Sub-Sahara Africa, An insight into Ghana and Nigeria. Environmental Health Insights. 35. Adaku et al 2024.Barriers to ensuring and sustaining street food safety in a developing economy. 36. https://www.ontario.ca/page/egg-grading-distribution-sales-and-processing-ontario
37. https://www.canadianveterinarians.net/policy-and-outreach/position-statements/statements/housing-systems-for-laying-hens/
38. https://food.ec.europa.eu/animals/animal-welfare/eu-animal-welfare-legislation/animal-welfare-farm/laying-hens_en
39. Stefano et al 2023, Coming out the egg: Assessing the benefits of circular economy strategies in agri-food industry.
40. https://www.eggfarmers.ca/wp-content/uploads/2024/11/2024-11-15_National-young-farmer-program.pdf
41. https://www.inno4grass.eu/en/partners/aia-italy-2
42.Trade Commissioner, 2025

7.6 Cross-Country Lessons for Agrifood Chain Development

The comparative analysis of egg agrifood chains in Ghana, Italy, and Canada highlights significant differences in the sector's structure, institutional organization, and competitiveness. Although the three countries operate within different economic and policy contexts, several shared lessons emerge regarding the factors that affect the performance and integration of agrifood SMEs. These lessons offer valuable insights to strengthen the Ghanaian egg value chain and enhance its overall competitiveness.

7.6.1 Institutional Coordination and Cooperative Structures

A key lesson from the comparative analysis is the importance of institutional coordination and collective organization within agrifood systems. In Italy, the agricultural district model encourages cooperation among producers, processors, and other value chain participants, enabling SMEs to share resources, collaborate on marketing, and increase their bargaining power. Similarly, Canada’s supply-management system offers a structured governance framework that coordinates production, stabilizes markets, and promotes industry sustainability.

In contrast, the Ghanaian egg agrifood chain is characterized by limited coordination among actors, resulting in fragmented market structures and weaker linkages between producers, traders, and distributors. Strengthening producer associations, cooperative platforms, and value chain networks could therefore improve coordination within the sector and enhance SMEs' bargaining position in the market.

7.6.2 Training and Skills Development

Another important lesson concerns the role of structured capacity-building systems in improving the performance of agrifood SMEs. Both Italy and Canada benefit from well-established training programs, technical support services, and institutional collaboration between government agencies, industry organizations, and educational institutions. These mechanisms help develop the technical, managerial, and entrepreneurial skills required for modern agrifood production and value-chain management.

In Ghana, although extension services and training initiatives exist, they remain limited in coverage and continuity. Many actors in the egg value chain rely primarily on experiential learning rather than structured training systems. Strengthening technical training, knowledge-sharing networks, and skills-development programs could significantly improve operational efficiency and reduce production and post-harvest losses across the chain.

7.6.3 Infrastructure and Financial Support Systems

Infrastructure and financial services also play a vital role in supporting the competitiveness of agrifood SMEs. In advanced agrifood systems like those of Italy and Canada, well-developed transportation networks, storage facilities, and financial instruments enable efficient supply chain coordination and facilitate market access. These structural supports lower transaction costs and improve SMEs' ability to expand their operations.

In Ghana, however, poor rural infrastructure, limited storage capacity, and restricted access to affordable credit still hinder the growth of agrifood SMEs. Improving rural transport networks, investing in storage and cold-chain facilities, and expanding access to agricultural financing are therefore crucial for strengthening the operational capacity of SMEs within the egg value chain.

7.6.4 Implications for the Ghanaian Egg Agrifood Chain

Overall, the above comparative analysis emphasizes the importance of coordinated institutional frameworks, structured capacity-building mechanisms, and supportive infrastructure for developing competitive agrifood systems. While Ghana’s egg industry faces multiple structural challenges, the experiences of Italy and Canada show how stronger governance, industry collaboration, and targeted support can enhance value-chain integration and sector performance.

These insights provide a foundation for developing strategies to strengthen the Ghanaian egg agrifood chain. Building on these lessons, the next chapter proposes an integrated capacity-building framework to enhance coordination, skills development, and infrastructure support necessary to improve the sector's competitiveness and sustainability.

CHAPTER EIGHT

Conclusion and Recommendations

This chapter presents conclusions based on primary survey data from 25 Ghanaian SMEs, which constitute the project's first phase. It also incorporates findings from the second phase, which used secondary data to analyze and compare the performance of agrifood chains in Ghana, Italy, and Canada. This chapter concludes with recommendations for policy reform, SMEs, and future research initiatives.

8.0 Conclusion

This study examines how capacity building supports the integration and competitiveness of agrifood SMEs, focusing on Ghana's egg agrifood chain while drawing comparative lessons from Italy and Canada.

The overall assessments suggest that the competitiveness of agrifood SMEs is mainly influenced by the development of human and social capital, the strength of institutional collaboration, and coherent policy frameworks. These factors, beyond productivity and profitability, contribute to resilience and support the transition toward sustainable agrifood systems. Compared with these countries, Ghana's challenge lies in transforming the fragmented structures of the agrifood chain into coordinated, sustainable, and inclusive systems that empower SMEs, enhance national food security, and drive rural transformation.

The empirical findings from Ghana revealed that the sector is primarily dominated by SMEs operating mainly in production, trading, and food service segments. Women constitute a significant share of both business owners and employees, signaling that improvements in the egg agrifood chain not only lead to economic development but also offer prospects for gender-inclusive rural transformation.

Moreover, traders who function as both wholesalers and retailers dominate the egg supply chain, serving as critical intermediaries linking producers and consumers. Essentially, these traders undertake key activities, including egg aggregation, packaging, and transporting eggs to both rural and urban markets. A supporting literature review found that the industry primarily operates within informal structures, suggesting weak linkages and coordination among value chain participants. This fragmentation weakens their competitiveness and access to markets.

Conversely, in Italy and Canada, SMEs are more formalized, cooperative-based, and integrated through industry associations and regulatory frameworks. With cooperatives and industry associations serving as conduits to agrifood chain integration. These institutions have proven essential for economies of scale, resource pooling, market access, and compliance with safety and quality standards. This further strengthens their positions in international markets for egg value

chains. Hence, the study concludes that enhancing the integration of Ghanaian SMEs is vital for improving value addition and competitiveness in the agrifood chain.

The study found that human and social capital significantly affect SME performance in the egg agrifood chain. The regression analysis confirms that employee training programs and community engagement substantially reduce post-harvest losses, emphasizing the importance of investing in human and social capital to enhance sectoral efficiency and sustainability. Empirical findings revealed that most SMEs belong to business associations and benefit from collaboration and improved market access. Similarly, in Italy and Canada, strong collaborative networks and industry associations have promoted knowledge sharing, collective bargaining, and ongoing learning through training and skills development programs. These contexts highlight the vital role of cooperative networks and institutional coordination in supporting competitiveness. Following the Recognizing Prior Learning (RPL) assessment, a structured capacity-building pathway was created to strengthen essential technical, managerial, and collaborative skills among agrifood SMEs, thereby boosting their resilience and efficiency within agrifood chains.

Moreover, the egg industry in Ghana is weakened by multiple systemic challenges, including limited access to finance, inadequate infrastructure, poor biosecurity, exposure to fluctuating feed and input prices, disease outbreaks, and climate variability. The influx of inexperienced and unqualified workers, especially in production, further exacerbates the situation. The effect of which impedes the effort to improve the overall integration and competitiveness of the egg agrifood sector. Meanwhile, Italy and Canada also contend with high production costs and environmental and welfare compliance pressures, which are mitigated through efficient institutional support, funding mechanisms, and innovation incentives. These mechanisms enable continuous upgrading, skill development, and market competitiveness. The comparison thus suggests that Ghana’s constraints can be alleviated through policy coherence, institutional strengthening, and infrastructure investment, thereby reducing operational risk and improving sustainability.

Additionally, the analysis shows that Ghana's policy environment offers significant potential to revitalize the egg industry through several government and donor-driven programs, including Rearing for Food and Jobs (RFJ), Feed Ghana Project (FGP), and Ghana Poultry Project (GPP), which often focus on donor-supported areas and resource distribution rather than continuous training and skills development. Also, these interventions are fragmented, short-term, and inadequately monitored. Consequently, these interventions temporarily alleviate resource and operational constraints, whilst their long-term sustainability remains limited.

Comprehensive regulatory frameworks, training, and institutional support are critical to the industry's success, as shown by Canada and Italy. Italy’s cooperative-driven model and Canada’s

supply management framework demonstrate how coherent institutional coordination can ensure long-term sustainability. These models will offer Ghana lessons to revitalize the egg agrifood industry. However, given Ghana's policy status, the country must increase institutional support, enforce regulations, strengthen cooperative networks, and prioritize training and skills development programs. This could significantly enhance the growth and performance of the egg agrifood industry.

This study has several limitations that should be acknowledged. First, the empirical survey was conducted only in Ghana and focused on SMEs operating within the egg value chain. While the comparative analysis includes Italy and Canada, this component relied primarily on secondary data sources. Consequently, the results should be interpreted with caution when generalizing to other agrifood sectors or national contexts. Nevertheless, the findings provide valuable insights into how capacity-building processes, particularly through human and social capital development, can enhance the integration and competitiveness of agrifood SMEs in emerging economies. Future research could extend this work by incorporating primary data from additional countries and by examining other agrifood value chains.

8.1 Recommendations

In essence, these recommendations emphasize the need for an integrated, sustainable capacity-building framework that links training and skills development, cooperative organization, infrastructure investment, and institutional reform, drawing on lessons from Italy's cooperative model and Canada's supply management system. Thus, implementing these recommendations will not only strengthen the egg agrifood chain but also contribute to broader national goals of food security, employment creation, and rural transformation.

a. Policy and Regulatory Reforms

1. Policy Alignment and Subsidies

Government policy should align with the industrial needs of SMEs in the agrifood chains through consistent trade, subsidy, and poultry-sector policies. Some of the challenges cited previously included the high cost of feed, limited access to credit facilities, weak institutional support, poor infrastructure, and intense competition from the import markets.

Therefore, government subsidies on key feed ingredients (such as maize, soya bean, and fish meal), vaccines, and other inputs will improve the cost-effectiveness for SMEs. Essentially, these subsidies should be reliable, long-term, and non-political. Likewise, trade policies should be stable and strategically aimed at supporting domestic agrifood SMEs. This will offer incentives for SMEs to plan and invest in the agrifood industry.

2. Financing and Infrastructure Development

Moreover, the government should consider measures to expand access to credit facilities through easy-access, friendly schemes targeted at agrifood SMEs, and develop regional storage and transport hubs to reduce post-harvest losses and improve product flow. This can be part of a unified national agrifood competitiveness strategy that aligns with food security and rural development goals.

3. Program Coordination, Monitoring, and Evaluation

Under a national agrifood competitiveness strategy, the government should consolidate fragmented poultry policies. Moreover, it is imperative to introduce robust monitoring and evaluation mechanisms for donor and government programs (e.g., RFJ, GPP, FGP) to ensure accountability and continuity. In addition, strengthening institutional coordination among the Ministry of Food and Agriculture (MoFA), the Ministry of Trade and Industry (MoTI), and local government authorities is critical for the coherent and effective implementation of agrifood policies nationwide.

4. Human Capital Development and RPL Integration

Training programs should be prioritized among supportive policy measures and offered to Extension officers and SME operators (with a focus on rural youth) as part of related training and skills development in digital innovations, entrepreneurship, and agribusiness skills to boost their respective competencies and reinforce improvements in human capital measures.

In addition, integrating Recognizing Prior Learning (RPL) mechanisms to formally recognize skills acquired in the informal sector. Lastly, fostering collaboration between universities, research institutions, and the egg agrifood industry is essential to align training curricula with industry needs and to promote knowledge transfer across the agrifood value chain.

b. Strengthen Regulatory enforcement

Ghana needs to strengthen regulatory enforcement in the agriculture and agri-food sectors to curb informal practices. These informal practices include actors failing to keep standardized records of transactions and production, using uncertified inputs such as feed ingredients and veterinary drugs, and engaging in unregulated retailing activities, among others. These practices have dominated the industry due to weak regulatory enforcement and have weakened the performance across the chains. The government should adequately resource regulatory institutions with funding, training, and logistics to ensure effective compliance. Penalties for non-compliance should be balanced with incentives, such as subsidies for sustainable practices. This is expected to enhance behavioral change towards compliance with standards across the chain. Again, the government may integrate digital monitoring systems to complement regulatory enforcement measures, thereby improving traceability and transparency across the agrifood chain.

c. SMEs -level Recommendations

Measures should support SMEs in embracing mechanization, innovation, and digital technologies to enhance productivity and coordination. The formation of cooperatives among SMEs across agrifood chains, or the advocacy for these SMEs to join agrifood-based cooperatives, will facilitate market access, reduce transaction costs, enable knowledge sharing, and, overall, help overcome the fragmented market structure. In addition, strengthening the cooperative's capacity will serve as a conduit for building strategic partnerships with institutions such as hospitals, prison services, schools, hotels, and food service providers to ensure a stable market.

Moreover, SMEs should invest in value addition (egg processing) to reduce post-harvest losses and increase profitability. Drawing on lessons from Italy and Canada and with government support, agrifood SMEs can adapt cooperative-based branding and supply management models to stabilize prices and ensure quality assurance.

8.2 Integrated Capacity-Building Model for the Ghanaian Egg Agrifood Chain

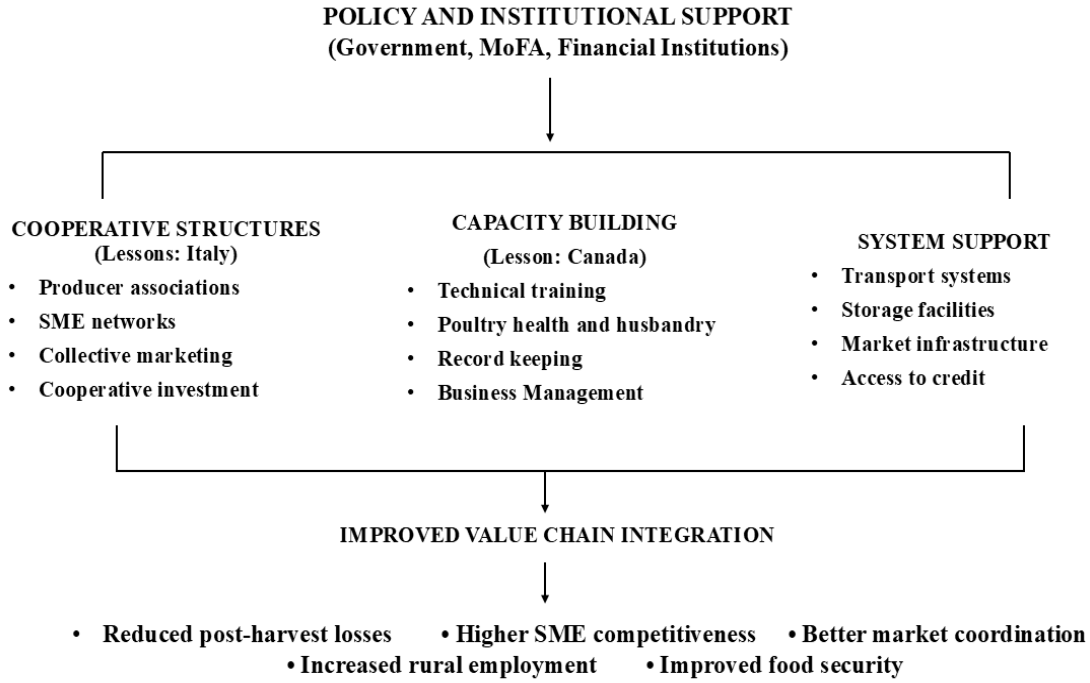
The integrated capacity-building model proposed in this chapter builds on the mixed-methods synthesis presented in Chapter 6, in which the regression results and RPL assessments revealed complementary patterns that explain competitiveness within the Ghanaian egg value chain.

Building on the cross-country lessons identified in Chapter Seven, this study proposes an integrated capacity-building model to enhance the competitiveness and coordination of Ghana's egg agrifood chain. The model highlights the interaction of three complementary pillars: cooperative organization, human capital development, and enabling infrastructure and financial support. Together, these components establish the institutional and operational conditions needed to improve value-chain integration and long-term sector performance.

Figure 8.1 illustrates the proposed Integrated Capacity-Building Model and highlights how the interaction among cooperative structures, human capital development, and system-level support mechanisms creates the conditions necessary for improved value chain coordination and competitiveness in Ghana's egg agrifood sector.

In developing economies, agrifood SMEs often operate in fragmented market environments characterized by weak institutional coordination, limited access to finance, and inadequate technical capacity (Reardon et al., 2019; FAO, 2021). In the Ghanaian context, these challenges limit the efficiency of the egg value chain and reduce the competitiveness of domestic producers. The integrated capacity-building model, therefore, proposes a coordinated approach that aligns institutional support with human capital development and infrastructure improvements to strengthen value chain integration and enhance sector performance.

Figure 8.1 Integrated Capacity-Building Model for the Ghanaian Egg Agrifood Chain



Source: Author's elaboration based on comparative analysis of Ghana, Italy, and Canada.

8.2.1 Policy and Institutional Support

The first pillar emphasizes strengthening institutional coordination through producer organizations, cooperatives, and industry networks. In the Ghanaian egg value chain, limited coordination among producers, traders, and distributors weakens market integration and diminishes the bargaining power of individual SMEs.

Strengthening producer associations and cooperative structures can enhance collective marketing, promote knowledge sharing, and support joint investment in production and distribution infrastructure. These mechanisms allow SMEs to pool resources, lower operational risks, and boost their ability to compete in both domestic and regional markets. Improved institutional coordination also fosters better communication between value chain actors and public institutions, thereby increasing the effectiveness of sector policies and development programs.

8.2.2 Cooperative Structures

The second pillar focuses on strengthening cooperative organizations among actors in the egg agrifood chain. The empirical findings from the survey indicate that many SMEs operate independently and with limited coordination, contributing to fragmented supply chains and inefficiencies in production, marketing, and logistics.

Drawing inspiration from the Italian Agricultural District model, this pillar emphasizes the role of collective action and local networks in improving coordination among value chain actors. By forming producer associations and SME networks, farmers and traders can pool resources, share

information, and collectively invest in infrastructure such as storage facilities, transport systems, and biosecurity measures. Such cooperative arrangements help reduce transaction costs and strengthen bargaining power in input and output markets. In this way, social capital becomes a strategic asset that enhances the overall competitiveness of the agrifood chain.

8.2.3 Capacity Building

The second pillar of the framework emphasizes human capital development, which is crucial for enhancing the operational efficiency of agrifood SMEs. Empirical findings from the Ghanaian case study reveal significant skill gaps among value chain actors; these deficiencies contribute to inefficiencies in production and distribution, including high post-harvest losses.

Addressing these gaps in poultry health and husbandry, record-keeping, handling, and storage can enhance productivity and reduce operational losses within the supply chain.

Lessons from the Canadian Sector Engagement Tables (SETs) and Supply Management logic demonstrate how structured industry engagement mechanisms can foster collaboration among government, industry stakeholders, and training institutions to improve workforce skills and industry competitiveness (Agriculture and Agri-Food Canada [AAFC], 2024).

An essential part of this process is the Recognizing Prior Learning (RPL) framework, which emphasizes identifying and validating the practical knowledge and skills that actors operating in informal agrifood systems already possess (Maurer, 2021). In many rural economies, producers and traders acquire technical skills through experience rather than formal education. Recognizing these "hidden" competencies provides an entry point for structured training and skills-development programs and enables actors to transition from informal knowledge systems to more professionalized production and management practices.

8.2.4 Enabling Infrastructure and Financial Support

The third pillar of the model emphasizes the significance of physical infrastructure and financial services in supporting agrifood SMEs. Effective value chain operations rely on dependable transportation networks, storage facilities, and access to financial resources, enabling producers and traders to expand their operations.

In Ghana, inadequate rural transportation systems, limited storage facilities, and restricted access to credit continue to hinder the growth of the egg agrifood sector. Improving these structural conditions would lower transaction costs, reduce post-harvest losses, and improve market access for SMEs.

Investment in rural infrastructure, including improved road networks and cold-chain storage systems, would greatly enhance supply chain efficiency. At the same time, expanding agricultural

financing programs and credit schemes targeted at agrifood SMEs would provide the necessary financial support for technological upgrades and business growth.

8.2.5 Expected Outcomes of the Integrated Framework

The interaction of cooperative organizations, human capital development, and enabling infrastructure lays the foundation for a more integrated and competitive egg agrifood chain. When implemented together, these components can improve coordination among value-chain actors, boost technical and managerial skills, and increase the overall efficiency of production and distribution systems.

Ultimately, the integrated capacity-building model aims to transform Ghana's egg agrifood chain into a more coordinated, productive, and resilient system that supports rural development, employment, and national food security. Based on the empirical findings in Chapter Six, the next section shows how this framework aligns with recent policy initiatives and international agrifood partnerships aimed at strengthening training, institutional coordination, and infrastructure in Ghana's agricultural sector.

8.2.6 Empirical Validation of the Integrated Capacity-Building Model

The integrated capacity-building model proposed in this study is supported by both empirical evidence and emerging policy initiatives within Ghana's agrifood sector. Recent national and international programs demonstrate a growing commitment to investing in training, infrastructure, and institutional collaboration, which can translate capacity development into improved value-chain performance.

First, the human capital component of the model is supported by regression analysis, which shows that participation in training programs significantly reduces post-harvest losses among SMEs. The RPL assessment also confirms that most actors operate at basic competency levels, particularly in storage, poultry health and husbandry management, and record-keeping. These findings emphasize the importance of structured skills development in enhancing operational efficiency across the egg value chain. This focus on technical capacity building is also evident in national initiatives such as the Feed Ghana Program and the Nkoko Nketenkete project, which prioritize training, advisory services, and technical support to help poultry producers shift from subsistence practices to more commercially oriented, efficient production systems.

Second, the social capital dimension is supported by the observed link between collaboration and better operational performance. SMEs involved in community networks and business associations have lower post-harvest losses and better information sharing. This pattern highlights the importance of cooperative networks in strengthening value-chain coordination. A similar principle

is reflected in international initiatives such as the €154 million Ghana–Italy Agrifood Partnership, launched under the Italy–Africa Mattei Plan, which adopts the Italian "Distretti Agricoli" philosophy that promotes locally embedded networks linking farmers, researchers, and agribusiness actors (AICS, 2025; Farmlandgrab, 2025; Mauritius EDB. 2025). This model illustrates how structured collaboration can transform individual capabilities into coordinated value-chain efficiency and competitiveness.

Third, the model's institutional support pillar draws on a comparative analysis of agrifood systems in Italy and Canada. These countries demonstrate how coordinated policy frameworks, industry organizations, and training institutions can turn capacity-building efforts into increased productivity and competitiveness. In contrast, the Ghanaian egg value chain lacks similar institutional structures, highlighting the need for integrated governance mechanisms within the proposed framework.

Recent initiatives, however, show a move toward strengthening this enabling environment. For example, the €154 million Ghana–Italy Agrifood Partnership, launched under the Italy–Africa Mattei Plan, includes investments in ICT hubs, digital advisory services, and improved storage and logistics infrastructure to modernize agricultural value chains and reduce post-harvest losses. These initiatives demonstrate how institutional support and digital infrastructure can enhance human and social capital development by creating the necessary structural conditions for SMEs to adopt better management practices and compete more effectively in modern agrifood systems.

Given the above, these initiatives demonstrate how the integrated capacity-building model supports Ghana's current agricultural transformation agenda. By combining structured training systems, cooperative networks, and institutional support mechanisms, the model offers a practical framework for enhancing the competitiveness and sustainability of Ghana's egg agrifood chain.

8.3 Future Research Recommendations

Future research should include a primary, data-driven survey across the study areas to validate the comparative role of capacity building in supporting the integration and competitiveness of agrifood chains. Moreover, the research may further assess how digitalization and supply chain innovation strengthen resilience across agrifood chains.

This study focused on the egg agrifood chain as a representative subsector of the poultry industry. Future research could extend the analysis to include other agrifood value chains, such as dairy, horticulture, cereals, and aquaculture, to determine whether similar patterns of capacity building and competitiveness exist across different commodities. A multi-chain comparison would help identify sector-specific and cross-cutting strategies for agrifood development.

Similarly, future comparative research could explore other developing and emerging economies with similar agrifood structures (e.g., Kenya, Nigeria, Brazil, or South Africa) to provide more comprehensive insights into how political, institutional, and socio-economic contexts shape capacity-building outcomes and policy effectiveness.

REFERENCES

Aalbers, J. (2024, April 2). Over 80% of the EU's farming subsidies support emissions-intensive animal products: New study. The Conversation. https://theconversation.com/over-80-of-the-eus-farming-subsidies-support-emissions-intensive-animal-products-new-study-226853

Abdulai, A.-R., Fraser, E. D. G., & Glaros, A. (2023). Is agricultural digitization a reality among smallholder farmers in Africa? Unpacking farmers' lived realities of engagement with digital tools and services in rural Northern Ghana. Agriculture & Food Security, 12, Article 11. https://doi.org/10.1186/s40066-023-00416-6

Adato, M., Carter, M. R., & May, J. (2006). Exploring poverty traps and social exclusion in South Africa using qualitative and quantitative data. Journal of Development Studies, 42(2), 226–247. doi.org

Adjei, P. O.-W., Agyemang, S., & Afriyie, K. (2012). Non-governmental organizations and rural poverty reduction in northern Ghana: Perspectives of beneficiaries on strategies, impact, and challenges. Journal of Poverty Alleviation and International Development, 3(2), 47–73. www.econstor.eu

Adzitey, F., & Nurul, H. (2011). Consumer preference for broiler meat in Ghana: A conjoint analysis approach. International Food Research Journal, 18(1), 159–164. www.ifrj.upm.edu.my

Agriculture and Agri-Food Canada. (2023). Information services. Government of Canada. Retrieved February 28, 2026, from https://agriculture.canada.ca/en/science/information-services

Agriculture and Agri-Food Canada. (2023, June 19). Sustainable Canadian Agricultural Partnership. https://agriculture.canada.ca/en/department/initiatives/sustainable-canadian-agricultural-partnership

Agriculture and Agri-Food Canada. (2024, June 21). Parliamentary Secretary Drouin announces new funding to help promote Canadian agri-food products around the world. Government of Canada. www.canada.ca

Agriculture and Agri-Food Canada. (2024, November 13). Overview of the Agriculture and Agri-Food Canada: Deputy minister transition book 2024. https://agriculture.canada.ca/en/department/transparency/briefing-documents/aafc-transition-books/overview-agriculture-and-agri-food-canada-deputy-minister-transition-book-2024-aafc

Agriculture and Agri-Food Canada. (2024). 2024–25 Departmental plan. https://agriculture.canada.ca/en/department/transparency/departmental-plan/2024-25-departmental-plan

Agriculture and Agri-Food Canada. (n.d.). Overview of the agriculture and agri-food sector. Government of Canada. Retrieved February 28, 2026, from agriculture.canada.ca

Aidoo, R., Danquah, K. O., & Victor, K. (2014). Determinants of postharvest losses in tomato production in the Offinso North district of Ghana. Journal of Development and Agricultural Economics, 6(8), 338–344. doi.org

Aikins, E. R. (2024, September 24). Ghana must stop galamsey before it sinks the country. ISS Africa. https://issafrica.org/iss-today/ghana-must-stop-galamsey-before-it-sinks-the-country

AICS. (2025, June 12). Mission of the Italian development cooperation system in Ghana, Côte d'Ivoire and Guinea. Italian Agency for Development Cooperation. www.aics.gov.it

Akinola, S. R. (2007). Coping with infrastructural deprivation through collective action among rural people in Nigeria. Nordic Journal of African Studies, 16(1), 30–46. www.njas.helsinki.fi

Aksoy, M. A., & Ng, F. (2014). The evolution of agricultural trade flows (Policy Research Working Paper No. 5308). World Bank. openknowledge.worldbank.org

Allen, T., & Thomas, A. (Eds.). (2000). Poverty and development into the 21st century. Oxford University Press. global.oup.com

Amanor-Boadu, V., Nti, F. K., & Ross, K. (2016). Structure of Ghana's chicken industry in 2015. Department of Agricultural Economics, Kansas State University. pdf.usaid.gov

Amicarelli, V., Bux, C., Spinelli, M. P., & Lagioia, G. (2023). Circular economy and sustainability in the Italian egg supply chain: Challenges and opportunities. Sustainability, 15(2), Article 1206. https://doi.org/10.3390/su15021206

Amin, A. (Ed.). (1994). Post-Fordism: A reader. Blackwell. onlinelibrary.wiley.com

Amoako, S. (2025). Exploring factors that enhance the growth of small and medium enterprises in Ghana. International Journal of Research and Innovation in Applied Science, 10(4), 355–360. https://doi.org/10.51584/IJRIAS.2025.10040029

ANSA. (2023, October 21). Oltre il 63% delle famiglie italiane fatica ad arrivare a fine mese [Over 63% of Italian families struggle to make ends meet]. https://www.ansa.it/sito/notizie/economia/2023/10/21/oltre-63-delle-famiglie-italiane-fatica-ad-arrivare-a-fine-mese_fea729ab-2939-4094-98e1-c8dc4017b406.html

Ansah, I. G. K., Gardebroek, C., & Ihle, R. (2020). Ghana's Planting for Food and Jobs Programme: A look at the role of capability in farmers' participation. Journal of Human Development and Capabilities, 21(2), 161–182. doi.org

Appiah-Kubi, K. (2011, August 10). President Kufuor's agricultural legacy for Ghana. GhanaWeb. https://www.ghanaweb.com/GhanaHomePage/features/President-Kufuor-s-Agricultural-Legacy-For-Ghana-215751

Asad, A. L., & Kay, T. (2014). Theorizing the relationship between NGOs and the state in medical humanitarian projects. Social Science & Medicine, 120, 325–333. doi.org

Ascoli, U., & Pavolini, E. (2016). The Italian welfare state in a European perspective: A comparative analysis. Policy Press.

Ashitey, E. (2017). Ghana: Poultry report (Report No. GH1702). USDA Foreign Agricultural Service. apps.fas.usda.gov

Ayim, C., Omillo, F., & Some, S. B. (2022). Adoption of ICT innovations in the agriculture sector in Africa: A review of the literature. Agriculture & Food Security, 11, Article 22. https://doi.org/10.1186/s40066-022-00364-7

Baagyere, E. Y., Awunyo-Vitor, D., & Amegashie, D. P. K. (2023). Organization and performance of chicken egg marketing in Northern Ghana. Journal of Agriculture and Food Research, 12, Article 100633. https://doi.org/10.1016/j.jafr.2023.100633

Babu, S. C., & Sanyal, P. (2009). Effects of commercialization of agriculture (shift from traditional crop to cash crop) on food consumption and nutrition: Application of chi-square statistic. In S. C. Babu & P. Sanyal (Eds.), Food security, poverty and nutrition policy analysis (pp. 39–59). Academic Press. doi.org

Babu, S. C., Haggblade, S., Mwiba, K., Mbwambo, N., & Gunaratna, N. S. (2016). Strengthening capacity for agribusiness development and management in Sub-Saharan Africa. Africa Journal of Management, 2(1), 1–30. doi.org

Battram, R. A. (2010). Canada in crisis: An agenda for survival of the nation. Trafford Publishing.

Bawole, J. N., & Hossain, F. (2015). Marriage of the unwilling? The paradox of local government and NGO relations in Ghana. Voluntas: International Journal of Voluntary and Nonprofit Organizations, 26(5), 2061–2083. doi.org

BDC. (2024, May 22). 10 things you didn’t know about Canadian SMEs. Business Development Bank of Canada. https://www.bdc.ca/en/articles-tools/business-strategy-planning/manage-business/10-things-didnt-know-canadian-sme

Belletti, G., Marescotti, A., & Touzard, J.-M. (2017). Geographical indications, public goods, and sustainable development: The roles of actors' strategies and public policies. World Development, 98, 45–57. doi.org

Belletti, G., Marescotti, A., & Touzard, J.-M. (2021). Geographical indications, public goods, and sustainable development: The roles of actors’ strategies and public policies. World Development, 145, Article 105595. doi.org

Birol, E., Asare-Marfo, D., Ayele, G., Mensah-Bonsu, A., Ndirangu, L., Okpukpara, B., Roy, D., & Yakhshilikov, Y. (2010, July). Investigating the role of poultry in livelihoods and the impact of avian flu on livelihoods outcomes in Africa: Evidence from Ethiopia, Ghana, Kenya, and Nigeria (IFPRI Discussion Paper No. 1011). International Food Policy Research Institute. https://hdl.handle.net/10568/154610

Bite, D., & Kruzmetra, Z. (2017). Non-governmental organizations as key actors of renewal of rural territories in Latvia. International Journal of Economics and Management Systems, 2, 277–286. www.wseas.org

Blacksmith, N. (2023, June 20). Social capital vs. human capital: What’s the difference and why does it matter? Medium. medium.com

Bock, B. B. (2016). Rural marginalization and the role of social innovation: A turn towards nexogenous development and rural reconnection. Sociologia Ruralis, 56(4), 552–573. doi.org

Bolay, J.-C. (2020). Urban planning against poverty: How to think and do better cities in the Global South. Springer. doi.org

Boschloo, R. (2019). Analysis poultry sector Ghana 2019: An update on the opportunities and challenges. Netherlands Enterprise Agency; Embassy of the Kingdom of the Netherlands. www.rvo.nl

Bourdieu, P. (1993). The field of cultural production: Essays on art and literature (R. Johnson, Ed.). Columbia University Press. cup.columbia.edu

Bravo, G. L. (2001). Italiani: Racconto etnografico [Italians: An ethnographic tale]. Meltemi. www.meltemieditore.it

Bray, R. (2025, July 10). Recognizing an individual’s prior learning (RPL). Cloud Assess. https://cloudassess.com/blog/rpl/

Bryman, A. (2016). Social research methods (5th ed.). Oxford University Press.

Bijman, J., & Iliopoulos, C. (2014). Farmers' cooperatives in the EU: Policies, strategies, and organization. Annals of Public and Cooperative Economics, 85(4), 497–508. doi.org

Brisson, D. (2009). Testing the relationship of formal bonding, informal bonding, and formal bridging social capital on key outcomes for families in low-income neighbourhoods. Journal of Sociology and Social Welfare, 36(1), 167–183. scholarworks.wmich.edu

Cagliero, R., & Novelli, S. (2012). Giovani e senilizzazione nel Censimento dell'agricoltura [Young people and aging in the Agricultural Census]. Agriregionieuropa, 8(31), 1–10. agriregionieuropa.univpm.it

Canada Commons. (n.d.). Social capital. Retrieved February 28, 2026, from canadacommons.ca

Canadian Agri-Food Policy Institute. (2025). Agri-food risk in 2025: From optimism to realism… to action. capi-icpa.ca

Canadian Rural Revitalization Foundation. (2024). State of Rural Canada 2024: Inclusive and sustainable futures for rural and northern communities. sorc.crrf.ca

Carbonaro, G. (26th Oct, 2023). Euro News.). https://www.euronews.com/business/2023/10/27/nearly-1-in-12-italians-live-in-absolute-poverty-due-to-higher-inflation-report-finds

CARE. (2023, July 11). Ghana: Inequalities in food insecurity. www.care-international.org

Central Intelligence Agency. (2021). The World Factbook. Archived from the original on July

Chant, S., & McIlwaine, C. (2009). Geographies of development in the 21st century: An introduction to the Global South. Edward Elgar. www.e-elgar.com

Chantarat, S., & Barrett, C. B. (2008). Social network capital, economic mobility and poverty traps (SSRN Scholarly Paper No. 1151353). Social Science Research Network. doi.org

Chase, S. (2022, June 13). Canada and Denmark reach settlement over disputed Arctic island, sources say. The Globe and Mail. www.theglobeandmail.com

Climate Policy Initiative. (2024, November 12). CLIC and CGIAR IMPACTSF: A strategic partnership to accelerate sustainable agrifood SMEs in Africa. https://www.climatepolicyinitiative.org/clic-and-cgiar-impactsf-a-strategic-partnership-to-accelerate-sustainable-agrifood-smes-in-africa/

Coleman, J. S. (1988). Social capital in the creation of human capital. American Journal of Sociology, 94, S95–S120. doi.org

Committee on World Food Security. (2013, June). Biofuels and food security (HLPE Report No. 5). www.fao.org

Confindustria Toscana Servizi. (2019). SME instrument: Lo strumento per l'innovazione delle PMI [SME instrument: The tool for SME innovation]. servizi.confindustria.toscana.it

Conti, M., & Sivini, S. (2023). Small municipalities attracting rural newcomers and fostering local cohesion: Innovative approaches for rural regeneration in Italy. Sustainability, 15(7), Article 5837. https://doi.org/10.3390/su15075837

Corvino, A., Doni, F., & Martini, S. B. (2019). The moderating effect of firm size on relational capital and firm performance. Journal of Intellectual Capital, 20(4), 510–532. doi.org

Cotella, G., & Brovarone, E. V. (2021). The Italian national strategy for inner areas: A place-based approach to regional development. In M. Neuman & W. Zonneveld (Eds.), The Routledge handbook of regional design (pp. 66–80). Routledge. doi.org

Coulombe, H., & Wodon, Q. (2007, May 2–3). Poverty, livelihoods, and access to basic services in Ghana [Paper presentation]. Ghana CEM Technical Review Growth Workshop: Meeting the Challenge of Accelerated and Shared Growth, Accra, Ghana. https://openknowledge.worldbank.org/handle/10986/7661

Council for Agricultural Research and Agricultural Economics Analysis [CREA], (2024, December 11). Rapporto sul commercio estero dei prodotti agroalimentari [Report on foreign trade in agri-food products]. www.crea.gov.it

Creswell, J. W., & Plano Clark, V. L. (2017). Designing and conducting mixed methods research (3rd ed.). SAGE Publications

Cull, R., & Hartarska, V. (2023). Overview of microfinance, financial inclusion, and development. In V. Hartarska & R. J. Cull (Eds.), Handbook of microfinance, financial inclusion and development(pp. 2–19). Edward Elgar Publishing. https://doi.org/10.4337/9781789903874.00006

Daddieh, C. K. (1994). Contract farming and palm oil production in Côte d'Ivoire and Ghana. In P. D. Little & M. J. Watts (Eds.), Living under contract: Contract farming and agrarian transformation in sub-Saharan Africa (pp. 188–215). University of Wisconsin Press. uwpress.wisc.edu

Dadush, U. (2015, June 11). Is the Italian economy on the mend? Carnegie Europe. carnegieeurope.eu

Davis, K., Di Giuseppe, S., & Keala, S. (2023). Estimating global and country-level employment in agrifood systems (FAO Statistics Working Paper Series No. 23-34). Food and Agriculture Organization of the United Nations. doi.org

Davis, K., Gammelgaard, J., Preissing, J., Gilbert, R., & Ngwenya, H. (2021). Investing in farmers: Agriculture human capital investment strategies. Food and Agriculture Organization of the United Nations; International Food Policy Research Institute. https://doi.org/10.4060/cb7134en

De Toni, A., Vizzarri, M., Di Febbraro, M., Lasserre, B., Noguera, J., & Di Martino, P. (2021). Aligning Inner Peripheries with rural development in Italy: Territorial evidence to support policy contextualization. Land Use Policy, 100, Article 104899. https://doi.org/10.1016/j.landusepol.2020.104899

De Vincenti, C. (2018). Relazione annuale sulla Strategia Nazionale per le Aree Interne [Annual report on the National Strategy for Inner Areas]. Ministro per la Coesione Territoriale e il Mezzogiorno.

Demeterová, B., Kozová, M., & Belčáková, I. (2020). Governance and sustainable rural development: Case studies from Central Europe. Sustainability, 12(17), Article 6804. doi.org

Diana, A., Adam, H., & Asante, B. O. (2023). The role of social capital in adoption of risky versus less risky subsidized input supplies: An empirical study of cocoa farmers in Ghana. Journal of Rural Studies, 97, 140–152. doi.org

Diebolt, C., & Hippe, R. (2019). The long-run impact of human capital on innovation and economic development in the regions of Europe. Applied Economics, 51(5), 542–563. doi.org

Diekmeyer, P. (2020, January 17). Capitalism. The Canadian Encyclopedia. www.thecanadianencyclopedia.ca

Dolislager, R., Reardon, T., Arslan, A., Hoffler, A., Liverpool-Tasie, L. S. O., Villani, C., & Zilberman, D. (2021). Youth and adult agrifood system employment in developing regions: Rural (peri-urban to hinterland) vs. urban. Journal of Development Studies, 57(4), 571–593. doi.org

Dragan, G., Ivankov, A., & Milić, T. (2023). The importance of human capital in agribusiness and rural development of Serbia. Western Balkan Journal of Agricultural Economics and Rural Development, 5(2), 121–204. doi.org

Dwumah, P., Acheampong, I. K., & Gyamfi, S. A. (2023). Youth employment paths in a Ghanaian rural community. E-Journal of Humanities, Arts and Social Sciences, 4(3), 196–211. doi.org

Dziwornu, R. K., & Sarpong, D. B. (2014). Application of the stochastic profit frontier model to estimate economic efficiency in small-scale broiler production in the Greater Accra region of Ghana. Review of Agricultural and Applied Economics, 17(2), 10–16. doi.org

Eatable Adventures. (2023). Foodtech in Italy report 2023. https://eatableadventures.com/news/foodtech-in-italy-report-2023/

European Commission (EC). (2016). A strategic approach to EU agricultural research and innovation [Strategy paper]. https://ec.europa.eu/programmes/horizon2020/sites/default/files/agri_strategypaper_web_1.pdf

EC. (2020). Skills for SMEs: cybersecurity, Internet of things and big data for small and medium-sized enterprises. Publications Office. https://data.europa.eu/doi/10.2826/708138.

EC. (2023, October 3). State aid: Commission approves €910 million Italian scheme under the Recovery and Resilience Facility to support agro-industrial development [Press release]. European Union.

EC. (2025). CAP strategic plans: Italy. Directorate-General for Agriculture and Rural Development. Retrieved March 1, 2026, from agriculture.ec.europa.eu

EC. (2025). Labour market information: Italy. EURES. Retrieved March 1, 2026, from eures.europa.eu

EC. (n.d.). CAP at a glance. Retrieved March 1, 2026, from https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en.

Egg Farmers of Canada. (2024, March 5). Annual report 2023. https://www.eggfarmers.ca/wp-content/uploads/2024/03/2023_Egg-Farmers-of-Canada_Annual-Report.pdf

Egg Farmers of Canada. (2025, March 19). Annual report 2024. https://www.eggfarmers.ca/wp-content/uploads/2025/03/2025-03-19_Egg-Farmers-of-Canada_Annual-Report-2024.pdf

Emmerson, M., Morales, M. B., Oñate, J. J., Batáry, P., Berendse, F., Liira, J., Aavik, T., Guerrero, I., Bommarco, R., Eggers, S., Isaksson, S., Tscharntke, T., Weih, M., & Bengtsson, J. (2016). How agricultural intensification affects biodiversity and ecosystem services. Advances in Ecological Research, 55, 43–97. doi.org

Ericksen, P. J. (2008). Conceptualizing food systems for global environmental change research. Global Environmental Change, 18(1), 234–245. doi.org

Europe-Data. (2025, March 6). What EU country reported the highest unemployment rate in November 2024?. https://europe-data.com/what-eu-country-reported-the-highest-unemployment-rate-in-november-2024/

European Environment Agency [EEA]. (2022, October 6). Rethinking agriculture (Briefing No. 25/2021). https://www.eea.europa.eu/publications/rethinking-agriculture

European Investment Bank [EIB]. (2023, November 29). Kenya: EIB supports cutting-edge cold storage facility [Press release]. https://www.eib.org/en/press/all/2023-479-eib-supports-africa-s-first-of-a-kind-cold-storage-facility-launch-in-kenya

European Network for Rural Development [ENRD]. (2018). Strategy for inner areas – Italy [Case study]. European Commission. enrd.ec.europa.eu

European Parliament. (2021, September 30). Report on a farm-to-fork strategy for a fair, healthy, and environmentally-friendly food system (A9-0271/2021). www.europarl.europa.eu

Eurostat. (2022, November). Farms and farmland in the European Union - statistics. https://ec.europa.eu/eurostat/statisticsexplained/index.php/Farms_and_farmland_in_the_European_Union_-_statistics

Farmlandgrab. (2025, October 24). Ghana secures €154m agric support from Italy; Minister says it'll transform agri-food systems. www.farmlandgrab.org

FAO (2013). Investing in smallholder agriculture for food security: Report of the Committee on World Food Security

FAO, IFAD, UNICEF, WFP, & WHO. (2020). The state of food security and nutrition in the world 2020: Transforming food systems for affordable healthy diets. doi.org

FAO, IFAD, UNICEF, WFP, & WHO. (2022). The state of food security and nutrition in the world 2022: Repurposing food and agricultural policies to make healthy diets more affordable. https://doi.org/10.4060/cc0639en

FAO, IFAD, UNICEF, WFP, & WHO. (2024). The state of food security and nutrition in the world 2024: Financing to end hunger, food insecurity and malnutrition in all its forms. https://doi.org/10.4060/cd1254en

FAO. (2019). Strengthening linkages between small actors and buyers in the root and tuber sector in Africa: African roots and tubers project. www.fao.org

FAO. (2021). The State of Food and Agriculture 2021: Making agrifood systems more resilient to shocks and stresses. Rome, FAO. https://doi.org/10.4060/cb4476en

FAO. (2023). The state of food and agriculture 2023: Revealing the true cost of food to transform agrifood systems. https://doi.org/10.4060/cc7724en

FAO. (2024). Small and medium enterprises and nutrition: understanding linkages, seizing opportunities – Discussion paper. Rome. https://doi.org/10.4060/cd0056e

FAO. (2024, September 27). Tackling food loss and waste from the farm to the table and beyond. https://www.fao.org/newsroom/detail/tackling-food-loss-and-waste-from-the-farm-to-the-table-and-beyond/en

FAO. (1998). Rural development and poverty alleviation: Key issues. FAO Repository

FAO. (2006). Food security (Policy Brief No. 2). FAO Food Security Concept Note

FAO. (2015). Poultry sector country review: Ghana. FAO Animal Production and Health Division. Livestock Country Reviews

FAO. (2019). The state of the world's biodiversity for food and agriculture (J. Bélanger & D. Pilling, Eds.). FAO Commission on Genetic Resources for Food and Agriculture Assessments. FAO Open Knowledge Repository

FAO. (2023, April 14). Almost half the world's population lives in households linked to agrifood systems. https://www.fao.org/newsroom/detail/almost-half-the-world-s-population-lives-in-households-linked-to-agrifood-systems/en

FAO. (2024). Rural livelihoods information system (RuLIS) [Data set]. www.fao.org

FAOSTAT. (2023, October 29). Egg consumption per capita in Ghana. HelgiLibrary. HelgiLibrary Indicators

Farrelly & Mitchell. (2023). SME development in Ghana: Overcoming barriers to growth. Retrieved March 1, 2026, from farrellymitchell.com

Farrelly Mitchell. (2022). Ghana food and agribusiness industry analysis (Report No. MARE01_2022). farrellymitchell.com

Federation of Canadian Municipalities [FCM]. (2018, May). Rural challenges, national opportunity: Shaping the future of rural Canada. https://fcm.ca/en/resources/rural-challenges-national-opportunity

Felicia, D. A., & Shikshya, A. (2021, February). Galamsey in Ghana: Mitigating its negative effects (Policy Brief). Women in International Security (WIIS). WIIS Global Policy Brief

Fi-compass. (2020). Financial needs in the agriculture and agri-food sectors in Italy (Study Report). European Investment Bank. www.fi-compass.eu

Fleming, A. R., Ysasi, N. A., Harley, D. A., & Bishop, M. L. (2018). Resilience and strengths of rural communities. In D. A. Harley, I. A. Ysasi, M. L. Bishop, & A. R. Fleming (Eds.), Disability and vocational rehabilitation in rural settings: Challenges to service delivery (pp. 117–136). Springer. Springer Link

Flohre, A., Fischer, C., Tscharntke, T., & Thies, C. (2011). Does soil biota benefit from organic farming in complex vs. simple landscapes? Agriculture, Ecosystems & Environment, 141(1–2), 210–214. doi.org

Fontefrancesco, M. F. (2020, January 17). Rural development and alternative agriculture in Italy: Cultivating the future by governing expectations of change. Fieldsights; Society for Cultural Anthropology. SCA Fieldsights

Forkuor, D., & Agyemang, S. (2018). Figurehting urban poverty in Ghana: The role of non-governmental organizations. Urban Forum, 29(2), 127–145. doi.org

Forster, T., Santini, G., Edwards, D., Flanagan, C., & Taguchi, M. (2021). Strengthening urban–rural linkages through city regional food systems. Food and Agriculture Organization of the United Nations. doi.org

Franzel, S. (2023). Investing in agriculture human capital: Roles for the private sector (Investment Brief). Food and Agriculture Organization of the United Nations; International Food Policy Research Institute. https://doi.org/10.4060/cc4370en

Fulmer, J. (2009). What in the world is infrastructure? PEI Infrastructure Investor, 1(4), 30–32.

Gabellini, S. (2021). Enhancing agricultural research for rural development: The role of territorial approaches [Doctoral thesis, University of Florence]. FLORE: Florence Research Repository. hdl.handle.net

Gabriel, A. (2012). Social capital: An indispensable resource in Ghana. Journal of Sustainable Development in Africa, 14(3), 219–227.

GCB Bank Plc. (2023). SME sector in Ghana 2023 v1. Strategy & Research Department. www.gcbbank.com.gh

Gebreselassie, S., Haile, M. G., & Kassie, M. (2019, November 3). The money farmers: How oligarchs and populists milk the E.U. for millions. The New York Times. www.nytimes.com

George, U., & Chaze, F. (2009). Social capital and employment: South Asian women's experiences. Affilia: Journal of Women and Social Work, 24(4), 394–405. https://doi.org/10.1177/0886109909343570

Geza, W., Ngidi, S., Slotow, R., & Mabhaudhi, T. (2022). The dynamics of youth employment and empowerment in agriculture and rural development in South Africa: A scoping review. Sustainability, 14(9), 5041. doi.org

Ghana Investment Promotion Centre (GIPC). (2022). Agriculture and agro-processing. https://gipc.gov.gh/sector/agriculture-agro-processing/

Ghana Poultry Report. (2019). Analysis of poultry sector in Ghana: An update on the opportunities and challenges.

Ghana Statistical Service (GSS). (2022). Ghana living standards survey: Report on vulnerability and food security (GLSS 7).

Ghana Statistical Service. (2024, July). Quarterly labour statistics bulletin.

Global Affairs Canada. (2022, May 19). Canada makes major contribution to support small and medium-sized agri-food enterprise growth in Africa. Government of Canada.

https://www.canada.ca/en/global-affairs/news/2022/05/canada-makes-major-contribution-to-support-small-and-medium-sized-agri-food-enterprise-growth-in-africa.html

Global Agricultural Information Network (GAIN). (2013). Ghana poultry annual report (GAIN Report No. 1304). USDA Foreign Agricultural Service.

Goldin, C. (2014). Human capital. In C. Diebolt & M. Haupert (Eds.), Handbook of cliometrics (pp. 1–43). Springer.

Gona, A., et al. (2018). The rapid transformation of the fish value chain in Nigeria: Evidence from Kebbi State (Research Paper 115). Feed the Future Innovation Lab for Food Security Policy; Michigan State University.

Government of Canada. (2025a, March 4). Government of Canada investment helps southern Ontario's agri-food companies scale. Federal Economic Development Agency for Southern Ontario. https://www.canada.ca/en/economic-development-southern-ontario/news/2025/03/government-of-canada-investment-helps-southern-ontarios-agri-food-companies-scale.html

Government of Canada. (2025b, September). Minister MacDonald meets with industry to discuss AgriMarketing funding increase and expansion into new markets. Agriculture and Agri-Food Canada. https://www.canada.ca/en/agriculture-agri-food/news/2025/09/minister-macdonald-meets-with-industry-to-discuss-agrimarketing-funding-increase-and-expansion-into-new-markets.html

Greene, W. H. (2018). Econometric analysis (8th ed.). Pearson.

Green, D., & Griffith, M. (2002, October). Dumping on the poor: The Common Agricultural Policy, the WTO and international development. Institute for Agriculture and Trade Policy.

Grischow, J. D. (2008). Rural 'community', chiefs and social capital: The case of southern Ghana. Journal of Agrarian Change, 8(1), 64–93. doi.org

Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics (5th ed.). McGraw-Hill Irwin

Guido de Blasio & Giorgio N., (2006). "The Legacy of History for Economic Development: The Case of Putnam's Social Capital," Temi di discussione (Economic working papers) 591, Bank of Italy, Economic Research and International Relations Area.

Guiso, L., Sapienza, P., & Zingales, L. (2004). The role of social capital in financial development. American Economic Review, 94(3), 526–556.

Gyasi, E. A. (1996). The environmental impact and sustainability of plantations in sub-Saharan Africa: Ghana's experiences with oil palm plantations. In G. Benneh et al. (Eds.), Sustaining the future (pp. 342–357). United Nations University Press.

Harris, R. C., Matthews, G. J., & Gentilcore, R. L. (Eds.). (1987). Historical atlas of Canada: Volume III: Addressing the twentieth century, 1891–1961. University of Toronto Press.

Heifer International. (2021, July 21). Only 5% of youth are into agric-processing: Report. The Business & Financial Times. https://thebftonline.com/2021/07/21/heifer-international-report-only-5-of-youth-are-into-agric-processing/

Helliwell, J. F., & Putnam, R. D. (1995). Economic growth and social capital in Italy. Eastern Economic Journal, 21(3), 295–307. www.jstor.org

Henderson, D. A., & Tickamyer, A. R. (2008). Lost in Appalachia: The unexpected impact of welfare reform on older women in rural communities. Journal of Sociology and Social Welfare, 35(3), 153–171. Western Michigan University ScholarWorks

High Level Panel of Experts on Food Security and Nutrition (HLPE). (2013). Investing in smallholder agriculture for food security (Report No. 6). Committee on World Food Security. FAO HLPE Report 6

Human Rights Watch. (2023). World report 2023: Italy. https://www.hrw.org/world-report/2023/country-chapters/italy

Iacovazzi Law Firm. (2023, December 5). How to open an agricultural business in Italy. Italian Business Lawyers. www.italianbusinesslawyers.com

ICE Agenzia. (2023). Value proposition: Italian agri-food industry. Italian Trade Agency. https://www.ice.it/en/sites/default/files/inline-files/value-proposition_agrifood.pdf

Ichino, A., & Maggi, G. (2000). Work environment and individual background: Explaining regional shirking differentials in a large Italian firm. The Quarterly Journal of Economics, 115(3), 1057–1090. doi.org

Intesa Sanpaolo Research Department. (2024). Monitor dei distretti agro-alimentari: Bilancio 2023.

Ilie, E. T., Hickey, A., & Kelly, S. (2022). The role of small and medium agrifood enterprises in rural transformation: The case of rice processors in Kenya (FAO Agricultural Development Economics Technical Study No. 17). Food and Agriculture Organization of the United Nations. https://doi.org/10.4060/cb8953en

Innovation, Science and Economic Development Canada (ISED). (2024). Rural opportunity, national prosperity: An economic development strategy for rural Canada. https://ised-isde.canada.ca/site/rural/en/rural-opportunity-national-prosperity-economic-development-strategy-rural-canada

Intergovernmental Panel on Climate Change (IPCC). (2014). Climate change 2014: Synthesis report (R. K. Pachauri & L. A. Meyer, Eds.). IPCC AR5 Synthesis Report

International Food Policy Research Institute (IFPRI). (2019, June 14). How small businesses are driving growth across African agriculture. IFPRI Blog

International Fund for Agricultural Development (IFAD). (2021). Rural development report 2021: Transforming food systems for rural prosperity. IFAD Publications

International Labour Organization (ILO). (2024, February 7). ILO modelled estimates database [Data set]. ILOSTAT. ilostat.ilo.org

International Trade Administration (ITA). (2023, November 29). Ghana - Country commercial guide: Agricultural sectors. U.S. Department of Commerce. Trade.gov Guide

Investopedia. (2024, December 18). Small and midsize enterprises (SMEs): Definition and characteristics. www.investopedia.com

ISED. (2021, August). Canada's rural economic development strategy: Progress report August 2021. https://ised-isde.canada.ca/site/rural/en/canadas-rural-economic-development-strategy-progress-report-august-2021

ISED. (2024). Key small business statistics 2024. https://ised-isde.canada.ca/site/sme-research-statistics/en/key-small-business-statistics/key-small-business-statistics-2024

ISMEA. (2021). Avicoli e uova: Ultime dal settore [Poultry and eggs: Latest from the sector]. Ismea Mercati. www.ismeamercati.it

ISTAT. (2014, October 30). Principali dimensioni geostatistiche e grado di urbanizzazione del Paese [Main geostatistical dimensions and degree of urbanization of the country]. Archived from the original on November 17, 2014.

ISTAT. (2019). Rapporto annuale 2019: La situazione del Paese [Annual Report 2019: The situation of the country]. Istituto Nazionale di Statistica. www.istat.it

ISTAT. (2023). 7° Censimento generale dell'agricoltura [7th General census of agriculture]. Istituto Nazionale di Statistica. https://www.istat.it/it/censimenti/agricoltura/7-censimentogenerale

ISTAT. (2025, January 24). Preliminary estimate of agricultural economic accounts: Year 2024 [Press release]. Istituto Nazionale di Statistica. https://www.istat.it/en/press-release/preliminary-estimate-of-agricultural-economic-accounts-year-2024/

Jacob, B., & Boerger, R. (2008). Rethinking local autonomy: Perceptions from four rural municipalities. Canadian Public Administration, 51(3), 435–463. doi.org

Jemima, J. A. D.(2024). The role of Ghana's Planting for Food and Jobs policy in local economic development. Journal of Production, Operations Management and Economics, 4(4), 1–15. doi.org

Katsinis, A., Papadopoulos, G., & Koufodontis, I. (2024). Annual report on European SMEs 2023/2024: SMEs and the green transition. Publications Office of the European Union. doi.org

Khalil, C. A., Conforti, P., Holleman, C., & Kelly, S. (2017). Defining small-scale food producers to monitor target 2.3 of the 2030 agenda for sustainable development (Working Paper No. 17-12). FAO Statistics Division. Archived PDF

KNUST. (2023, October 15). KNUST holds 3rd national hatchery capacity building workshop. Kwame Nkrumah University of Science and Technology. https://www.knust.edu.gh/news/news-items/knust-holds-3rd-national-hatchery-capacity-building-workshop

Koffi, Z. (2020, September 11). Scaling-up job opportunities in food systems for youth and women in West Africa. OECD Development Matters. https://oecd-development-matters.org/2020/09/11/scaling-up-job-opportunities-in-food-systems-for-youth-and-women-in-west-africa/

Koomen, E. (2011). Indicators of rural vitality: A GIS-based analysis of the socio-economic development of the rural Netherlands. In J. Stillwell, S. Geertman, & S. Openshaw (Eds.), Geographic information and urban issues (pp. 115–134). Springer.

Kortleve, A., Aalbers, J., Schiavo, M., & Solano-Hermosilla, G. (2024). Over 80% of the European Union's Common Agricultural Policy supports emissions-intensive animal products. Nature Food, 5(4), 332–341. https://doi.org/10.1038/s43016-024-00949-4

Kumar, A., Saroj, S., & Joshi, P. K. (2023). Impact of marketing reforms on farm-market linkages. In Sustainable food value chain development: Perspectives from developing and emerging economies (pp. 239–257). Springer Nature Singapore. doi.org

Lapitan, K. (2025, February 12). How SMEs can shape climate-resilient agri-food systems. Green Growth Knowledge Partnership. https://www.greenpolicyplatform.org/blog/how-smes-can-shape-climate-resilient-agri-food-systems

Li, P. (2004). Social capital and economic outcomes for immigrants and ethnic minorities. Journal of International Migration and Integration, 5(2), 171-190.

Lin, N. (2001). Social capital: A theory of social structure and action. Cambridge University Press. doi.org

Livermore, M., & Neustrom, A. (2003). Linking welfare clients to jobs: Discretionary use of worker social capital. Journal of Sociology and Social Welfare, 30(2), 87–103. Western Michigan University ScholarWorks

Liverpool-Tasie, L. S. O., & Reardon, T. A. (2021). Can the expansion of SMEs along Africa's food supply chains improve food and nutrition security? (PEGNet Policy Brief No. 25/2021). Kiel

Institute for the World Economy; Poverty Reduction, Equity and Growth Network. Kiel Institute Repository

Liverpool-Tasie, L. S. O., Adjognon, S. G., & Reardon, T. (2017). Growth and transformation of food systems in Africa: Evidence from the poultry value chain in Nigeria. Nigerian Journal of Agricultural Economics, 7(1), 1–15. NJAE Archive

Liverpool-Tasie, L. S. O., Quaye, I., Belton, B., Obadina, A., Sanni, S., & Reardon, T. (2021). Demand for imported versus domestic fish in Nigeria. Journal of Agricultural Economics, 72(3), 852–872. https://doi.org/10.1111/1477-9552.12423

Lopez-Vallejo, M. (2016). ReconFigureuring global climate governance in North America: A transregional approach. Routledge.

Lyon, F. (2003). The relations of co-operation in group enterprise and associations Ghana: Exploration of issues of trust and power. In F. Sforzi (Ed.), The institutions of local development (pp. 75–92). Ashgate.

Lyons, T., & Reimer, B. (2006). Assessing community capacity and social capital in rural America: Lessons from two rural observatories. Community Development, 37(1), 1–18. doi.org

Marchetti, S., & Secondi, L. (2021). The economic perspective of food poverty and (in)security: An analytical approach to measuring and estimation in Italy. Social Indicators Research, 162(2), 651–675. doi.org

Martin Prosperity Institute. (2011). The global creativity index. Archived PDF

Materiali UVAL. (2014). A strategy for inner areas in Italy: Definition, objectives, tools and governance (Issue No. 31). Department for Development and Economic Cohesion. http://www.dps.gov.it/it/pubblicazioni_dps/materiali_uval

Matthews, A. (2007, June 25–26). Rural development in the European Union: Issues and objectives [Paper presentation]. Workshop on Public Policy and Rural Development: An EU/US Comparison, Ashford, Kent, United Kingdom. ResearchGate

Mauritius EDB. (2025, March 15). Strengthening Africa's food systems: The importance of research and investment. www.linkedin.com

Maurer, M. (2021). The recognition of prior learning in vocational education and training systems of lower and middle income countries: An analysis of the role of development cooperation in the diffusion of the concept. Research in Comparative and International Education, 16(4), 469–487.

Maurer, M. (2022). Recognizing prior learning in vocational education and training: Global ambitions and actual implementation in four countries. Compare: A Journal of Comparative and International Education, 54(5), 785–802.

McEldowney, J. (2015, September). Measures to support dairy farmers after the end of EU milk quotas (PE 569.012). European Parliamentary Research Service. www.europarl.europa.eu

Md. Mustafizur, R., Shishir, R., & Faruque, H. M. O. (2024). Role of government and private sector on agribusiness development: Comparison between the USA and Bangladesh. ORGANIZE: Journal of Economics, Management and Finance, 3(2), 71–90. https://doi.org/10.58355/organize.v3i2.79

Mensah, E. P., Bannor, R. K., Oppong-Kyeremeh, H., & Kyire, S. K. C. (2022). An assessment of postharvest losses to support innovation in the egg value chain in Ghana. African Journal of Science, Technology, Innovation and Development, 14(6), 1642–1654. doi.org

Mensah-Bonsu, A., Lartey, N. N., & Kuwornu, J. K. M. (2019). Gender-segregated analysis of the poultry value chain in Ghana. Gender, Technology and Development, 23(2), 130–164. https://doi.org/10.1080/09718524.2019.1661611

Meshesha, J. G. (2011). Impact of contract farming on household income of smallholder farmers: The case of organic honey production in Southwest Ethiopia, Sheka Zone [Master's thesis, Addis Ababa University]. Institutional Repository.

Ministry of Economy and Finance. (2021). The National Recovery and Resilience Plan (NRRP). Government of Italy. www.mef.gov.it

Ministry of Finance. (2014). 2012–2013 Ghana Extractive Industries Transparency Initiative (GHEITI) oil & gas report (p. 60). Government of Ghana. GHEITI Reports

Ministry of Trade and Industry. (2010). Annual trade report. Government of Ghana.

Mitacs. (2022, February 23). Five must-seize opportunities for agri-business innovators. https://www.mitacs.ca/our-innovation-insights/five-must-seize-opportunities-for-agri-business-innovators/

Ministry of Food and Agriculture (MoFA). (2007). Statement by Minister Eskil Erlandsson on the reform of the Common Agricultural Policy. Government Offices of Sweden. web.archive.org

MoFA. (2020). Agriculture in Ghana: Facts and Figures (2019). Statistics, Research, and Information Directorate. MoFA Statistics

MoFA. (2021). Investment guide for the agriculture sector in Ghana. MoFA Investment Portal

MoFA. (2023, August 25). Ageing farmer population worrying. The Business & Financial Times

MoFA. (2025a). Feed Ghana project. https://mofa.gov.gh/site/index.php/feed-ghana

MoFA. (2025b). Revamping the poultry sector in Ghana. https://mofa.gov.gh/site/publications/agricultural-articles/321-revamping-the-poultry-sector-in-ghana

MoFA. (n.d.). Youth in agriculture. Government of Ghana. https://mofa.gov.gh/site/index.php/programmes/youth-in-agriculture

Monaco, F., & Tortorella, W. (2015). I Comuni della Strategia Nazionale Aree Interne [The municipalities of the National Strategy for Inner Areas]. IFEL. Fondazione IFEL

Montgomerie, T. (2015, September 25). We've got to dig up the green belt to build more homes. The Times. www.thetimes.com

More About Chicken. (2023a). The global industrial poultry pyramid and the top of the supply chain. https://moreaboutchicken.com/the-global-industrial-poultry-pyramid-and-the-top-of-the-supply-chain

More About Chicken. (2023b). Criticism of the poultry sector generates losses: What losses? https://moreaboutchicken.com/criticism-of-the-poultry-sector-generates-losses-what-losses

Morgan, P. (2006). The concept of capacity (Policy Management Brief No. 18). European Centre for Development Policy Management. ecdpm.org

Morgan, K. (2006). School food and the culture of procurement: The developmental role of the public plate. Regional Studies, 40(3), 379–395. doi.org

Musotti, F. (2015). Agricultural districts in the Italian regions: Looking toward 2020. SpringerPlus, 4(1).

Naggujja, J., Njiru, N., Msoffe, P., Naazie, A., Kelly, T., Enahoro, D., & Ouma, E. (2020). Tanzania and Ghana poultry sector policy review. International Livestock Research Institute; United States Agency for International Development. USAID Development Experience Clearinghouse

Nannoni, E., Vizzarri, F., Sardi, L., & Giovagnoli, G. (2025). Native Italian poultry products: The factors influencing consumer perceptions. Italian Journal of Animal Science, 24(1), 347–

NEPAD. (2002, November). Comprehensive Africa agriculture development programme. Food and Agriculture Organization of the United Nations. https://www.fao.org/4/y6831e/y6831e00.htm

Netherlands Enterprise Agency. (2021, May). Ghana food manufacturing study: An analysis of Ghana's aquaculture, fruits & vegetable, and poultry processing sectors. Rijksdienst voor Ondernemend Nederland. https://www.rvo.nl/sites/default/files/2021/05/Ghana-Food-Manufacturing-Study.pdf

North, D. C. (1991). Institutions. Journal of Economic Perspectives, 5(1), 97–112. https://doi.org/10.1257/jep.5.1.97

Nurre, S. G., Cavdaroglu, B., Mitchell, J. E., Sharkey, T. C., & Wallace, W. A. (2012). Restoring infrastructure systems: An integrated network design and scheduling (INDS) problem. European Journal of Operational Research, 223(3), 794–806. doi.org

O'Neill, A. (2025, February 14). Distribution of gross domestic product (GDP) across economic sectors in Italy in 2023. Statista. www.statista.com

O'Neill, A. (2025, February 6). Value added by the agriculture sector to the GDP in Ghana from 2017 to 2023, by sub-sector. Statista. www.statista.com

O'Neill, A. (2025, November 28). Distribution of the workforce across economic sectors in Canada from 2013 to 2023. Statista. https://www.statista.com/statistics/271244/distribution-of-the-workforce-across-economic-sectors-in-canada/

OECD. (1998). Human capital investment: An international comparison. doi.org

OECD. (2006). The challenge of capacity development: Working towards good practice. OECD Publishing. doi.org

OECD. (2006). The challenge of capacity development: Working towards good practice. OECD Publishing

OECD. (2010). OECD rural policy reviews: Canada 2010. https://doi.org/10.1787/9789264082151-en

OECD. (2023). Recognition of prior learning: A practical guide for policy makers. OECD Publishing.

OECD (2023). Development co-operation report 2023: Debating the aid system. OECD Publishing. doi.org

OECD. (2024). Italy. In OECD regions and cities at a glance 2024. www.oecd.org

Opoku, E. (2025, February 6). A new chapter in Ghana's agricultural development. Agroberichten Buitenland. www.agroberichtenbuitenland.nl

Opoku-Mensah, E., Adu-Gyamfi, P., & Osei, B. Y. (2023). Market margin analysis and constraints in fresh egg value chain in the Ashanti Region, Ghana. International Journal of Economics, Commerce and Management, 11(7), 88–105. ijecm.co.uk

Ordu, A., & Ntungire, N. (Eds.). (2023). Foresight Africa: Top priorities for the continent in 2023. Brookings Institution; Africa Growth Initiative. www.brookings.edu

Pauw, K. (2022). A review of Ghana's Planting for Food and Jobs program: Implementation, impacts, benefits, and costs. Food Security, 14(4), 1015–1031. doi.org

Peasant Farmers Association of Ghana (PFAG). (2019). An assessment of the Planting for Food and Jobs programme: From the beneficiary farmers' perspective. PFAG Reports.

Pelletier, N., Ibarburu, M., & Arsenault, N. (2018). Sustainability in the Canadian egg industry: Learning from the past, navigating the present, planning for the future. Sustainability, 10(10), 3524. https://doi.org/10.3390/su10103524

Perry, E. (2021, July 14). Human capital: Why it matters and 5 tips to improve it. BetterUp. www.betterup.com

Pichler, F., & Wallace, C. (2009). Social capital and social class in Europe: The role of social networks in social stratification. European Sociological Review, 25(3), 319–332. doi.org

Porter, G. (2003). NGO and poverty reduction in a globalizing world: Perspectives from Ghana. Progress in Development Studies, 3(2), 131–145. https://doi.org/10.1191/1464993403ps057ra

Porter, M. E. (1990). The competitive advantage of nations. Free Press.

Presidenza del Consiglio dei Ministri. (2021). Piano nazionale di ripresa e resilienza [National recovery and resilience plan]. Italia Domani. www.italiadomani.gov.it

Pure Greens. (n.d.). What is intensive farming? puregreensaz.com

Putnam, R. D. (1993a). Making democracy work: Civic traditions in modern Italy. Princeton University Press.

Putnam, R. D. (1993b, March 21). The prosperous community: Social capital and public life. The American Prospect, 4(13). The American Prospect Archive

Q&A: Reform of EU farm policy. (2013, July 1). BBC News. https://www.bbc.com/news/world-europe-11216061

Qu, M., Zhang, T., & de Jong, A. (2023). Neo-endogenous revitalization: Enhancing community resilience through art tourism and rural entrepreneurship. Journal of Rural Studies, 97, 105–114. doi.org

Quaye, W., Akon-Yamga, G., Akuffobea-Essilfie, M., & Onumah, J. A. (2024). Technology adoption, competitiveness, and new market access among SMEs in Ghana: What are the limiting factors? African Journal of Science, Technology, Innovation and Development, 16(7), 1023–1037. doi.org

Rana, R. L., Giungato, P., Tarabella, A., & Tricase, C. (2020). Sustainability of global value chains: Evidence from the Italian agrifood system. Sustainability, 12(7), 2781. doi.org

Reardon, T., Echeverria, R., Berdegué, J., Minten, B., Liverpool-Tasie, L. S. O., Tschirley, D., & Zilberman, D. (2019). Rapid transformation of food systems in developing regions: Highlighting the role of agricultural research and innovations. Agricultural Systems, 172, 47–59. doi.org

Reardon, T., Liverpool-Tasie, L. S. O., & Minten, B. (2021). The SMEs' quiet revolution in the "hidden middle" of agrifood value chains in developing regions. Global Food Security, 28, 100457. doi.org

Regulation (EU) No 1307/2013 of the European Parliament and of the Council of 17 December 2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy and repealing Council Regulation (EC) No 637/2008 and Council Regulation (EC) No 73/2009. (2013). Official Journal of the European Union, L 347, 608–670. data.europa.eu

Reimer, B., & Tachikawa, M. (2008). Capacity and social capital in rural communities. In P. Apedaile & N. Tsuboi (Eds.), Revitalization: Fate and choice (Chapter 6). Rural Development Institute. Brandon University RDI

Reimer, B. (2002, May 29–June 1). Understanding social capital: Its nature and manifestations in rural Canada [Paper presentation]. Canadian Sociology and Anthropology Association (CSAA) Annual Conference, Toronto, ON, Canada. http://nre.concordia.ca

Riganti, A. (Ed.). (1991). Enciclopedia universale Garzanti [Garzanti universal encyclopedia] (New updated and expanded ed.). Garzanti.

Rossi, R. (2019, November). The EU poultry meat and egg sector: Main features, challenges and prospects (PE 644.195). European Parliamentary Research Service. www.europarl.europa.eu

Rossi, R. (2022, September). Small farms' role in the EU food system (PE 733.601). European Parliamentary Research Service. www.europarl.europa.eu

Ryan, M. (2023). Labour and skills shortages in the agro-food sector (OECD Food, Agriculture and Fisheries Paper No. 189). OECD Publishing. doi.org

Sallah, C. A., & Caesar, L. D. (2020). Intangible resources and the growth of women businesses: Empirical evidence from an emerging market economy. Journal of Entrepreneurship in Emerging Economies, 12(3), 329–355. doi.org

Saunders, M., Lewis, P., & Thornhill, A. (2019). Research methods for business students (8th ed.). Pearson Education.

Sasu, D. D. (2024, June 20). Employment in Ghana. Statista. Retrieved March 1, 2026, from www.statista.com

Sasu, D. D. (2025, April 14). Annual contributions of livestock to the GDP in Ghana from 2017 to 2024. Statista. https://www.statista.com/statistics/1272321/annual-contributions-of-livestock-to-gdp-in-ghana/

Satterthwaite, D., & Mitlin, D. (2014). Reducing urban poverty in the global south. Routledge.

Sardone, R., Solazzo, G., & Vanni, F. (2025). Where is Italian agriculture heading? A discussion in light of the prospects for the future CAP.

Sauchyn, D., Diaz, H., & Kulshreshtha, S. (Eds.). (2010). The new normal: The Canadian Prairies in a changing climate. CPRC Press.

Schejtman, A., & Berdegué, J. A. (2004). Rural territorial development (Working Paper No. 4). RIMISP – Latin American Center for Rural Development. www.rimisp.org

Schuh, B., Gaugitsch, P., Munch, A., Brkanovic, S., & Delponte, L. (2019). Research for AGRI Committee: The EU farming employment – current challenges and future prospects. European Parliament, Policy Department for Structural and Cohesion Policies.

Seo, J. (2005). Overcoming economic hardship: The effects of human capital and social capital (Publication No. 3176412) [Doctoral dissertation, The Ohio State University]. ProQuest Dissertations and Theses Global.

Seung-Yong, K. (2012). Linkages between agriculture and food industry, and food processing by farmers in Korea. Journal of Rural Development, 35(2), 79–102. KREI Repository

Sgroi, F. (2022). Cooperation and innovation in Italian agribusiness between theoretical analysis and empirical evidence. Journal of Agriculture and Food Research, 10, Article 100406. https://doi.org/10.1016/j.jafr.2022.100406

Shroff, J. (2022, September 20). Why smallholder farmers are central to new food security interventions. World Economic Forum. www.weforum.org

Sicilia Agricoltura. (2022, April 28). Per il settore avicolo italiano crescono i consumi, meglio se da allevamenti sostenibili e certificati bio. www.siciliaagricoltura.it

Songsore, J. (2003). Regional development in Ghana: The theory and the reality. Woeli Publishing Services.

Soressi, M. (2025, April 23). Italy produces 12.5 billion eggs a year: +10% consumption at Easter. Il Sole 24 Ore. https://en.ilsole24ore.com/art/italy-produces-125-billion-eggs-per-year-10-per-cent-easter-consumption-AHhaKdL

Statista. (2024). Unemployment rate in Ghana 2023. https://www.statista.com/statistics/808481/unemployment-rate-in-ghana/

Statista. (2025). Ghana: Share of economic sectors in the gross domestic product (GDP) 2023. https://www.statista.com/statistics/447524/share-of-economic-sectors-in-the-gdp-in-ghana/

Statistics Canada. (2024, May 22). Canadians are facing higher levels of food insecurity. www.statcan.gc.ca

Statistics Canada. (2025, May 1). Canadian Income Survey, 2023. www150.statcan.gc.ca

Stephen, S. (2023, June 7). Expert tips and trends for Canadian agriculture and food. Export Development Canada. https://www.edc.ca/en/article/export-tips-trends-canadian-agriculture-food

Stewart, K. J., McCutcheon, J. R., & McLachlan, S. M. (2023). Climate change perceptions and associated characteristics in Canadian Prairie agricultural producers. Challenges, 14(4), 54. https://doi.org/10.3390/challe14040054

Stock, J. H., & Watson, M. W. (2020). Introduction to econometrics (4th global ed.). Pearson.

Sumberg, J., Awo, M., & Kwadzo, G. T. M. (2017). Poultry and policy in Ghana: Lessons from the periphery of an agricultural policy system. Development Policy Review, 35(3), 419–438. doi.org

Tanko, M., Ismaila, S., & Sadiq, S. A. (2019). Planting for Food and Jobs (PFJ): A panacea for productivity and welfare of rice farmers in Northern Ghana. Cogent Economics & Finance, 7(1), 1693683. doi.org

Taremwa, J. K., Mulyungi, P., & Ndikubwimana, P. (2023). Impact of contract farming on the income of smallholder dairy farmers from Nyagatare District in the Eastern Province of Rwanda. African Journal of Food, Agriculture, Nutrition and Development, 23(5), 23419–23434. doi.org

TechnoServe. (2017). Solutions for African Food Enterprises (SAFE): Final report. https://www.technoserve.org/wp-content/uploads/2018/04/solutions-for-african-food-enterprises-final-report.pdf

Tekuni, N., Kyere, G. H., Anang, S. A., & Mensah, N. O. (2021). Robustness of food security and policy trust on smallholder participation in Ghana's Planting for Food and Jobs programme. African Journal of Agricultural Research, 17(12), 1517–1523. doi.org

Teye, E. S., & Quarshie, P. T. (2021). Impact of agricultural finance on technology adoption, agricultural productivity, and rural household economic wellbeing in Ghana: A case study of rice farmers in Shai-Osudoku District. South African Geographical Journal, 104(2), 231–250. https://doi.org/10.1080/03736245.2021.1962395

Tiepoh, M. G., & Reimer, B. (2004). Social capital, information flows, and income creation in rural Canada: A cross-community analysis. The Journal of Socio-Economics, 33(4), 427–448. doi.org

Tilli, E., Maioli, R., Di Giuseppe, A., & Cito, F. (2024). Supporting measures to improve biosecurity within Italian poultry production. Animals, 14(12), 1734. https://doi.org/10.3390/ani14121734

Tilman, D., Reich, P. B., Knops, J., Wedin, D., Mielke, T., & Lehman, C. (2001). Diversity and productivity in a long-term grassland experiment. Science, 294(5543), 843–845. doi.org

Timmer, C. P. (2005). Agriculture and pro-poor growth: An Asian perspective (Working Paper No. 63). Center for Global Development. CGD Publications.

Trade Commissioner Service. (2025). Canada's free trade agreements. Government of Canada. https://www.tradecommissioner.gc.ca/en/market-industry-info/free-trade-agreements.html

Trading Economics. (2025, March 3). Canada unemployment rate. tradingeconomics.com

TrendEconomy. (2025). Ghana: Birds' eggs, in shell, fresh, preserved or cooked (HS 0407) — Annual import and export statistics. trendeconomy.com

Turner, K., Pelletier, N., & Ibarburu, M. (2022). Life cycle assessment of contemporary Canadian egg production systems during the transition from conventional cage to alternative housing systems: Update and analysis of trends and conditions. Resources, Conservation and Recycling, 176, 105907. doi.org

U.S. Department of Agriculture (USDA). (2022). Poultry voluntary report: Ghana (GAIN Report No. GH2021-0010). Foreign Agricultural Service. fas.usda.gov

UN Ghana. (2021). Economic transformation analysis (Common Country Analysis [CCA] Thematic Brief, p. 52). United Nations. ghana.un.org

UNDP. (2009). Capacity development: A UNDP primer. United Nations Development Programme. www.undp.org

UNCTAD. (2021, May 10). Global trade's recovery from the COVID-19 pandemic [Chart]. unctad.org

UNICEF. (2022, April 22). At least 10 million children face severe drought in the Horn of Africa [Press release]. www.unicef.org

United Nations Industrial Development Organization (UNIDO). (2024). Agribusiness infrastructure for the attraction of the private sector. United Nations Industrial Development Organization. https://www.unido.org/world-without-hunger-conference/day-1/development-strategic-infrastructure-agribusiness-development

USDA. (2024, January). Ghana poultry voluntary update 2024 (GAIN Report No. GH2024-0001). Foreign Agricultural Service. apps.fas.usda.gov

USDA. (2025, February). Canada trade and FDI. Economic Research Service. https://www.ers.usda.gov/topics/international-markets-us-trade/countries-regions/usmca-canada-mexico/canada-trade-fdi

Ussif, R., Mohammed, J., & Sirin, U. A.-A. (2024). The effect of fuel prices on agri-food sector output in Ghana. Cogent Economics & Finance, 12(1), Article 2421886. Taylor & Francis Online.

Van Campenhout, B., Minten, B., & Swinnen, J. (2021). Leading the way: Foreign direct investment and value chain upgrading in Uganda. Agricultural Economics, 52(4), 1–25. doi.org

van Manen, B., van der Meer, P., & van Geijn, B. (2018, November). Critical capital for African agri-food SMEs. ICCO Cooperation. www.icco-cooperation.org

Vodden, K., & Cunsolo, A. (2021). Rural and remote communities. In F. J. Warren & N. Lulham (Eds.), Canada in a changing climate: National issues report (Chapter 3). Government of Canada. changingclimate.ca

Vodden, K., & Cunsolo, A. (2025). Recognizing prior learning (RPL) in the context of rural community development in Canada. Journal of Public Learning and Assessment, 13

Weaver, R. D., & Habibov, N. (2012). Social capital, human capital, and economic well-being in the knowledge economy: Results from Canada's General Social Survey. The Journal of Sociology & Social Welfare, 39(2), 53–74. scholarworks.wmich.edu

World Bank. (2005). Doing business in 2006: Creating jobs. openknowledge.worldbank.org

World Bank. (2017). Ghana: Agriculture sector policy note—Transforming agriculture for economic growth, job creation and food security (Report No. AUS15904). openknowledge.worldbank.org

World Bank. (2019). Future of food: Harnessing digital technologies to improve food system outcomes. openknowledge.worldbank.org

World Bank. (2020). World Development Report 2020: Trading for development in the age of global value chains. doi.org

Wooldridge, J. M. (2016). Introductory econometrics: A modern approach (6th ed.). Cengage Learning.

Wu, L., Wang, Y., & Li, Z. (2020). Successor selection in family business using theory of planned behaviour and cognitive dimension of social capital theory: Evidence from Ghana. Journal of Small Business and Enterprise Development, 27(6), 905–926. doi.org

Wudil, A. H., Usman, M., Rosak-Szyrocka, J., Pilař, L., & Boye, M. (2022). Reversing years for global food security: A review of the food security situation in Sub-Saharan Africa (SSA). International Journal of Environmental Research and Public Health, 19(22), 14836. doi.org

Xie, J. Z., & Wang, W. T. (2016). Social structure change, social capital transition, and income inequality in rural China. China Soft Science, 10, 20–36.

Yakimova, L., & Streltsova, A. (2020). Human capital as a fundamental determinant of rural development. IOP Conference Series: Earth and Environmental Science, 548(2), 022037. doi.org

Yanyan, G., Wang, L., & Chen, H. (2024). The impact of human capital and social capital on entrepreneurship entry: The threshold of human capital–social capital coupling. Humanities and Social Sciences Communications, 11, 1626. doi.org

Yaro, J. A., Teye, J. K., & Torvikey, G. D. (2018). Historical context of agricultural commercialization in Ghana: Changes in land and labour relations. Journal of Asian and African Studies, 53(1), 49–63. doi.org

Yevu, M., & Ebo Onumah, E. E. (2021). Profit efficiency of layer production in Ghana. Sustainable Futures, 3, 100057. https://doi.org/10.1016/j.sftr.2021.100057

Yin, R. K. (2018). Case study research and applications: Design and methods (6th ed.). SAGE Publications.

Yusuf, S. A. (2008). Social capital and household welfare in Kwara State, Nigeria. Journal of Human Ecology, 23(3), 219–229. doi.org

Zadawa, A. N., & Omran, A. (2020). Rural development in Africa: Challenges and opportunities. In A. Omran & O. Schwarz-Herion (Eds.), Sustaining our environment for a better future (pp. 11–28). Springer. doi.org

Zahrnt, V. (2009). Public money for public goods: Winners and losers from CAP reform (ECIPE Working Paper No. 08/2009). European Centre for International Political Economy. https://doi.org/10.22004/ag.econ.51300

Zamani, O., Giduthuri, K., & Bawa, A. (2025). Aligning policy for success in developing countries: Evidence from the poultry sector of Ghana. Agricultural and Food Economics, 13, 5. https://doi.org/10.1186/s40100-025-00348-8

Zarbà, C., Hamam, M., Burniece, G., & Pappalardo, G. (2022). Supporting agri-food SMEs in Italy in the post-COVID-19 context: From Horizon 2020 to Horizon Europe. Sustainability, 14(13), 7615. https://doi.org/10.3390/su14137615

Zepeda, L. (2001). Agricultural investment, production capacity, and productivity (FAO Economic and Social Development Paper No. 148). Food and Agriculture Organization of the United Nations.

Zhou, Y., & Liu, X. J. (2017). Cognitive abilities and family entrepreneurship: An empirical analysis based on China Household Tracking Survey (CFPS) data. Journal of Economic Perspectives, 2(6), 66–75.

APPENDIX 1 – Consent Form and Questionnaire

Rural Capacity Building and its role in supporting the integration and competitiveness of Agrifood chains. A comparative analysis of three case studies: Italy, Canada, and Ghana.

Consent Form and Questionnaire for Egg producers, Traders, and Food Service Providers

☐ I agree to participate voluntarily and understand I may skip any question or withdraw at any time without consequence.

Introduction

This questionnaire collects information to assess training needs, institutional support, and capacity-building opportunities across Ghana's egg value chain. The findings will inform strategies to enhance skills, foster collaboration, boost producers' competitiveness, and support organizations. The estimated time to complete this questionnaire is approximately 20–30 minutes.

Consent to Participate

By completing this questionnaire, you agree to voluntarily participate in this research project, which examines capacity building and competitiveness in Ghana's egg sector. Participation is voluntary, and you can choose not to answer any question or withdraw at any time without any consequences.

Confidentiality

Information collected through this questionnaire will be kept strictly confidential and used only for research purposes. Responses will be analyzed and reported in aggregate form, and no organization, producer, or individual will be identified by name in any publication, report, or presentation. Only the lead researcher will have access to the raw data.

(Egg producers, Traders and Food Service Providers)

Information about Respondent & Company

1. Have you registered your business? Yes ( ) No ( )
2. Legal form: *(indicate x where it applies)*
   a. Sole Proprietorship b. Partnerships c. Corporations d. Limited Liability Company
3. Year of incorporation:
4. Business Location (City and Country):

Demographics

5. Name of Manager/Owner: Sex (Manager/Owner): M / F
6. Educational Level *(indicate x where it applies)*

1. Primary education 2. Secondary Education 3. Technical Training
4. College degree 5. Postgraduate

7. Did the Manager/Owner have any related previous experience in egg production? Yes / No

8. Number of years of experience in the field.

9. Total number of Employees. ……..…of which Male……. of which female …….

10. How many employees, 5 years ago? .....

11. Presence of Employee Training Program (e.g., Technical or Managerial or both) during the last 5 years: Yes / No

If yes, how many times in a year do employees receive this training?.....

12. What incentive benefits do you offer employees? *(indicate x where it applies)*

13. health insurance b. free breakfast/lunch c. overtime compensation

14. Does the business hire an External Consultant? Yes / No

15. Is this business your main source of income or a secondary source of income?

a. Main income b. Secondary income (choose one)

Business Operations (Poultry farmer)

16. What type of housing system is used (e.g., caged, free-range, deep litter)?.....

17. How do you store eggs to maintain quality? ☐ No special method ☐ Refrigeration ☐ Other (specify)

18. What is the average mortality rate of the flock in the last 6months? ……

19. Do they have access to veterinary services? Yes No

20. Do you use biosecurity measures to prevent diseases?

a. Never b. Sometimes c. Always

21. How often do you do Animal welfare checks (Basic needs (feed, water, shelter, etc), Health and Veterinary Care, Housing needs (space, ventilation, lighting systems, etc.), Handling (pains/stress)

a. Always b. Often c. sometimes d. Rarely

(TRADERS)

22. How do you transport eggs to minimize breakage?
☐ No special method ☐ Use of cartons ☐ Refrigerated transport

(**Food service Providers)**

23. Where do you buy the eggs from? A. Directly from the farm B. Directly from a trader

ALL

24. How do you store eggs to maintain quality? ☐ No special method ☐ Refrigeration ☐ Other (specify)

FOOD SECURITY

ALL

25. Are you able to operate all year round? Yes / No
If No, explain
……..……
……

26. How many eggs per day/week go to waste because of operational activities?
…….

(TRADERS & FOOD SERVICE PROVIDERS)

27. How do you ensure the eggs you buy from farmers meet quality standards?
☐ No checks ☐ Visual check ☐ Other (specify)

(FOOD SERVICE PROVIDERS)

28. Do you check eggs for quality and freshness before use? ☐ YES ☐ NO

Compliance and Regulation- ALL

29. Are you aware of any food safety regulations for egg production? ☐ YES ☐ NO

30. Have you ever participated in any certification process? ☐ YES ☐ NO

31. Do you have any food safety certificates? ☐ YES ☐ NO

Technology & Innovation - ALL

32. Are you able to use Information and Communication Technology (ICT) in your business activities?
☐ YES ☐ NO

33. Have you adopted any new technology/equipment to enhance your business? ☐ YES ☐ NO

Government Support - ALL

34. Do you receive support from the government to improve your business operations?
☐ YES ☐ NO

35. Are you enrolled in any government policy programs (e.g Nkoko Nkitikitin or business support programs) ? ☐ YES ☐ NO

Finance - ALL

44. What was the source of your start-up capital?
a. Bank ……. b. Cooperatives ……. c. Private lender ……. d. Family/Friends ……. e. Government support loans …… f. NGO support loans …….

46. Would you say your business has grown/improved in terms of Sales Revenue? Yes / No
46.b.- If it has increased in the last 5 years, please explain how……
……
…….

47. Do you have access to any credit facility? Yes / No

48. If yes, from which source do you access this credit? You may indicate (x) where it applies.

a. Bank ……. b. Cooperatives ……. c. Private lender ……. d. Family/Friends ……. e. Government support loans …… f. NGO support loans ……

49. How do you use this credit facility? You may indicate (x) where it applies.

a. Marketing services b. Buy modern technologies/ equipment/ machinery.

c. Others (specify) ……...

If you are not able to access credit, could you explain the constraints involved in accessing credit?…… …… ……

Marketing Operations

Egg Producers

50. How many birds did you start with?

51. How many birds do you have now?

53. How many of the total eggs are produced in a month?

54. How many crates are sold to a. Traders……. Institution ……Individuals

Traders & food services

55. How many crates of eggs did you start with?

56. How many crates of eggs do you manage?

57. How often do you review your egg suppliers to ensure quality and price competitiveness?

a. Never b. Occasionally c. Regularly

ALL

58. How do you determine prices for your eggs? a. Fixed Price b. market price c. other specify

59. How many eggs do we have in a crate?

60. Are you aware of local market demand trends? Yes / No

61. Would you admit that your business has grown in terms of sales revenue? Yes / No

62. On average, what is your annual sales Revenue for the past 5 years? …….

Social Capital (Community Engagement)

63. Number of times participating (and/or Sponsoring) in cultural and religious events……

64. (Collaboration): No of Suppliers……. No. of Membership Associations ……..

Human Capital

65. Skills and Knowledge assessment- **ALL**

Initial (1) – Intermediate (2) – Advanced (3)

Poultry Husbandry Management (PHM): Understanding the specific needs of laying hens, including their housing, feeding, and environmental requirements	1. Carry out activities under full supervision 2. Carry out activities under partial supervision 3. Able to carry out activities without	Write No. here
Egg Collection and Proper handling techniques (EC): Proper techniques for collecting eggs to ensure they are clean, undamaged, and fresh	Number of damaged eggs due to poor techniques in handling.	Write No. here

Poultry Health Management:(PHM-2) Identifying signs of illness or distress in birds, and knowing how to respond appropriately.	1. Hardly identify signs of illness or distress 2. Able to identify but cannot respond appropriately. 3. Able to identify and respond appropriately	Write No. here
Record Keeping (RK): Maintaining accurate records of egg production, feed consumption, and bird health Key areas	1. Number of eggs produced 2. Feeds/drugs/vaccines 3. Mortality 4. Inventory of birds/stock 5. Income from sales of eggs 6. Expenditure on feeds/ingredients 7. Feed consumption 8. Expenditure on drugs/vaccines 9. Birds' health 10. Number of eggs procured 11. Number of egg losses in transport and storage 12. Sales and Operational costs incurred	Write No. here
Record Keeping levels (RKL)	1. Any three (3) of the above 2. Any six (6) of the above 3. All the above	Write No. here
Basic Business Management: (BSM) Understanding basic business principles, marketing and sales, risk, and financial management for running a poultry farm.	1. No knowledge of basic business 2. Have some knowledge but require guidance 3. Able to manage and apply basic business principles and financial management.	Write No. here
Communication (Cm) - explain tasks to new employees or guide existing staff. - ability to communicate about problems, gather information, and work towards solutions. - how they handle disagreements	1. Able to carry out any one 1 of the aspects 2. Able to carry out any two of the aspects 3. Able to carry out all three (3) aspects	Write No. here

or conflicts with colleagues. - Regular meetings with the team/Staff		
Leadership (L)	1. Able to plan and undertake tasks and activities under guidance 2. Able to plan, carry out activities to ensure completion of tasks and deliverables as planned, but requires guidance for any adjustments in the plan. 3. Able to plan, direct, and monitor activities to ensure completion of tasks and deliver as planned; able to plan for adjustments without any guidance.	Write No. here

66. **Education & Training Certifications- ALL**

	Credentials	Duration
Formal Education		
Practical Training		
Food Safety and HACCP		
Workshops		
Licensing		
Information and communication technology (ICT)		
Business Management Courses		

67. Could you elaborate on the challenges your business is currently facing? ALL

(*You may indicate (x) where it applies)*

	Very important	Quite important	Not Relevant
Competition from other producers			
Too low a price received from buyers			
Low reliability of input suppliers			
High Cost of Transportation			
Problems with technology, equipment, etc			

Difficult access to the main markets due to a poor road network			
Inadequate capital			
Inadequate access to credit facilities			
Losses due to egg breakage			
High tax			
Others specify			

68. How do you dispose of the waste during production?

……..