# Agriculture in Malta – Can the fruit and vegetable farming community be competitive?

**Joseph Vella**

Master in Public Policy Leadership

Department of Policy, Politics and Governance
Faculty of Economics, Management and Accountancy
University of Malta

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# Agriculture in Malta – Can the fruit and vegetable farming community be competitive?

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Student Name: Joseph Vella

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## Abstract

**Title:** Agriculture in Malta – Can the fruit and vegetable farming community be competitive?

**Purpose:** This study investigates the competitiveness of Malta's fruit and vegetable farming community. It explores whether the sector, facing unique structural and resource-based challenges, can overcome barriers to secure a viable and profitable future.

**Design/Methodology:** A mixed-methods research approach was employed, combining quantitative surveys and qualitative semi-structured interviews with farmers, buyers, and policymakers. This three-dimensional perspective provided triangulation, ensuring data validity and robustness.

**Findings:** Malta's agricultural sector is hindered by fragmented landholdings, an aging workforce, water scarcity, and limited adoption of modern agricultural practices. However, the sector benefits from unique local produce characterised by authenticity, freshness, and quality. The study identifies potential competitiveness drivers, including short supply chains, premium product positioning, and better marketing practices. It also highlights the pivotal role of policies, leadership within farmer organizations, and innovation in driving future competitiveness.

**Conclusions:** Although Malta's agricultural sector currently faces significant barriers, it holds considerable potential for improved competitiveness. By adopting a proactive cluster policy, investing in innovation and modern infrastructure, and enhancing farmers' entrepreneurial and leadership skills, the sector can capitalise on local advantages and EU support. This transformation is essential for sustainable and competitive sector.

**Implications/Value:** The findings provide a roadmap for policymakers, agricultural stakeholders, and the farming community. Recommendations emphasize creating a cluster to integrate stakeholders and focusing on sustainable practices stewardship.



**Keywords:** Agriculture, Competitiveness, Farming Community, Innovation, Cluster Policy, Leadership.

*This study is dedicated to my wife, Anna.*

## Acknowledgements

This dissertation is only possible due to the many people who have been of assistance and helped me in any way, shape, or form throughout the completion of this dissertation.

First and foremost, I would like to express my sincere gratitude to my dissertation supervisor, Dr. Marie Louise Mangion, BCom (Melit), BA Hons (Econ) (Melit), PhD (Nottingham) for her invaluable guidance, support, and encouragement throughout the course of this research.

I also wish to show appreciation to all those who in some way contributed to my study, especially to all the participants who accepted my request for an interview and all those who participated in the surveys. This study would not have been possible without their time, assistance, and valuable insights.

I am deeply thankful to my family for their patience, inspiration, and for always being a reminder of what truly matters.

Finally, I thank God for granting me the strength, clarity, and perseverance to undertake and complete this research.

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## List of Abbreviations

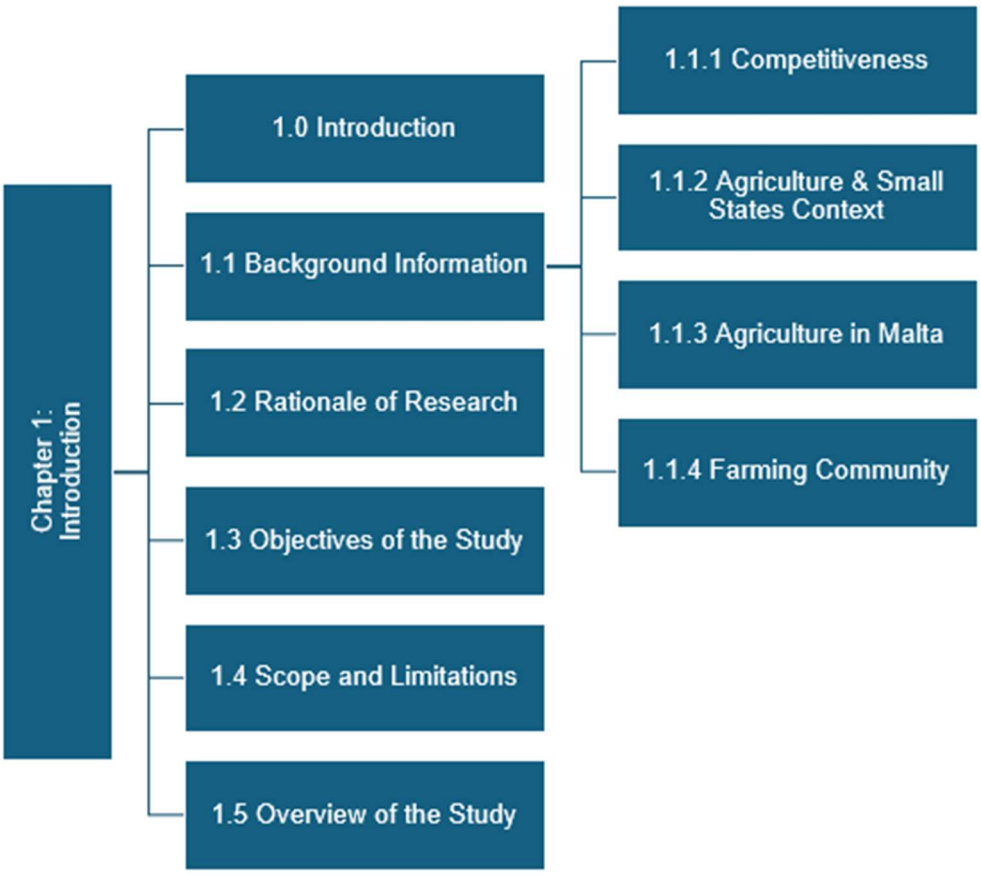
| | |
|---|---|
| Common Agricultural Policy | CAP |
| European Union | EU |
| Farmers Central Cooperative Society | FCCS |
| Food and Agriculture Organisation | FAO |
| Global Competitiveness Index | GCI |
| Gross Domestic Product | GDP |
| Herfindahl-Hirschman Index | HHI |
| Liaison Entre Actions de l'Economier Rurale | LEADER |
| Local Action Groups | LAGs |
| Malta | MLT |
| Malta Food Agency | MFA |
| National Statistics Office | NSO |
| Office of the Prime Minister | OPM |
| Organisation for Economic Cooperation and Development | OECD |
| Pitkalija Market Management System | PMMS |
| Producer Organisations | POs |
| Sales and Marketing Agents | SMA |
| Strengths, Weaknesses, Opportunities, Threats | SWOT |

# Chapter 1 – Introduction

# 1. Introduction

This chapter frames the research presented in this dissertation, providing some background information, the rationale for this research, and an overview of the objectives, scope and limitations of this study.

**Figure 1-1: Overview – Introduction**



## 1.1 Background Information

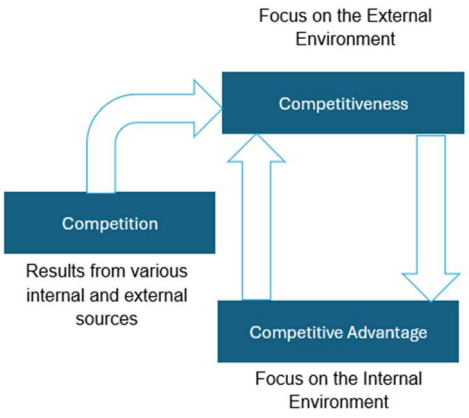
Agriculture is fundamental to human survival and societal stability, ensuring a consistent food supply underpinned by quality and diversity, and positively influencing the environment around us to the betterment of communities. However, agricultural sectors around the world are facing several challenges arising from environmental, economic, and geopolitical factors. The overexploitation of natural resources that are essential to agriculture exacerbates the rate of climate change, biodiversity loss, and crises in soil and water quality. Agricultural sectors are also undergoing structural changes that are driven by technology breakthroughs, intensification, and global supply chain disruptions. These changes raise questions about food sustainability and profitability for farmers.

This dissertation explores the potential for a competitive edge within Malta's agriculture sector and analyses the factors that help or hinder this potential. The study provides a comprehensive theoretical framework to assess the sector's present condition and highlights the potential for improved competitiveness using fieldwork data and secondary data sources. Key findings reveal that Malta's distinctive geographical and cultural characteristics provide significant benefits in terms of taste, freshness and supply chain. Nonetheless, systemic barriers including limited economies of scale, scarce resources, and governmental restrictions have given rise to considerable challenges. The contradictions between agricultural productivity and environmental sustainability call for innovative ideas and policies that reconcile economic viability with environmental management. A healthy Maltese agriculture industry underpinned by these ideals would better contribute to local economic development and strengthen the resilience of the country’s food systems.

## 1.2 Competitiveness

Competitiveness is defined as the ability to effectively compete with other competitors who are pursuing similar objectives. (Nowak & Rozanska-Boczula, 2022). Upon reviewing the ongoing debate surrounding the concept, one finds that it is one of international prominence. Competitiveness and competition, as a business concept, have been around since the advent of international trade. They are the core of a nation's economy (Bhawsar & Chattopadhyay, 2015). Hart and Rodgers (2023) argue that competition, competitiveness, and competitive advantage are closely linked. They explain that competition provides the external context, while an institution's level of competitiveness influences how it responds within that context. Competitive advantage then represents the positive outcomes achieved when an institution implements effective competitive strategies. (Hart & Rodgers, 2023)

**Figure 1-2: Relationship between competition, competitiveness, and competitive advantage.**




**Source: Hart & Rodgers (2023)**

Competition is a concept that is both multilayered and multidisciplinary, with engaging debates in fields such as business management, economics, and the social sciences. These ongoing debates are enriched by the dynamic and evolving process of the concept

itself (Porter, 1990). Competition is seen as a mechanism that regulates market processes and contributes to economic freedom whilst stimulating further competitiveness (Melnyk & Yaskal, 2013). Competition is a fundamental element of the market economy and a driving force behind economic development. It refers to the contest between participants seeking to gain advantages from economic activities. As international business environments continue to evolve and globalization intensifies, the role of competition has become increasingly significant across all sectors of the economy, including the agricultural industry (Nowak & Kaminska, 2016)

(Porter, 1990) argues that the success of a business is ingrained in competition because that competition deepens the business' activities, in turn boosting performance, innovation, and the working culture. Porter affirms that a competitive strategy leads to a leading competitive position in the industry that the business has entered. This enables that business to achieve profitability and sustainability against its competitors. Relatedly, Feurer & Chaharbaghi (1994) argue that competitiveness is relative and not absolute, and is dependent on (i) stakeholders, namely shareholders and customers, as well as (ii) the financial and technical resources that are made available to implement strategic and innovative changes.

In The Wealth of Nations (1776), Adam Smith offers an early account on how competition drives economic systems and determines prices and market efficiency. Smith views competition as a self-regulating mechanism that aligns the market price with the natural price, hence the demand and supply dynamics (Smith, 1776 [2007]).

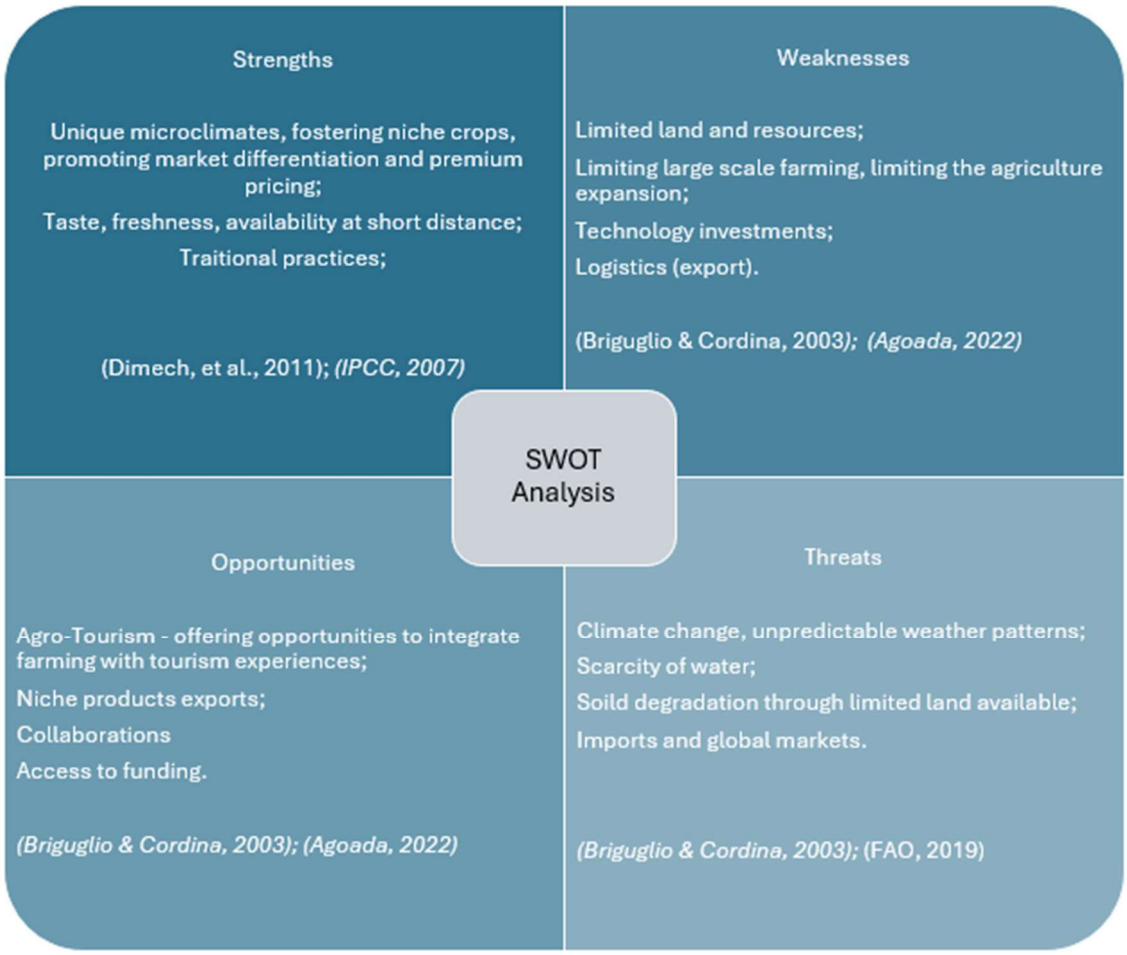
Michael Porter's work, *The Competitive Advantage of Nations* (1990), reinforces the concepts of competition and competitiveness by offering a systemic approach to understanding how nations develop and sustain a competitive advantage in the global economy. The focus is on the synergy between national resources, industry dynamics,

and government policies. Porter's approach to competitiveness takes productivity as the key determinant of a location's sustainable prosperity, distinguishing between 'created' and 'inherited' prosperity, and emphasizing the importance of economy-wide productivity over individual measures. While the approach has faced criticism for its economic focus, because a competitiveness agenda based solely on economic metrics may influence policy towards growth in numbers but not consider the social and environmental aspects, Porter maintains that it can align with broader social and environmental goals (Ketels, 2006). More recently, Laure Latruffe (2010) also spoke of the measurement of competitiveness and productivity. (Latruffe, 2010)

### 1.1.2 Agriculture in the Context of Small States

Small states are normally defined based on their population, geographical area and/or their economic output. Small states are characterised by their unique vulnerabilities. These typically include scarce resources, limited domestic markets and a high dependency on external trade (Briguglio, 1995). The Food and Agriculture Organisation (FAO) confirmed this by stating that limited land, scarcity of water, and climate change create major stumbling blocks even if agriculture is still a contributing factor to the economy of these countries (FAO, 2019). The SWOT analysis (Figure 1-3) demonstrates these findings.

**Figure 1-3: SWOT Analysis of Agriculture**




Source: Own Compilation

### 1.1.3 Agriculture in Malta

The agricultural sectors of nations are vital to the global economy. Agriculture contributes directly to economic growth, amount to approximately 4% of the global gross domestic product (GDP) and up to 25% of the GDP of some developing countries. (World Bank, 2024). There is also a positive correlation between agriculture and employment, poverty reduction, food security, and support to other industries through the economic multiplier effect. It is worth adding that agriculture contributes both positively and negatively to the environmental impact. On the positive side, for instance, agriculture plays a key role in the production of food and the conservation of natural resources (Domagała, 2021).

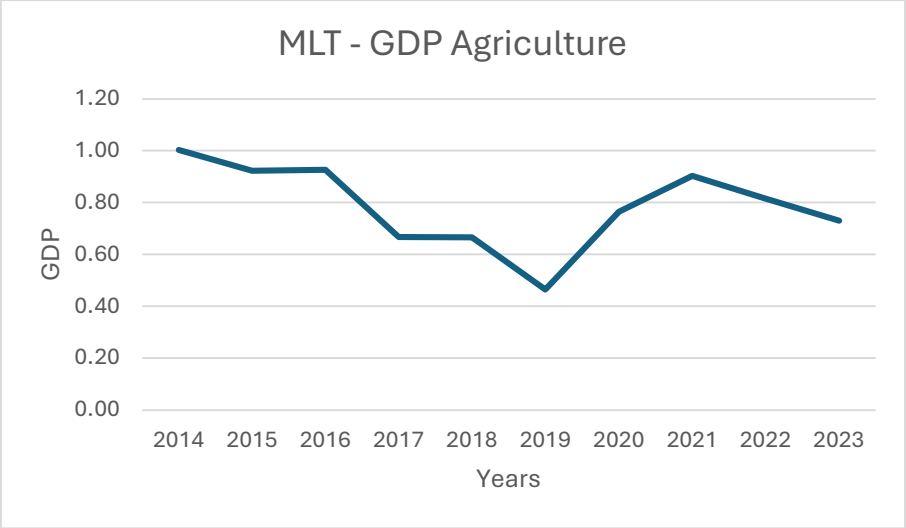
Maltese agriculture faces several structural and contextual challenges that contribute to its current fragile state, thereby justifying the need for targeted and well-informed policy responses (Briguglio & Cordina, 2003). Malta's accession to the European Union (EU) has deepened some of these already existing handicaps. For example, since legislative frameworks cannot be applied to minimise or control imports from other EU Member States, the local farming community is subjected to significant market competition from farmers overseas who are larger, better equipped, and have the required economies of scale (Dimech, et al., 2011), whilst giving wider choice to the consumer.

Despite its handicaps, however, the local agricultural sector has also benefitted from several key opportunities. The way fruits and vegetables are cultivated and sold in Malta completely falls in line with the EU's farm to fork framework because the product can reach the consumer in a considerably short time frame, with its full nutrients and without any preservative chemicals. The local product is also renowned for authenticity, freshness, and taste. (Dimech, et al., 2011). Another benefit is the ability of diversify crop production, which helps to mitigate risks associated with crop failures and market fluctuations (Avertano, et al., 2005). Maltese farming is based on traditional practices including crop rotation, intercropping, and the use of fertilisers that improve soil fertility without the use of chemicals. These local practices result in agricultural produce thought to be high in quality. The Mediterranean climate, which contributes to the taste and nutritional value of Maltese produce, has certainly influenced local farming practices as well (Briguglio & Cordina, 2003).

However, despite the significant positives in the local agricultural sector, its contribution to Malta's GDP is minimal, being < 1% as from 2014 onwards and hitting a low of 0.46% in 2019. Across the EU, agriculture accounted for an average of 1.68% of GDP in 2023, compared to Malta's 0.73% and the global average of 4.12% (World Bank Group, 2025). In economic terms, therefore, Maltese agriculture falls below the EU and global

averages; further justifying the importance of addressing the state of local agricultural competitiveness in this study.

**Figure 1-4: Malta GDP Agriculture**




Source: Based on data retrieved from (World Bank Group, 2025)

### 1.1.4 Farming Community

The fruit and vegetable farming community in Malta is comprised of small-scale family holdings that are integral to the islands' rural landscape and food system. The community is still characterised by:

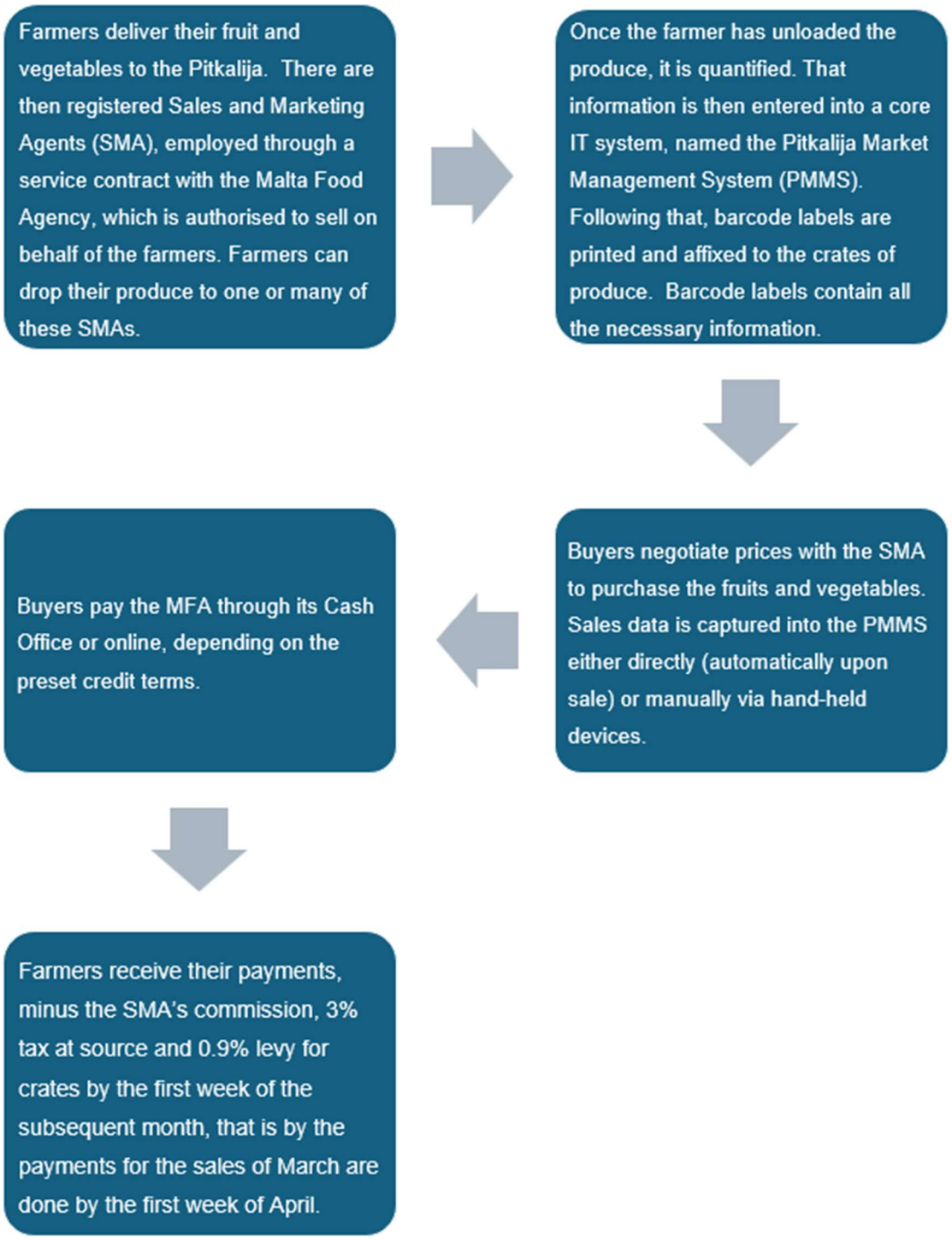
- Ageing demographics, with76% of workers over 45 years of age (NSO, 2022). Indeed, Malta's National Common Agricultural Policy (CAP) Strategic Plan notes that the sector is "dominated by older farmers" (Government of Malta, 2024).

- Fragmented land tenure, with half the utilised land rented from Government estates (NSO, 2022).

Several works in the literature note the importance of physical markets to farming communities around the world. For example, (Russomanno & Jabson Tree, 2021)state the importance of markets both for the farmers and the consumers, due to the sense of inclusion, promotion of healthy food with affordable prices and contributing towards food insecurity. In Malta the main fruit and vegetable markets are the *Pitkalija* and the Farmers' markets.

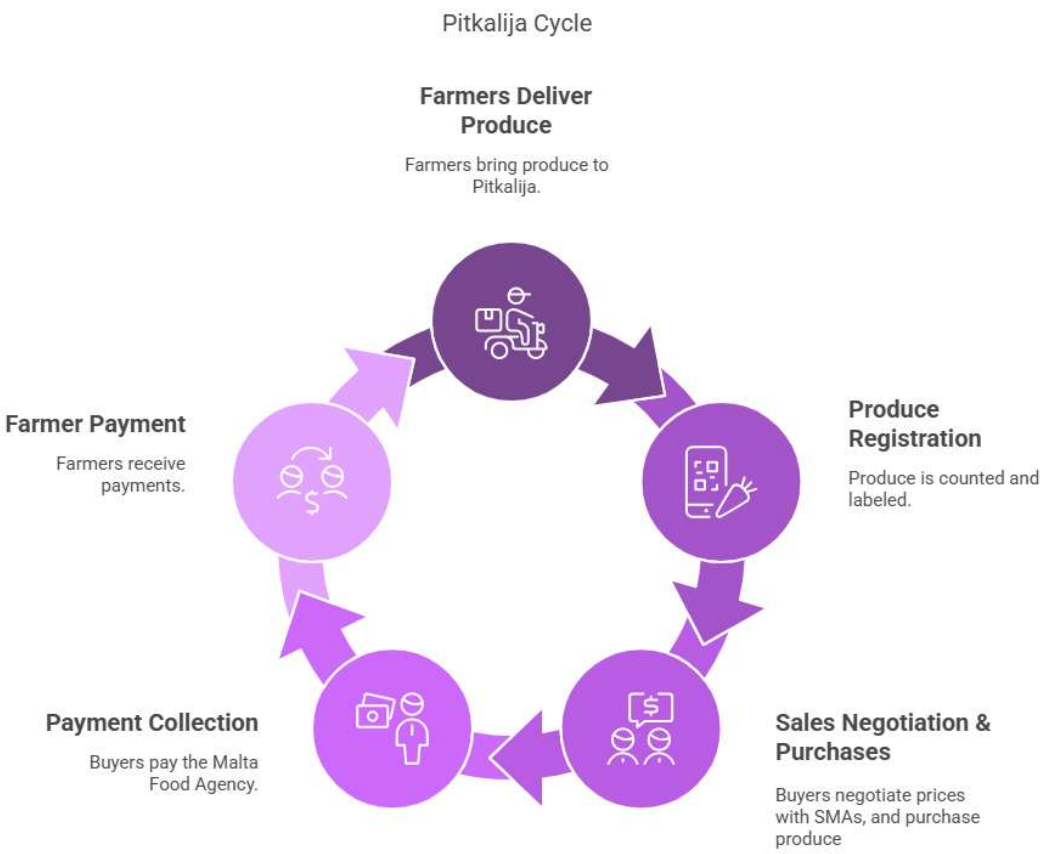
The Ta' Qali Fruit and Vegetables Market, known locally in Maltese as "*il-Pitkalija*", is the farming community's main source of revenue, acting as the island's main hub where farmers bring their produce and buyers converge, aligning local supply with market demand (Vella, 2024). The *Pitkalija* farming community amounts to circa 1,800 farmers. The annual turnover in 2024 exceeded the €28M mark. The number of registered buyers is circa 1,200 (Malta Food Agency internal data). The Pitkalija sales process is as follows:

**Figure 1-5: Pitkalija Flow**




**Source: Own Compilation**

**Figure 1-6: Pitkalija Cycle**




Source: Own Compilation

Another important market to the local farming community are the farmers' markets that were established in 2010, with one located in Ta' Qali and another in Cottonera (Vella, 2024). To date, no data regarding sales has been captured. Thus, whilst these markets are highly popular among consumers, there is no relative data on the sales volumes.

The operator of these fruit and vegetable markets in Malta is the MFA. It was established as a government agency under the *Malta Food Agency (Establishment) Order, 2021* (Legal Notice 7 of 2021), issued in exercise of the Public Administration Act (Cap. 595). Article 2 formally gives birth to the Agency, while Article 3 sets out its "responsibilities",

including that to “implement regulations and Government’s policy in sales and marketing of food from farming and fisheries” (Government of Malta, 2021)

The MFA is governed as follows:

**Figure 1-7: MFA Governance Structure**

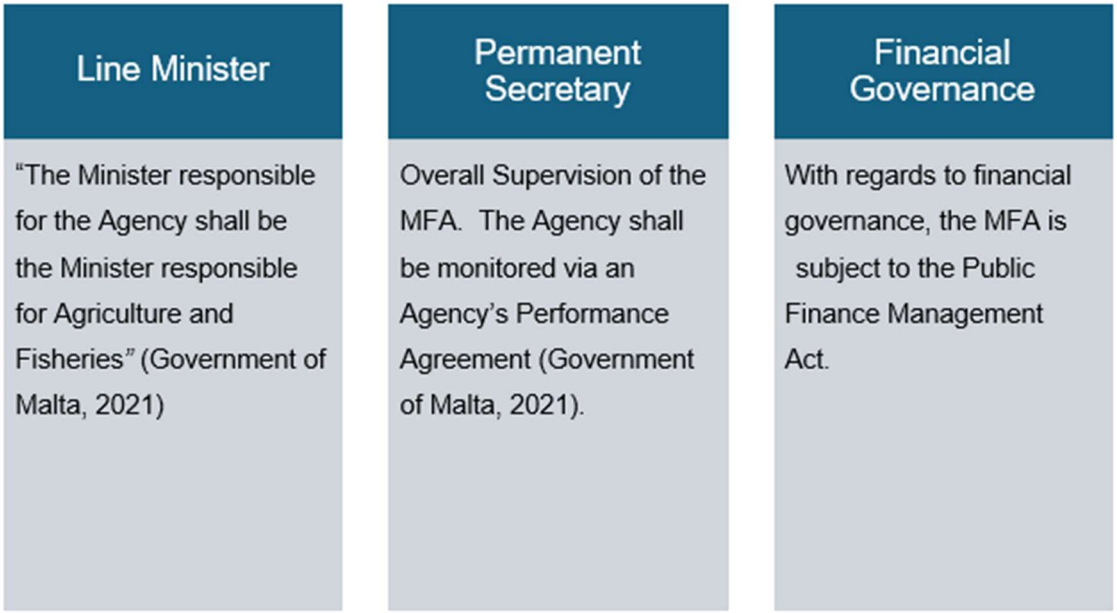



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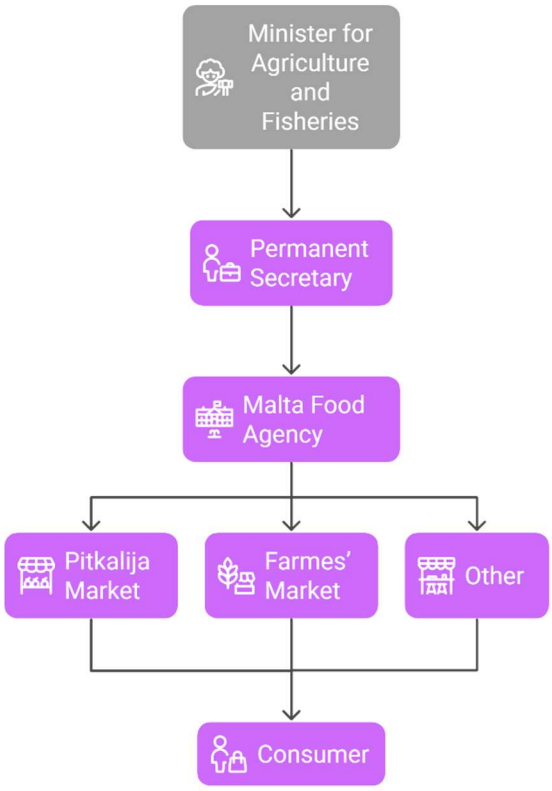
**Figure 1-8: MFA Governance**

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## 1.2 Rationale of the Research

As already noted, this study aims to contribute towards identifying whether the agricultural sector in Malta, namely its fruit and vegetables sector, can be competitive. The local farming community is aging and is generally conservative and adverse to change. It is based on tradition, with farmers who generally do not have the financial means and digital literacy to be equip themselves with machinery that would boost their production (Briguglio & Cordina, 2003). The adoption of innovative technologies and new concepts is still in the infancy in Malta. Few concepts have gone beyond the drawing board. The educational aspect is also lacking, with most farmers having inherited their

skills and knowledge from previous generations in their families, with little exposure to other practices implemented outside the familial circle. The general tendency of the farmer is to treat their work as a vocation rather than a business enterprise. In fact, one of the main issues is the lack of entrepreneurial skills, business strategy, and planning. Despite all this, the local agricultural sector does have significant potential based on proximity, authenticity, and freshness of the produce (Dimech, et al., 2011).

Thus, from an empirical standpoint, this study aims at identifying the potential competitive disruptors, the challenges and the opportunities of the local sector, and determine whether the sector has the potential to be competitive. The study also aims to raise awareness on the farming community in Malta, and their contribution to socio-economic scenarios and is beneficial to those who form part of this community, at all levels, and those who intend to invest in this sector.

## 1.3 Objectives of the Study

The main objectives of this study are depicted as follows:

**Objective 1** **Market Dynamics & Trends**

- To research and analyse the dynamics of the market in relation to agricultural produce. Focus on market trends, shares (local vs foreign produce) and the consumers' needs and what the consumer is buying and why.

**Objective 2** **External Forces & Disruptors**

- Research the external forces that are affecting the local sector, being economic, environmental, political, and educational, including the main disruptors that are affecting the markets.

**Objective 3** **Work Methodology**

- Research the farmers' work methodology, their planning and strategy they may use, leading to the issues and challenges they face.

Through this study, the following research questions shall be analysed.


To achieve the objectives of this dissertation, a convergent mixed-methods design will be employed, comprising separate surveys conducted with farmers and buyers,

alongside semi-structured interviews with key stakeholders. Each data source will be analysed independently and subsequently integrated through a joint display analysis, allowing for a comprehensive and triangulated understanding of the factors influencing the competitiveness of Malta's fruit and vegetable farming community.

In summary, through this research, it is planned that a comprehensive look at the current situation, research on the historical concept, and research on internal and external factors will be conducted which shall serve as a basis to the compilation of possible solutions.

## 1.4 Scope & Limitations

Although Maltese farmers face many of the same issues encountered by farmers from other EU Member States, mainly environment, climate change pandemics, wars etc., the local agricultural sector is unique. Maltese farmers face issues relating to land, whereby most rural land is now being used for construction and urbanisation, (Agius, 1992), fragmented parcels of land, making economies of scale even more difficult to obtain, water scarcity, and a market that is oversaturated with imported produce (Attard & Meli, 2008). The resources are limited, and the competition is fierce. Having said that, local produce has its unique selling points, mainly in the form of taste, freshness, and authenticity.

Having gone through different reports, policies, and articles it was found that few offer implementable policy solutions. Another aspect of the available material is that it is either compiled by scientists or by experts in a specific field. There seems to be a gap between the theoretical and scientific aspects against the practical requirements and difficulties being faced at ground level. This research shall be based on a bottom-up approach

focusing on the challenges being faced by the farmers which shall then be analysed against the external factors, with the intention of presenting a series of recommendations that can be implemented on the ground. The focus is more on the economic aspect rather than social or environmental.

The dissertation conclusions shall be limited to the time (May 2025) until which the research and conclusions shall be compiled.

## 1.5 Overview of the Study

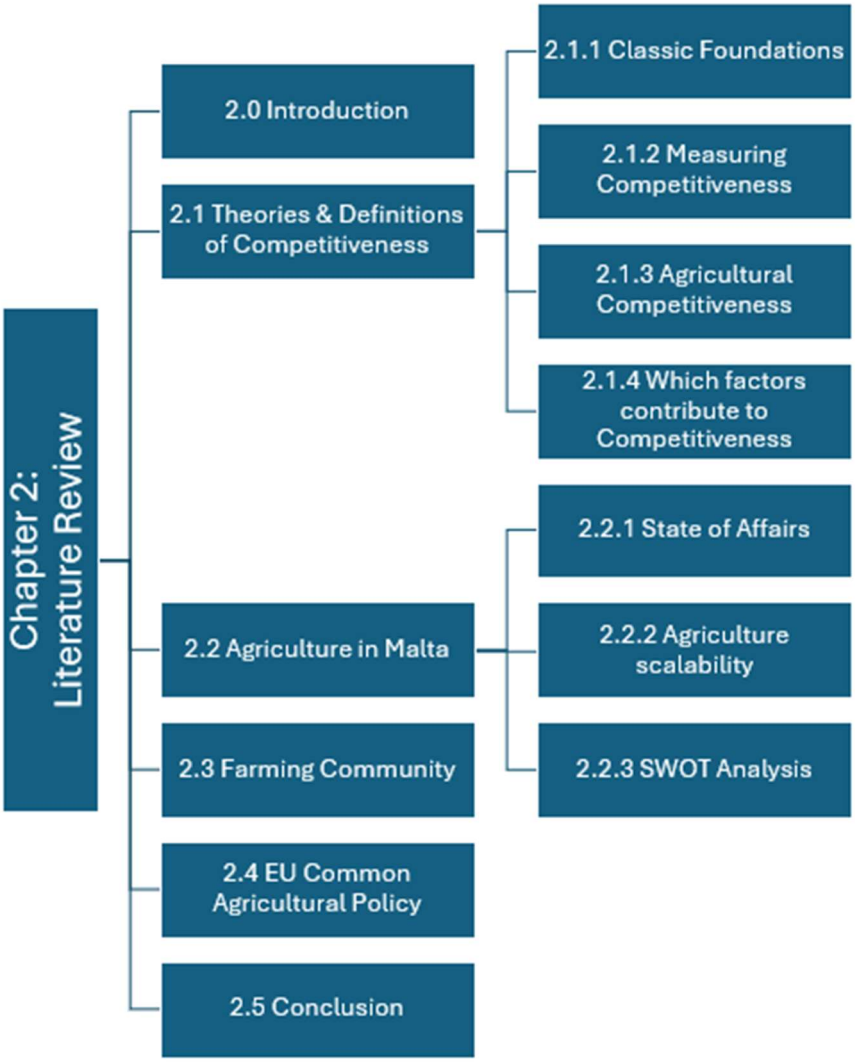
| | | |
|---|---|---|
| **Overview of the Study** | **Chapter 1; Introduction** | Chapter 1 compiles a brief introduction of the research, providing rationale, objectives and possible limitations |
| | **Chapter 2: Literature Review** | Chapter 2 depicts the relevant literature to the study area. |
| | **Chapter 3: Research Methodology** | Chapter 3 provides the methodology of the research, data analysis techniques and any limitations encountered. |
| | **Chapter 4: Research Findings** | Chapter 4 depicts the findings of the research conducted. |
| | **Chapter 5: Discussion** | Chapter 5 is where the findings of the quantitative and qualitative reviews and discussed in line with the literature review. |
| | **Chapter 6: Summary, Conclusion & Recommendations** | Chapter 6 shall focus on the combinations of research, findings and discussions, and shall project any recommendations and areas for further research. |

# Chapter 2 - Literature Review

## 2. Introduction

This chapter, in reviewing the literature, discusses the theory, concepts, and definitions of competition and Competitiveness. The discussion will then go on to define the local agricultural setup and describe the farming community in Malta based on previous works.

**Figure 2-1: Overview - Literature Review**



## 2.1 Theories and Definitions of Competition and Competitiveness

### 2.1.1 Classic Foundations

The basic concept of competition and competitiveness has evolved with distinct contributions from prominent economists and researchers. The following table lists these interlocutors and summarises their core arguments.:

**Table 2-1: Main Interlocutors and core arguments**

| Researcher | Work | Summary |
|---|---|---|
| **Adam Smith** | The Wealth of Nations (1776) | Set the foundation for understanding how competition is a self-regulating force within free markets and constitutes a natural person's pursuit of self-interest. |
| **David Ricardo** | On the Principles of Political Economy and Taxation (1817) | Ricardo's research, particularly that which tackles comparative advantage, improved the comprehension of international competition, highlighting how trade and specialization boost competitiveness and efficiency among nations. |
| **John Stuart Mill** | Principles of Political Economy (1848) | Examined competitive conduct in marketplaces and analysed the impact of competition on price, production, and societal welfare. |

| Researcher | Work | Summary |
|---|---|---|
| **Alfred Marshall** | Principles of Economics (1980) | Formalized ideas about the cost of manufacturing, marginal utility, and demand for goods. Marshall believed that economic equilibrium, which eventually pushes prices toward costs, depends on competition. |
| **Joseph Schumpeter** | Concept of "Creative Destruction" (1942) | Posited that competition stimulates economic growth and dynamic competitiveness by forcing businesses to constantly improve their goods and production methods. |
| **Michael Porter** | Competitive Advantage (1985) | Lays out definitions of competitiveness at the firm that have had a significant influence on the contemporary literature and practice of business strategic planning. Strategic positioning, cost leadership, and product differentiation are the main pillars of his beliefs on how nations and businesses gain a competitive edge. |
| **Paul Krugman** | New Trade Theory | Outlines the importance of economies of scale, networking, and strategic policies to achieve international competitiveness. |
| **Christian Ketels** | Competitiveness and Clusters: Implications for a new European | Instrumental in advancing the understanding of how clusters and regional strategies can contribute to national level and global level competitiveness. |

Source: Dr. Marie-Louise Mangion Lecture Notes & Own Research.

These researchers and authors together with others like Edward Chamberlin, Joan Robinson, Philip Kotler, and John Van Reenen have all contributed to our present understanding of competition and competitiveness.

In *The Wealth of Nations*, Smith describes competition as a key economic force that balances price and improves market efficiency. He explains the difference between the natural price—based on production costs such as wages, rent, and profit—and the market price, which fluctuates with supply and demand. When demand exceeds supply, prices rise; when supply exceeds demand, they fall. Smith also introduces the idea of "effectual demand," referring to buyers who can afford the natural price. He criticises monopolies and trade restrictions, arguing they distort competition, reduce efficiency, and raise prices, while healthy competition drives innovation, fair pricing, and economic progress.

Smith covered several other important themes besides trade. Smith consistently noted that ordinary people can successfully manage their own interests if they are not burdened by the kind of obligations that governments tend to impose on the masses to benefit elites (Boudreaux, 2020).This why Smith writes about "*the obvious and simple system of natural liberty*" (Smith, 1776 [2007], p. 533) .

The concept of competitiveness has been further shaped by David Ricardo's theories of comparative advantage and income distribution, emphasising the value of specialization and free trade (Ricardo, 1817). Ricardo's comparative advantage theory, presented in *Principles of Political Economy and Taxation*, states that countries benefit from specializing in goods that can be produced more efficiently than others, with international trade maximizing a country's productivity and economic competitiveness. Ricardo also illustrates his rule of diminishing returns for land and labour, illustrating how competition for finite resources affects production costs and income distribution. This showed how

resource demand raises prices, affecting salaries, profits, and economic growth (Bochenek, 2017).

Another work of relevance is Ricardo's essay on grain pricing, in which he explores economic implications of Britain's grain laws. He claimed that maize tariffs raised domestic food prices, which in turn raised wage demands as workers fought to maintain their purchasing power. Higher salaries diminish industrialists' profit margins, which Ricardo believed to have hurt the country's competitiveness. He found that free maize trade would lower manufacturing costs, boost efficiency, and boost Britain's industrial competitiveness by reducing wage pressures (de Vivo G., 2015).

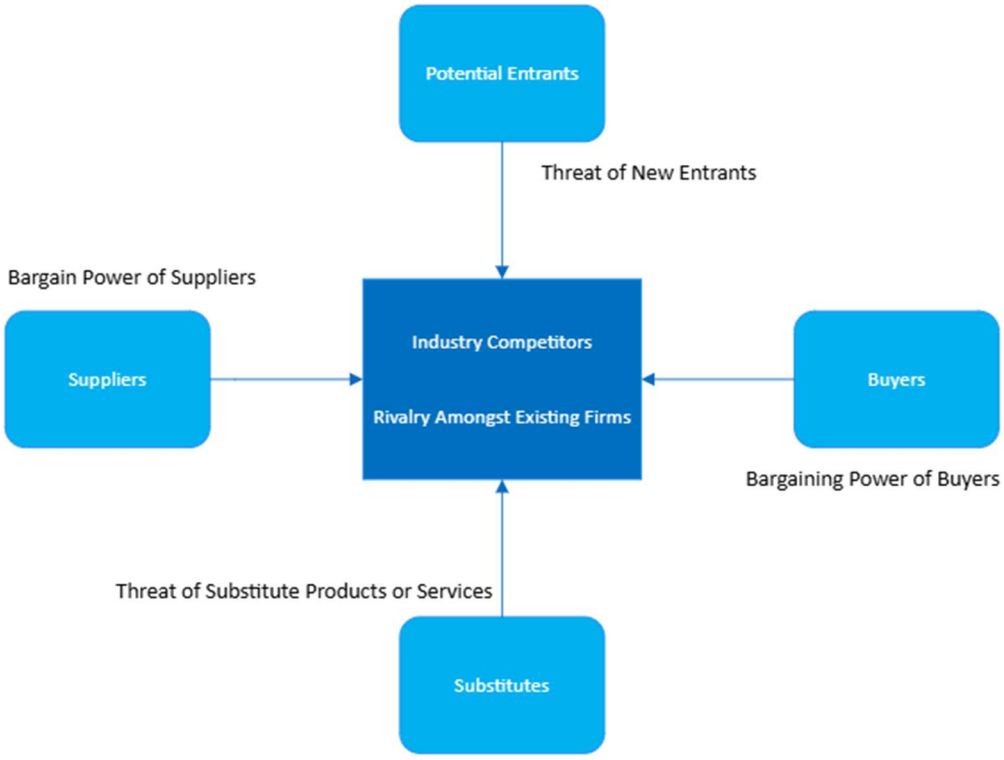
Michael Porter has also made significant contributions to the debate on competition and competitiveness, focusing on models to achieve competitive strategy, an industry analysis and a definition of the sources of competitive advance. The set models and framework act as pillars depicting how companies and nations can achieve and sustain a competitive advantage. Porter's Five Forces Model, introduced in Competitive Strategy (1980), changed the approach to industry analysis by identifying five key forces that shape competition:

1. New entrants to the market.
2. Bargaining power with suppliers.
3. Bargaining power of buyers.
4. The use of substitute products.
5. Competitors' rivalry.

As an example, Porter (1980) argues that already established companies in a market enjoy a competitive advantage when the barriers to enter that same market are high. He

also argues that if the bargaining power of the suppliers and/or the buyers is high then the profit margins of the companies are minimised (Porter, 1998).

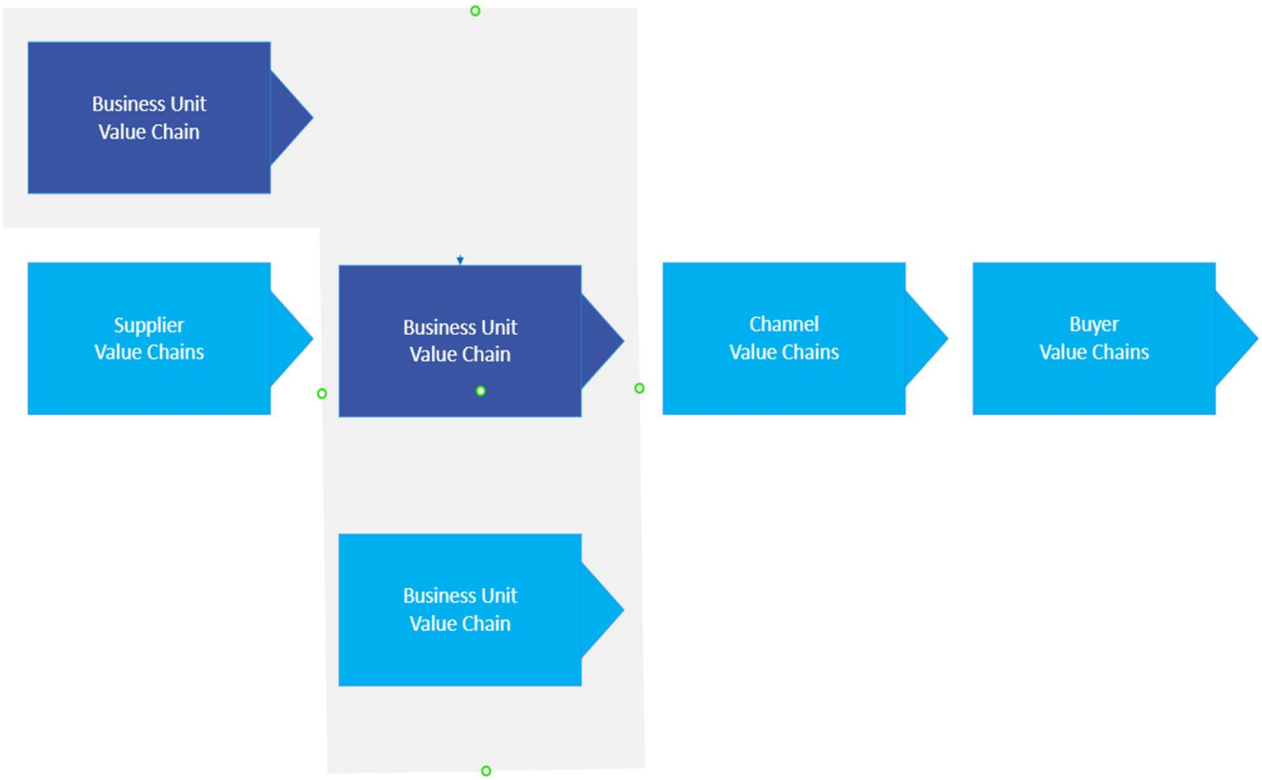
**Figure 2-2: Five Key Forces Diagram**




Source: (Porter, 1998, p. 4)

Porter (1985) introduced the value chain model, dividing business activities into primary and support functions to identify where value is added and costs can be reduced. He argues that firms gain a competitive advantage by lowering costs or offering unique products. Efficient operations, therefore, allow greater focus on creating value for customers (Porter, 2004).

**Figure 2-3: The Value System**




Source: (Porter, 2004, p. 35)

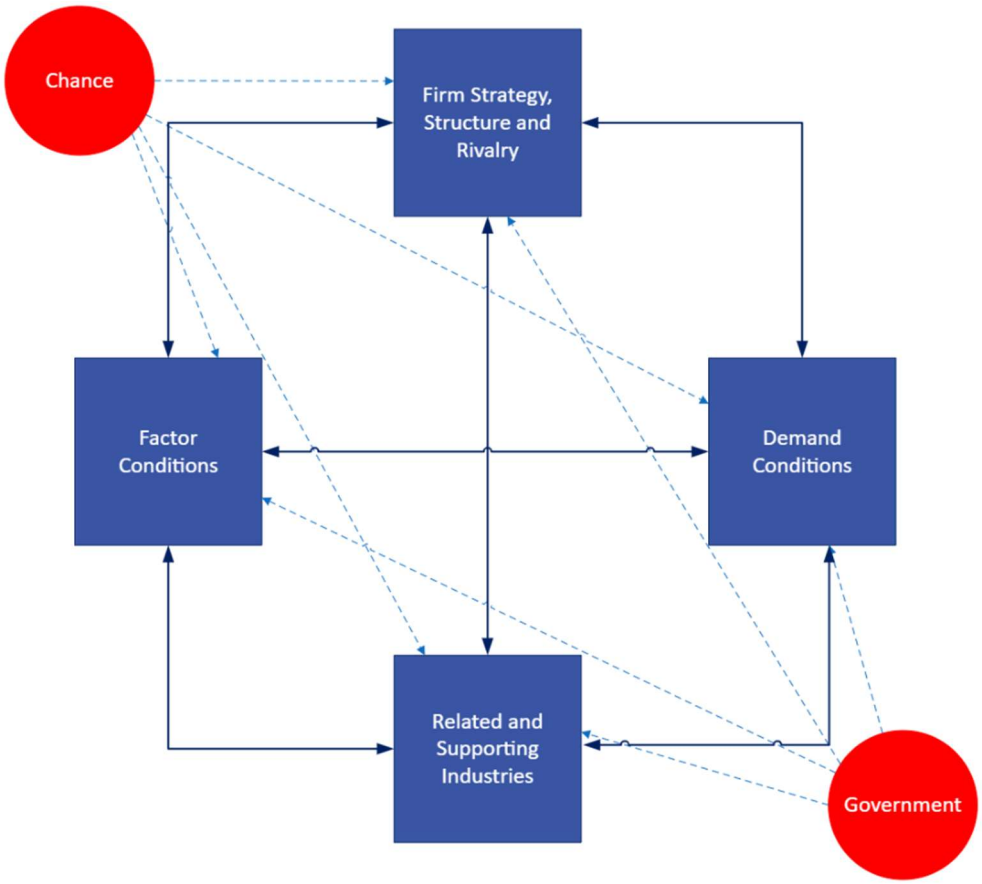
Porter subsequently expanded his framework to a national level and introduced the Diamond Model in *The Competitive Advantage of Nations* (1990). This new model promotes four factors that influence national competitiveness. These are:

1. Factor Conditions.
2. Demand Conditions.
3. Related and Supporting Industries.
4. Firm strategy, structure, and rivalry.

Through this model, Porter projects the idea that nations can create and manage competitive industries by focusing on conducive environments in which these factors positively interact. Porter argues that innovations and improvements are triggered by

domestic rivalry. The presence of strong supporting industries contributes to enhance the nation's competitive advantage through innovation, collaboration and increased productivity (Porter, 1990).

**Figure 2-4: Determinants of National Competitive Advantage**




Source: (Porter, 1990, p. 78)

Joseph Schumpeter's concept of creative destruction, introduced in his seminal work *Capitalism, Socialism, and Democracy* (1942) is a founding theory in studies about competition and competitiveness. The gist of the theory is that progress is enabled from the continuous replacement of old technologies, practices, processes, and products with new ones. The core of the theory is the entrepreneur, being described by Schumpeter

as the primary agent of the economic growth and the driving force being the creative destruction. This is because entrepreneurs are catalysts to innovations, new products, improved production methodologies, new markets and the development of organisational structures that contribute to replace outdated economic structures and improve industries (Schumpeter, 2010).

Meanwhile, Paul Krugman's New Trade Theory stipulates that economies of scale and market imperfections are critical factors that can lead to a competitive advantage, particularly in industries where large-scale production reduces costs and raises the market share (Krugman, 1980). In Krugman's (1980) view, when firms experience increasing returns to scale, countries can gain a competitive advantage by specializing in industries where scale economies are achievable, leading to reduced costs and enhanced global competitiveness.

In *Competitiveness: A Dangerous Obsession* (1994), Krugman also distinguishes between the notion of countries competing against each other and the way companies compete. Krugman states that a company's success is often at the expense of one of its rivals. The notion that a nation's competitive success depends on "*beating*" other nations is misleading. Krugman continues to state that the true elements of a country's economic success are internal productivity and efficiency rather than its relative performance against other nations. Krugman contends that productivity, infrastructure, education, and innovation are the factors that drive long-term economic growth, rather than aggressive trade policies aimed at surpassing other nations. It is by having these factors in place that companies and industries can thrive (Krugman, 1994).

Christian Ketels' work further shows how competitiveness and clusters can generate insights for regional policy. Building on Porter's cluster theories, Ketels states that there is an interconnected nature between competitiveness drivers and integrating economic,

institutional and social factors. Ketels further reiterates that clusters are pivotal for converting theoretical competitiveness into practical regional growth. Furthermore, Ketels states that regional policies contribute significantly to improved competitiveness through targeted investments and collaborative frameworks (Ketels, 2013) .

### 2.1.2 Measuring Competitiveness

Measuring competition and competitiveness is essential for evaluating economic performance at both firm and national levels. Calculating levels of competitiveness is a complex undertaking that involves several aspects (Latruffe, 2010). The main reasons for measuring competitiveness are:

1. Identifying strengths and weaknesses. The company's strengths and weaknesses are defined by its assets and skills profile in relation to competitors, including financial resources, technological capabilities, popularity, and similar factors (Porter, 1998).

2. Addressing Policy and Strategy. Policy is central to achieving competitiveness. The World Economic Forum states that competitiveness is a set of institutions, factors and policies that contribute to the productivity level of a nation (Blanke, et al., 2011). To improve competitiveness, which includes sustainable prosperity, the main challenge is to provide policymakers with the necessary information to draft suitable policies for greater (Ketels, 2013).

3. Benchmarking, Evaluation and Setting Goals. This concept and its logic are clearly highlighted by Porter (1985) through the Value Chain Model. (Blanke, et al., 2011) argue about the importance of focusing on the measurement of social and economic aspects as well as the integration of concepts to benchmark.

There are various measures and indices including The Diamond Model and Competitive Advantage Metrics by Michael Porter, The World Economic Forum's Global Competitiveness Index (GCI), World Bank's Ease of Doing Business Index, Schumpeter's Innovation Metrics and Creative Destruction, Market Structure and Competition Intensity: Herfindahl-Hirschman Index, Krugman's Perspective: Trade Balance and Economies of Scale, Resource-Based View: Firm-Level Competitiveness Metrics and others to measure competitiveness. Refer to Appendix 1 for an analysis of the different frameworks.

Joseph Schumpeter and Michael Porter have laid the foundation for understanding competitiveness and its key determinants. Schumpeter (2010) emphasized innovation as a catalyst for dynamic competition, while Porter (1990) linked national industry structure and firm strategy to competitive advantage. Porter's value chain and diamond model linked competitive advantage to firm strategy, industry structure, and national conditions.

### 2.1.3 Agricultural competitiveness

Competitiveness in agriculture is determined by a combination of institutions, policies, and factors that affect the sector's productivity including productivity, innovation, human capital and supporting institutions (Zia, et al., 2024). Human capital is crucial because a skilled, agricultural workforce uptakes innovations and education both considered as prerequisite for competitiveness, together with efficient infrastructure, market dynamics and efficient and supporting institutions (Jambor & Babu, 2017).

### 2.1.4 Which factors contribute to competitiveness?

#### 2.1.4.1 Innovation

Innovation, as a core driver of competitiveness, is stimulating improvements that enable companies to thrive in dynamic markets. (Farinha, et al., 2014) states that the high-tech clusters show how innovation integrates into ecosystems to enhance productivity and competitive positioning. Schumpeter defines innovation as the process leading to new functionality and new products, basing his view on innovation as a disruptive force that contributes to cost reduction and the creation of new markets (Ramadani & Gerguri, 2011). Innovation is characteristically seen to emerge in line with productivity and competitiveness, with all three being interconnected. Innovation is seen as one of the core drivers of competition that affects the cost factor and the differentiation of a product. All this is fostered if there are national innovation policies to increase competitiveness and encourage collaboration and innovation (Carayannis & Grigoroudis, 2014). Promoting a culture of innovation not only enhances a company's adaptability but also secures a competitive edge in global markets.

#### 2.1.4.2 Leadership

Leadership is key for competitiveness as it fosters innovation, strategic vision, inspiration, and transforms teams to achieve greater goals. Transformational leadership is a direct consequence of driving competitiveness through strategy and employee creativity (Yangailo, 2023). It is based on managers who can direct the level of innovation in organisations. Effective leadership is the bridge between organizational sustainability practices and competitiveness, particularly during periods of change or periods of disruption. Leaders need to have the ability to align strategic vision with achievable goals

and to enable the organizations they lead to become leaders in their sectors. This boosts the overall competitiveness of the sector (Alnamlah & Nalband, 2024)

### 2.1.4.3 Human Capital

Another aspect that drives competitiveness is Human Capital. (Hatch & Dyer, 2004) argue that organizations that leverage skilled human capital can secure a sustainable competitive advantage, because that skilled human capital can enhance productivity and innovation. Moreover, (Nie & Yang, 2023) argue that there are certainly several positive effects of human capital on innovation, and that the more talented the human capital pool is, the higher are the chances of achieving competitiveness through the set goals.

### 2.1.4.4 Organisational Structures

Organisational structure promotes an organisation's competitiveness by defining decision-making, efficiency, innovation, and adaptability. A well-designed structure guarantees efficient communication and decision-making processes, allowing faster responses to market changes and customer demands. This fosters agility and enhances competitive advantage. Organisations with decentralised structures often display higher levels of innovation and adaptability, fostering competitiveness in volatile environments. This is aligned with (Porter, 1990) ‘s view that the organisational capabilities that emerge from an effective structure can create sustainable competitive advantages.

### 2.1.4.5 Customer Focus

Customer focus or customer orientation is defined as the identification of what the customer wants. (Wang & Lo, 2004) argue that customer-focused performances defined in view of the targeted customers’ needs should be prioritised by an organisation to

achieve success. Furthermore, (Wang & Lo, 2004) claim that organisations utilising customer insights to improve their service quality would perform better and more consistently than their competitors, thus evoking the strong link between customer orientation and long-term success.

#### 2.1.4.6 Technology

Technological advancements are core to building competitiveness in the sector, improving productivity, innovation, and adaptability. Technology is gaining more and more attention as a source of competitive advantage at the business and national economies levels (Laitsou, et al., 2020). Technology has notable influenced the way business is done. The emerging technologies promote not only competitive advantage but also significantly changed the way business is conducted (McManus, et al., 2021).

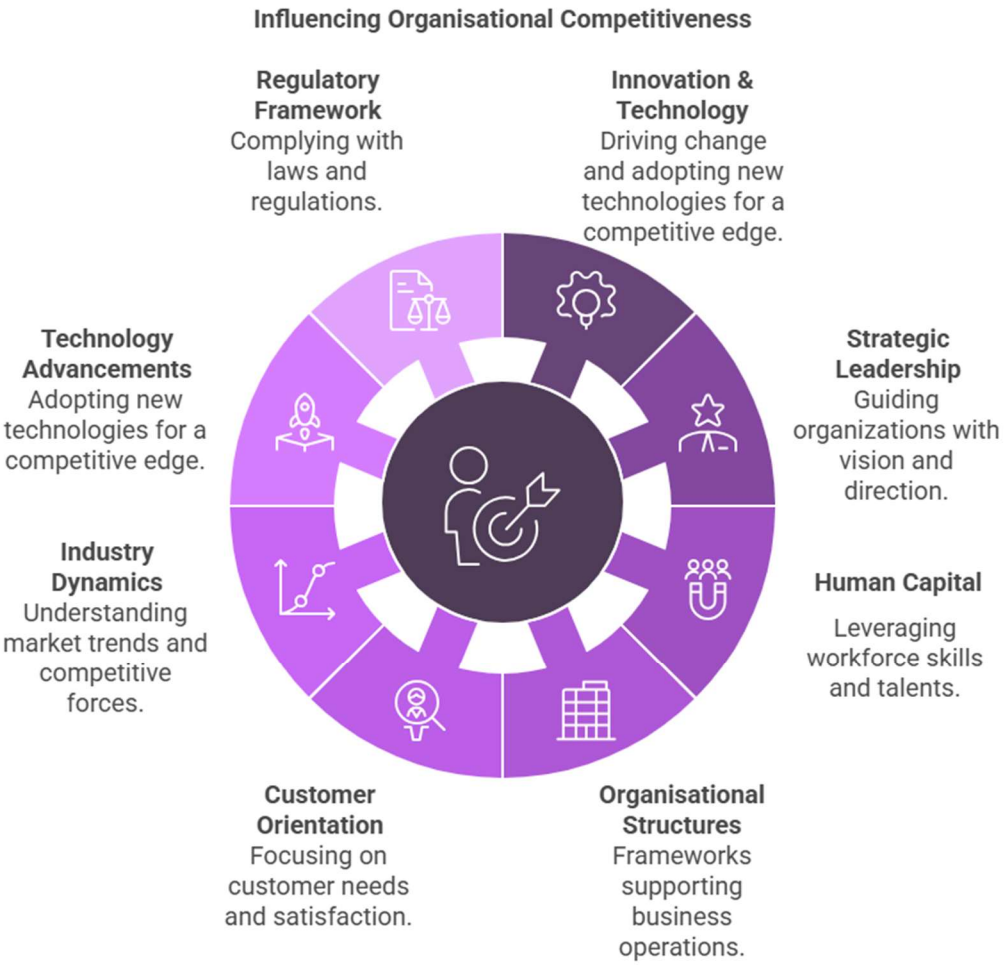
#### 2.1.4.7 Regulatory Frameworks

Regulatory frameworks significantly shape sectoral competitiveness by fostering fair competition, innovation, and sustainable practices. Robust regulations provide a structured environment that mitigates market failures and ensures operational efficiency. Nicoletti and Scarpetta (2003) contend that product market regulations can significantly affect the structure of corporate governance. These influences extend to factors such as distinctions between state and private ownership, access to entrepreneurial opportunities, and the ease of entering markets. They argue that strong governance, effective incentives, and competition drive innovation and productivity, acting as catalysts for competitiveness.

### 2.1.4.8 Summary of factors influencing Competitiveness

The elements influencing organisational competitiveness are diverse, complex, and interrelated. Internal variables like innovation, strategic leadership, human capital, organisational structures, and customer orientation, and focus combine with external influences that include industry dynamics, technological advancements, and regulatory frameworks to form a comprehensive competitive landscape.

**Figure 2-5: Factors influencing competitiveness**




Source: Own Derivation

Organisations seeking prolonged competitiveness must prioritise a comprehensive strategy that incorporates innovation, effective leadership, proficient human capital, a robust organisational structure, and customer orientation, while maintaining agility in response to organisational trends.

## 2.2 Agriculture in Malta

### 2.2.1 State of Affairs

Agriculture is key in food production and environmental conservation (Domagała, 2021). Malta's agriculture is characterized by small and fragmented farm holdings, limiting economies of scale and competitiveness in international markets. The sector heavily depends on imports due to scarce arable land and natural resources, resulting in high production costs. Most farms are family-run on a part-time basis, with agriculture not being the primary income source for many farmers (Commission, 2023). Local agriculture is known to be affected by several adversities (Briguglio & Cordina, 2003). The situation has been further complicated by Malta's accession to EU, due to the European single market that opens the door to larger and better equipped farmers in other Member States to export their produce to Malta (Dimech, et al., 2011).

Malta's agricultural sector, although modest in its contribution to the national GDP (< 1%), leaves a positive impact in safeguarding food security, cultural heritage, and environmental stewardship. A key component of Maltese agriculture is the production of fruits and vegetables, which are grown on small, family-run farms that are usually smaller than one hectare (Briguglio & Cordina, 2003). Despite its cultural significance, this fragmented structure makes it challenging to achieve economies of scale and modern mechanisation. Malta's agricultural production value as a percentage of the total EU agricultural production at 0.03 is of negligible importance for EU Agriculture (Domagała, 2021). Focusing on sustainability, productivity and competitiveness, the main issues can be summarised as follows:

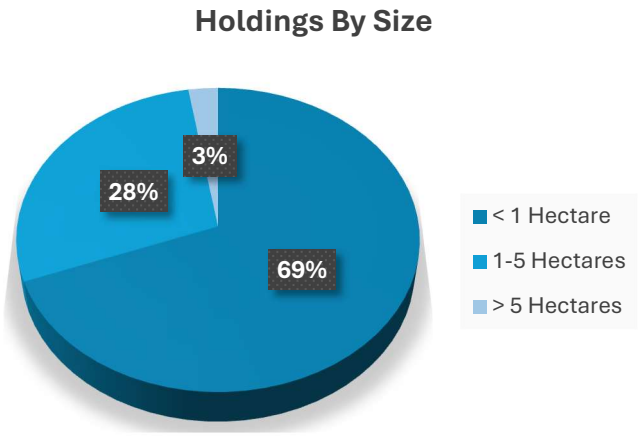
- Agricultural Holdings - Land fragmentation and scarcity.
- Natural Resources (natural, water scarcity).

- Labour force (aging workforce).
- Competition from imports
- Environmental Issues.

### 2.2.1.1 Agricultural Holdings

Agriculture in Malta has historically been characterized by small parcels of land. This is clearly highlighted in the last agricultural census conducted by the National Statistics Office (NSO). There were 10,281 agricultural holdings overall in 2020. 8,199 holdings, or 79.7% of this total, were in Malta, while the remaining 2,082 holdings, or 20.3%, were in Gozo. According to the 2020 Census, 7,118 holdings, or 69.2% of all agricultural holdings in Malta and Gozo, managed a utilised agricultural area (UAA) of less than one hectare, indicating that most of these holdings were quite small. There were 2,898 (28.2%) medium-sized agricultural holdings that managed one to five hectares of land, and 265 (2.6%) big agricultural holdings that managed more than five hectares of UAA (NSO, 2024).

**Figure 2-6: Holdings by Size**




Source: NSO Agricultural Census 2020

Fragmentation and small holdings are an ongoing issue. The NSO Agricultural Census indicates a decrease in agricultural holdings by 16.2% between 2010 (12,268 holding units recorded) and 2020 (10,281 holding units). Likewise, UAA usage decreased by 6.2% between 2010 (11,455 hectares) and 2020 (10,731 hectares). Alarmingly, the NSO recently reported in January 2025 that the total holdings amounted to 7,975, signalling another 22.4% decrease in just four years (NSO, 2025). The same decrease was reported in UAA. As of January 2025, the reported UAA was 8,880 hectares, equating to a decrease of 13.6% (NSO, 2025).

#### 2.2.1.2 Natural Resources

Overall agriculture has an impact on natural resources such as water scarcity, erosion and soil degradation (Miglietta, et al., 2023). Malta ranks highest among European nations that are most affected by water scarcity and falls into the top 10 most water-stressed countries worldwide. Malta's surface water resources are negligible, and so the farmers' irrigation needs are mainly supplied through groundwater. Indeed, agriculture is currently the primary consumer of groundwater on the island also note that the quality of Maltese groundwater is deteriorating, mostly due to nitrates. As a result, this groundwater is gradually becoming unsuitable for irrigation (Papadimitriou, et al., 2019).

The effective management of soil degradation, encompassing desertification, contamination, loss of soil biodiversity, sealing and compaction, decline in organic matter, landslides, and salinisation, is essential to preserve this natural resource, which plays a crucial role in agricultural production (Cutajar, 2014).

### 2.2.1.3 Labour Force

The state of the local farming community can be summed up by the Borg et al (2024 p. 76) statement that "*Malta has fewer young farmers and a smaller labour force than the rest of Europe*." The agricultural labour force declined by 26.7%, from 18,212 individuals in 2010 to 13,341 in 2020. However, it is interesting to note that those who worked more than 1,800 hours during the reference year increased by 38.2 %, from 1,300 hours in 2010 to 1,797 hours in 2020 (NSO, 2025).

The agricultural labour force is also characterised by an aging farming community. Historically, the farming community was a family social factor, in which the farming trade was passed on to the new generations. This is no longer happening, as today's younger generations are more inclined to work in sectors that come with a better and more secure income and demand less physical exertion (Grima, 2021).

### 2.2.1.4 Competition from Imports

After Malta's accession to the EU in 2004, the local fruit and vegetable sector has been significantly affected by increased volumes of imported fruit and vegetables. The main reason for this was the elimination of restrictions, tariffs and other protections through the European single market (Briguglio & Cordina, 2003).

This increase in imports offset local produce in terms of both its price and availability. The NSO reported €104 Million worth of fruit and vegetable imports in 2024 whilst Maltese producers limitedly exported €171,645 (NSO, 2024),

**Table 2-2: Fruit and Vegetables Imports**

| Imports | 2023 | 2024 |
|---|---|---|
| Edible vegetables | 35,689,000 | 39,792,000 |
| Edible fruits and nuts | 56,292,001 | 64,536,001 |
| Total | 91,981,001 | 104,328,001 |

Source: (NSO, 2024)

**Figure 2-7: Fruit and Vegetables Exports**

| Export | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|
| 07: EDIBLE VEGETABLES AND CERTAIN ROOTS AND TUBERS | 518,534.00 | 961,020.00 | 885,691.00 | 1,141,112.00 | 644,698.00 | 453,648.00 | 65,698.00 |
| 08: EDIBLE FRUIT AND NUTS; PEEL OF CITRUS FRUIT OR MELONS | 19,440.00 | 19,192.00 | 29,845.00 | 33,856.00 | 49,575.00 | 58,272.00 | 105,947.00 |
| TOTALS | 537,974.00 | 980,212.00 | 915,536.00 | 1,174,968.00 | 694,273.00 | 511,920.00 | 171,645.00 |

Source: (NSO, 2024)

Imports have a considerable effect on the local farming community due to its already scarce resources, fragmented agricultural landscape, and economies of scale (Briguglio & Cordina, 2003). Cheap imports of fruit and vegetables and rising costs for local production has negatively impacted the income of local farmers. Historically, these farmers relied on levies and other measures that hindered importation. However, following Malta's EU accession, farmers have had to adapt to a new reality (Attard & Meli, 2008). The increasing dependency on fruit and vegetable imports also risks having socio-environmental repercussions given that it may result in lowered productions of

local food that would expose the country to food security issues (Friends of the Earth, 2022).

#### 2.2.1.5 Environmental Issues

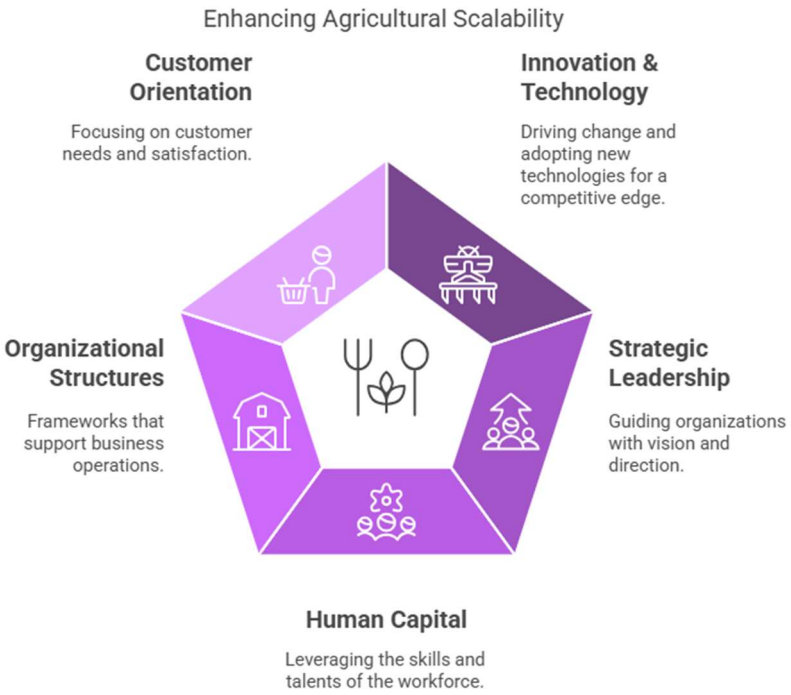
Indeed, the local agricultural sector is highly affected by environmental factors. Increasing air temperatures, decreasing rainfalls, and the resultant water scarcity are climatic shifts that directly impact the sector. These factors also hurt production levels (Galdies & Vella, 2019). In their bid to achieve a required level of production, Maltese farmers overuse the soils, leading to soil degradation by erosion, structural deterioration, the minimisation of organic matter, and harm from excess chemical use (Baron, 2023). Malta's water resources face significant challenges in terms of both quantity and quality. Agriculture is the sector that makes the highest use of the country's freshwater resources, calculated at 46.7% between 2005 and 2013 (Baron, 2023). Furthermore, bad planning, illegal construction, and the illegal dumping of bulky waste are harming local biodiversity and ecosystems (Baron, 2023).

These environmental factors that are affecting fruit and vegetable production in Malta are multifaceted, comprising climatic changes, soil health, and water resource limitations. Addressing these challenges necessitates a comprehensive approach that integrates sustainable agricultural practices, effective water management, and robust support systems for farmers.

### 2.2.2 Agriculture Scalability

The scalability of agriculture in Malta presents unique challenges due to its small land area, fragmented agricultural holdings, and limited natural resources. During this chapter, the agricultural scalability shall be assessed against the factors that influence the competitiveness.

**Figure 2-8: Factors affecting Agricultural Scalability**




**Source: Own Derivation**

### 2.2.2.1 Innovation & Technology

Innovation is a key driver of competitiveness and scalability in agriculture. Malta has the potential to leverage technology to enhance agricultural productivity while maintaining environmental sustainability.

Technological advancements such as vertical farming, hydroponics, and precision agriculture have been identified as potential solutions to Malta's agricultural challenges (Grima, 2021). Automation, artificial Intelligence, robotic irrigation systems and smart monitoring technologies, can optimize resource use and enhance efficiency. AI-driven solutions can help address labour shortages by automating routine tasks such as

planting, watering, and harvesting (Baron, 2023). Another aspect of innovation which is not being adopted is the integration of data analytics into agricultural management which can facilitate real-time decision-making, improve yields and reduce waste. The development of digital platforms connecting farmers to consumers can enhance market access and profitability (Baron, 2023).

Malta's Action Plan for Organic Food 2023-2030 identifies significant challenges relating to the aging farming workforce and the sector's declining appeal to younger generations have created limits in the adoption of innovative practices such as organic farming and precision agriculture. Although Malta has seen an increase in organic farming initiatives, barriers such as limited technical expertise, insufficient advisory services, and underdeveloped infrastructure for organic produce persist. (MAFA, 2023)

Malta's agricultural innovation system remains constrained by limited investment in research and development (R&D) and a lack of private sector involvement. Furthermore, the aging and traditional based community is averse to change and as such Government must invest local fund in R&D. Addressing these gaps will require a shift toward integrated innovation systems that combine traditional knowledge with modern technologies to meet challenges like climate change and food security (Baron, 2023).

By embracing innovation, Malta can enhance its agricultural competitiveness whilst maintaining environmental sustainability. Innovation promotes diverse solutions, including vertical farming, hydroponics, automation, and sustainable practices. Increased investment in R&D, digital transformation, and policy reforms that are all crucial to ensuring the sector's long-term viability. All this was clearly highlighted in the National Strategy for Research and Innovation (2007-2010) in which the then Ministry

for Agriculture was set to implement and Research and Innovation Unit, and to focus on the introduction of new technologies (MCST, 2006).

### 2.2.2.2 Strategic Leadership

Strategic leadership in relation to agriculture relates to policy frameworks, institutional support, and technological innovations designed to enhance productivity, competitiveness and sustainability of the sector. The main stakeholders together with the Maltese government must focus on modernisation, alignment with EU strategies and plans, and compile sustainability strategies to ensure long-term viability. The set-up of organisation like the Malta Food Agency (MFA) plays a key role to enable strategic leadership within the sector (Vella, 2024). Farmers have historically resorted to cooperative structures for leadership. However, over the years the corporate governance including management aspects have been marred with barriers and difficulties. This is also complemented by general lack of regulatory enforcement by the cooperative management (Baldacchino, et al., 2018).

Malta's strategic leadership in agriculture is at a crossroads, requiring an integrated approach that balances economic, environmental, and policy considerations. While efforts have been made to modernize and sustain agriculture, long-term success will depend on strategic investments in innovation, sustainability, and institutional support.

### 2.2.2.3 Human Capital

(Attard & Meli, 2008) explain that Malta's farming community is aging with limited generational renewal given that younger generations are more inclined to pursue other careers. 72% of the farmers are over 50 years old (MFA Internal Data). In a report published by the EU, following the farmers' protests of 2024, the Union recognises the

importance of attracting new farmers in the sector and stresses the importance of building a resilient and consistent eco-system with the right policies to attract young farmers (EU, 2024).

Another aspect that characterises the local agricultural workforce is that most workers have weak educational backgrounds in formal education. Farmers, especially young farmers, have good practical experience but limited agricultural training (1.5% versus 19.1% EU average) (E-Cubed Consultants, 2021).

The sector is facing challenges and threats in relation to its aging workforce, skills and education shortages. A multi-faceted approach leading to better education programmes and incentives leading to technology, innovation and entrepreneurship is required.

#### 2.2.2.4 Organisational Structures

The Maltese agricultural sector lacks organisational structures. In this study, structures are defined as institutions that facilitate agricultural production, including government agencies, cooperatives, producer organisations (POs), and informal farmers' organisations.

The main governmental organisation set to promote and manage the farmers' produce, sales, and markets is the MFA. The MFA operates the main fruit and vegetable market, the Pitkalija, and works closely with government and farmers to promote and help the sector (MFA Internal Data). The MFA plays a significant role in the agri-food supply chain, and its role has a direct impact on the local farming community (Vella, 2024).

POs are organisational structures formed and controlled by producers in specific agricultural sectors to pursue objectives outlined in the Common Market Organisation (CMO) Regulation. These organisations aim to strengthen the position of producers in

the food supply chain (Commission, 2024). Historically, producers' organisations in Malta have been unsuccessful. Delia states that *"the formation of producers' organisations and the restructuring of agricultural co-operatives in terms of the new trading domain is a matter that demands urgent attention"* (Delia, 2005, p. 27).

Cooperatives are seen as drivers for agricultural growth. The Farmers' Central Cooperative Society (FCCS) is a main player. However, despite good intentions and efforts the cooperative has never achieved its goals (Vella, 2024). In a report issued by the European Commission in 2024, it was clearly stated the importance of implementing policies to facilitate and encourage the role of Cooperatives (Commission, 2024). Therefore, the Commission reiterates the need to encourage the formation of cooperatives and POs to elevate the sector (Commission, 2024).

The organisational structures in Maltese agriculture face several challenges, including bureaucratic inefficiencies, limited financial resources, and weak farmer participation. Strengthening cooperatives and POs and improving policy alignment with EU directives is crucial to the effectiveness of agricultural organisations.

#### 2.2.2.5 Customer Orientation

Customer orientation and customer focus in Maltese agriculture have become increasingly important in the face of globalization, changing consumer preferences, and the need for sustainable food systems. The authenticity, freshness and taste (Dimech, et al., 2011); crop diversification (Avertano, et al., 2005); traditional farming (Baron, 2023); high quality, taste and nutritional value (Briguglio & Cordina, 2003) highlight the strengths of the local produce. Fruit and vegetables are delivered in the same type of crates for several years. Packaging in the sizes and type of packages are needed by the customer are a must for the survival of the sector (E-Cubed Consultants, 2021).

Traditional ways of packaging and presentation of the product is difficult to change as there is resistance to change from the old farmers (E-Cubed Consultants, 2021).

### 2.2.3 SWOT Analysis Based on Literature Reviews

**Table 2-3: Strengths**

| Strength | Description |
|---|---|
| Freshness, Quality, Zero Kilometre | Malta's geographical size ensures that the local produce can reach the customers in a very short time, thus preserving quality, freshness, nutritional values and without the need of any added chemicals (Dimech, et al., 2011). |
| Traditional Farming Practices | Many Maltese farmers employ traditional techniques such as crop rotation, intercropping, and organic fertilization, which enhance soil fertility and product quality (Baron, 2023). |
| Climatic Conditions | Malta's Mediterranean climate is favourable for the cultivation of various crops enhancing their quality (Briguglio & Cordina, 2003). |
| Authenticity & Taste | Maltese consumers often associate local produce with authenticity, taste, and quality, making it a preferred choice in the domestic market (Dimech, et al., 2011). |

Source: Own Derivation

**Table 2-4: Weaknesses**

| Weakness | Description |
|---|---|
| Resource Limitations | Malta faces severe water scarcity, with agriculture being a major consumer of groundwater, leading to over-extraction and environmental stress (Galdies & Vella, 2019) |
| Aging Farming Community | The Maltese farming community is dominated by older individuals, with few young entrants into the sector, creating long-term sustainability concerns (Attard & Meli, 2008). |
| Small & Fragmented Land Holdings | The fragmentation of farmland due to inheritance laws limits economies of scale and production efficiency (Briguglio & Cordina, 2003) |
| Imports | Despite local production, Malta imports a substantial portion of its fruit and vegetable supply, creating intense competition for local farmers against lower-cost foreign produce (Attard & Meli, 2008) |

Source: Own Derivation

**Table 2-5: Opportunities**

| Opportunity | Description |
|---|---|
| Alternative Markets | With the growing interest in sustainable food production and farm-to-table initiatives, Malta can develop Agri-tourism and branding strategies for local produce (Grima, 2021). |
| EU Funding | Malta has access to EU funding programs that support sustainable agricultural practices, infrastructure improvements, and organic farming (EU, 2024). |
| Innovations | The adoption of hydroponics, vertical farming, and smart irrigation systems could enhance productivity despite Malta's limited land and water resources (Grima, 2021). |
| Consumer Marketing | Maltese consumers are showing a growing interest in traceable, organic, and locally sourced food, presenting an opportunity for local farmers to differentiate themselves (Dimech, et al., 2011). |

Source: Own Derivation

**Table 2-6: Threats**

| Threat | Description |
|---|---|
| Climate Change | Rising temperatures, prolonged droughts, and unpredictable rainfall patterns are negatively impacting crop yields and soil quality (Galdies & Vella, 2019) |
| Competition from Imports | The influx of price-competitive imports from the EU and beyond presents a significant threat to local farmers, who struggle to match the economies of scale enjoyed by larger foreign producers (Attard & Meli, 2008) |
| Lack of Innovation and Knowledge Transfer | Malta ranks low in agricultural innovation, with limited research and development activities in the sector, restricting its competitiveness (Briguglio & Cordina, 2003) |
| Agricultural Workforce | The declining workforce in agriculture, coupled with a lack of training and formal education, reduces the potential for innovation and sustainable growth (Baron, 2023) |

Source: Own Derivation

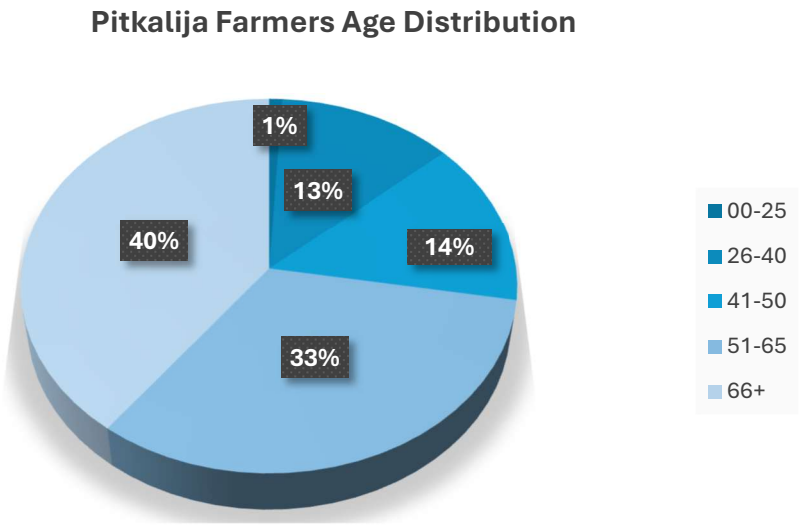
Maltese agriculture benefits from fresh, high-quality produce, thanks to the country's small size, traditional farming methods, favourable climate, and consumer preference for local food. However, the sector faces serious challenges, including limited water resources, an aging farming population, fragmented land, and heavy reliance on imported produce. Opportunities exist in tapping into alternative markets like Agri-tourism, using EU funds, adopting smart farming technologies, and meeting rising consumer demand for local, organic products. Still, threats such as climate change, competition from cheaper imports, low levels of innovation, and a shrinking, undertrained workforce pose serious risks to the sector's future sustainability and competitiveness.

## 2.3 Farming Community

The farming community in relation to this study is based on the fruit and vegetables sector. The Ta' Qali Fruit & Vegetable Market better known as *il-Pitkalija*, is the main source of income for the local farming community. The sales turnover of the last two years (2023 and 2024) amounted to circa € 28 Million (MFA Internal Data).

72% of the farming community that operates in the *Pitkalija* is over 50 years of age. However, farmers under the age of 50 years do contribute 43% of the overall turnover. In a study conducted by (Borg, et al., 2024) it transpired that 53.5% of the young farmer, taking into consideration all the farming sectors (fruit, vegetables, dairy, meat etc.), work directly in the fruit and vegetables sector.

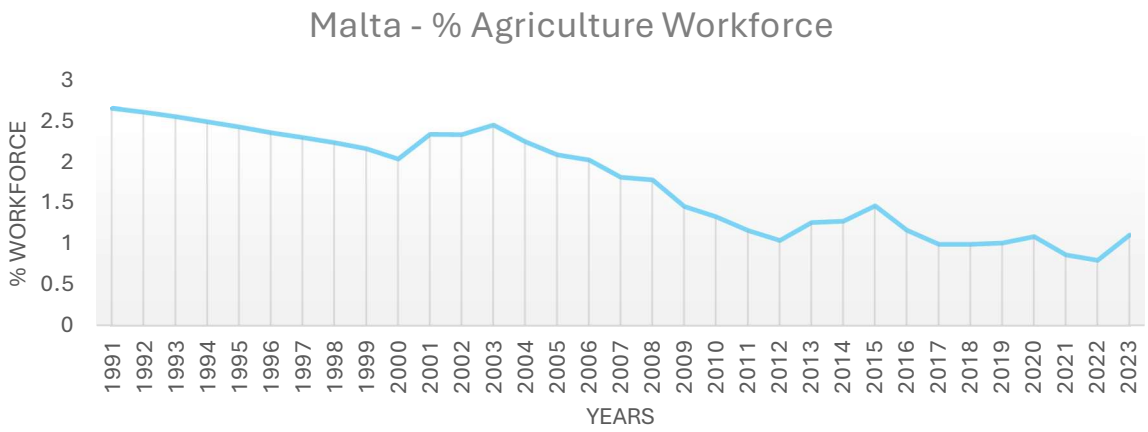
**Figure 2-9: Pitkalija Farmers Age Distribution**




Source: MFA data base year 2024

The average percentage of the local workforce dedicated to Agriculture according to the International Labour Organization is 1%. The average percentage of the World Bank is 26% (ILO, 2025). The report clearly depicts a worldwide decline, as in 1991 the index was 43%.

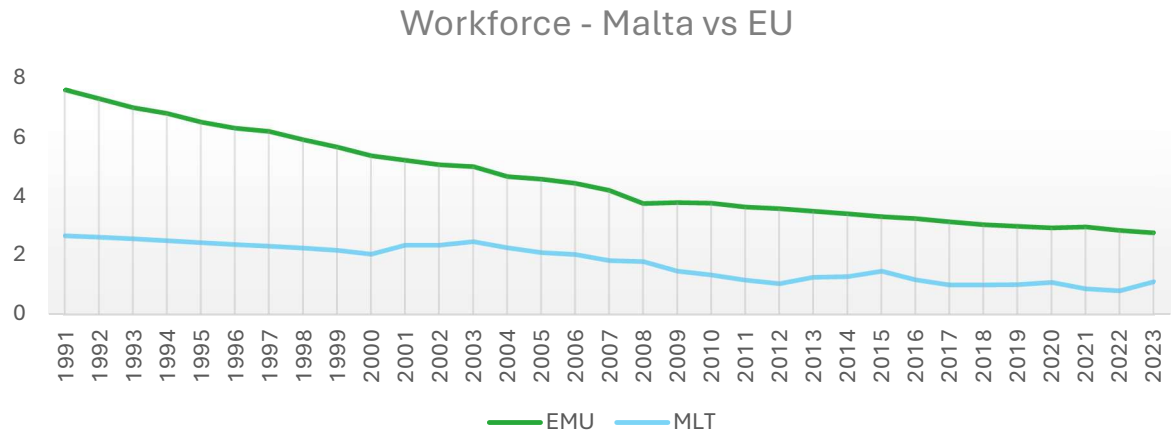
**Figure 2-10: Agricultural Workforce**




Source – World Bank Index – ILO 2025

Malta's average is way below that of other EU Member States, as depicted in the below graph. However, there is a decreasing trend in the agricultural related workforce across all the EU countries (ILO, 2025).

**Figure 2-11: Workforce - Malta vs EU**




Source – World Bank Index – ILO 2025

## 2.4 EU Common Agricultural Policy

Following Malta's EU accession in 2004, the Common Agricultural Policy (CAP) was introduced. This had a profound effect on the institutional landscape of the agricultural sector.

Overall, the 2014-2020 CAP implementation delivered a mixed outcome. Positives include direct payments and rural development measures that contributed to farm incomes and support to small farms. The CAP Performance analysis showed that more must be done to improve agricultural sustainability and contribute more to environmental objectives. (COMMISSION, 2021).

The CAP Strategic Plan 2023–2027 represents a pivotal policy framework shaping the future of agriculture and rural development across the Maltese Islands. With a total allocation of €166 million in combined EU and national funds, the Plan is designed to enhance farm income, promote sustainable practices, and modernise the sector through investment and innovation. IT supports a suite of targeted interventions aligned with nine specific objectives and one cross-cutting objective focused on knowledge-sharing and digitalisation. Key priorities include boosting competitiveness through technology, supporting generational renewal via targeted schemes for young farmers and encouraging ecological transition through eco-schemes, and organic farming incentives Collectively, these actions aim to foster a resilient and diversified agricultural sector (Fondi.eu, 2025).

Malta's EU Accession led to the creation of new governance frameworks, notably the establishment of Local Action Groups (LAGs) under the Liaison Entre Actions de l'Economier Rurale (LEADER) initiative, which were designed to promote "bottom-up, community-led local development" (EUROPA.EU, 2021). A LAG focuses on the

development of its territory with the aim of improving the rural infrastructure and the quality of life of its local communities. In Malta, the uptake of LAGs is limited to three (GAL Xlokk, GAL Majjistral and Gozo Action Group Foundation.) GAL Xlokk Foundation emerged as a key actor, implementing rural tourism schemes, restoration projects and education campaigns on sustainable farming practices amongst others. These projects are implemented with stakeholders' participation ranging from local councils, civil society and micro-enterprises (Galxlokk, 2023). GAL Majjistral uses EU support and local collaboration to preserve rural heritage, enhance local food systems, promote sustainable practices, and encourage international cooperation on cultural and environmental efforts (GAL Majjistral, 2025). Gozo Action Group Foundation promotes environmental conservation, eco-tourism, sustainable farming education, and community infrastructure projects—linking local development with broader European partnerships (Gozo Action Group, 2023).

What emerges clearly is that the LAGs focus on regional territory, conserving nature, improving the land, promoting culture and enhancing the lives of the community. Evidently LAGs do not focus on market dynamics and competitiveness. Indeed, that requires a different approach (as will be outlined in the final chapter of this dissertation.)

## 2.5 Conclusion

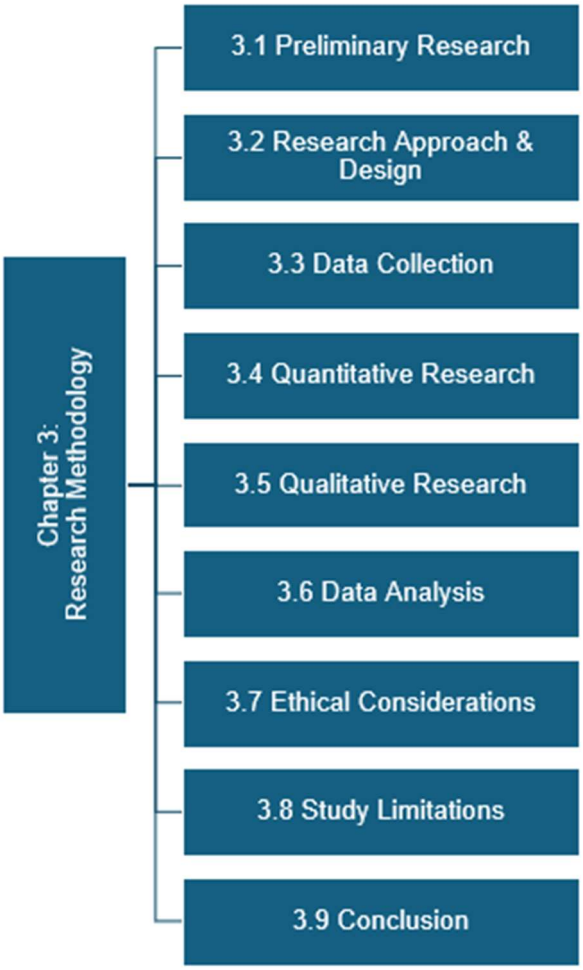
This chapter outlined previous literature conducted by several researchers pertinent to the research area. The subsequent section focuses on the research methodology used in this study.

# Chapter 3 – Research Methodology

# 3. Introduction

This chapter projects the research methodology employed in this study, with an explanation of the data collection methods that were applied prior to the data analysis. The structure of this chapter is depicted below.

**Figure 3-1: Overview Research Methodology**



## 3.1 Preliminary Research

The topic area was chosen as it is both practical and relevant. Some early research directed the framing of the research and the setting of clear objectives for the study. The reading of several peer-reviewed academic papers (see Chapter 2), acted as the basis for understanding of the main ideas, concepts and debates about this topic.

The research questions in this study directly support the two main objectives I set out in Section 1.3. These are as follows:

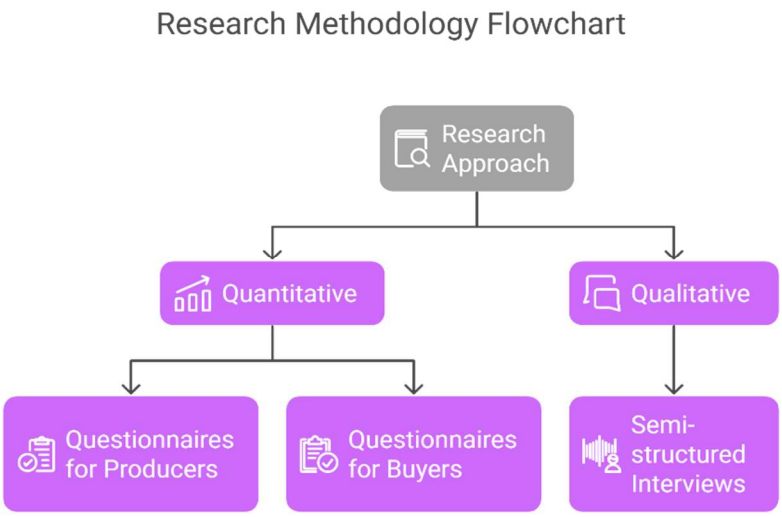

## 3.2 Research Approach and Design

This study employed a convergent mixed-methods design, that is, the quantitative and qualitative data were collected separately and in parallel, without one informing the other. This two-part strategy was chosen as it most effectively triangulates the findings from the different methods.

The quantitative research was conducted via a survey using questionnaires to collect data. The target respondents were both producers (farmers) and the buyers who make use of the Ta' Qali Fruit and Vegetable Market (Pitkalija) which is the main source of fruit and vegetables in Malta.

The qualitative research was conducted via semi-structured interviews with key players and stakeholders within the Agricultural Sector. An open-ended, semi-structured approach was employed in qualitative interviews, each conversation is different. Researchers tailor their questions to fit what each person knows and what they are comfortable sharing (Rubin & Rubin, 2004). In a study on the financial decision-making of farmers, Hayden et al. found that the semi-structured approach allowed for important points that came up in the interviews to be explored in more detail by asking follow-up questions, or 'probes', which allowed the interviewees to explain their answers or provide more detail (Hayden, et al., 2023). The flexible nature of this type of interview allowed me to guide the conversation and dig deeper into areas that were most useful for answering the research questions.

**Figure 3-2: Research Methodology Flowchart**




Source: Own Derivation

## 3.3 Data Collection

This dissertation draws on both primary data, collected firsthand from participants or observations, and secondary data sourced from existing literature, to provide a well-rounded understanding of the topic. This approach allows researchers to focus on the exact questions and issues they are investigating, making the data more relevant and precise for their study's goals. Methods of gathering primary data include interviews, surveys, experiments, and direct observations. Each method has its strengths and is chosen based on what is best suited for the research topic (Persaud, 2010).

## 3.4 Quantitative Research

Two tailored questionnaires for farmers and buyers were conducted at Pitkalija, Malta's main market for local produce (refer to Appendix 3 and 4). The questionnaires were collected manually and via entry in Google Forms during the entry time of the farmers at the Pitkalija (Monday and Thursday at 0100 am and Wednesday at 0700 am). The buyer's questionnaire was conducted in a similar manner, with the Monday and Thursday timings being 0400 am.

Data collection was done with the help of a colleague[1] who is knowledgeable of the stakeholders and as such helped into obtaining a mixture of responses to meet the different types of the stakeholders. Thus, whilst the sampling was random, there was some selection to ensure that all category combinations are represented. The data collection process was split over 4 weeks. Some questionnaire data collection also

[1] A colleague from the IT Support team assisted with the circulation of approximately 55% of the questionnaires among farmers and buyers during the Pitkalija waiting time. His role was solely to distribute and collect the documents.

provided extra information, as the process ended up into a lengthy discussion process with the stakeholder. This proved useful as more insights into the subject were captured.

### 3.4.1 Research population and Sample Considerations

**Table 3-1: Research Population and Sample Considerations**

| Type | Population (approx.) | Samples | % | Margin of Error |
|---|---|---|---|---|
| Producers (Farmers) | 1800 | 201 | 11% | +/-6% |
| Buyers | 1200 | 102 | 9% | +/-9% |

Source: Own Derivation

## 3.5 Qualitative Research

The semi-structured interviews were conducted with policy makers, operational leaders, stakeholders' leaders, politician and a European Commission Head of Unit. Eight interviews were conducted out of the nine scheduled. Only one candidate did not participate. The semi-structured interviews were conducted one-to-one on site, apart from two interviews which were conducted online. The interviews followed a script (Appendix 4) with a set of questions relating to the factors influencing competitiveness. All interviews apart from two, were recorded and transcripts compiled. For the two interviews which were not recorded, notes were taken accordingly.

The participants were contacted after the necessary approvals from the University of Malta Faculty Research - Ethics Committee, Office of the Prime Minister (OPM) and Permanent Secretary Office were received. An official email was sent to the participants. To maintain anonymity the participants have been categorised as follows:

**Table 3-2: List of Interview Participants**

| Participant | Type | Qty | Codes |
|---|---|---|---|
| High officials – Policy Makers | Policy | 3 | P01, P02, P03[2] |
| High Officials – Operational | Operational | 2 | OP1, P03 |
| High Officials – Regulatory | Regulatory | 2 | R01[3], R02[4] |
| High Officials – Education | Education | 1 | R02 |
| High Officials – Stakeholders | Stakeholders | 2 | R02, S02 |
| Politician | Politics | 1 | PT1 |
| Head, EU | EU | 1 | EU1 |

Source: Own Compilation

One interview was conducted with the participants who have more than one role. Interviews took an average of 45 minutes.

[2] Participant has two roles
[3] Participant did not participate
[4] Participant has three roles

## 3.6 Data Analysis

### 3.6.1 Questionnaires

The data from the questionnaires were analysed using SPSS running frequencies for demographic variables (example: age bracket, type of farmer and buyer) and descriptive statistics having all responses following a Likert-type scale. The Friedman Test and Kruskal-Wallis tests were conducted to analyse the data. Refer to Appendix 2 for details.

### 3.6.2 Semi-structured interviews

The semi-structured interviews were carefully analysed using Braun and Clarke's six-phase framework for thematic analysis (Byrne, 2022). This method helps researchers find and organise recurring patterns and themes in the data. It was used here to identify enablers and disruptors to local producers in being more competitive.

The first step was to carefully read the interview transcripts to understand what the participants were saying. Next, the main ideas and key points that came up repeatedly were analysed. After that, these main points and ideas were grouped into broader categories, which became the themes for the study. These themes were then refined and named, ensuring they clearly captured the participants' views and experiences. Finally, these themes were written up and included in the findings chapter.

In addition to finding and grouping themes, a qualitative analysis of the responses was also done. This was done using Braun and Clarke's Six-Phase Thematic Analysis Process, thus familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and documenting the themes (Braun & Clarke, 2006) This involved looking more closely at what people said to identify common

opinions, unique insights, and differences in experiences. The replies and frequency of themes was counted to determine the relative importance.

### 3.6.3 Joint Display Analysis

The qualitative analysis was compared with the quantitative findings to combine broad patterns with deeper insights, allowing for triangulation that supports comparison and enhances understanding of the subject under study.

## 3.7 Ethical Considerations

Ethical clearance was obtained from University of Malta and the OPM Data Protection Office. Participants were informed by email, took part voluntarily, signed consent forms, and interviews were recorded only with written permission. The research followed ethical guidelines, ensuring participants' privacy, anonymity, and confidentiality, with no names or affiliations disclosed.

My position as Chief Officer at the MFA made it easier to arrange the interviews, as I have established professional relationships with most of the participants.

## 3.8 Study Limitations

This study focuses only on fruit and vegetable stakeholders, such as farmers, buyers, and related industry professionals, because of the specific scope and aims of the research. It does not include final consumers or other broader stakeholders like external policymakers or non-agricultural businesses.

The study is also focused on the Pitkalija, as this is the main fruit and vegetables selling hub, and there is no data so far in relation to other fruit and vegetables markets, namely the farmers market and direct sales.

This means that the findings of the study are limited to the views and experiences of those directly involved in the Pitkalija market and may not fully represent the opinions or perspectives of those outside that market system, such as the consumers themselves.

## 3.9 Conclusion

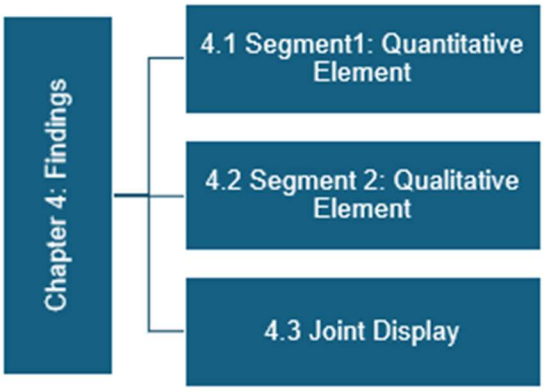
The research methods used to accomplish the study's goals were explained in this chapter. The results of the mixed methodological approach are further discussed in the following chapter.

# Chapter 4 – Research Findings

# 4. Introduction

This chapter presents the research findings, split into two main segments. The first segment outlines the statistical findings based on the quantitative element, whilst the second segment depicts the results obtained from the semi-structured interviews. Finally, the study compared qualitative insights with quantitative results, merging detail with wide-ranging data. This triangulation cross-checked the findings, strengthening accuracy and reliability. Counting how often each theme appeared showed which topics were most relevant.

**Figure 4-1: Overview Findings**




The findings of Segment 1: Quantitative Element is based on questionnaires with producers (farmers) and buyers. Segment 2: Qualitative Element is based on semi-structured interviews with the main stakeholders of the sector. These are then brought together in the Joint Display presented in Section 4.3.

Both the Quantitative and Qualitative Elements are based on the Factors Influencing Competitiveness as identified in Summary of Factors influencing Competitiveness. This contains eight factors which have been grouped into five main topics (findings). The reason being to facilitate the data collection and interpretation of the results.

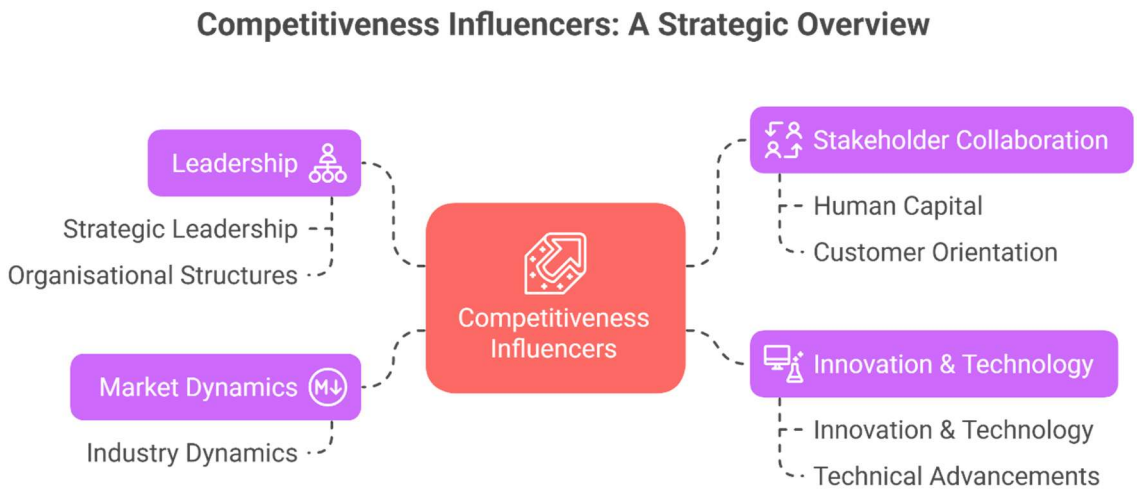
These are grouped as follows:

**Table 4-1: Mapping of Findings with Factors**

| Findings | Factors Influencing Competitiveness |
|---|---|
| Market Dynamics | Industry Dynamics |
| Leadership | Strategic Leadership; Organisational Structures |
| Stakeholder Collaboration | Human Capital; Customer Orientation; |
| Policy | Regulatory Frameworks |
| Innovation & Technology | Innovation & Technology; Technical Advancements |

**Source: Own Compilation**

**Figure 4-2: Thematic Map – Mapping**

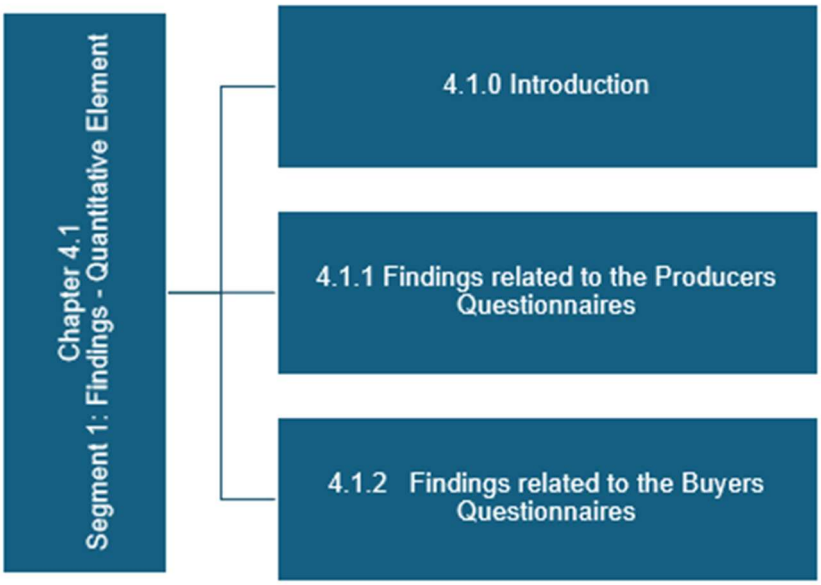



**Source: Own Compilation**

## 4.1 Segment 1: Findings - Quantitative Element

This section presents findings from the producers' and buyers' questionnaires, both using a 5-point Likert scale. It also covers the outcomes of the Friedman and Kruskal-Wallis tests.

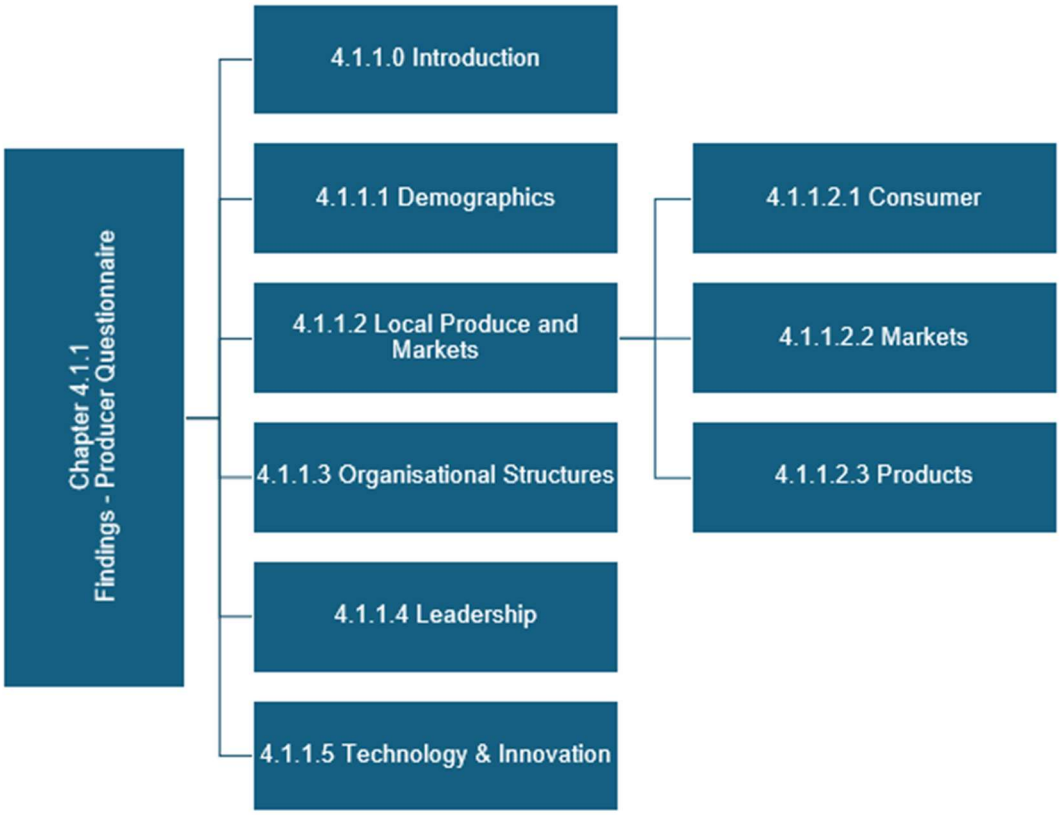
**Figure 4-3: Overview Quantitative Element**



### 4.1.1 Findings – Producer Questionnaire

This section portrays the findings from the producer's questionnaire. Figure 4.2 offers a visual summary.

**Figure 4-4: Overview Producer Questionnaire**



#### 4.1.1.1 Demographics

The population of this study amounts to 201 participants.

**Figure 4-5: Employment Type**

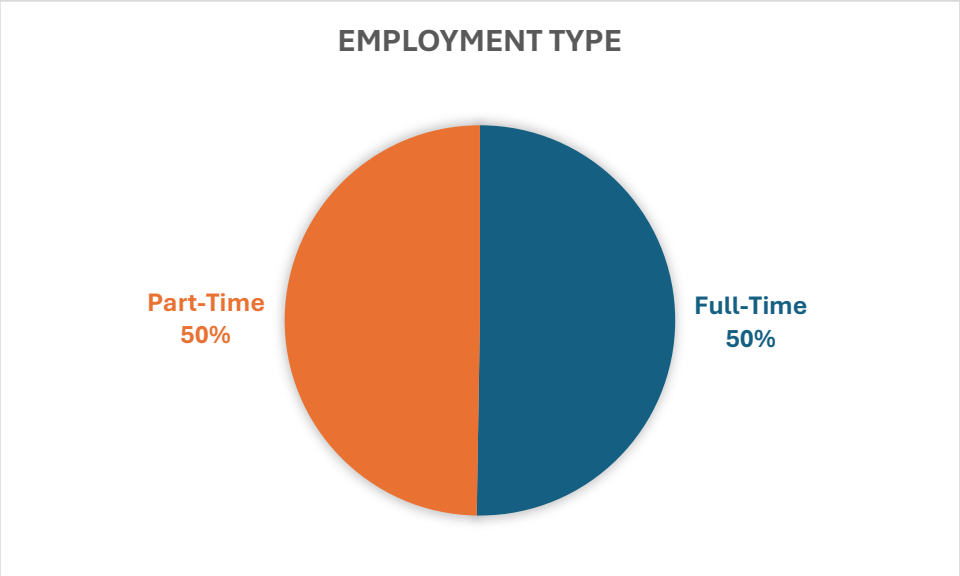



Figure 4-5 shows that 50.25% $_{(101/201)}$ work full-time and 49.75 $_{(100/201)}$ are part-timers.

**Figure 4-6: Age Brackets**

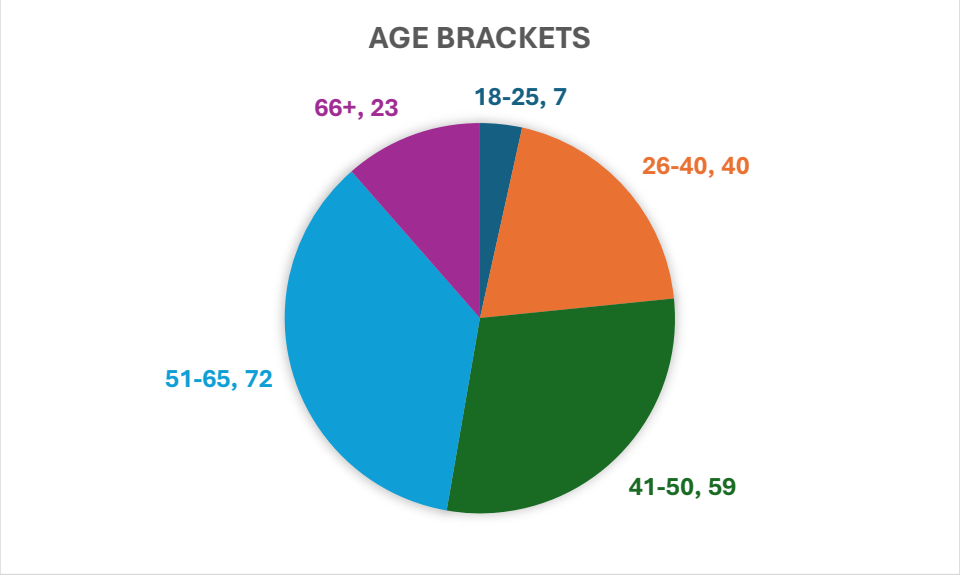


Figure 4-6 shows that 3.48% of respondents are aged 18-25 years (7/201), whilst 19.90% are aged 26-40 (40/201), 29.35% are aged 41-50 (59/201), 35.82% are aged 51-65 (72/201) and 11.44% are 66 years or over (23/201).

**Figure 4-7: Member of a Farmers Organisation**

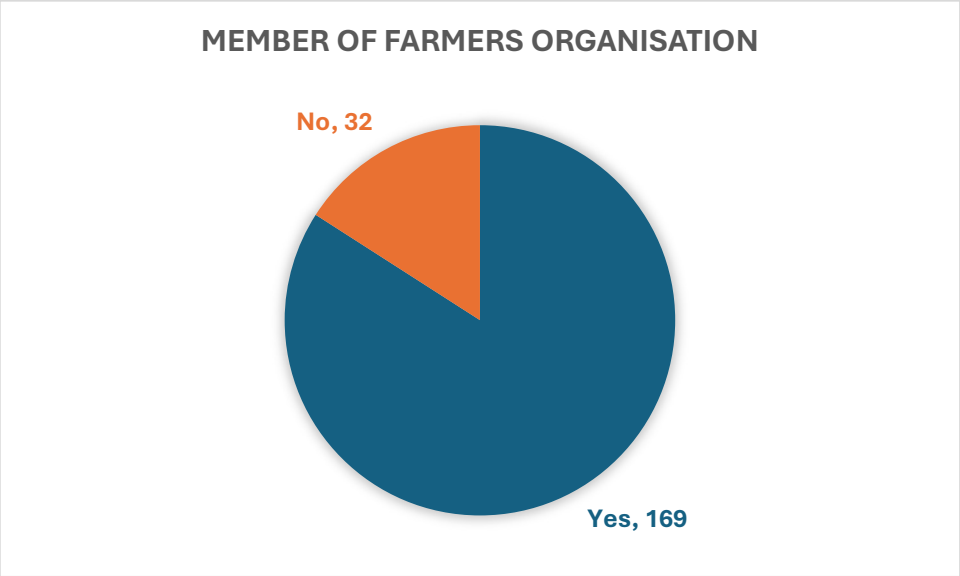



Figure 4-7 shows that 84.08% (169/201) are members of a farmer's organisation or cooperative and 15.92% (32/201) are not.

**Figure 4-8: Education**

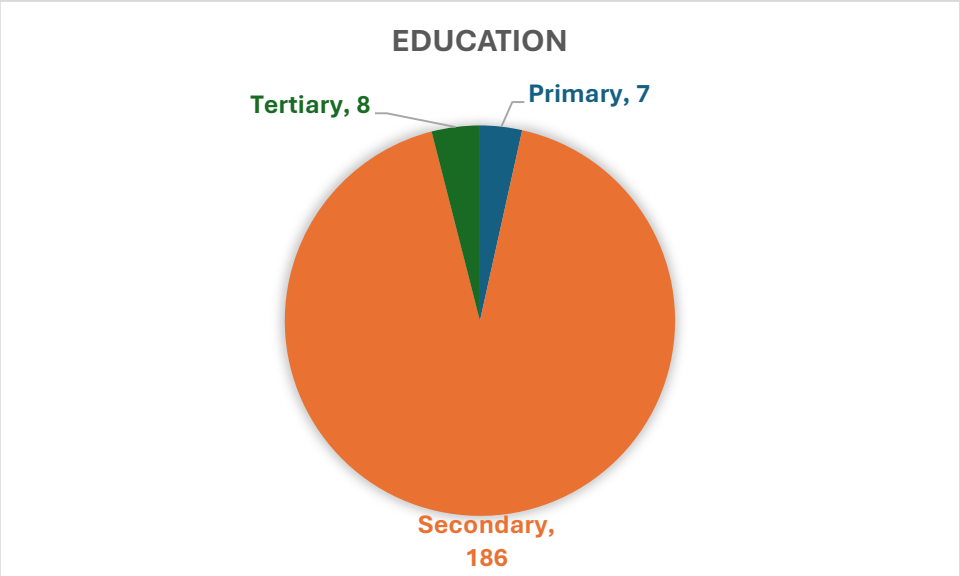


Figure 4-8 shows that 3.48% (7/201) have primary education, 92.54% (186/201) have secondary education, whilst 3.98% (8/201) have tertiary education.

**Figure 4-9: Gender**

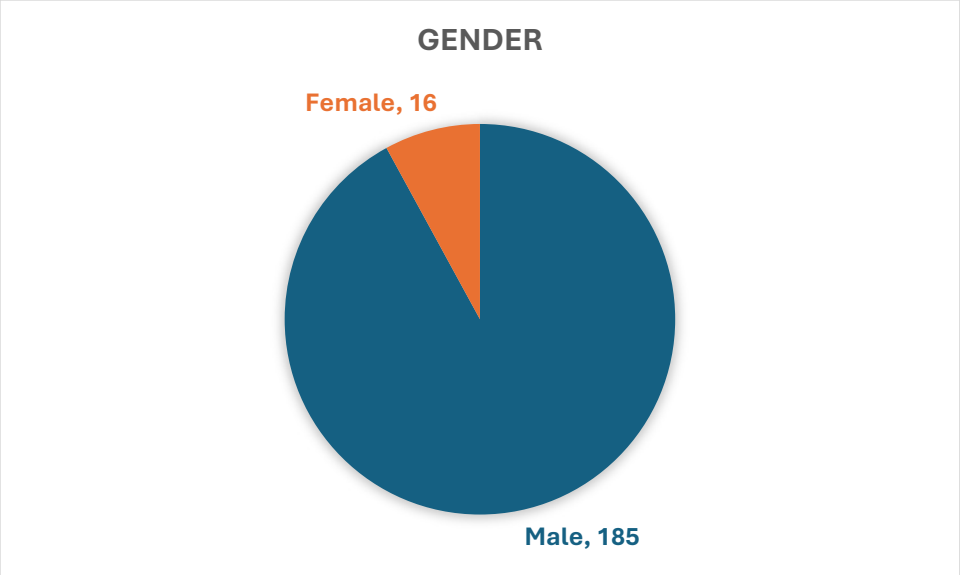



Figure 4-9 shows that 92.04% (185/201) of respondents are male and 7.96% (16/201) are female.

### 4.1.1.2 Local Produce and Markets

The test being conducted are the Friedman test is which a non-parametric statistical tool for checking if the average scores or median ranks given to a group of related statements are significantly different. In this case it is mapped to the questionnaires Likert-scale data where responses range from 1 ('Strongly Agree') to 5 ('Strongly Disagree'). The second test based on the same data is the Kruskal-Wallis Test which is used to compare the distributions of scores given to a statement by different independent groups. The questions are grouped into the different sectors in line with the identified factors affecting competitiveness.

#### 4.1.1.2.1 Consumer Aspect

Questions S1 and S2 are related to the consumer, with the scope to determine the preference and availability of the local fruit and vegetables.

**Table 4-2: Mean rating scores S1 and S2**

| Consumer related questions | Mean | Std. Dev |
|---|---|---|
| S1 - Consumers prefer the local fruit and vegetables. | 3.64 | 0.641 |
| S2 - The consumer has accessibility to buy local fruit and vegetables. | 3.28 | 0.884 |
| | | $X^2(1) = 23.040, p<0.001$ |

Table 4-2 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high $_{(23.040)}$ which indicates a low correlation between the statements. S1 is the statement that participants have agreed with the most.

**Table 4-3: Mean Rating Scores clustered by type of farmer, age bracket, and member of COOP/Agricultural organisation for S1 and S2**

| Kruskal Wallis Test | | Type of Farmer | | Age Bracket | | | | | Member of COOP/Agricultural Organisation | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | 18-25 | 26-40 | 41-50 | 51-65 | 66+ | Yes | No |
| S1 - Consumers prefer the local fruit and vegetables. | Mean | 3.57 | 3.71 | 3.86 | 3.58 | 3.69 | 3.65 | 3.52 | 3.65 | 3.59 |
| | Std. Dev | 0.712 | 0.556 | 0.378 | 0.594 | 0.534 | 0.632 | 0.994 | 0.609 | 0.798 |
| | P-Value | | 0.182 | | | | | 0.703 | | 0.815 |
| S2 -The consumer has accessibility to buy local fruit and vegetables. | Mean | 3.33 | 3.23 | 3.71 | 3.28 | 3.12 | 3.28 | 3.57 | 3.31 | 3.09 |
| | Std. Dev | 0.850 | 0.920 | 0.488 | 0.816 | 1.001 | 0.876 | 0.728 | 0.888 | 0.856 |
| | P-Value | | 0.489 | | | | | 0.178 | | 0.069 |

For S1 and S2, the mean rating scores do not vary between the type of farmer, age bracket and member of a farmer's organisation, which is supported by the p-value being more than the than 0.05 significance level as shown in Table 4-3.

#### 4.1.1.2.2 Market Aspect

Questions S3, S4 and S5 relate to the market aspect as are intended to assess the price element, the fairness of the market and the impact of the imports.

**Table 4-4: Mean Rating Scores of S3, S4 and S5**

| Market Aspect | Mean | Std. Dev |
|---|---|---|
| S3 - Farmers get a fair price from the sales of their fruit and vegetables. | 1.76 | 1.051 |
| S4 - The Pitkalija provides a fair marketplace. | 2.30 | 0.944 |
| S5 - Imports are a disruptor to the local products competitiveness. | 3.92 | 0.488 |
| | | $X^2(2) = 306.079, p<0.001$ |

Table 4-4 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high $_{(306.079)}$ which indicates a low correlation between the statements. S5 is the statement that participants have agreed with the most whilst S3 is the statement that participants have agreed with the least.

**Table 4-5: Mean Rating Scores clustered by type of farmer, age bracket, and member of COOP/Agricultural organisation for S3, S4 and S5**

| Kruskal Wallis Test | | Type of Farmer | | Age Bracket | | | | | Member of COOP/Agri Organisation | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | 18-25 | 26-40 | 41-50 | 51-65 | 66+ | Yes | No |
| S3 - Farmers get a fair price from the sales of their fruit and vegetables. | Mean | 1.63 | 1.88 | 1.43 | 1.83 | 2.05 | 1.53 | 1.70 | 1.76 | 1.75 |
| | Std. Dev | 0.956 | 1.131 | 1.134 | 1.035 | 1.057 | 0.978 | 1.146 | 1.027 | 1.191 |
| | P-Value | | 0.115 | | | | | 0.042 | | 0.971 |
| S4 - The Pitkalija provides a fair marketplace. | Mean | 2.24 | 2.36 | 2.00 | 2.50 | 2.46 | 2.22 | 1.87 | 2.25 | 2.56 |
| | Std. Dev | 0.918 | 0.969 | 1.000 | 0.847 | 0.988 | 0.923 | 0.920 | 0.968 | 0.759 |
| | P-Value | | 0.341 | | | | | 0.065 | | 0.105 |
| S5 - Imports are a disruptor to the local products competitiveness. | Mean | 3.94 | 3.89 | 4.00 | 3.98 | 3.95 | 3.86 | 3.87 | 3.92 | 3.91 |
| | Std. Dev | 0.369 | 0.584 | 0.000 | 0.158 | 0.391 | 0.678 | 0.458 | 0.505 | 0.390 |
| | P-Value | | 0.677 | | | | | 0.593 | | 0.372 |

Table 4-5 shows that for S3, the response varies between the age bracket as the p-value is less than 0.05 significance level. Age bracket 18-25 and 66+ disagree with this statement the most whilst respondents aged 41-50 agree with this statement the most.

#### 4.1.1.2.3 Product Aspect

Questions S6, S7, S8 and S9 relate to the product aspect as are intended to assess the promotion of the product, the grading and packaging aspect, as well as the need to manage the supply.

**Table 4-6: Mean Rating Scores of S6, S7, S8 and S9**

| Product Aspect | Mean | Std. Dev |
|---|---|---|
| S6 - The local fruit and vegetables are adequately marketed and promoted. | 2.08 | 1.065 |
| S7 - Grading of fruit and vegetables is important. | 3.23 | .748 |
| S8 - Adequate and consumer friendly packaging is needed. | 2.83 | .928 |
| S9 - Crop plans are important to manage the supply and demand. | 1.91 | 1.205 |
| | | $X^2(3) = 171.579, p<0.001$ |

Table 4-6 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high which indicates a low correlation between the statements. S7 is the statement that participants have agreed with the most. S9 is the statement that participants have agreed with the least.

**Table 4-7: Mean Rating Scores clustered by type of farmer, age bracket, and member of COOP/Agricultural organisation for S6, S7, S8 and S9**

| Kruskal Wallis Test | | Type of Farmer | | Age Bracket | | | | | Member of COOP/Agricultural Organisation | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | 18-25 | 26-40 | 41-50 | 51-65 | 66+ | Yes | No |
| S6 - The local fruit and vegetables are adequately marketed and promoted. | Mean | 2.10 | 2.06 | 2.29 | 1.98 | 2.17 | 2.01 | 2.17 | 2.11 | 1.94 |
| | Std. Dev | 1.025 | 1.108 | 0.951 | 1.143 | 1.177 | 0.971 | 0.984 | 1.058 | 1.105 |
| | P-Value | | 0.808 | | | | | 0.800 | | 0.322 |
| S7 - Grading of fruit and vegetables is important. | Mean | 3.20 | 3.27 | 3.43 | 3.45 | 3.22 | 3.25 | 2.78 | 3.22 | 3.31 |
| | Std. Dev | 0.775 | 0.723 | 0.787 | 0.639 | 0.744 | 0.746 | 0.795 | 0.727 | 0.859 |
| | P-Value | | 0.546 | | | | | 0.010 | | 0.262 |
| S8 - Adequate and consumer friendly packaging is needed. | Mean | 2.74 | 2.92 | 2.71 | 2.90 | 3.03 | 2.79 | 2.35 | 2.83 | 2.81 |
| | Std. Dev | 0.913 | 0.939 | 1.254 | 0.928 | 0.890 | 0.871 | 0.982 | 0.884 | 1.148 |
| | P-Value | | 0.086 | | | | | 0.027 | | 0.733 |
| S9 - Crop plans are important to manage the supply and demand. | Mean | 1.75 | 2.07 | 3.14 | 2.25 | 1.76 | 1.72 | 1.91 | 1.95 | 1.69 |
| | Std. Dev | 1.187 | 1.208 | 1.069 | 1.006 | 1.179 | 1.270 | 1.164 | 1.219 | 1.120 |
| | P-Value | | 0.063 | | | | | 0.010 | | 0.276 |

Table 4-7 shows that for S7, S8 and S9, the response varies between the age bracket as the p-value is less than 0.05 significance level. For S7, age bracket 26-40 agree with this statement the most whilst age bracket 66+ disagree with this statement the most. For S8, age bracket 41-50 agree with this statement the most whilst age bracket 66+ disagree with this statement the most. For S9, age brackets 18-25 and 26-40 agree with this statement the most whilst age bracket 51-65 agree with this statement the least.

### 4.1.1.3 Organisational Structure

Questions S10, S11 and S12 relate to the organisational structures, intended to assess whether farmers want to be part of an organisation and if they are ready to produce as directed by the organisation.

**Table 4-8: Mean Rating Scores of S10, S11 and S12**

| Organizational Aspect | Mean | Std. Dev |
|---|---|---|
| S10 - Being part of an organisation can help farmers. | 3.45 | .888 |
| S11 - I am ready to form part of an organisation and produce as directed by the organisation. | 2.52 | 1.196 |
| S12 -I am ready to be part of an organisation that gives me direction on what to produce to get a standard and fair price. | 2.18 | 1.191 |
| | | $X^2(2) = 204.174, p<0.001$ |

Table 4-8 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high $_{(204.174)}$ which indicates a low correlation between the statements. S10 is the statement that participants have agreed with the most whilst S12 is the statement that participants have agreed with the least.

**Table 4-9: Mean Rating Scores clustered by type of farmer, age bracket, and member of COOP/Agricultural organisation for S10, S11 and S12**

| Kruskal Wallis Test | | Type of Farmer | | Age Bracket | | | | | Member of COOP/Agricultural Organisation | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | 18-25 | 26-40 | 41-50 | 51-65 | 66+ | Yes | No |
| S10 - Being part of an organisation can help farmers. | Mean | 3.58 | 3.32 | 3.71 | 3.63 | 3.53 | 3.28 | 3.43 | 3.70 | 2.13 |
| | Std. Dev | 0.778 | 0.973 | 0.488 | 0.740 | 0.817 | 1.024 | 0.896 | 0.471 | 1.314 |
| | P-Value | | 0.020 | | | | | 0.319 | | <0.001 |
| S11 - I am ready to form part of an organisation and produce as directed by the organisation. | Mean | 2.62 | 2.41 | 3.43 | 3.13 | 2.51 | 2.26 | 2.00 | 2.67 | 1.69 |
| | Std. Dev | 1.139 | 1.248 | 0.535 | 0.883 | 1.194 | 1.233 | 1.206 | 1.158 | 1.061 |
| | P-Value | | 0.254 | | | | | <0.001 | | <0.001 |
| S12 - I am ready to be part of an organisation that gives me direction on what to produce to get a standard and fair price. | Mean | 2.33 | 2.03 | 3.29 | 2.80 | 2.27 | 1.81 | 1.70 | 2.27 | 1.69 |
| | Std. Dev | 1.159 | 1.210 | 0.488 | 1.137 | 1.112 | 1.134 | 1.146 | 1.179 | 1.148 |
| | P-Value | | 0.077 | | | | | <0.001 | | 0.011 |

Table 4-9 shows that for S10, the response rate varies between the type of farmer as the p-value is less than 0.05 significance level. The full-time farmers agree more with S10 then the part-time farmers. For S11 and S12, the response rate varies between the age bracket as the p-value is less than the 0.05 significance level. For both S11 and S12, age bracket 18-25 agree with these statements the most whilst age bracket 66+ disagree with these statements the most. For S10, S11 and S12, the mean rating scores vary between whether a respondent is part of a farmers' organisation, which is supported by the p-value being less than 0.05 significance level. Respondents that are part of an organisation agree with these three statements much more than respondents that are not part of an organisation.

### 4.1.1.4 Leadership

Questions S13, S14 and S15 relate to the leadership, intended to assess whether authorities are seen as doing a good work in the managing the Pitkalija, the promotion of fruit and vegetables and whether the policies and decisions taken are beneficial.

**Table 4-10: Mean Rating Scores of S13, S14 and S15**

| Leadership Aspect | Mean | Std. Dev |
|---|---|---|
| S13 - The authorities are doing good work in relation the markets from which the local produce is being sold. | 2.73 | .824 |
| S14 - The authorities are doing good work in relation to promoting the local produce. | 2.62 | .973 |
| S15 - The policies and decision being taken in relation to agriculture are beneficial to the farmers. | 2.12 | 1.000 |
| | | $X^2(2) = 80.182, p<0.001$ |

Table 4-10 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high $_{(80.182)}$ which indicates a low correlation between the statements. S13 is the statement that participants have agreed with the most. S15 is the statement that participants have agreed with the least.

**Table 4-11: Mean Rating Scores clustered by type of farmer, age bracket, and member of COOP/Agricultural organisation for S13, S14 and S15**

| Kruskal Wallis Test | | Type of Farmer | | Age Bracket | | | | | Member of COOP/Agri. Organisation | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | 18-25 | 26-40 | 41-50 | 51-65 | 66+ | Yes | No |
| S13 - The authorities are doing good work in relation the markets from which the local produce is being sold | Mean | 2.74 | 2.71 | 2.57 | 2.75 | 2.68 | 2.76 | 2.74 | 2.72 | 2.78 |
| | Std. Dev | 0.716 | 0.924 | 0.787 | 0.840 | 0.899 | 0.831 | 0.619 | 0.781 | 1.039 |
| | P-Value | | 0.562 | | | | | 0.761 | | 0.253 |
| S14 - The authorities are doing good work in relation to promoting the local produce. | Mean | 2.74 | 2.49 | 2.57 | 2.68 | 2.61 | 2.44 | 3.09 | 2.65 | 2.44 |
| | Std. Dev | 0.730 | 1.159 | 0.787 | 0.764 | 0.965 | 1.137 | 0.668 | 0.921 | 1.216 |
| | P-Value | | 0.380 | | | | | 0.149 | | 0.517 |
| S15 - The policies and decision being taken in relation to agriculture are beneficial to the farmers. | Mean | 2.21 | 2.04 | 2.00 | 1.98 | 2.05 | 2.29 | 2.09 | 2.11 | 2.19 |
| | Std. Dev | 0.952 | 1.044 | 1.000 | 1.050 | 1.041 | 0.999 | 0.793 | 0.972 | 1.148 |
| | P-Value | | 0.345 | | | | | 0.565 | | 0.484 |

Table 4-11 shows that the mean rating scores do not vary significantly between the type of farmer, age bracket and member of COOP/agricultural organisation for S13, S14 and S15.

### 4.1.1.5 Technology and Innovation

Questions S16, S17 and S18 relate to the technology and innovation, intended to assess the farmers' appetite to technology and innovation.

**Table 4-12: Mean Rating Scores of S16, S17 and S18**

| Technology and Innovation Aspect | Mean | Std. Dev |
|---|---|---|
| S16 - I am ready to be more innovative and adapt new technology to grow my products. | 2.55 | 1.421 |
| S17 - I am ready to go to courses to learn new techniques on how to grow my products. | 2.43 | 1.441 |
| S18 - I would rather work the traditional way, than use new technology like hydroponics, vertical farming etc. | 2.00 | 1.748 |
| | | $X^2(2) = 8.710, p<0.013$ |

Table 4-12 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high which indicates a low correlation between the statements. S16 is the statement that participants have agreed with the most whilst S18 is the statement that participants have agreed with the least.

**Table 4-13: Mean Rating Scores clustered by type of farmer, age bracket, and member of COOP/Agricultural organisation for S16, S17 and S18**

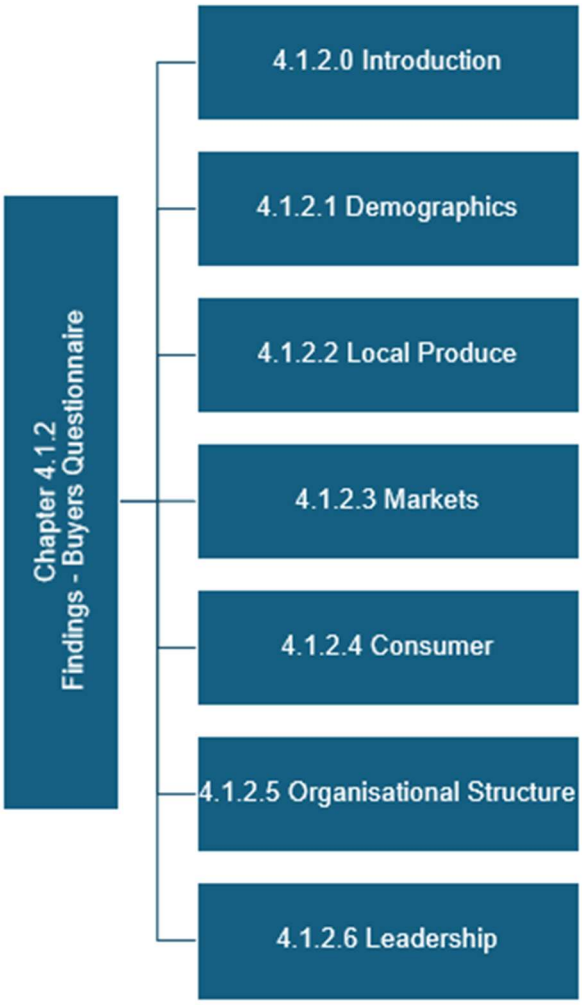
| Kruskal Wallis Test | | Type of Farmer | | Age Bracket | | | | | Member of COOP/Agri. Organisation | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | 18-25 | 26-40 | 41-50 | 51-65 | 66+ | Yes | No |
| S16 - I am ready to be more innovative and adapt new technology to grow my products. | Mean | 2.78 | 2.31 | 4.00 | 3.45 | 3.25 | 1.92 | 0.70 | 2.61 | 2.22 |
| | Std. Dev | 1.324 | 1.482 | 0.000 | 1.011 | 0.883 | 1.330 | 0.635 | 1.402 | 1.497 |
| | P-Value | | 0.017 | | | | | <0.001 | | 0.163 |
| S17 - I am ready to go to courses to learn new techniques on how to grow my products. | Mean | 2.69 | 2.16 | 3.86 | 3.48 | 3.00 | 1.79 | 0.70 | 2.49 | 2.09 |
| | Std. Dev | 1.355 | 1.482 | 0.378 | 1.012 | 1.232 | 1.186 | 0.703 | 1.440 | 1.422 |
| | P-Value | | 0.006 | | | | | <0.001 | | 0.127 |
| S18 - I would rather work the traditional way, than use new technology like hydroponics, vertical farming etc. | Mean | 1.88 | 2.13 | 1.14 | 0.83 | 1.39 | 2.76 | 3.52 | 1.99 | 2.06 |
| | Std. Dev | 1.762 | 1.733 | 1.676 | 1.394 | 1.565 | 1.543 | 1.163 | 1.754 | 1.740 |
| | P-Value | | 0.292 | | | | | <0.001 | | 0.714 |

Table 4-13 shows that for S16 and S17, the response rate varies between the type of farmer as the p-value is less than 0.05 significance level. The full-time farmers agree more with S16 and S17 then the part-time farmers. For S16 and S17, the response rate varies between the age bracket as the p-value is less than the 0.05 significance level. For S16, S17 and S18, age bracket 18-25 agree with these statements the most whilst age bracket 66+ disagree with these statements the most. For S18, age bracket 66+ agree with this statement the most whilst age bracket 26-40 disagree the most with S18. The mean rating scores do not vary between whether a respondent is part of a farmers' organisation, which is supported by the p-value being more than the than 0.05 significance level for S16, S17 and S18.

### 4.1.2 Findings – Buyers Questionnaire

This section portrays the findings from the buyers' questionnaire. Figure 4.2 offers a visual summary.

**Figure 4-10: Overview Buyers Questionnaire**



### 4.1.2.1 Demographics

The population of this study amounts to 102 participants.

**Figure 4-11: Employment Type**

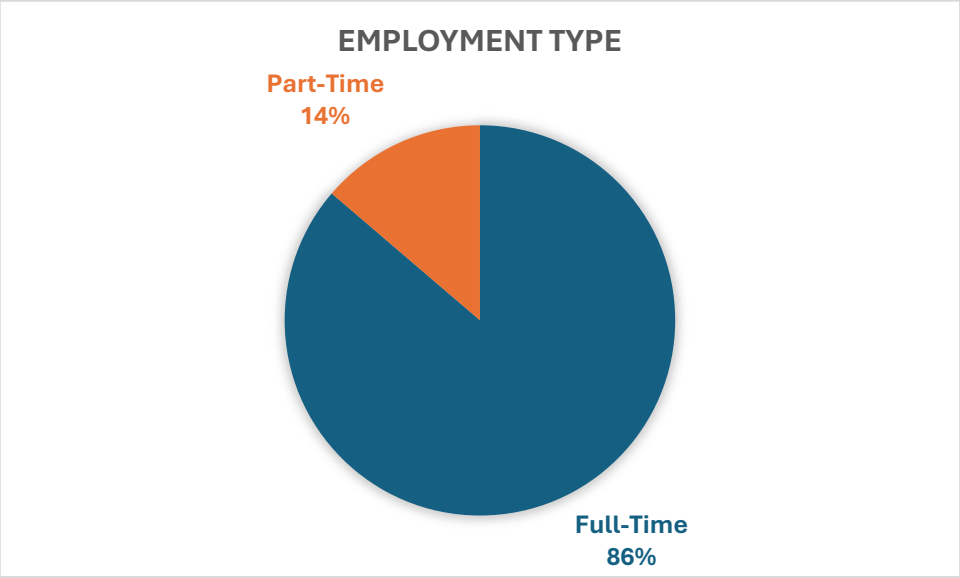



Figure 4-11 shows that 86% (88/201) work full-time and 14% (14/201) are part-timers.

**Figure 4-12: Type of Business**

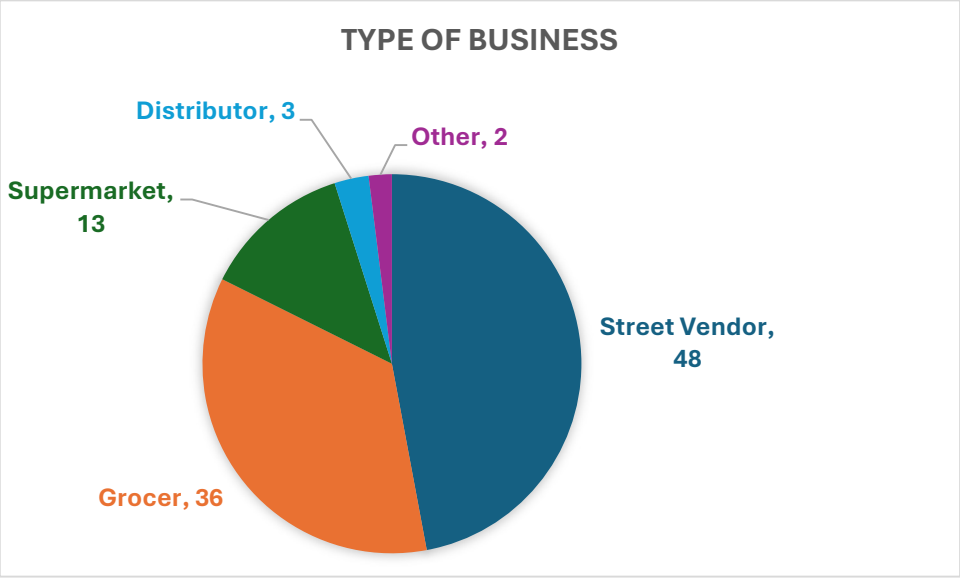


Figure 4-12 shows that: 47.06% of respondents (48/102) are street vendors, 35.29% (36/102) are grocers, 12.75% (13/102) are supermarkets, 2.94% (3/102) are distributors and 1.96% (2/102) are other type.

### 4.1.2.2 Local Produce

Questions S1, S2, S3, S4 and S5 relate to the local produce, intended to assess the consumers' preferences, the marketing and promotion, grading and packaging and the quality of the local fruit and vegetables.

**Table 4-14: Mean Scoring Rates for S1, S2, S3, S4 and S5**

| Local Produce Aspect | Mean | Std. Dev |
|---|---|---|
| S1 - Consumers prefer the local fruit and vegetables | 3.57 | 0.725 |
| S2 - The local fruit and vegetables are adequately marketed and promoted. | 2.50 | 0.741 |
| S3 - Grading of fruit and vegetables is a must for the local produce to survive. | 3.64 | 0.768 |
| S4 - The local produce must be packaged in adequate, new, and consumer friendly packaging. | 2.48 | 1.303 |
| S5 - The quality of the local produce is good. | 3.42 | 0.724 |
| | | $X^2(4) = 150.911, p<0.001$ |

Table 4-14 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high which indicates a low correlation between the statements. S3 is the most agreed with. S4 is the least.

**Table 4-15: Mean Rating Scores clustered by type of buyer and business (S1, S2, S3, S4 and S5)**

| Kruskal Wallis Test | | Type of Buyer | | Type of Business | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | Street Hawker | Grocer | Super-market | Distributor | Other |
| S1 - Consumers prefer the local fruit and vegetables | Mean | 3.56 | 3.64 | 3.60 | 3.47 | 3.69 | 4.00 | 3.00 |
| | Std. Dev | 0.725 | 0.745 | 0.610 | 0.845 | 0.751 | 0.000 | 1.414 |
| | P-Value | | 0.532 | | | | | 0.541 |
| S2 - The local fruit and vegetables are adequately marketed and promoted. | Mean | 2.50 | 2.50 | 2.54 | 2.33 | 2.92 | 2.00 | 2.50 |
| | Std. Dev | 0.695 | 1.019 | 0.617 | 0.956 | 0.277 | 0.000 | 0.707 |
| | P-Value | | 0.393 | | | | | 0.072 |
| S3 - Grading of fruit and vegetables is a must for the local produce to survive. | Mean | 3.67 | 3.43 | 3.65 | 3.67 | 3.46 | 4.00 | 3.50 |
| | Std. Dev | 0.754 | 0.852 | 0.838 | 0.756 | 0.660 | 0.000 | 0.707 |
| | P-Value | | 0.110 | | | | | 0.336 |
| S4 - The local produce must be packaged in adequate, new, and consumer friendly packaging. | Mean | 2.36 | 3.21 | 2.21 | 2.53 | 2.85 | 4.00 | 3.50 |
| | Std. Dev | 1.297 | 1.122 | 1.336 | 1.230 | 1.281 | 0.000 | 0.707 |
| | P-Value | | 0.015 | | | | | 0.047 |
| S5 - The quality of the local produce is good. | Mean | 3.38 | 3.71 | 3.52 | 3.39 | 3.54 | 3.00 | 1.50 |
| | Std. Dev | 0.700 | 0.825 | 0.618 | 0.766 | 0.660 | 0.000 | 0.707 |
| | P-Value | | 0.022 | | | | | 0.049 |

Table 4-15 shows that for S4 and S5, the response rate varies between the type of buyer as the p-value is less than 0.05 significance level. The part- time buyers agree more with S4 and S5 compared to the full-time buyers. S4 and S5 also vary between the type of business as the p-value is less than the 0.05 significance level. All distributors have strongly agreed with S4, and street hawkers are the least that agreed with S4. For S5, supermarkets have agreed with this statement the most whilst other have disagreed the most with this statement.

### 4.1.2.3 Markets

Questions S6, S7, S8, S9 and S10 relate to the Pitkalija market, intended to assess the buyers' perspective on whether farmers are getting a fair price, whether the Pitkalija is a fair marketplace, the accessibility to the markets, and whether large buyers should be and/or are being preferred.

**Table 4-16: Mean scoring rates for S6, S7, S8, S9 and S10**

| Market Aspect | Mean | Std. Dev |
|---|---|---|
| S6 - Farmers do get a fair price for their produce. | 2.31 | 1.024 |
| S7 - The Pitkalija provides a fair marketplace, both to the buyer and to the seller. | 2.23 | 0.795 |
| S8 - The local markets are accessible to buyers and local produce can be purchased fairly. | 2.76 | 0.760 |
| S9 - The market is changing and there is a preference to sell more to the large buyers. | 3.27 | 1.162 |
| S10 - The market dynamics are changing, and large buyers need to be preferred. | 1.13 | 1.376 |
| | | $X^2(4) = 124.119, p<0.001$ |

Table 4-16 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high which indicates a low correlation between the statements. S9 is the statement that participants have agreed with the most whilst S10 is the statement that participants have agreed with the least.

**Table 4-17: Mean Rating Scores clustered by type of buyer and business for S6, S7, S8, S9 and S10**

| Kruskal Wallis Test | | Type of Buyer | | Type of Business | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | Street Hawker | Grocer | Super-market | Distributor | Other |
| S6 - Farmers do get a fair price for their produce. | Mean | 2.31 | 2.36 | 2.31 | 2.14 | 2.62 | 3.00 | 2.50 |
| | Std. Dev | 0.998 | 1.216 | 0.949 | 1.150 | 1.044 | 0.000 | 0.707 |
| | P-Value | | 0.891 | | | | | 0.426 |
| S7 - The Pitkalija provides a fair marketplace, both to the buyer and to the seller. | Mean | 2.23 | 2.21 | 2.31 | 2.11 | 2.23 | 2.00 | 2.5 |
| | Std. Dev | 0.784 | 0.893 | 0.776 | 0.854 | 0.832 | 0.000 | 0.707 |
| | P-Value | | 0.946 | | | | | 0.791 |
| S8 - The local markets are accessible to buyers and local produce can be purchased fairly. | Mean | 2.76 | 2.79 | 2.85 | 2.64 | 3.00 | 2.00 | 2.5 |
| | Std. Dev | 0.773 | 0.699 | 0.652 | 0.867 | 0.577 | 0.000 | 2.121 |
| | P-Value | | 0.878 | | | | | 0.156 |
| S9 - The market is changing and there is a preference to sell more to the large buyers. | Mean | 3.28 | 3.21 | 3.27 | 3.58 | 2.85 | 2.00 | 2.50 |
| | Std. Dev | 1.124 | 1.424 | 1.267 | 0.841 | 1.281 | 0.000 | 2.121 |
| | P-Value | | 0.658 | | | | | 0.017 |
| S10 - The market dynamics are changing, and large buyers need to be preferred. | Mean | 1.14 | 1.07 | 0.85 | 0.78 | 2.46 | 4.00 | 1.00 |
| | Std. Dev | 1.366 | 1.492 | 1.148 | 1.098 | 1.613 | 0.000 | 0.000 |
| | P-Value | | 0.698 | | | | | <0.001 |

Table 4-17 shows that for S6, S7, S8, S9 and S10 the response rate do not vary by the type of buyer as the p-value is greater than the 0.05 significance level. S9 and S10 do vary between the type of business as the p-value is less than the 0.05 significance level. For S9, grocer respondents have agreed with this statement the most whilst distributors have agreed the least with this statement. Distributors have agreed the most with S10 whilst grocer respondents have agreed the least.

### 4.1.2.4 Consumer

Questions S11, S12, S13, S14 and S15 relate to the consumers' aspect, trying to assess if the product is available, the preferences and the reasons why customers buy the local product, being it because of freshness, quality and price. Question S14 addresses the need for consumer-friendly packaging.

**Table 4-18: Mean scoring rates for S11, S12, S13, S14 and S15**

| Consumer Aspect | Mean | Std. Dev |
|---|---|---|
| S11 - The consumer is finding the local produce that he/she requires. | 3.08 | 0.829 |
| S12 - Consumers prefer local produce because of freshness. | 3.32 | 0.834 |
| S13 - Consumers prefer local produce because of quality. | 3.28 | 0.776 |
| S14 - Local produce is in general not convenient to buy due to its packaging not being consumer friendly. | 2.00 | 1.227 |
| S15 - Price is the determinantal factor for the consumer to decide whether to buy local or imported. | 1.99 | 1.263 |
| | | $X^2(4) = 137.866, p<0.001$ |

Table 4-18 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high which indicates a low correlation between the statements. S13 is the statement that participants have agreed with the most whilst S15 is the statement that participants have agreed with the least.

**Table 4-19: Mean Rating Scores clustered by type buyer and business for S11, S12, S13, S14 and S15**

| Kruskal Wallis Test | | Type of Buyer | | Type of Business | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | Street Hawker | Grocer | Super-market | Distributor | Other |
| S11 - The consumer is finding the local produce that he/she requires. | Mean | 3.17 | 2.50 | 2.83 | 3.28 | 3.31 | 4.00 | 2.50 |
| | Std. Dev | 0.776 | 0.941 | 0.834 | 0.741 | 0.855 | 0.000 | 0.707 |
| | P-Value | | 0.010 | | | | | 0.013 |
| S12 - Consumers prefer local produce because of freshness. | Mean | 3.35 | 3.14 | 3.25 | 3.33 | 3.31 | 4.00 | 4.00 |
| | Std. Dev | 0.774 | 1.167 | 0.838 | 0.862 | 0.855 | 0.000 | 0.000 |
| | P-Value | | 0.822 | | | | | 0.316 |
| S13 - Consumers prefer local produce because of quality. | Mean | 3.31 | 3.14 | 3.21 | 3.28 | 3.46 | 4.00 | 3.00 |
| | Std. Dev | 0.764 | 0.864 | 0.798 | 0.815 | 0.519 | 0.000 | 1.414 |
| | P-Value | | 0.506 | | | | | 0.438 |
| S14 - Local produce is in general not convenient to buy due to its packaging not being consumer friendly. | Mean | 1.97 | 2.21 | 2.02 | 1.86 | 2.08 | 2.00 | 3.50 |
| | Std. Dev | 1.217 | 1.311 | 1.246 | 1.150 | 1.498 | 0.000 | 0.707 |
| | P-Value | | 0.453 | | | | | 0.458 |
| S15 - Price is the determinantal factor for the consumer to decide whether to buy local or imported. | Mean | 2.01 | 1.86 | 1.56 | 2.47 | 2.38 | 2.00 | 1.00 |
| | Std. Dev | 1.317 | 0.864 | 1.335 | 1.183 | 0.768 | 0.000 | 0.000 |
| | P-Value | | 0.675 | | | | | 0.009 |

Table 4-19 shows that S11 response rate do vary between the type of buyer. Part-time buyers have agreed with this statement more than full-time buyers. The response rate for S11 and S15 also varies between the type of business. For S11, distributors have strongly agreed with this statement having other type of businesses the least agreeing with S11. For S15, grocer respondents have agreed the most with this statement whilst others have agreed the least.

### 4.1.2.5 Organisational Structure

Questions S16, S17, S18 and S19 assess the organisational structures, namely preferences from where and how to buy.

**Table 4-20: Mean scoring rates for S16, S17, S18 and S19**

| Organisational Structures | Mean | Std. Dev |
|---|---|---|
| S16 - I prefer buying directly from farmers than from markets like Pitkalija. | 1.46 | 1.347 |
| S17 - It is better to buy directly from a farmers' organisation than from the market. | 1.66 | 1.239 |
| S18 - Would like to have fixed contracts with market organisation to buy fruit and vegetables. | 1.59 | 1.292 |
| S19 - Farmers are too traditional and need to change the way they work. | 2.93 | 1.451 |
| | | $X^2(3) = 63.012, p<0.001$ |

Table 4-20 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high which indicates a low correlation between the statements. S19 is the statement that participants have agreed with the most whilst S16 is the statement that participants have agreed with the least.

**Table 4-21: Mean Rating Scores clustered by type of buyer and business for S16, S17, S18 and S19**

| Kruskal Wallis Test | | Type of Buyer | | Type of Business | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | Street Hawker | Grocer | Super-market | Distributor | Other |
| S16 - I prefer buying directly from farmers than from markets like Pitkalija. | Mean | 1.53 | 1.00 | 1.56 | 1.44 | 1.54 | 0.00 | 1.00 |
| | Std. Dev | 1.397 | 0.877 | 1.335 | 1.362 | 1.450 | 0.000 | 1.414 |
| | P-Value | | 0.279 | | | | | 0.250 |
| S17 - It is better to buy directly from a farmers' organisation than from the market. | Mean | 1.55 | 2.36 | 1.52 | 1.58 | 2.23 | 2.00 | 2.00 |
| | Std. Dev | 1.203 | 1.277 | 1.052 | 1.204 | 1.787 | 0.000 | 2.828 |
| | P-Value | | 0.027 | | | | | 0.632 |
| S18 - Would like to have fixed contracts with market organisation to buy fruit and vegetables. | Mean | 1.58 | 1.64 | 1.75 | 1.08 | 2.46 | 2.00 | 0.50 |
| | Std. Dev | 1.257 | 1.550 | 1.313 | 0.937 | 1.664 | 0.000 | 0.707 |
| | P-Value | | 0.984 | | | | | 0.018 |
| S19 - Farmers are too traditional and need to change the way they work. | Mean | 2.90 | 3.14 | 3.13 | 2.31 | 3.92 | 4.00 | 1.50 |
| | Std. Dev | 1.470 | 1.351 | 1.265 | 1.687 | 0.277 | 0.000 | 0.707 |
| | P-Value | | 0.485 | | | | | 0.001 |

Table 4-21 shows that for S17 the response rate varies between the type of buyer as the p-value is less than 0.05 significance level, having part-time respondents agreeing with this statement much more than full-time respondents. The response rate for S18 and S19 do vary between the type of business as the p-value is less than the 0.05 significance level. Supermarket respondents have agreed with S18 the most whilst other respondents have agreed the least with this statement. Distributor respondents have agreed the most with S19 whilst other respondents have agreed the least with S19.

### 4.1.2.6 Leadership

Questions S20, S21 and S22 assess the leadership aspect with a focus on the work being done at the Pitkalija, the promotion of the local produce and the policies.

**Table 4-22: Mean scoring rates for S20, S21 and S22**

| Leadership Aspect | Mean | Std. Dev |
|---|---|---|
| S20 - The authorities are doing good work in relation the markets from which the local produce is being sold. | 2.47 | 0.841 |
| S21 - The authorities are doing good work in relation to promoting the local produce. | 2.57 | 0.751 |
| S22 - The policies and decision being taken in relation to agriculture are beneficial to the farmers. | 1.92 | 0.941 |
| | | $X^2(2) = 60.448, p<0.001$ |

Table 4-22 shows that the mean rating scores differ between the statements as the p-value is less than the 0.05 significance level. The $X^2$ result is high which indicates a low correlation between the statements. S21 is the statement that participants have agreed with the most whilst S22 is the statement that participants have agreed with the least.

**Table 4-23: Mean Rating Scores clustered by type of buyer and business for S20, S21 and S22**

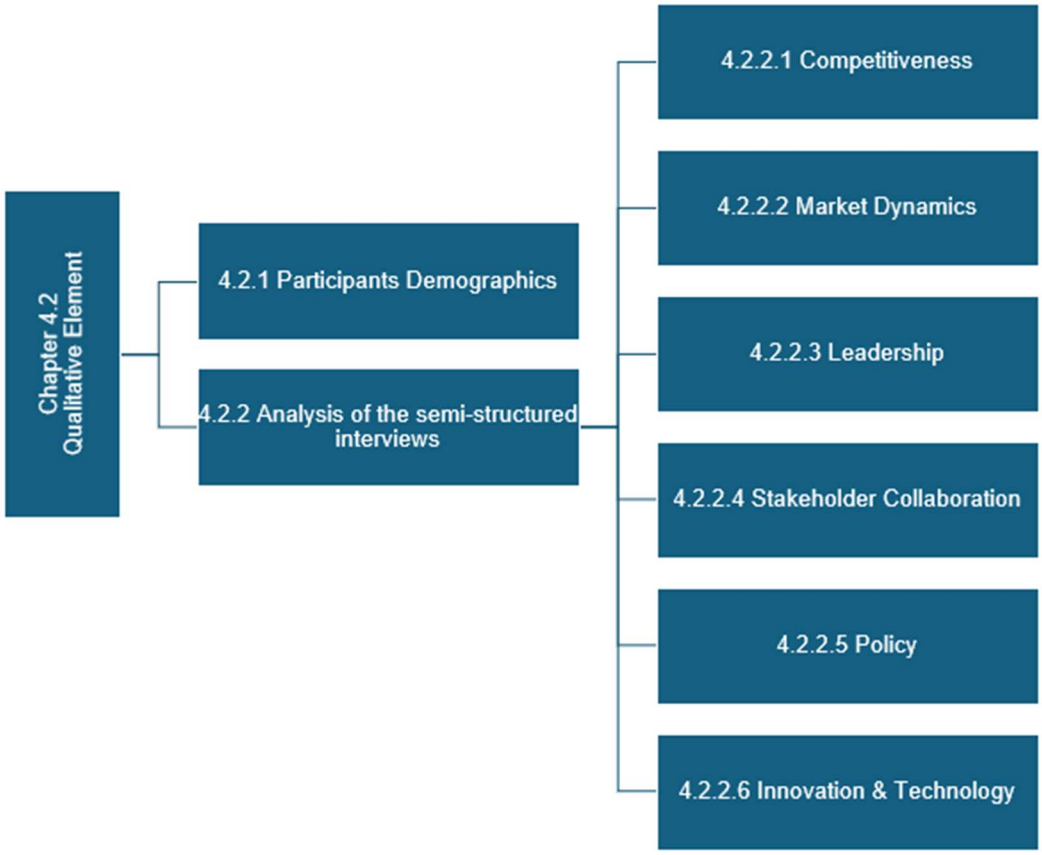
| Kruskal Wallis Test | | Type of Buyer | | Type of Business | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Full Time | Part Time | Street Hawker | Grocer | Super-market | Distributor | Other |
| S20 - The authorities are doing good work in relation the markets from which the local produce is being sold. | Mean | 2.43 | 2.71 | 2.38 | 2.58 | 2.62 | 3.00 | 1.00 |
| | Std. Dev | 0.843 | 0.825 | 0.890 | 0.692 | 0.961 | 0.000 | 0.000 |
| | P-Value | | 0.293 | | | | | 0.098 |
| S21 - The authorities are doing good work in relation to promoting the local produce. | Mean | 2.52 | 2.86 | 2.35 | 2.72 | 2.92 | 3.00 | 2.00 |
| | Std. Dev | 0.742 | 0.770 | 0.758 | 0.566 | 0.954 | 0.000 | 1.414 |
| | P-Value | | 0.107 | | | | | 0.022 |
| S22 - The policies and decision being taken in relation to agriculture are beneficial to the farmers. | Mean | 1.93 | 1.86 | 1.81 | 2.06 | 1.92 | 2.33 | 1.50 |
| | Std. Dev | 0.956 | 0.864 | 1.024 | 0.715 | 1.256 | 0.577 | 0.707 |
| | P-Value | | 0.744 | | | | | 0.538 |

Table 4-23 shows that for S20, S21 and S22 the response rate does not vary by the type of buyer as the p-value is greater than the 0.05 significance level. The response rate for S21 varies between the type of business, having supermarket respondents agreeing with this statement the most whilst other respondents have agreed with this statement the least.

## 4.2 Segment 2: Findings - Qualitative Element

The section depicts the findings obtained from the semi-structured interviews.

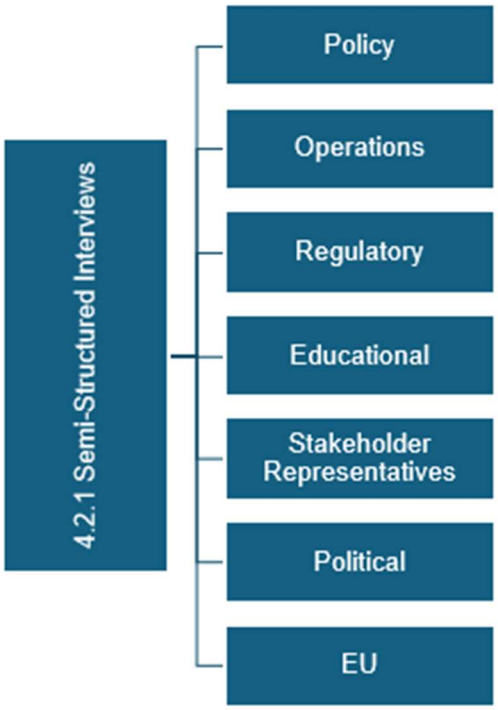
**Figure 4-13: Overview Segment 2 – Qualitative Element**



### 4.2.1 Participants Demographics

The semi-structured interviews as explained in Table 3.1: List of Interview Participants in Chapter 3 were conducted with high-ranking officials who cover the management of the main aspects of structures, rules, decision-making and operational aspects, coupled with the main stakeholders of the agricultural sector. Some participants cover diverse cover diverse aspects because they have different roles and responsibilities. The main aspects covered are depicted as follows:

**Figure 4-14: Overview Demographics**



## 4.2.2 Qualitative Findings Analysis

### 4.2.2.1 Competitiveness

Participants were asked about Overall Competitiveness of the Agricultural Sector, with the discussions focusing on the strengths and weaknesses, and evolving to the factors that contribute and hinder the segment's competitiveness.

#### 4.2.2.1.1 Defining the Themes

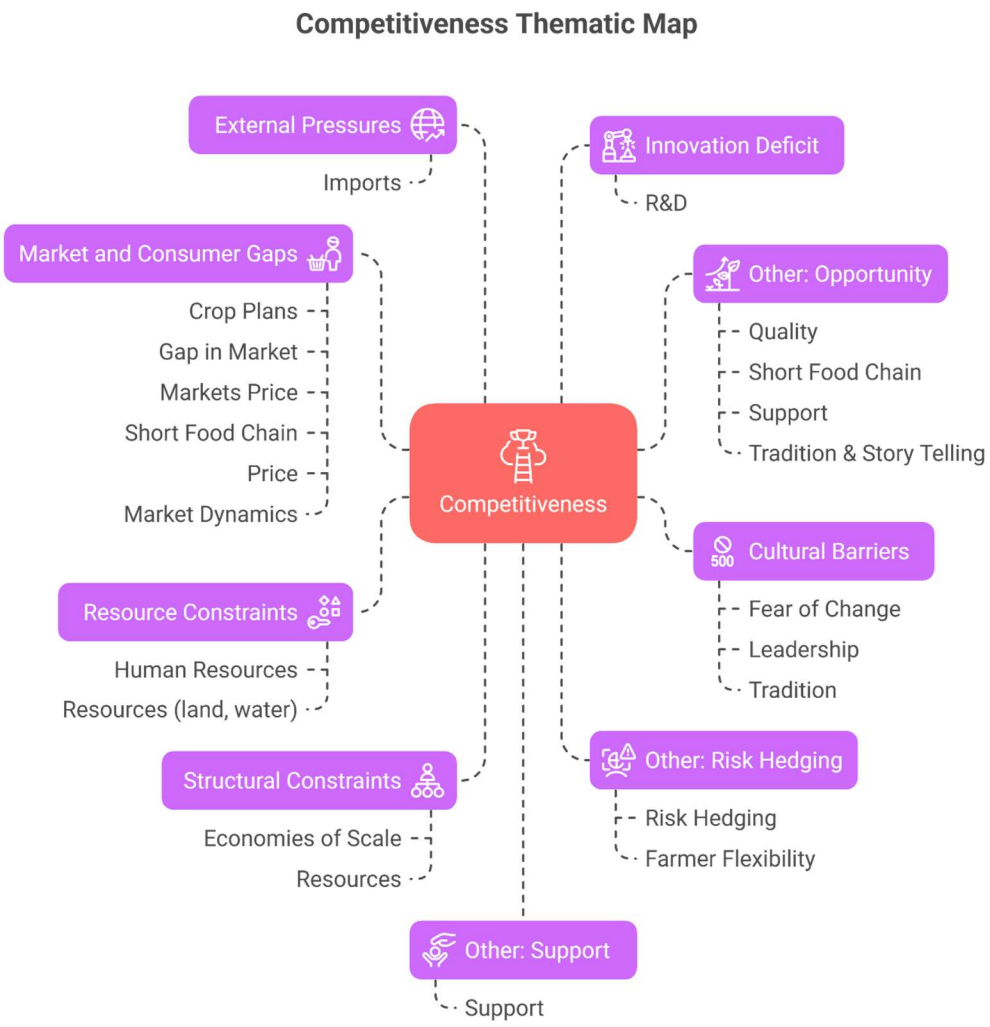
The recurrent themes captured from the interviews were defined as follows:

**Table 4-24: Definition of Themes - Competitiveness**

| Theme | Description |
|---|---|
| Structural Constraints | Constraints resulting from fragmented land holdings, and hence lack of economies of scale. |
| Resource Constraints | Constraints relating to human capital, aging population and resources (water, land, soil nutrients) which critical to production, |
| Market and Consumer Gaps | Difficulties arising from gaps in the market, market dynamics and missed consumer opportunities. |
| Cultural barriers | Arising from the sector being rooted in tradition, leadership and coordination deficits, and the fear to change. All of which are impeding innovation. |

**Source: Own Compilation**

**Figure 4-15: Thematic Map: Competitiveness**




**Source: Own Compilation**

#### 4.2.2.1.2 Analysis of the Themes

**Structural Constraints**

All participants agreed that the fragmented landholdings, impede capital investment and innovation and technology. Participants linked this to higher unit costs and inability to meet volume requirements of the large buyers, reinforcing dependence on the available markets. R02 said "*the small and fragmented holdings do not enable economies of scale*". Participant that (R02, PT1, OP1, EU1) also referred to economies of scale. The commercial risks associated with the land owned was also referred to by P03 "*the commercial risk is too high based on the land owned*".

**Resource Constraints**

All participants highlighted Resource Constraints as a fundamental issue: "*Water scarcity, land fragmentation, human resources are all factors affecting the competitivity of the local agriculture*" (PT1). The over-utilised soil and the aging labour force and issues in succession planning are all limitations directly affecting competitivity. EU1 commented on the "*lack of and the use of 2$^{nd}$ class water*" whilst about water, P02 stated that "*2$^{nd}$ class water is not provided to all farmers*". "*The soil composition and its overuse due to crop rotation*" was stated by P02 as a resource constraint.

**Market and Consumer Gaps**

Another key theme was the market dynamics. R02 stated "*The local fruit and vegetables are mainly available fresh produce"* as there are no grading and processing facilities and infrastructure for temperature-controlled storage. This was highlighted also by P01 "*lacking infrastructure*". P02 stated that these limitations are affecting the product quality "*no infrastructure that leads to no marketing standards*". R02 stated that these gaps lead to "*a model that is not what the consumer wants or needs".* EU1 noted that these gaps lead to "*limits market penetration and the potential for value-added products*". PT1 indicated that "*consumers must be educated to appreciate the value of the local produce*".

**Cultural Barriers**

Cultural Barriers also emerged as a significant theme. Farmers were reported to resist change due to a perceived imbalance of risk: *"Farmers resist change as they believe that the risk is all on them*" (R02). Additionally, traditional practices and leadership styles within cooperatives and farmers' organizations were viewed as hindering progress (OP1, P01, P02, P03).

PT1 pointed out that "*leadership must be provided by Government*". Leadership issues were linked directly to lack of governance within the farmers related organisations. OP1 and R02 agreed on the concept that the farming community is linked to traditional practices.

**Innovation Deficit**

Technology and innovation deficits are attributed to "*R&D functions at a government level are lacking*" (R02), "*lack of internationalisation*" (EU1), "*the need for a central innovation hub*" (OP1). The need for a central innovation hub was also mentioned by, PT1 and P02.The responses show lack of investment in innovation that could affect productivity and competitiveness.

**External Pressures**

The theme External Pressures captured the impact of global market forces. Imports from other countries were noted to "*directly affect the supply and demand and have a negative impact on the price models of the local produce*" (R02). This external competition drives down prices and limits the market share of local farmers.

#### 4.2.2.1.3 Important factors identified

Other themes that were captured during the semi-structured interviews:

**Table 4-25: Other Themes related to Competitiveness**

| Theme | Description |
|---|---|
| Opportunity<br>Short Supply Chain, Quality and Story Telling | The perceived main enabler is Malta's geographic compactness, which allows ultra-short supply chains. All the respondents argued that immediacy of harvest-to-market-to-consumer not only preserves high quality, taste and freshness but also directly contributes to environmental issues. This is an opportunity for competition which is not being exploited. Together with this opportunity, storytelling and quality are also seen as opportunities not exploited. |
| Risk Hedging | The operational flexibility of farmers, through which they use their limited and fragmentated land to grow different crops, and the farmers ability to quickly rotate crops, is both a way to maximise income, but also a clever way to hedge risks. |
| Supportive institutional Environment | The competitivity of the sector is aided through the support structures offered by Government, including the setup of agencies, like the Malta Food Agency, Agri Connect and others. |

**Source: Own Compilation**

#### 4.2.2.1.4 Quantitative Content Analysis

**Table 4-26: Quantitative Content Analysis – Competitiveness**

| Theme / Topics | Responses | % |
|---|---|---|
| **01.Structural Constraints** | **5** | |
| Economies of Scale | 4 | 80% |
| Land & Risks | 1 | 20% |
| **02.Resource Constraints** | **4** | |
| Soil | 1 | 25% |
| Water | 3 | 75% |
| **03.Market and Consumer Gaps** | **7** | |
| Education | 1 | 14% |
| Gaps | 2 | 29% |
| Markets Organisation | 1 | 14% |
| Price | 1 | 14% |
| Short Food Chain | 1 | 14% |
| Supply & Demand | 1 | 14% |
| **04.Cultural barriers** | **5** | |
| Fear of Change | 1 | 20% |
| Leadership | 2 | 40% |
| Tradition | 2 | 40% |
| **05.Innovation Deficit** | **6** | |
| Central Hub | 3 | 50% |
| Internationalisation | 1 | 17% |
| R&D | 2 | 33% |
| **06.External Pressures** | **8** | |
| Imports | 8 | 100% |
| **07.Other: Opportunity** | **11** | |
| Quality | 1 | 9% |
| Short Food Chain | 8 | 73% |
| Support | 1 | 9% |
| Tradition & Story Telling | 1 | 9% |
| **08.Other: Risk Hedging** | **2** | |
| Flexibility | 1 | 50% |
| Risk Hedging | 1 | 50% |
| **09.Other: Support Institutional Environment** | **1** | |
| Support | 1 | 100% |

**Source: Own Compilation**

Table 4-26 shows the participants responses and frequency of topics raised against the discussed themes. The was a 100% agreement on the External Pressures Theme, which identified the imports as the main disruptor. The economies of scale (80%) featured with 80% on the Structural Constraints Theme, making it an important competitivity disruptor. The short supply chain with 73% is seen as an opportunity not being exploited in the Other: Opportunity Theme.

### 4.2.2.2 Market Dynamics

Participants were asked about the role of the Pitkalija, Malta's main wholesale market for fruit and vegetables and which plays a central role in how fruits and vegetables are sold. The participants were asked to discuss the fairness, improvements and how well it is serving the stakeholders. The participants were also asked about price fairness.

#### 4.2.2.2.1 Defining the Themes

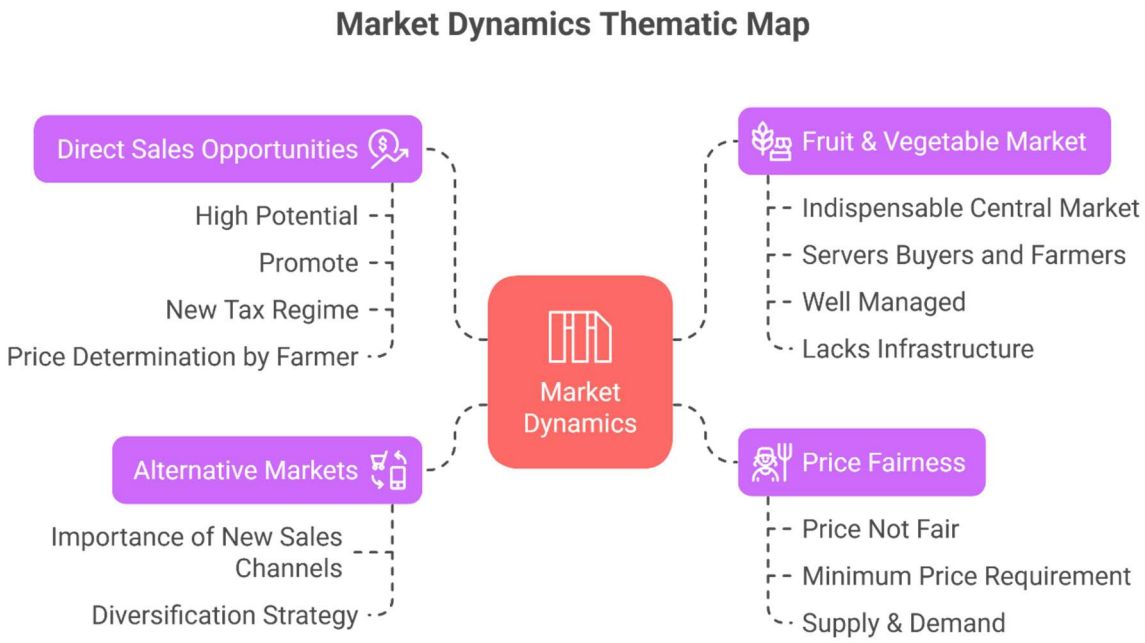
The recurrent themes captured from the interviews, defined as follows:

**Table 4-27: Defining the Themes - Market Dynamics**

| Theme | Description |
|---|---|
| Market Dynamics | Constraints resulting from lack of infrastructure, the farmers are dependent on the Pitkalija and an overall understanding that the market is serving its purpose. |
| Direct Sales Opportunities | Direct sales encouragement, need to be organised and promoted. |
| Alternative Markets | The importance of alternative markets, from where producers can sell their produce. The lack of dissent indicates consensus that diversification beyond the Pitkalija is strategically desirable. |
| Price Fairness | Price fairness was debated with mostly negative commentary. Price dynamics depict an area which directly affects competitiveness as expected. |

**Source: Own Compilation**

**Figure 4-16: Thematic Map - Market Dynamics**




**Source: Own Compilation**

#### 4.2.2.2.2 Analysis of the Themes

**Market Dynamics**

Market Dynamics was a prominent theme throughout the interviews. Stakeholders consistently highlighted the vital role of the Pitkalija Market as the central hub for fruit and vegetable sales, "*Markets are important and inevitable*" (P02) and *"the role of the Pitkalija is major and significant for the farmers, and the majority of the farmers are dependent on the Pitkalija to sell their produce*" (P01). Described as serving the needs of both farmers and buyers effectively "*the market is serving the sector well. The Pitkalija is well managed*" (OP1) and "*The main market, the Pitkalija is serving the farmers and the buyers*" (R02).

Concerns raised mainly on "*Pitkalija must have more facilities like cold storage and Infrastructure is lacking*" (P01) and "*Pitkalija must have more facilities like cold storage. Focus must be the service*" (PT1). Lack of competitiveness was raised by PT1 "*The market does offer a fair marketplace to both the farmer and the buyer*". Whilst P03 remarked "*Markets must be an ongoing evolution and change their dynamics accordingly*".

**Direct Sales Opportunities**

Direct sales are seen as a measure that could help the farmers get better deals. "*Direct sales by farmers need to be encouraged*" was stated by R02 and reiterated by P01, whilst EU1 stated "*What needs to be further promoted and organised is direct selling by the farmers to the consumer, businesses etc*.". P01 also stated "*the implementation of tax regime similar to the Pitkalija and the central implementation of sales digital platform open to all farmers shall facilitate the direct sales*". P02 acknowledged that "*Price received by farmer not fair – unless it is a direct sale done by the farmer*". Such direct sales channels could help build a stronger link between producers and consumers, enhancing competitiveness and ensuring better returns for farmers.

**Alternative Market Opportunities**

Alternative Markets is a key idea expressed by stakeholders: the need to diversify where and how farmers sell their produce. P01 stated the need for "*more alternative markets from where the farmers can sell and the buyers can procure their produce are needed*".

**Price Fairness**

Price fairness centred around diverse concerns namely "*Based on risk, effort, labour element, sacrifices, the farmers do not get a fair price. Basing all the hours and risk, then not it is not worth the effort. It is more of a vocational thing*" (R02); and "*Pricing received by farmers, when considering all the effort, expenses and risk is not fair*" (P03). EU1 iterated that "*There must be an analysis of the base costs and the willingness to pay*".

Contrary to the general concerns, S02 stated that "*The Pitkalija is a market, based on supply and demand, and hence drives the price according to the market requirements. Thus, the price received by the farmer is the fair market price at that moment in time*".

### 4.2.2.2.3 Quantitative Content Analysis

**Table 4-28: Quantitative Content Analysis - Market Dynamics**

| Theme / Topics | Responses | % |
|---|---|---|
| **01.Market Dynamics** | **13** | |
| Dependency | 2 | 15% |
| Dynamic | 1 | 8% |
| Lacks Infrastructure | 2 | 15% |
| Leadership | 1 | 8% |
| Not Compatible | 1 | 8% |
| Serves the Purpose | 6 | 46% |
| **02.Direct Sales Opportunities** | **4** | |
| Direct Sales | 3 | 75% |
| Price | 1 | 25% |
| **03.Alternative Markets** | **2** | |
| Alternative Markets | 2 | 100% |
| **03.Price Fairness** | **7** | |
| Price Not Fair | 6 | 86% |
| Supply & Demand | 1 | 14% |

**Source: Own Compilation**

Table 4-17 shows the Market Dynamics quantitative content analysis. To note is the 46% responses relating to the Pitkalija Market serving the purpose and the contrasting view of 86% under the Price Fairness Theme stating that Price is not fair.

### 4.2.2.3 Leadership

Participants were asked to discuss the role of cooperatives, POs and other farmer related organisations, and the challenges faced. Main point to discuss was the leadership factor. Part of the discussion was around the role of Government.

#### 4.2.2.3.1 Defining the Themes

The recurrent themes captured from the interviews, defined as follows:

**Table 4-29: Defining the Themes – Leadership**

| Theme | Description |
|---|---|
| Management of Organisations | Mostly related to the absence of a professional and expert setup in leading farming organisations. |
| Unity of Farmers | The theme relates to the importance of farmers uniting and being part of an organisation in line with the management of organisation theme. Clearly indicating that this duality indicates respect for farmer ownership alongside recognition of managerial skill gaps. |
| Governance | The theme incorporates the sector's lack of leadership and that governance must be core to any organisation. |
| Hybrid Producer-Organisation Models | The theme resorts around restructuring POs under a "hybrid" governance model that marries private-sector agility with public sector oversight. This management model shall ensure governance and entrepreneurship, as well as be able to steer the sector to be more productive, professional and competitive. |

| Theme | Description |
|---|---|
| Government as Coordinating Leader | Discussion around explicit leadership to the Malta Food Agency (MFA). The participants asserted that the Malta Food Agency should participate more effectively with the sectors' organisations. |

**Source: Own Compilation**

**Figure 4-17 Thematic Map – Leadership**


**Source: Own Compilation**

#### 4.2.2.3.2 Analysis of the Themes

**Management of Organisations**

Farmers' organisations are deemed to be important but need to be properly managed. "*Organisations must be led by strong management*" (R02). S02 acknowledged the need for persons knowledgeable of the sector "*Management must be compiled by persons who work in the sector*". The lack of leadership provided by the farmers' organisations was clearly stated by OP1 "*Not offering the leadership required for the farming community to progress*". EU1 advocated for internationalisation "*Local organizations do not have links with international organizations", "Island mentality is not helping the leadership organisations to lead the sector"* and reiterated the need of professionals managing the farmers' organisations "*Inject with a professional setup*". The current setup of the organisations, whereby the management is done by the stakeholders was criticised by P03 "*Organisation cannot function with the current model of being managed by the stakeholders*".

**Unity of Farmers**

Farmers mostly work on their own. The view is that if they unite, they can achieve better economies of scale. "*Farmers need to unite*", "*Farmers do collaborate based on loyalty…. this is a sociological and cultural issue*" (R02). The difficulties to have a united front of farmers was raised by P02 "*Farmers difficult to unite, mainly due to our size*" and "*Farmer is an opportunist, because he is a survivor*".

**Governance**

Farmers' organisations need to be managed well. Farmers can only trust the organisations if there is governance and PT1 clearly states "*There is lack of trust*". OP1 attributes success to having strong leadership and governance by stating that "*Leadership and governance are a must to ensure long term vision".* The governance aspect was discussed by P02 "*Farming organisations must ensure good governance"* and further reiterated by P01 "*Governance is of utmost importance*".

**Hybrid Producer-Organisation Models**

The difficulty of having properly managed organisations, the unity of farmers and the importance of governance, prompted the implementation of a hybrid model – PO made of farmers, Government and Private sector. "*A government agency like the MFA should take over the leadership role*" (PT1). OP1 commented that "*Government, Government entities and private sector should embark on different alliances*". EU1 reiterated that the need of hybrid models by stating "*There must be a public private partnership to manage the sector*".

**Government as Coordinating Leader**

The sector is deemed to be a market failure. The intervention of Government is seen as crucial. S02 attributes the responsibility to Government by stating "*The role of Government is to take over and tackle the issues relating to the farming community*". This is reiterated by PT1 by stating "*Government must take a leading role in offering leadership to farmers*". P02 highlighted the need of Government to provide expertise via "*Government intervention in providing experts and management*". P01 commented that the role of agencies, like the MFA shows that Government is intervening by stating "*Direct*

*role by Government – MFA coordinates activities and provide the leadership role*". P03 also agreed that "*Government intervention needed*".

#### 4.2.2.3.3 Quantitative Content Analysis

**Table 4-30: Quantitative Content Analysis – Leadership**

| Theme / Topics | Responses | % |
|---|---|---|
| **01.Management of Organisations** | **10** | |
| Internationalisation | 1 | 10% |
| Management | 8 | 80% |
| Status | 1 | 10% |
| **02.Unity of Farmers** | **5** | |
| Farmers uniting | 5 | 100% |
| **03.Governance** | **4** | |
| Governance | 4 | 100% |
| **04.Government as Coordinating Leader** | **4** | |
| Government role | 4 | 100% |
| **05.Hybrid PO Model** | **6** | |
| PO – Private & Public Sectors | 6 | 100% |

**Source: Own Compilation**

Table 4-30 shows the quantitative content analysis related to Leadership. The management of the farmers organisation with an 80% response rate under the Management of the Organisations theme shows the importance of the management structures. This is corroborated by high responses in Farmers unity, Government role in the leadership model and setup of hybrid management models.

### 4.2.2.4 Stakeholder Collaboration

The discussion was related to assessing levels of collaboration and coordination among different stakeholders in this sector (farmers, cooperatives, government agencies, retailers and other stakeholders) and how this collaboration could be improved. This discussion also included what the consumer thinks of the local produce and what needs to be done to meet the demands and preferences of the consumers.

#### 4.2.2.4.1 Defining the Themes

The recurrent themes captured from the interviews, defined as follows:

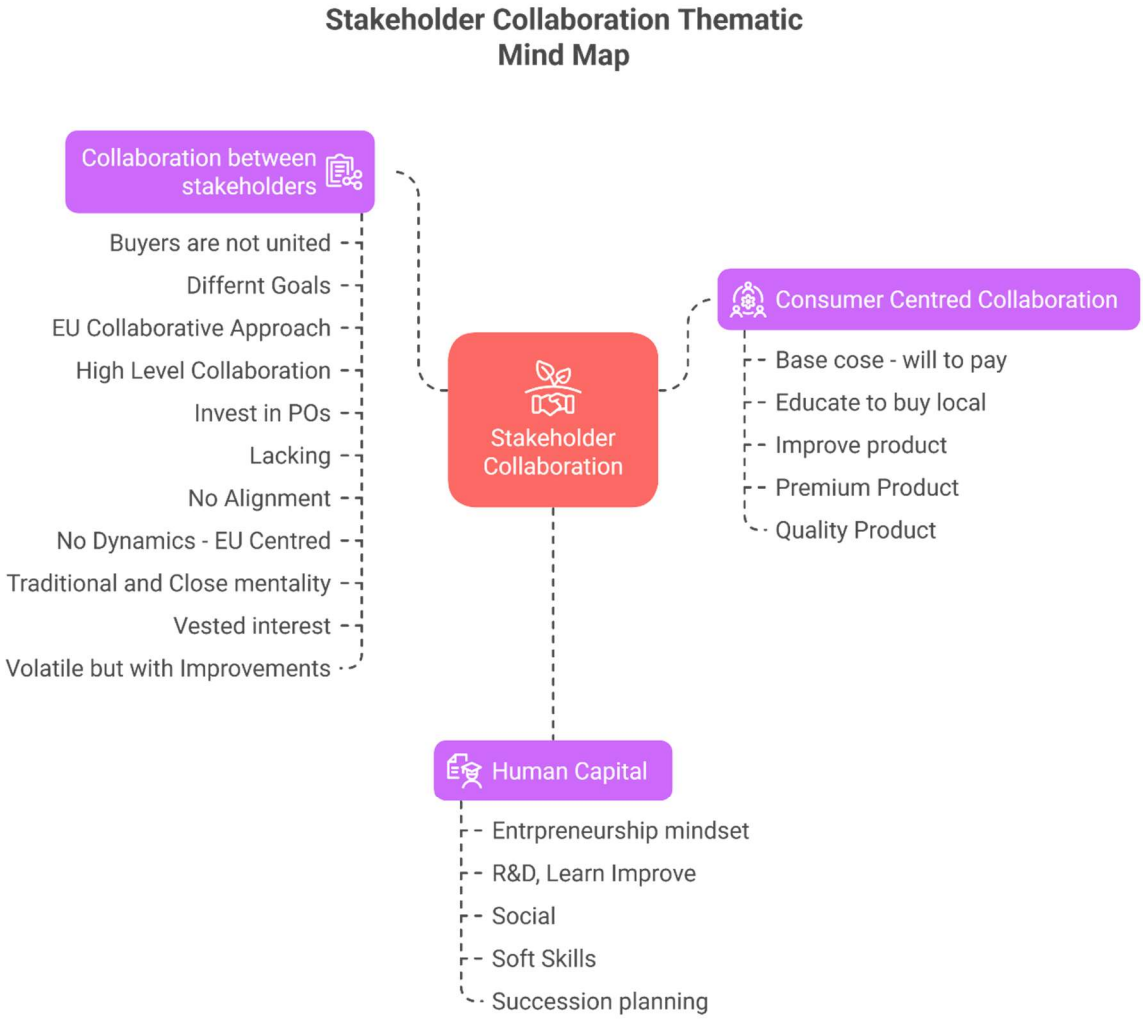
**Table 4-31: Defining the Themes - Stakeholder Collaboration**

| Theme | Description |
|---|---|
| Consumer-Centred Collaboration | Participants highlighted that the focus is often on producing high-quality goods, but not enough attention is given to what consumers want. There is a need to better understand and respond to consumer demands, which could help build loyalty and create more value for local products. |
| Collaboration between stakeholders | In Collaboration Between Stakeholders, whilst some improvements have been noted, many felt that cooperation between farmers, cooperatives, and other market actors still lacks consistency and trust. This can limit the ability to work together on challenges like pricing, marketing, and efficient distribution. |

| Theme | Description |
|---|---|
| Human Capital | Participants pointing out the importance of soft skills, communication, and management abilities. Farmers often work in isolation, which can make it harder to share ideas and change. Noted that farmers have a strong sense of resilience, but not always have an entrepreneurial mindset. |

**Source: Own Compilation**

**Figure 4-18: Thematic Map - Stakeholder Collaboration**




**Source: Own Compilation**

#### 4.2.2.4.2 Analysis of the Themes

**Consumer Centred Collaboration**

From a consumer perspective, EU1 commented on the need of a better-quality product by stating that "*Upgrade the quality of the product".* EU1 also address the pricing model by suggesting to *"Assess the base cost vs. the willingness to pay".* P02 also commented on quality by stating "*Upgrade the quality"*. P02 suggested that the produce must be conveniently available to consumer by stating *"Make the product more available"*. P02 declared that consumers must be educated on the benefits of the local produce by stating that "*Educate the consumer to valorise the local produce*". P01 argued the quality marks and premium products are needed by stating that "*Implement Quality Marks".*

**Collaboration between stakeholders**

The overall collaboration was discussed. R02 commented on the volatile relationship over the years and acknowledged improvements in recent years. R02 commented "*Volatile – last years improved. Positive dynamics and inclusion. Collaboration is to be set by authorities*". S02 stated that "*There is a high level of collaboration and coordination between all the stakeholders*" however S02 noted that collaboration with buyers is an issue as there is no buyers' organisation by stating "*There is an issue relating to the buyers. Currently the buyers are not represented by an organisation*".

PT1 did not agree with the other participants and stated that "*Stakeholder collaboration is lacking. Needs to be more collaborative approach.* P03 reiterated this and explained by stating "*They speak different languages".* EU1 commented on the importance of collaboration by stating "*We need to collaborate and work smart*".

**Human Capital**

The human capital, including aging population, succession planning and the lack of farmers was a topic mentioned throughout all the interviews. EU1 recommends investments in education and R&D by stating "*Invest in education and provide R&D"*. Most interviewees mention the young farmers.

P02 disagreed with this and stated that investment should be concentrated on part-time farmers. The reason being that part-timers have another income; hence they are more willing to risk and innovate. P02 stated "*Invest in part time farmers, as these may take more risks"* (P02).

P01 urged investments in young farmers and the active farmers by stating "*Invest in generational renewal"* and *"Focus on active farmers".* P03 commented on working methods of farmers and stated, "*Farmers are meant to produce and not be entrepreneurial"*.

#### 4.2.2.4.3 Quantitative Content Analysis

**Table 4-32: Quantitative Content Analysis - Stakeholder Collaboration**

| Theme / Topics | Responses | % |
|---|---|---|
| **01.Consumer Centred Collaboration** | **23** | |
| Base cost - willingness to pay | 1 | 4% |
| Educate to buy local | 5 | 22% |
| Improvement | 1 | 4% |
| Premium Products | 4 | 17% |
| Quality Product | 12 | 52% |
| **02.Collaboration between Stakeholders** | **12** | |
| Buyers are not united | 1 | 8% |
| EU Collaborative approach | 1 | 8% |
| High level of collaboration | 1 | 8% |
| Invest in POs | 1 | 8% |
| Lacking | 1 | 8% |
| No Alignment | 3 | 25% |
| No Dynamics - EU Centred | 1 | 8% |
| Tradition & Close mentality | 2 | 17% |
| Volatile but with Improvements | 1 | 8% |
| **03.Human Capital** | **21** | |
| Entrepreneurship mindset | 5 | 24% |
| R&D, Learn, improve | 2 | 10% |
| Soft skills and management skills | 2 | 10% |
| Succession Plan - Part Time Farmers | 1 | 5% |
| Social Aspect | 5 | 24% |
| Succession Plan | 6 | 29% |

**Source: Own Compilation**

Table 4-33 displays the responses by theme for Leadership. In the Consumer Centred Collaboration, the Quality Produce (52%) depicts the need to upscale the local product. There is an agreement of non-alignment (25%) in the Collaboration with Stakeholder Theme, whilst in the Human Capital Theme the succession planning (29%) takes priority. An interesting point is the 24% responses stating that farmers are not entrepreneurs.

### 4.2.2.5 Policy

For the discussion about Policy, the participants were asked to discuss and evaluate the government's role: to comment on existing policies, propose and identify new ones, and point out any gaps.

#### 4.2.2.5.1 Defining the Themes

The recurrent themes captured from the interviews, refined as follows:

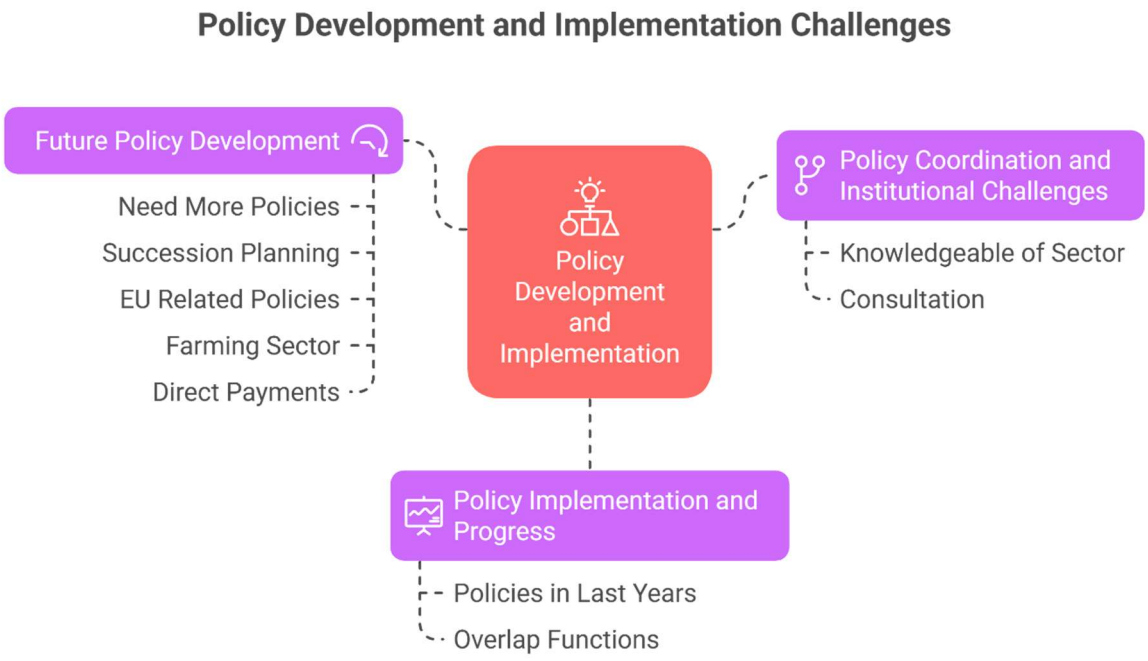
**Table 4-33: Defining the Themes - Policy**

| Theme | Description |
|---|---|
| Policy Implementation and Progress | Covers how various stakeholders acknowledged the recent introduction of several beneficial policies in the sector. These policies are seen as positive steps forward in supporting the sector's growth and competitiveness. |
| Future Policy Development | Emerged around the need for more policies tailored to the challenges in farming. Stakeholders highlighted gaps in current policies and suggested new policies for succession planning, direct payments, and broader inclusion of smaller farmers. This theme also emphasized aligning national policies with EU regulations to fully leverage EU funds and support. |

| Theme | Description |
|---|---|
| Policy Coordination and Institutional Challenges | Addresses challenges in policy development and execution. Participants stressed the need for policy makers to have strong knowledge of the farming sector and to consult directly with farmers. Concerns were raised about overlapping government functions and the lack of a proactive policy push, which may limit the sector's ability to benefit from available EU support. |

**Source: Own Compilation**

**Figure 4-19 Thematic Map – Policy**




**Source: Own Compilation**

#### 4.2.2.5.2 Analysis of the Themes

**Policy Implementation and Progress**

There was a general agreement that in recent years several beneficial policies were implemented This was clearly stated by R02 "*Recently several policies beneficial to the sector were implemented"* and by S02 by stating "*Current policies are being done in the interests of the farming sector*". PT1 acknowledged this by commenting "*Several policies in favour of farmers"*, whilst P01 stated that "*Several policies implemented in the last years".* OP1 declared that more coordination is needed to ensure more policies are implemented, by stating that "*Overlapping functions may hinder progress*".

**Future Policy Development**

Participants were asked to identify new policies and possible gaps. PT1 identified issues relating to land and building permits for farmers and stated that "*A lot more policies need to be introduced (example: related to land) for the sector to be competitive*".

EU1 commented that proactive policies targeting EU and EU Funds need to be augmented, by commenting that "*No proactive policy to push the sector through a targeted EU drive, without which the sector is at a disadvantage to tapping targeted EU funds*". P02 specified that policies should cover the whole sector, referring as an example to 2nd class water which was provided to selected farmers only. P02 quoted this "*Policies should be directed at the whole farming sector. Direction of policies to only large farmers may inhibit production and the upscale of the small farmers*". P01 focussed on EU aides and commented that "*Policies to enable more direct payments to farming community need to be implemented*". S02 focussed on young farmers and commented

"*More policies aimed at young farmers*". OP1 argued that the products need to be upscaled and as such stated that *"Policies to give value to local produce".*

**Policy Coordination and Institutional Challenges**

There was a general agreement that policy makers must be experts in the sector. R02 reiterated this by stating "*Policy makers must be knowledgeable in the sector…. history or unknowledgeable policy makers who did not consult*". R02 attributed the recent positive progress to "*Recent developments show that because of knowledgeable policy makers several useful policies have neem implemented*". PT1 recommends that more policies need to be implemented by stating "*Lot more needs to be done*". P03 attributed the main challenge being more alignment with the EU polices by stating that there must be "*Alignment with EU*".

### 4.2.2.5.3 Quantitative Content Analysis

**Table 4-34: Quantitative Content Analysis – Policy**

| Theme / Topics | Responses | % |
|---|---|---|
| **01.Policy Implementation and Progress** | **9** | |
| Status | 8 | 89% |
| Progress | 1 | 11% |
| **02.Future Policy Development** | **5** | |
| Succession Plan | 1 | 20% |
| Land | 1 | 20% |
| EU | 2 | 40% |
| Holistic Approach | 1 | 20% |
| **03.Policy Coordination and Institutional Challenges** | **10** | |
| Policy Makers (experts) | 9 | 90% |
| Future Policies | 1 | 10% |

**Source: Own Compilation**

Table 4-34 depicts the policy discussion. 89% agreement in the Policy Implementation and Progress Theme about the success of policies implemented in the last few years. Future Policy theme had mixed response, with EU alignment scoring the most (20%). The need for experts in the sector was clearly highlighted (90%) in the Policy Coordination and Institutional Challenges Theme.

### 4.2.2.6 Innovation & Technology

Discussion centred around theme of innovation, asking about the importance of technological advancement and the openness to change in farming practices. Participants were also asked about the adoption of modern technology in the agricultural sector by the farmers, what measures are being taken to encourage innovation and modernization.

#### 4.2.2.6.1 Defining the Themes

The recurrent themes captured from the interviews, refined as follows:

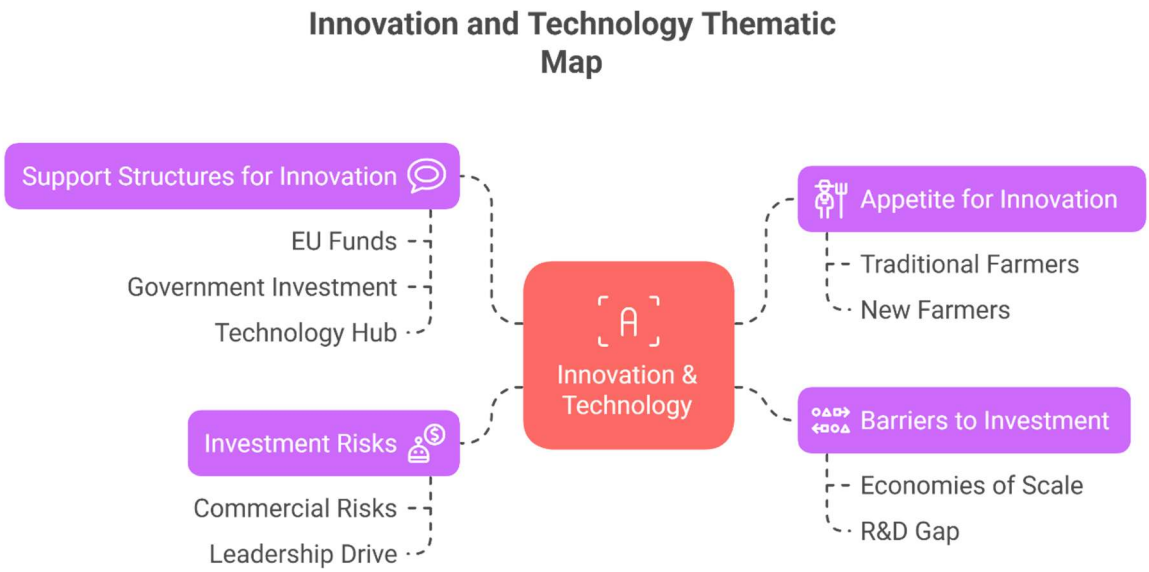
**Table 4-35: Defining the Themes - Innovation and Technology**

| Theme | Description |
|---|---|
| Appetite for innovation | Showed that while some farmers remain cautious, younger farmers are more willing to adopt new technologies. They see innovation to improve their work and are keen to explore new methods. |
| Barriers to Investment | Highlighted issues like economies of scale and bureaucratic hurdles. Smaller farms often find it hard to afford new technologies, and complicated planning and permit processes make it even more difficult. |
| Support Structures for Innovation | Pointed to the need for help from government and educational bodies. Participants suggested that better funding, training hubs, and stronger links to universities and research groups could support farmers in taking up new practices. |

| Theme | Description |
|---|---|
| Investment Risks | Captured concerns about the financial risks of adopting new technologies, especially in areas like organic or vertical farming. Some participants thought partnerships with government and private groups could help share these risks and encourage farmers to invest. |

**Source: Own Compilation**

**Figure 4-20: Thematic Map - Innovation and Technology**




**Source: Own Compilation**

#### 4.2.2.6.2 Analysis of the Themes

**Appetite for innovation**

The traditional aspect of the local farmers was attributed to the lack of innovation by OP1 by stating "*Farmers are very traditional and less prone to investment".* PT1 highlighted that farmers may be prone to invest but administrative burdens may discourage them. PT1 depicted this by stating that "*The main issue here is planning authority. Farmers who would like to invest many times find issues in relation to permits. Farmers who want to invest find these hurdles which discourage from embarking on new and innovative project*".

On a positive perspective, R02 outlined that new farmers are more adaptable to invest in innovation and technology, by stating *"From a farmers' perspective: the guardians of the traditional system are retiring; hence we are in a transition phase whereby these retiring guardians are being replaced by new blood, who have more appetite for innovation and technology*". S02 also acknowledged the appetitive for innovation by young farmers by declaring that "*There is an appetite for innovation especially from the younger generation of farmers*".

**Barriers to Investment**

The economies of scale were seen as the biggest barrier for investment. This was mentioned by most of the participants. P01 stated that "*Economies of scale are a disruptor to invest in innovation and technology*".

The sociological factor of the farmer being a survivor, thus there is no need to invest in change is a main investment disruptor outlined by R02 by declaring "*The mentality of "I*

*am surviving, so why change" is also a factor on the lack of innovation and technology investments*".

PT1 attributed traditionality as the main barrier by stating that "*Farmers are very traditional, hence less prone to invest in innovation and technology*".

**Support Structures for Innovation**

There was an agreement that the farming community need support structured to take up innovation. EU1 urged that EU Funds are directed for innovation and technology, by declaring that "*EU Funds must be directed to innovation and technology*".

Statements by P01 "*Government must invest centrally on innovation and technology and share with farmers*" and similarly by P02 "*Implementation of a technology, innovation and experimental farming hub by Government*", clearly depict the need for Government investment and involvement to push innovation and technology. S02 also commented in agreement with Government involvement by declaring that "*There must be an experts' hub managed by Government who can teach farmers about innovation and technology*".

EU1 identified experts and R&D links between academics, experts and international organisations by declaring that "*Innovation and Technology can only succeed if there is R&D and experts across all the sectors, which are directly linked with University of Malta, MCAST and international organisations*".

**Investment Risks**

The discussion around risk complemented the hybrid approach of public and private sector as outlined by P03 by stating *"Tailored and small technologies with possible*

*inclusion of Government and private partnerships*". OP1 reiterating the need of strategic leadership to promote innovation and minimising risk for the sector by declaring that "*The drive to embark on innovation and improved technology is led by leadership*".

#### 4.2.2.6.3 Quantitative Content Analysis

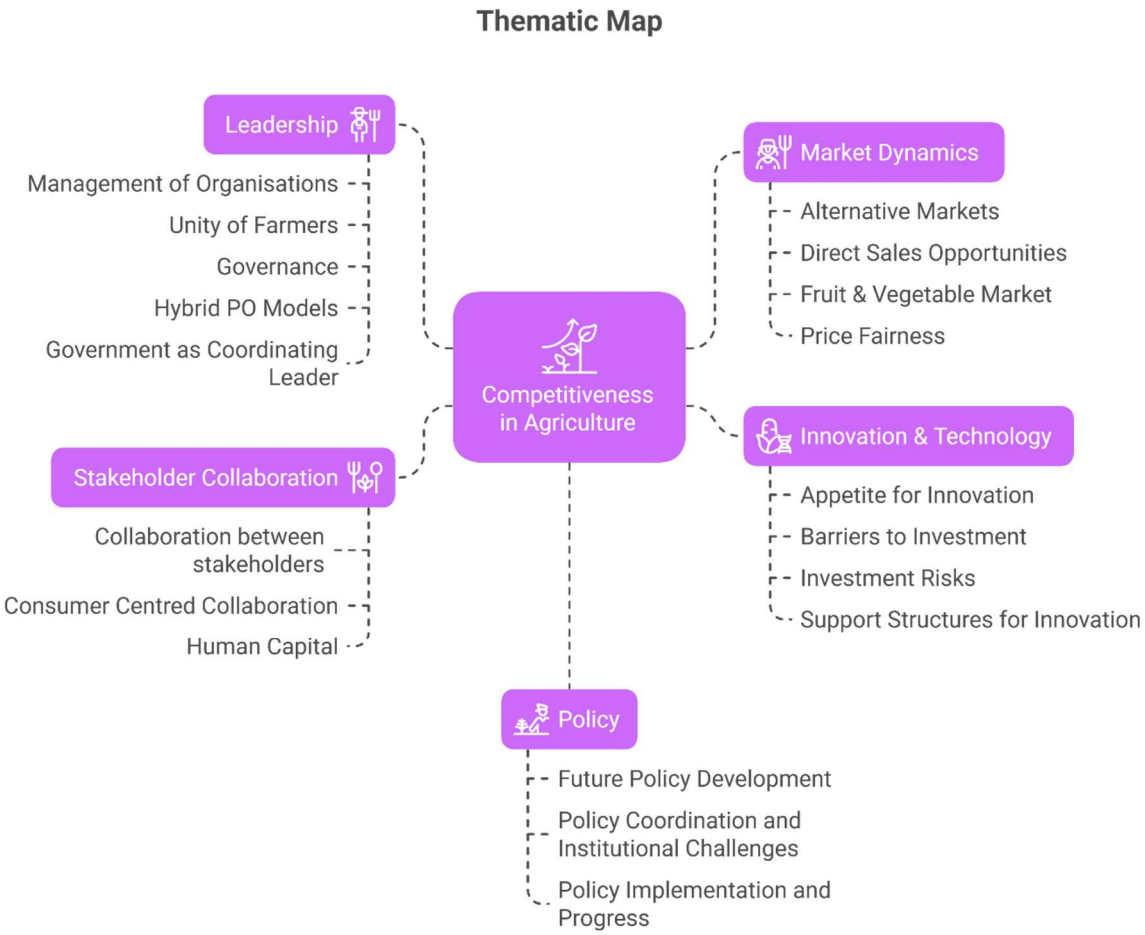
**Table 4-36: Quantitative Content Analysis - Innovation and Technology**

| Theme / Topics | Responses | % |
|---|---|---|
| **01.Appetite for Innovation** | **8** | |
| Administrative Burdens | 1 | 13% |
| Profitability | 1 | 13% |
| Traditional | 3 | 38% |
| Young Farmers | 3 | 38% |
| **02.Barriers to Investment** | **14** | |
| Administrative Burdens | 1 | 7% |
| Economies of Scale | 8 | 57% |
| Exposure | 2 | 14% |
| Opportunism | 1 | 7% |
| R&D | 1 | 7% |
| Traditional | 1 | 7% |
| **03.Support Structures for Innovation** | **16** | |
| Academia & Experts | 3 | 19% |

**Source: Own Compilation**

Table 4-36 shows the responses frequencies for Innovation and Technology. The appetite for Innovation Theme clearly shows that young farmers (38%) are more prone to invest, whilst traditional farmers (38%) are less prone to invest. The economies of scale (57%) is the main barrier for investment.

**Figure 4-21 Thematic Map - Semi-structured Interviews**




**Source: Own Compilation**

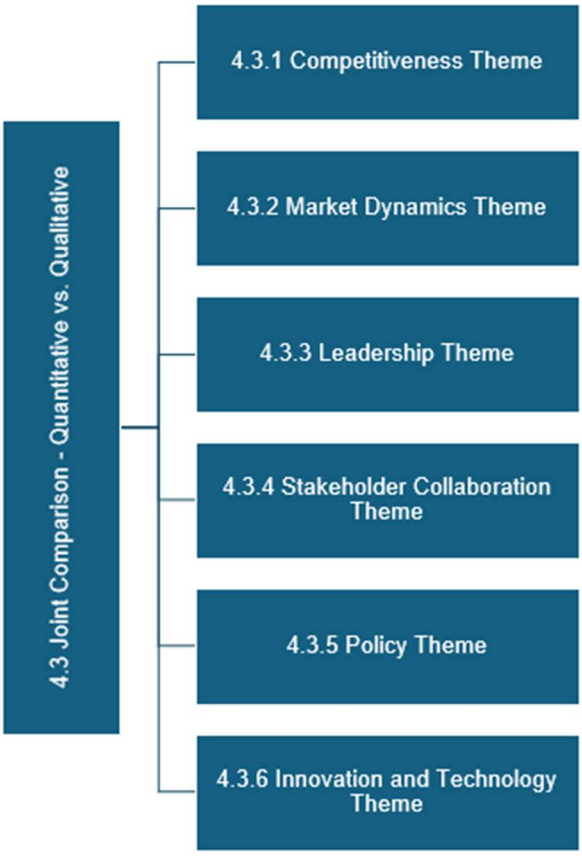
## 4.3 Joint Comparison – Quantitative vs Qualitative

The approach adopted matches a convergent (triangulation) mixed-methods design. This entailed the process of:

- Collect and analyse the quantitative data from the surveys (farmers and buyers).
- Use thematic analysis on the qualitative material (semi-structured interviews).
- Compare (triangulate) the two data sets to see where they converge, diverge, or contradict each other, strengthening validity and highlighting the most important topics.

This approach provides the breadth of statistics and the depth of rich narrative to validate the data.

**Figure 4-22: Overview**



### 4.3.1 Competitiveness Theme

**Table 4-37: Joint Display - Competitiveness Theme**

| Theme | *Insight* | Survey Farmers | Survey Buyers | Themes vs. Farmers | Themes vs Buyers | Farmers vs Buyers |
|---|---|---|---|---|---|---|
| **Structural Constraints** | *"The small and fragmented holdings do not enable economies of scale"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Resource Constraints** | *"Water scarcity, land fragmentation, human resources are all factors affecting the competitivity of the local agriculture"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Market and Consumer Gaps** | *"No infrastructure that leads to no marketing standards"*<br><br>*"There is a gap in the market. The local fruit and vegetables are mainly available fresh, as there is no large-scale processing, grading and packing model"* | Most of the Farmers agree that the Malta fruit and vegetables are adequately marketed and promoted. (Table 4-6: S6).<br><br>Majority of farmers agree that fruit and vegetables grading is important. (Table 4-6: S7).<br><br>Most of farmers agree on adequate consumer friendly packaging. (Table 4-6: S8)<br><br>Majority of farmers do not agree on crop planning. To note that age brackets 18-25 and 26-40 agree. (Table 4-6: S9) | Most of the buyers agree that local fruit and vegetables are adequately marketed and promoted (Table 4-14: S2)<br><br>Majority of the buyers agree that grading is important (Table 4-14: S3)<br><br>Most of the Buyers agree on adequate packaging (Table 4-14: S4) | Convergence | Convergence | Convergence |
| **Cultural barriers** | *"Farmers resist change as they believe that the risk is all on them"*<br><br>*"Farming activities are too much linked to traditions. Leaders within the farmers organisations are traditional / old way farmers, hence progress is being limited."* | Most of farmers agree (age brackets 18-50) to invest in becoming more innovative and adapt technology, whilst age brackets 51+ do not agree. (Table 4-12: S16 and S17)<br><br>Most of farmers agree that they would rather work the traditional way (Table 4-12: S18) | Most of the Buyers agree that farmers are too traditional and need to change the way they work. (Table 4-20: S19) | Convergence<br><br>(Farmers Under 50 want to invest in innovation and technology). | Convergence | Convergence |

| Theme | *Insight* | Survey Farmers | Survey Buyers | Themes vs. Farmers | Themes vs Buyers | Farmers vs Buyers |
|---|---|---|---|---|---|---|
| **Innovation Deficit** | *"R&D functions at a government level are lacking"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **External Pressures** | *"Directly affect the supply and demand and have a negative impact on the price models of the local produce"* | The majority of the farmers agree that imports are a disruptor. All the farmers aged 18-25 agree. (Table 4-4). | Not Applicable | Convergence | Not Applicable | Not Applicable |
| **Opportunity** | *"Short supply chain" "taste, freshness and quality" "Storytelling, tradition"* | Majority of the farmers agree that authorities are doing enough to promote the local produce. (Table 4-10: S14). | Most of the buyers agree that the authorities are doing good work to promote local produce (Table 4-22: S21) | Divergence<br><br>Farmers perspective is limited and may not be aware of all opportunities and strengths. | Divergence<br><br>Buyers' perspective is limited and may not be aware of all opportunities and strengths. | Convergence |
| **Risk Hedging** | *"Crop rotating and diversification leads to risk hedging"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Supportive institutional Environment** | *"Government must support the sector"* | Most of the farmers agree that the authorities are doing good work in relation to the markets (Table 4-10: S13).<br><br>Most of the farmers agree that the policies and decisions being taken are beneficial to farmers (Table 4-10: S15) | Most of the Buyers agree that the authorities are doing good work in relation to the markets (Table 4-22: S20).<br><br>Most of the buyers do not agree that the policies and decisions being taken are beneficial to farmers (Table 4-22: S22) | Convergence | Part Convergence (Buyers agree about the Market but not about the policies) | Part Convergence (Buyers agree about the Market but not about the policies) |

#### 4.3.1.1 Analysis

There is an agreement between the qualitative and quantitative data sets about Market and Consumer Gaps. Data shows that the need for grading and adequate packaging are gaps in the market.

There is an agreement about Cultural Barriers relating to farmers being traditional. A part contradiction was displayed by the farmers under the age 0f 50 years, who the most of them stated that they would prefer innovation over tradition.

There is a convergence in External Pressures. Majority of farmers agree with the data from the semi-structured interviews that imports are a main disruptor.

A divergence was noted under the topic Opportunity. Majority of farmers and most buyers agree that the authorities are doing good work in relation to promotion of local produce. This contrasts with the view of the semi-structured interviews participants. Farmers and Buyers may have a limited perspective and are not aware of all the possible opportunities and strengths.

With regards to Supportive Institutional Environment, there is an agreement on the work being done at the markets. There is an agreement about the implementation of policies between the farmers survey and the semi-structured interviews. However, Buyers do not agree the decisions and policies implemented are beneficial to the sector.

### 4.3.2 Market Dynamics

**Table 4-39: Joint Display - Market Dynamics Theme**

| Theme | *Insight* | Survey Farmers | Survey Buyers | Themes vs. Farmers | Themes vs Buyers | Farmers vs Buyers |
|---|---|---|---|---|---|---|
| **Market Dynamics** | *"Markets are important and inevitable" "The main market, the Pitkalija is serving the farmers and the buyers"* | Most of farmers agree that the Pitkalija is a fair marketplace. Farmers aged (18-25 and 66+) disagree. (Table 4-5: S4).<br><br>Most of farmers agree that good work is being done at the markets. (Table 4-10: S15) | Most of the buyers agree that the Pitkalija provides a fair marketplace. (Table 4-16: S6)<br><br>Most of the buyers agree that good work is being done by authorities at the Pitkalija. (Table 4-22: S20) | Convergence | Convergence | Convergence |
| **Direct Sales Opportunities** | *"Direct sales by farmers need to be encouraged"* | Not Applicable | The majority of buyers do not agree that it is better to buy directly from farmers. (Table 4-20: S16) and (Table 4-20: S17) and (Table 4:20: S18) | Not Applicable | Not Applicable | Divergence<br><br>Buyers do not agree to purchase directly from farmers. |
| **Alternative Markets** | *"More alternative markets from where the farmers can sell and the buyers can procure their produce are needed"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Price Fairness** | *"Based on risk, effort, labour element, sacrifices, the farmers do not get a fair price. Basing all the hours and risk, then not it is not worth the effort. It is more of a vocational thing"* | Most of farmers disagree that they get a fair price from their sales. Only farmers aged 41-50 agree on the fair price. (Table 4-5: S3). | Most of Buyers agree that farmers do get a fair price for their products (Table 4-16: S6). | Convergence | Divergence<br><br>Buyers agree that farmers get a fair price. | Divergence<br><br>Buyers agree that farmers get a fair price. |

#### 4.3.2.1 Analysis

There is full convergence between all the data sets for topic Market Dynamics, stating that the Pitkalija is serving the farmers and buyers, that it is a fair marketplace and that the authorities operating the Pitkalija well.

There is a divergence in the Direct Sales Topic, as most of the buyers stated that they do not agree with buying directly from the farmers. The semi-structured interviews depicted direct sales as something to be encouraged.

Price fairness topic depicted contradictory analysis. Farmers agreed with the semi-structured interviews participants that the price received is not fair. However, Buyers agree that farmers do get a fair price, contradicting both the farmers and the semi-structured interviews participants.

### 4.3.3 Leadership

**Table 4-40: Joint Display - Leadership Theme**

| Theme | *Insight* | Survey Farmers | Survey Buyers | Themes vs. Farmers | Themes vs Buyers | Farmers vs Buyers |
|---|---|---|---|---|---|---|
| **Management of Organisations** | *"Organisations must be led by strong management"* | Most of farmers agree with being part of an organisation. Agree to produce as directed by the organisation and agree on selling to the organisation at an agreed fair price. (Table 4-9: S10) | Not Applicable | Convergence | Not Applicable | Not Applicable |
| **Unity of Farmers** | *"Farmers do collaborate based on loyalty…. this is a sociological and cultural issue"* | Majority of farmers agree on being part of an organisation, and have the organisation direct them on what to produce (Table 4-9: S11).<br><br>Contradiction as then majority of farmers do not agree with the crop plans (Table 4-7: S9). | Not Applicable | Convergence<br><br>Contradictory Statement | Not Applicable | Not Applicable |
| **Governance** | *"Farming organisations must ensure good governance"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Hybrid Producer-Organisation Models** | *"A government agency like the MFA should take over the leadership role"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Government as Coordinating Leader** | *"Government must take a leading role in offering leadership to farmers"* | Majority of farmers agree on work being done at the markets by authorities, and the work being done in relation to promotion. (Table 4-11: S13) | Majority of buyers agree that authorities are doing good work at the markets (Table 4-22: S20) | Convergence | Convergence | Convergence |

#### 4.3.3.1 Analysis

There is a convergence in topic Management of Organisations, as most farmers agree to being part of an organisation.

In the topic Unity of Farmers, there is an agreement by most farmers to have an organisation direct them on what to produce. To not a contradictory statement, as majority of farmers did not agree with the adoption of crop planning.

Government as Coordinating Leader topic was agreed by both the farmers and buyers.

### 4.3.4 Stakeholder Collaboration

**Table 4-41: Joint Display - Stakeholder Collaboration Theme**

| Theme | *Insight* | Survey Farmers | Survey Buyers | Themes vs. Farmers | Themes vs Buyers | Farmers vs Buyers |
|---|---|---|---|---|---|---|
| **Consumer-Centred Collaboration** | *"Upgrade the quality" and "Make the product more available"* | Majority of farmers think that consumers prefer local (Malta) fruit & vegetables (Table 4-3: S1).<br><br>Majority of farmers agree that consumers have access to buy local fruit and vegetables (Table 4-3: S2). | Majority of Buyer prefer local fruit & vegetables (Table 4-14: S1))<br><br>Majority of Buyers agree that quality of local produce is good (Table 4-14: S5) | Convergence | Convergence | Convergence |
| **Collaboration between stakeholders** | *"Volatile – last years improved. Positive dynamics and inclusion. Collaboration is to be set by authorities"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Human Capital** | *"Invest in generational renewal"* | Whilst Most of the farmers agree that they are ready to train themselves, the survey shows that this relates only to farmers between 18-50. Over 50+ do not agree. (Table 4-13: S17) | Most of the Buyers agree that farmers are too traditional and need to change the way they work. (Table 4-20: S19) | Convergence | Convergence | Convergence |

#### 4.3.4.1 Analysis

In the topic Consumer-Centred Collaboration there was full convergence. The majority of the farmers and buyers agree that the local fruit and vegetables is preferred by the consumer and that there is adequate access to buy the local produce and that the quality is good.

Human Capital topic depicted a convergence as semi-structured interviews, farmers and buyers' surveys, highlighted the traditionality of the Maltese farmers and the need for generational renewal.

## 4.3.5 Policy

**Table 4-42: Joint Display - Policy Theme**

| Theme | *Insight* | Survey Farmers | Survey Buyers | Themes vs. Farmers | Themes vs Buyers | Farmers vs Buyers |
|---|---|---|---|---|---|---|
| **Policy Implementation and Progress** | *"Recently several policies beneficial to the sector were implemented"* | Most of farmers agree that the policies and decision being taken are beneficial to farmers. (Table 4-11: S15) | Buyers do not agree that the Policies and decisions being taken in relation to agriculture are beneficial to farmers (Table 4-22: S22) | Convergence | Divergence<br><br>Buyers do not agree that Policies and decisions being taken in relation to agriculture are beneficial to farmers | Divergence<br><br>Buyers do not agree that Policies and decisions being taken in relation to agriculture are beneficial to farmers |
| **Future Policy Development** | *"A lot more policies need to be introduced (example: related to land) for the sector to be competitive"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Policy Coordination and Institutional Challenges** | *"Policy makers must be knowledgeable in the sector…. history or unknowledgeable policy makers who did not consult"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |

### 4.3.4.1 Analysis

With regards to Policy Implementation and Progress, there is convergence between the farmers' survey and the semi-structured interviews, that the policies and decision being taken by the authorities are beneficial to the sector. However, most of the buyers do not agree with this statement.

## 4.3.6 Innovation and Technology

**Table 4-43: Joint Display - Innovation and Technology**

| Theme | *Insight* | Survey Farmers | Survey Buyers | Themes vs. Farmers | Themes vs Buyers | Farmers vs Buyers |
|---|---|---|---|---|---|---|
| **Appetite for innovation** | *"Farmers are very traditional and less prone to investment"* | Majority of farmers agree that they want to adapt new technology. (Table 4-13: S16).<br><br>Majority of farmers do not agree to continue working the traditional way. However, age brackets (51-65 and 66+) do agree. (Table 4-13: S16). | Most of the Buyers agree that farmers are too traditional and need to change the way they work. (Table 4-20: S19) | Divergence<br><br>Farmers Under 50 want to invest in innovation and technology. | Convergence | Divergence<br><br>Between Buyers and Farmers Responses |
| **Barriers to Investment** | *"Economies of scale are a disruptor to invest in innovation and technology"*<br><br>*"Young farmers may be different – more exposed to information"* | Majority of farmers agree that they are willing to learn new techniques. This is true to age brackets 18 to 50 (Table 4-13: S17). | Most of the Buyers agree that farmers are too traditional and need to change the way they work. (Table 4-20: S19) | Divergence<br><br>Farmers Under 50 want to invest in innovation and technology. | Convergence | Divergence<br><br>Between Buyers and Farmers Responses |
| **Support Structures for Innovation** | *"Government must invest centrally on innovation and technology and share with farmers"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |
| **Investment Risks** | *"Tailored and small technologies with possible inclusion of Government and private partnerships"* | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable |

#### 4.3.6.1 Analysis

Appetite for Innovation Topic – Agreement by Buyers, however a contradictory conclusion by the farmers. The data shows that farmers under 50 years of age do not want to continue working the traditional way, whilst farmers over 50 agree to continue working the traditional way.

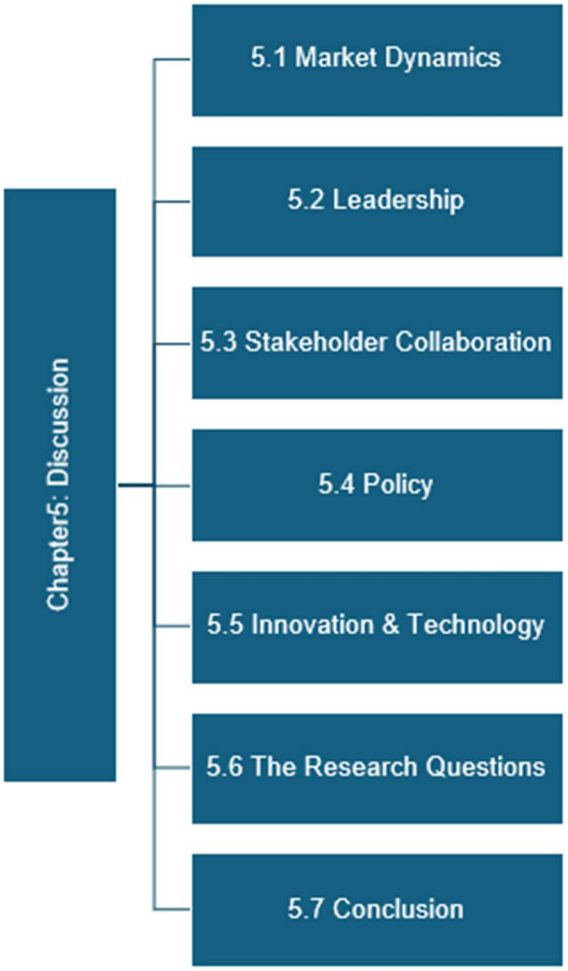
Barriers to investment topic depicts contradictions. Farmers aged 18 to 50 agree on the willingness to adopt and learn new technologies, whilst over 50 do not agree. Buyers agree that the farmers are too traditional to change.

# Chapter 5 – Discussion on Findings

# 5. Introduction

This chapter convenes the results of both the quantitative and qualitative findings and expounds upon their interpretation and significance, in relation to the literature review. This chapter is divided into three segments relating to the study's research objectives.

**Figure 5-1: Overview Discussion**



## 5.1 Market Dynamics

In Malta, we have one key fruit and vegetable market known as “il-Pitkalija”. The market is constellated with forces that disrupt its competitiveness. Using Porter’s (1988) Five Key Forces to identify and analyse the Pitkalija’s competitive forces, the intensity of competition is determined highlighting where power lies in this sector. Table 5.1: Five Key Forces for the Pitkalija Market

**Table 5-1: Mapping 5 Key Forces**

| Five Key Forces | Comments |
|---|---|
| Threats of New Entrants | New supermarkets, new suppliers selling predominantly imported produce. |
| Bargaining power of Buyers | Large buyers dictating the price |
| Bargaining power of suppliers (farmers) | The suppliers (farmers) have no bargaining power. Sales are done based on supply and demand. |
| Threat of substitute products | Imported fruit and vegetables. Farmers corroborated this as many farmers agree that imports are a disruptor to competitiveness (Table 4-4: S5). |
| Industry Competitors | There is no leading organisation managing the farmers; hence they are competing against each other and against the importers. |

Source: Own compilation

The five key forces point to the strong power large buyers, particularly supermarkets, have within the Pitkalija. Such power emanates from the quantity such large buyers

purchase and from the capability of importing substitute products. Within the local produce market from the Pitkalija, power is predominantly within the hands of the large buyers. Latest figures depict that 20% of the buyers buy 75% of the produce value annually at the Pitkalija (Source: Own compilation from MFA Data).

The Pitkalija market is serving the scope of enabling the farmers to sell their products, being vital for farmers, as confirmed by the joint display in the Chapter 4-Findings. “The main market is serving the sector well” has been corroborated by most farmers who agree that the Pitkalija is a fair marketplace (Table 4-4) and many farmers agree that good work is being done by authorities at the market (Table 4-9). The market, however, lacks the necessary infrastructure, namely temperature control storage and grading, packing and processing facilities to enable competitive growth, as without this infrastructure, no value added can be attributed to the product.

However, with regards to price fairness, there was mostly negative commentary. “*Pricing received by farmers, when considering all the effort, expenses and risk is not fair”* was corroborated by most of the farmers who disagree that they get a fair price from their sales (Table 4-5: S3). This was rebutted by an observation raised during the qualitative segment, in which one of the participants (S02) stated that “*The Pitkalija is a market, based on supply and demand, and hence drives the price according to the market requirements. Thus, the price received by the farmer is the fair market price at that moment in time*”.

The survey responses show that both the farmers (Table 4-5: S4) and the buyers (Table 4-16: S7) agree that the Pitkalija is a fair place to sell and buy, and they believe the authorities there are doing a good job (Table 4-11: S13 and Table 4-23: S20). But there are missed opportunities, like selling premium products, using short supply chains, and telling the story of the products (see section 4.2.2.1.3). These missed opportunities could

be linked to cultural barriers (section 4.2.2.1.2). Farmers are only interested in having a place to sell their produce, so they don't focus on adding value.

The Pitkalija is seen as functional because it lets farmers sell their fresh fruit and vegetables. But what happens to products that do not sell? Right now, they just get thrown away because there is no cold storage. Could these products be packed in a way that makes them easier for people to buy? No, because there is no space for machinery, so the market only sells fresh produce. Could the products be sorted by quality? No, as there are no marketing standards. These limitations, along with several similar issues, restrict the market's potential and highlight the need for structural improvements.

This brings us back to the idea of competitiveness, meaning businesses make more profit and people benefit from better, higher quality products. In the fruit and vegetable market, the businesses are the farmers, and the people are the consumers. With better infrastructure like cold storage, sorting areas, and packaging facilities, farmers would be able to sell more and make better returns. Consumers would benefit because they would have access to higher quality products. The upgrade of the Pitkalija must be managed by an organisational structure which provides leadership and governance.

**Direct Sales**

Another explored theme was Direct Sales Opportunities. No data was captured from the surveys, however the qualitative segment, clearly showed that "*direct sales by farmers need to be encouraged*". The implementation of a digital platform to enable farmers to do the sales process themselves and the ability to have a preferential tax regime, should promote more direct sales. The buyers' response was contradictory to this, as most buyers did not agree to either buying directly from farmers or having fixed contracts to buy from an organisation (Table 4-20: S17 and S18). Only supermarkets agreed to

buying directly from farmers. Interestingly the requirements of the supermarkets differ from the other buyers. In Table 4-17: S10, only supermarkets agree on the need to change the process to prefer the large buyers.

**Alternative Markets**

There was an agreement on the alternative market via the Opportunities theme. Diversification and more avenues from where farmers can sell can be a counter measure to Porter's Five Key Forces – Threats from new entrants and Bargaining Power of buyers (Porter, 1998).

Alternative markets and direct sales opportunities will also contribute to the competitiveness of the Pitkalija. The Pitkalija is a supply and demand market. The alternative markets will diminish the supply and hence contribute to better prices for the farmers. This was stated by (Smith, 1776 [2007]), when he explained that when demand surpasses supply, prices will rise. Alternative markets can be promoted and developed only by an organisational structure that promotes leadership, governance and manages the farmers. The alternative markets can be various, for example, direct sales link with the HORECA Industry. Export can be another alternative market, however the limitation in production volumes and the transportation fees may be a limiting factor.

## 5.2 Leadership

Leadership plays a crucial role in navigating the competitive environment defined by Porter's Five Forces and the broader context of the Diamond Model. Strong leadership shapes how organisations respond to industry rivalry, bargaining power of suppliers and buyers, threats from new entrants, and substitute products (Porter, 1990). This ties in

with the Malta scenario in relation to the lack of leadership in farmers' organisations. In his 2016 study on how Maltese agricultural co-operatives are run, Vella said that governance does not meet the best practice standards. He pointed out that there is a shortage of technical experts to drive change and highlighted issues such as low levels of trust and loyalty, poor decision-making, and a tendency to avoid risk (Vella, 2016). Farmers organisation needs to be managed by professionals in management which can provide strategic vision, direction and decision-making and experts who can provide technical direction based on latest innovations and technology.

The Diamond Model emphasises how leadership also influences the development of firm strategy, structure, and rivalry; factor conditions; demand conditions; and related and supporting industries (Porter, 1990). By fostering a clear vision and encouraging collaboration, leaders can align internal capabilities with external market pressures and local competitive advantages, thereby enhancing firm performance. Leadership, therefore, acts as a bridge that links the strategic choices influenced by competitive forces and the national and industry-level factors identified in the Diamond Model. All these aspects are missing. This is clear as the Sector looks for Government to fill in and take the leadership role.

The discussions and surveys outlined a major issue in relation to leadership. The Competitiveness (4.2.2.1) related theme Supportive Institutional Environment, and the Leadership themes (4.2.2.3) clearly indicate the need for Governmental intervention across all the agricultural sectors. Agriculture in Malta is mostly made up of small, fragmented farms, which limits their ability to compete internationally. Because of scarce land and natural resources, Malta relies heavily on imported raw materials, driving up production costs. Many of these farms are run part-time by families who depend on other sources of income. These gaps and the intervention of Government is the sector, makes the sector a *"market failure."* The main themes depicted a situation in which Government

intervention must be across all the levels, from operating, managing, promoting and business development.

Leadership is a complete ecosystem that thrives innovation, strategy, vision and inspiration. There are issues on all these aspects. There is an agreement between farmers (Table 4-11: S13, S14, S15) and buyers (Table 4-22: S20, S21) that the public service and/or public sector is providing the leadership service. However, different solutions need to be implemented as the over-reliance on Government is not healthy. The alternative preferred solution is an organisation-setup which includes the public and private sector together with the farming community. The role of organisations, like the MFA, is seen as a precursor for this approach. The foundation for any setup must always be good governance.

The importance of the sector is such that dependence on Government intervention needs to be diminished. An institution like the MFA must work with the private sector to compile a strategic plan to overcome the identified gaps with the aim to move away from the state of market failure and ensure competitiveness.

## 5.3 Stakeholder Collaboration

The stakeholder collaboration covered two main aspects, the human capital in relation to mainly farmers and related stakeholder and the consumer aspect.

It is a known fact that the farming labour force is an issue. The aging farming population, its reliance on traditional ways of farming clearly identified under the theme cultural barriers, and the operational burdens identified under the structural and resource constraints are the main elements affecting the labour force. Does the EU's vision to

lure back to the sector new young farmers (EU, 2024), work in the Malta scenario? Based on the findings, the answer is no, or at least not yet and not sufficient measures have been adopted to entice young farmers. The solution is the definition of a cluster. Based on Porter (1990), clusters are ***"geographic concentrations of interconnected companies and institutions in a particular field".*** A cluster is crucial because productivity can be enhanced, innovation fostered, and economic growth can be driven by leveraging the synergies and efficiencies within these ecosystems. Malta's geographics make all this possible. Hence, the solution is a cluster made up of is a network of policies directed at attracting farmers, who shall be managed through an ecosystem providing education, central innovation, shared technology and an entrepreneurial mindset. The Malta situation possibly entails a farming industry based mainly on part-timers. Part-timers, having an income coming from the full-time job may be ready to risk investing in innovative techniques and new technologies which can lead to more productivity.

The consumer aspect is complex. The surveys depicted an agreement from a majority of farmers and buyers, that in their opinion, the consumer prefers local fruit and vegetables (Table 4-3: S1, S2 and Table 4-14: S1); and that the consumer has accessibility to purchase the produce (Table 4-3: S1, S2 and Table 4-18: S12). On the other hand, both farmers and buyers agree on grading of the produce (T4-6: S7 and T4-4: S4) and about adequate packaging (Table 4-6: S8 and Table 4-14: S4). This identifies that the product is not consumer friendly. The buyers identified that consumers buy the local product based on freshness (Table 4-18: S12) and quality (Table 4-18: S13) and believe that the price is not detrimental to the choice (Table 4-18: S15). This ties in well with the results from the interviews, Market and Consumer Gaps Theme, for the need of product upgrade and Consumer Centred Collaboration Theme in which quality marks and premium products were identified. The consumer needs are changing, and the market must change accordingly. The local fruit and vegetables need to compete with an inflow of imports; thus, the local produce must stand out. The competition must not be

on price, but on quality, freshness, short supply chain and valorisation of the product. There must be educational campaigns addressing consumers detailing the benefits of the local produce.

## 5.4 Policy

The policy framework must be aligned with EU's CAP. For the benefit of the sector, policy makers must be more aligned with the CAP and identify niche areas which would be beneficial specifically to the local sector. The direction of the policies should factor all the active farmers, including the part-time farmers. The link of the stakeholders with other EU counterparts is crucial. The internationalisation aspect is missing. Internationalisation can help the stakeholders and the policy makers to anticipate what policies to implement.

## 5.5 Innovation and Technology

Schumpeter (2010) states that entrepreneurs are catalyst to innovation, and that progress is triggered from the continuous replacement of technology, process and practices. The findings clearly show that local farmers are not entrepreneurs as defined in the Human Capital Theme and that farmers are dependent on traditional mode of operations (Table 4-13: S18 – most farmers over 51 years agree on the traditional mode and Table 4-21: S19 – most buyers attribute traditionality to farmers).

Krugman (1980) stipulates the importance of economies of scale. The theme Barriers to Investment depicted that the main issue for farmers to innovate is the economies of scale, which the local farmer does not have. Other barriers, like complicated administrative burdens and traditionality are main disruptors.

The theme Support Structures for Innovation depicted a scenario where innovation and technology can only succeed if there is a direct support and investment from Government. The setup of central innovation hub for innovation and technology, the investment in technology which is then shared across farmers and the collaboration between academic institutions, international organisation and local experts were the solutions identified.

The solution is linked to the identified in the Leadership Section, that of a Cluster based on public, private and educational institutions, which provides the entrepreneurial attitude and the projects the appetite for investment in innovation and technology through centrally funded projects.

## 5.6 The Research Questions

**Does Malta's agricultural sector have the potential to be competitive?**

The Malta agricultural sector is burdened with several difficulties. The labour force, decreasing and aging; the structural resources, diminishing and fragmented land, scarcity of resources (water); no economies of scale and a sector linked to tradition. On the other hand, there is a product that is acknowledged to be fresh, of high quality and easily available. The product has loads of opportunities for improvement, namely short supply chain, farm to fork, upscale to premium product and improved marketing standards, which would give the product more value. It does however face threats, primarily from imported produce. The product coupled with adequate policies and the setup of organisational structures which promote entrepreneurial attitudes, education and innovation shall ensure that the sector can have the potential to be competitive.

**What are the factors promoting or disrupting the achievement of competitiveness in the local agricultural Sector?**

**Promoters (Enablers)**

- Human Capital (farmers are survivors and resilient)
- Product (fresh, quality)
- Opportunities (short supply chain, premium and high value product)
- Central market (Pitkalija) which is meeting the current demands of farmers and buyers
- Policy and Regulatory framework
- EU Funding and Aids

The key factors supporting the competitiveness of Malta's agriculture sector include strong and resilient farmers, fresh and high-quality produce, The central market, Pitkalija, effectively meets the needs of both farmers and buyers. Additionally, supportive policies and regulations, along with funding and assistance from the EU, further improve the sector's strength. There are also several opportunities which can promote competitiveness, namely the short supply chain, premium and high-value goods, more direct EU payments and the implementation of a cluster to manage the sector.

**Disruptors**

- Leadership across farmers' organisations
- Human Capital (aging and diminishing labour force)
- Organisational structures
- Lack of customer focus
- Market dynamics – no alternative market to the Pitkalija
- Lack of innovation and adaptation of technology
- External pressures (imports)

The agricultural sector in Malta faces several challenges that undermine its competitiveness. These include leadership issues within farmers' organizations and an aging, shrinking workforce. Organizational structures are often outdated, and there is limited attention to customer needs. Market challenges are evident as the Pitkalija remains the sole market outlet, leaving farmers with no alternatives. Moreover, there is a lack of innovation and slow adoption of new technologies, and external pressures from imported goods.

## 5.7 Conclusion

The discussion presented a comprehensive analysis of the findings and recommendations regarding the five factors identified as influencing the competitiveness of Malta's agricultural sector. In this chapter, the enablers and barriers to competitiveness were examined in detail, drawing from data gathered through surveys and semi-structured interviews and linked to the literature review. These elements were thoroughly explored within the context of each factor.

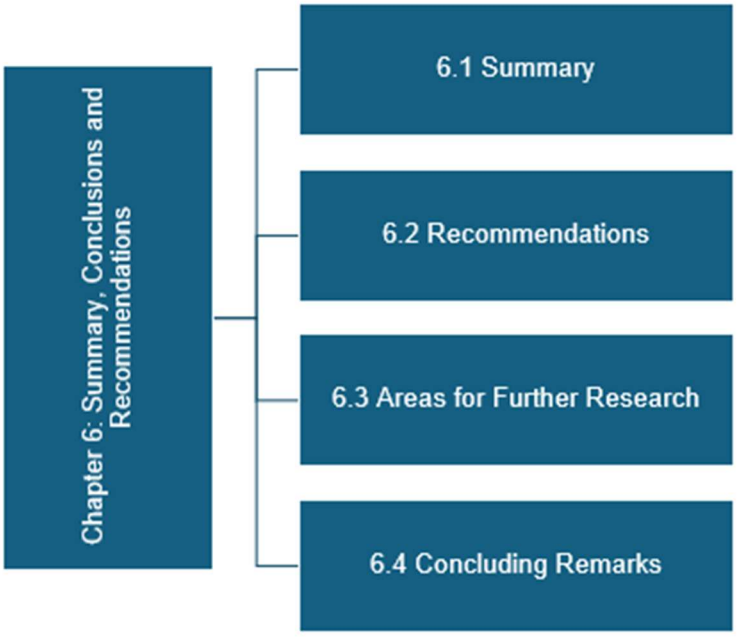
The resulting insights directly address the two research questions posed by this study, with the answers to these questions embedded within the detailed discussion of the findings.

# Chapter 6 - Conclusions and Recommendations

# 6. Introduction

The final chapter of this dissertation provides a summary on the findings in line with the research objectives followed by several author recommendations and the author's suggestions for areas for further research.

**Figure 6-1: Overview Summary, Conclusions and Recommendations**



## 6.1 Summary

This study explored the competitiveness of Malta's agricultural sector, focusing on fruit and vegetables. It assessed the sector's performance, potential, and resource management while identifying key challenges and opportunities. Using a mixed-method approach, the research combined qualitative and quantitative data, with triangulation enhancing the validity of results. This revealed both converging and diverging views among farmers, buyers, and interviewees.

The first question examined whether Malta's agricultural sector can be competitive. Despite challenges like an aging workforce, land fragmentation, water scarcity, and reliance on tradition, the sector offers fresh, high-quality produce. Opportunities lie in short supply chains, premium products, and improved marketing. With policy support, better organisation, and a focus on innovation, the sector holds competitive potential.

The second question explored what drives or hinders competitiveness in Maltese agriculture, based on insights from key stakeholders. Enablers include farmer resilience, high product quality, premium market opportunities, supportive policies, EU funding, and the role of the Pitkalija market. Disruptors include weak farmer organisation leadership, workforce decline, limited innovation, over-reliance on Pitkalija, and pressure from cheaper imports.

## 6.2 Recommendations

Recommendations are put forward based on findings and the discussion as outlined below:

### 6.2.1 Define the cluster policy

Define a cluster composed of the relevant stakeholders, including the authorities, MFA, University, MCAST, Farmers Organisations and their members, Buyers and their representatives, consumers, to work together on areas they can cooperate on, whilst very importantly, allowing competitiveness to continue. One area of cooperation could be the compilation of a network of policies directed at attracting farmers, who shall be managed through an ecosystem providing education, central innovation, shared technology and an entrepreneurial mindset.

Clusters offer a more effective model for driving competitiveness in agriculture. By bringing together Government, producers, suppliers, academia, and support services, clusters, through cooperation but continuous competition among the market players forming part of the cluster, encourage specialisation, innovation, and scale economies. This leads to higher productivity, competitiveness and better integration into agri-food value chains, as the cluster focuses on market dynamics and market performance. This is in contrast with the existing LAGs that focus on area-based rural development and inclusion, often prioritising social goals over market performance (as defined in Section 2.4). Thus, clusters are better aligned with the demands of a competitive agricultural sector.

#### 6.2.1.1 Actions

**Action#1: Facilitate a cluster setup**

Encourage and facilitate the bottom-up emergence of a fruit-and-vegetable cluster, then support its professional management potentially through an existing body such as the MFA so it can; become the market leader in production, promotion and sales; champion innovation and the adoption of new technologies and provide expert guidance and education to both farmers and consumers. This approach ensures the cluster grows organically while still benefiting from dedicated, sector-leading expertise.

**Action#2: Infrastructure of the Pitkalija**

Invest in infrastructure relating to temperature control storage, grading, packaging and processing at the Pitkalija to enable value added to the product.

**Action#3: Market Dynamics**

Assessment of the changing market dynamics. The needs of the large buyers may differ from the needs of the small/medium buyers. As such assess and create market dynamics to meet the changing needs of the buyers.

**Action#4: Crop Planning**

Price varies with supply and demand. There is no control over the supply. Farmers must start doing crop plans from which excess supply may be identified and corrective actions can be taken.

**Action#5: Alignment with EU Vision**

Internationalisation, be part of EU organisations, identify visions, strategies of other countries and align to the Malta reality, with the possibility to anticipate implementation.

**Action#6: Future Research Policies**

Compile research and studies to analyse future trends, innovations and technologies. Compile policies around this research in a proactive manner.

## 6.3 Areas for future research

This research has focused on the policymakers, farmers and buyers' views on market competitiveness. There are additional dimensions that can be studied, including the contribution such competitiveness allows not only to farmers' profits but also for society to thrive. Further studies are required to provide a holistic understanding of this agricultural segment.

### 6.3.1 Economic study of the farmers' contribution

The Agricultural Sector contribution to GDP is less than 1%. An economic study needs to be done to determine the contribution per capita the sector is contributing to the society in terms of food security, environment, tradition etc. Over and above the GDP.

### 6.3.2 Consumer Analysis

Study why the end consumer buys (or not) local fruit and vegetables. Analysing the needs of the consumer and how the needs have changed over time. Compare the need with the current product and identify how the current product needs to change to meet the consumer needs.

### 6.3.3 Profitability Analysis

Economic analysis on the farmers profitability. Majority of farmers rate their profitability only as sales less expenses. The labour element is not considered. This study needs to determine the actual profitability of the farmers.

### 6.3.4 Study of the product cost

A study to determine the cost price of the main crops' lifecycle (cultivation-harvest-market). The cost price can then be analysed against selling price and determine whether price fairness.

## 6.4 Conclusion

This study adds valuable information to the limited research available on agricultural competitiveness in Malta. It finds that even though the sector faces many barriers, the local product still has the potential to be competitive. It however requires and calls for policy action to reduce these barriers and better use the potential of the product, contributing to society. It is such an approach that will help ensure that the fruit and vegetable sector in Malta becomes more competitive, to allow farmers to profit and society to thrive.

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# Appendices

# Appendix 1: Frameworks for measuring Competitiveness

### The Diamond Model and Competitive Advantage Metrics by Michael Porter

The diamond model (Porter, 1990) is the most popular and widely used framework to assess national competitiveness. The base of the model entails the use of metrics for quality of infrastructure, level of industry competition, employees' skill levels and local demand (Porter, 1990). Porter's framework is applied in competitive indices such as the World Economic Forum's GCI. This index is used to assess nations across twelve pillars, which are aligned to Porter's framework. These pillars include institutions, infrastructure, and innovation (Schwab, 2018).

### The World Economic Forum's Global Competitiveness Index

The World Economic Forum developed the GCI, which is a widely recognized measure of national competitiveness. The index is structured around twelve pillars, ranging from macroeconomic stability to health and education, which capture the multi-dimensional nature of competitiveness (Schwab, 2018). As stated above, the index builds on Porter's concepts.

### World Bank's Ease of Doing Business Index

The World Bank used to issue the Ease of Doing Business Index, which assesses the regulatory environment and offers insights into national competitiveness. This index evaluates topics like obtaining building permits, enforcing contracts, and launching a business. The index represents aspects of both rivalry and competitiveness by (i) determining the level of difficulty for businesses to operate in a particular country, and (ii) identifying obstacles that could impede economic growth and commercial activity (World Bank, 2024). The foundation of this index is Porter's theory that competitive and productive business environments are necessary for national competitiveness (Porter, 1990). In terms of economic openness and commercial efficiency, nations with high Ease

of Doing commercial Index scores typically have an edge over their competitors, drawing in more investment and creating a more competitive market structure.

**Schumpeter's Innovation Metrics and Creative Destruction**

The significance of innovation as an indicator of competitiveness is emphasised by Schumpeter's theory of creative destruction. Schumpeter (2010) asserts that industries thrive through constant innovation, with new competitors challenging established firms and driving economic expansion. Thus, research and development (R&D) spending, patent filings, and the rate of new product releases are common ways of measuring innovation, which is an essential indicator of competitiveness (Schumpeter, 2010).

Metrics used by the Organisation for Economic Cooperation and Development (OECD) Innovation Scoreboard, which monitors innovation performance across nations, reflects Schumpeter's notion of innovation-based competition. In accordance with Schumpeter's theory that innovation promotes competitive advantage and growth in the economy, this scoreboard evaluates variables such as R&D intensity, scientific research outputs, and venture capital investment (OECD, 2021).

**Market Structure and Competition Intensity: Herfindahl-Hirschman Index**

#A frequently used indicator of market concentration and competition is the Herfindahl-Hirschman Index (HHI). The degree of competition is indicated by HHI values, which are calculated as the sum of the squares of market shares of all enterprises within an industry. Higher values indicate monopolistic or oligopolistic structures, whereas lower values reflect higher competition (Hirschman, 1964). By measuring the level of competition within an industry, the HHI is consistent with Porter's Five Forces Model (Porter, 1990). Industries with high HHI values have little competition, which frequently results in higher costs and worse customer welfare. Since it enables policymakers to

evaluate market dynamics and identify potentially anti-competitive practices, the index has become a standard in antitrust policy and competition regulation.

**Krugman's Perspective: Trade Balance and Economies of Scale**

In his New Trade Theory, Paul Krugman highlights intra-industry trade and economies of scale as indicators of competitiveness. According to this theory, nations that focus on sectors where large-scale production is feasible attain competitiveness by lowering costs while establishing market dominance (Krugman, 1980). According to Krugman's method, competitiveness may be assessed by looking at export diversification, scale-based economies within key sectors, and trade balance in high-value industries. The Global Innovation Index (GII), which analyses how well nations use economies of scale and incorporates trade-related metrics, has been impacted by Krugman's idea. The approach supports Krugman's contention that nations can become more competitive by entering markets where high productivity and scale efficiencies are achievable (Krugman, 1980).

**Resource-Based View: Firm-Level Competitiveness Metrics**

Jay Barney (1991) developed the Resource-Based View (RBV), which highlights firm-specific resources as sources of competitive advantage. RBV states that indicators such as organisational culture, brand equity, and intellectual property strength are essential for evaluating firm-level competitiveness. These resources enable businesses to gain and maintain a competitive edge because they are rare, valuable, unique, and non-substitutable (Barney, 1991). RBV places a greater focus on intangible resources when evaluating competitiveness since it claims that a firm's unique assets, not the structure of the industry, are the source of competitive advantage. These elements are crucial to evaluations of competitiveness because companies with powerful portfolios of intellectual property or unique brands can use these resources to surpass their rivals.

**Comparison of the Models**

Various indicators are used to measure competitiveness, including productivity, institutional factors (as per Porter's Diamond Model), market concentration (e.g., HHI), and innovation (reflecting Schumpeter's creative destruction). These metrics highlight the complexity of competition and the influence of both internal dynamics and external market forces in shaping competitive advantage.

| Model / Index | Focus | Similarities | Strengths | Weakness |
|---|---|---|---|---|
| **Porter's Diamond Model** | Explains why some nations (or regions) become globally competitive, using four interacting determinants, factor conditions, demand conditions, related & supporting industries, and firm strategy / rivalry. | Forms the conceptual backbone for GCI and informs Ease of Doing Business (regulation aspect) and HHI (rivalry aspect). | Holistic; bridges micro (firm rivalry) and macro-conditions; intuitive visual tool for policy debate. | Hard to quantify directly (requires proxy indices); static snapshot, doesn't model dynamics such as disruptive innovation. |
| **WEF Global Competitiveness Index (GCI)** | Converts Porter's ideas into 12 measurable pillars. Provides cross-country scoreboard for policymakers and investors. | Shares Diamond's factors; overlaps with OECD Innovation Scoreboard on R&D/innovation pillars. | Broad coverage; long time-series; global acceptance makes benchmarking easy. | Large pillar set can blur causality; survey components introduce perception bias. |
| **World Bank Ease of Doing Business** | Benchmarks business-regulation frictions. Aims to flag reform priorities. | Aligns with Diamond's "*firm strategy, structure & rivalry*" and with HHI focus on competitive conduct. | Clear, concrete indicators; actionable for reform; strong link to FDI attraction. | Narrow regulatory lens, ignores macro stability or innovation; data collection controversies led to 2021 suspension. |
| **Schumpeter / Creative-Destruction Metrics** | Tracks innovation vigour via R&D intensity, patents, venture capital, new-product counts. | Complements GCI's innovation pillar; conceptually pairs with RBV's intangible-asset emphasis. | Captures dynamic, forward-looking edge of competitiveness; good firm or sector-level granularity. | Innovation and competitiveness in all sectors (e.g., commodity industries); patent counts can mis-measure impact. |
| **Herfindahl-Hirschman Index (HHI)** | Quantifies market concentration to infer competition intensity. | Operationalises Porter's "rivalry" force; merges with EoDB (antitrust lens). | Simple, widely used in antitrust policy; industry-specific precision. | Says nothing about cross-border trade or innovation; high/low HHI thresholds can be arbitrary across sectors. |
| **Krugman's New Trade Theory Metrics** | Looks at intra-industry trade patterns, export diversification and scale-economy advantages to judge national competitiveness. | Complements Diamond on "*related & supporting industries*" and links to GCI trade-openness indicators. | Explains why similar countries trade heavily; highlights economies-of-scale benefits that other models skip. | Less useful for service-driven economies; scale bias may under-value niche, high-value producers. |

Source: Own Compilation

# Appendix 2 – Definition of Data Analysis Test

## The Freidman Test

The Friedman test is a non-parametric statistical tool for checking if the average scores or median ranks given to a group of related statements are significantly different. It is often used with Likert-scale data, where responses range from 0 (‘Strongly Disagree’) to 4 (‘Strongly Agree’). The null hypothesis states that all statements have similar average scores, and it is accepted if the p-value is greater than 0.05. If the p-value is smaller than 0.05, the alternative hypothesis is accepted, suggesting that some statements have significantly different average scores. This test is useful for analysing whether responses across related items are consistent or if there are meaningful differences that should be considered in further analysis.

## The Kruskal-Wallis Test

The Kruskal-Wallis Test is used to compare the distributions of scores given to a statement by different independent groups. It’s commonly used with Likert-scale data, where responses range from 0 (‘Strongly Disagree’) to 4 (‘Strongly Agree’). The null hypothesis suggests that the distribution of scores across the groups do not differ much and is “fail to reject” if the p-value is higher than 0.05. If the p-value is below 0.05, the alternative hypothesis is accepted, showing that the groups’ scores vary significantly. This test helps identify whether different groups have similar or different views on a statement, making it useful for comparing opinions or attitudes across independent groups in research.

# Appendix 3: Questionnaires – Farmers

## Questionnaire Schedule – Farmers (Producers)

My name is Joseph Vella, and I am currently reading Master's in Public Policy Leadership at the University of Malta.

I am currently conducting research that aims to analyse the whether the fruit and vegetable farming community be competitive. The survey which you are invited to complete forms part of this study and only takes about 5 minutes to complete. Any data collected from this survey is solely used for purposes of this study. There are no direct benefits or anticipated risks in taking part.

Participation is entirely voluntarily meaning that one is free to accept or refuse participation. At no point during the survey will one be asked to provide a name or other personal data that may lead to the individual being identified. Furthermore, one may refuse to answer certain questions.

If you wish to participate in this study, please begin the survey. Should you have any questions, do not hesitate to contact me on 79777234 or joseph.vella.22@um.edu.mt.

Yours Sincerely,
Josef Vella

## Declaration by Respondents

- I confirm that I am 18 years of age or older
- I am aware that I am completing and submitting this anonymous questionnaire implies that I am participating voluntarily and with fully informed consent on the above listed conditions.

## Section 1: Demographics

1. Farmer Type:

- Full-Time
- Part-Time

2. Age Bracket:

- 00 - 25
- 26 – 40
- 41 – 50
- 51 – 65
- 66 +

3. Gender:

- Male
- Female
- Not Applicable

4. Education:

- Primary
- Secondary
- Tertiary

5. Are you a member of a coop or farmers organisation:

- Yes
- No

## Section 2: Local Produce and Markets

| Ref | Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | Consumers prefer the local fruit and vegetables. | | | | | |
| **2** | Farmers get a fair price from the sales of their fruit and vegetables. | | | | | |
| **3** | The Pitkalija provides a fair marketplace. | | | | | |
| **4** | The local fruit and vegetables are adequately marketed and promoted. | | | | | |
| **5** | Grading of fruit and vegetables is important. | | | | | |
| **6** | Adequate and consumer friendly packaging is needed. | | | | | |
| **7** | Crop plans are important to manage the supply and demand. | | | | | |
| **8** | The consumer has accessibility to buy local fruit and vegetables. | | | | | |
| **9** | Imports are a disruptor to the local products competitiveness. | | | | | |

## Section 3: Organisational Structure

| Ref | Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | Being part of an organisation can help farmers. | | | | | |
| **2** | I am ready to form part of an organisation and produce as directed by the organisation. | | | | | |
| **3** | I am ready to be part of an organisation that gives me direction on what to produce to get a standard and fair price. | | | | | |

## Section 4: Leadership

| Ref | Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | The authorities are doing good work in relation the markets from which the local produce is being sold. | | | | | |
| **2** | The authorities are doing good work in relation to promoting the local produce. | | | | | |
| **3** | The policies and decision being taken in relation to agriculture are beneficial to the farmers. | | | | | |

## Section 5: Technology and Innovation

| Ref | Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | I am ready to be more innovative and adapt new technology to grow my products. | | | | | |
| **2** | I am ready to go to courses to learn new techniques on how to grow my products. | | | | | |
| **3** | I would rather work the traditional way, than use new technology like hydroponics, vertical farming etc. | | | | | |

1: Strongly Agree
2: Agree
3: Neutral
4: Disagree
5: Strongly Disagree

# Appendix 4: Questionnaires – Buyers

## Questionnaire Schedule - Buyers

My name is Joseph Vella, and I am currently reading Master's in Public Policy Leadership at the University of Malta.

I am currently conducting research that aims to analyse the whether the fruit and vegetable farming community be competitive. The survey which you are invited to complete forms part of this study and only takes about 5 minutes to complete. Any data collected from this survey is solely used for purposes of this study. There are no direct benefits or anticipated risks in taking part.

Participation is entirely voluntarily meaning that one is free to accept or refuse participation. At no point during the survey will one be asked to provide a name or other personal data that may lead to the individual being identified. Furthermore, one may refuse to answer certain questions.

If you wish to participate in this study, please begin the survey. Should you have any questions, do not hesitate to contact me on 79777234 or joseph.vella.22@um.edu.mt.

Yours Sincerely,
Josef Vella

## Declaration by Respondents

- I confirm that I am 18 years of age or older
- I am aware that I am completing and submitting this anonymous questionnaire implies that I am participating voluntarily and with fully informed consent on the above listed conditions.

## Section 1: Demographics

1. Buyer Type:

- Full-Time
- Part-Time

2. Buyer Type:

- Street Vendor
- Grocer
- Supermarket
- Distributor
- Other _____

3. Gender:

- Male
- Female
- Not Applicable

## Section 2: Local Produce and Markets

| Ref | Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | Consumers prefer the local fruit and vegetables. | | | | | |
| **2** | Farmers do get a fair price for their produce. | | | | | |
| **3** | The Pitkalija provides a fair marketplace, both to the buyer and to the seller. | | | | | |
| **4** | The local fruit and vegetables are adequately marketed and promoted. | | | | | |
| **5** | Grading of fruit and vegetables is a must for the local produce to survive. | | | | | |
| **6** | The local produce must be packaged in adequate, new, and consumer friendly packaging. | | | | | |
| **7** | The quality of the local produce is good. | | | | | |
| **8** | The local markets are accessible to buyers and local produce can be purchased fairly. | | | | | |
| **9** | I prefer buying directly from farmers than from markets like Pitkalija. | | | | | |
| **10** | The market is changing and there is a preference to sell more to the large buyers. | | | | | |
| **11** | The market dynamics are changing, and large buyers need to be preferred. | | | | | |
| **12** | It is better to buy directly from a farmers' organisation than from the market. | | | | | |
| **13** | I would rather have a contract with specific farmers than buy from the market. | | | | | |
| **14** | Farmers are too traditional and need to change the way they work. | | | | | |

## Section 3: Consumers

| Ref | Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | The consumer is finding the local produce that he/she requires. | | | | | |
| **2** | Consumers prefer local produce because of freshness. | | | | | |
| **3** | Consumers prefer local produce because of quality. | | | | | |
| **4** | Local produce is in general not convenient to buy due to its packaging not being consumer friendly. | | | | | |
| **5** | Price is the determinantal factor for the consumer to decide whether to buy local or imported. | | | | | |

## Section 4: Leadership

| Ref | Question | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| **1** | The authorities are doing good work in relation the markets from which the local produce is being sold. | | | | | |
| **2** | The authorities are doing good work in relation to promoting the local produce. | | | | | |
| **3** | The policies and decision being taken in relation to agriculture are beneficial to the farmers. | | | | | |

1: Strongly Agree
2: Agree
3: Neutral
4: Disagree
5: Strongly Disagree

# Appendix 5: Semi-Structured Interviews

## Semi-Structured Interview Questions on

## Competitiveness of Malta's Fruit & Vegetable Farming Sector

## Introduction

- Greet the participant and introduction
- Purpose of the research Analysing the competitiveness of the fruit and vegetable farming community in Malta.
- Outline the interview structure and ensure informed consent.
- Assure confidentiality and anonymity.

## Demographics

- What is your role within the organization/ministry/agency?
- How long have you been involved in the agriculture sector?
- Can you briefly describe the functions and responsibilities of your department or organization in relation to the agriculture sector?

## Questions Framework

Overall Competitiveness of the Agricultural Sector

*How would you describe the current competitiveness of Malta's fruit and vegetable farming community, and what factors or conditions most significantly influence it?*

- In your opinion, what are the main strengths and weaknesses of the Maltese fruit and vegetable farming community?
- How do you perceive the current level of competitiveness of this sector?
- What factors do you believe contribute to or hinder the competitiveness of the sector? (e.g., market accessibility, imports, resources, leadership, technology, etc.)

## Market Dynamics

*The Pitkalija – Malta's main wholesale market for produce – plays a central role in how fruits and vegetables are sold.*

- How well do you think the Pitkalija system is serving farmers and buyers?
- In your view, is it a fair and efficient marketplace, and are there any changes you would suggest improving how it operates?

## Pricing and Profitability

*Addresses market dynamics and value chain issues, exploring whether farmers get equitable returns and how that impacts their competitiveness.*

- To what extent do you feel that farmers are receiving a fair price for their produce under the current system?
- How do the pricing and distribution arrangements (from farm to market) affect farmers' profitability and their ability to compete?

## Leadership - Role of Cooperatives/Organizations

*Explores organisational structure by examining how collective action or the lack thereof affects farmers' success.*

- How do you perceive the role of cooperatives and producer organizations in enhancing competitiveness?
- What are the challenges faced by such organizations in Malta?
- What role should government agencies and ministries play in promoting agricultural competitiveness?

## Stakeholder Collaboration & Consumer Preferences

*Looks at organisational dynamics and leadership, probing whether better teamwork and guidance in the sector could address current challenges, and addresses consumer preferences, asking interviewees to connect market demand trends with farmers' responses or adjustments in production and marketing.*

- How would you assess the level of collaboration and coordination among different stakeholders in this sector (farmers, cooperatives, government agencies, retailers, etc.)?

- Could stronger collaboration or leadership among these players help improve the farming community's competitiveness, and if so, how?

- What do you think Maltese consumers value most when buying fruits and vegetables (e.g. freshness, quality, price, variety, convenience), and how is the local farming community adapting to meet these consumer preferences and demands?

## Innovation and Technology

*Covers the theme of innovation, asking about the importance of technological advancement and the openness to change in farming practices.*

- What is your view on the adoption of modern technology in the agricultural sector by the farmers?

- What measures are being taken to encourage innovation and modernization among farmers?

- Are there any specific policies or programs aimed at promoting technological advancements in agriculture?

## Policy and Support

*Targets the policy theme by inviting critique and suggestions on government's role and potential reforms to support the industry.*

- In your view, how do current government policies, regulations, or support programs affect the competitiveness of Malta's fruit and veg farmers?

- Are there any specific policy changes or new initiatives that you believe would significantly help strengthen the sector's competitive position?

- What policies or regulatory frameworks are in place to support the competitiveness of the fruit and vegetable farming community?

- Are there gaps or areas where improvement is needed in terms of policy support?

## Niche Opportunities and Strengths

*Encourages discussion of Malta's distinctive advantages and potential niche strategies that leverage local strengths in the marketplace.*

- Are there any unique strengths or niche opportunities that Malta's fruit and vegetable sector can capitalize on to enhance its competitiveness? For instance, are there particular high-quality products, traditional varieties, organic farming prospects, or other niches (like Agri-tourism or farmers' markets) that could give

local produce an edge?

- What impact does the influx of imported fruits and vegetables have on the local farming sector's competitiveness, and how can Malta's local produce stand out or remain competitive against these imports?

## Future Improvements

*A forward-looking question that invites interviewees to summarize key recommendations or priorities for enhancing competitiveness across the sector.*

- Looking ahead, what do you believe are the most important actions or changes — whether by farmers themselves, industry organizations, or policymakers — needed over the next few years to improve the competitiveness of Malta's fruit and vegetable farming sector?

- What are your suggestions for enhancing the competitiveness of the fruit and vegetable farming community in Malta?

- What role do you think innovation, policy reform, and organizational restructuring can play in achieving competitiveness?

## Conclusion

- Thank the participant for their time and insights.

- Inform them that their contribution is valuable and will be treated with the utmost confidentiality.

- Ask if they would like to receive a copy of the study's findings once completed.

# Appendix 6: Letter of Introduction and invitation to participate

10th May 2025

Dear Sir or Madam

My name is Joseph Vella, and I am a student at the University of Malta, presently reading for a Masters in Public Policy Leadership. This project is being conducted under the supervision of Dr. Marie-Louise Mangion, Senior Lecturer. This letter is an invitation to participate in this study. Below you will find information about the study and about what your involvement would entail, should you decide to take part.

I am conducting a research study for my dissertation titled Agriculture in Malta – Can the fruit and vegetable farming community be competitive? This study aims to research and analyze the potential of competitiveness of the local agricultural sector and to determine what are the factors promoting and disrupting competitiveness. Any data collected from this research will be used solely for the purposes of this study.

Should you choose to participate, you will be asked to be interviewed to discuss local fruit and vegetables focusing on markets, consumers, leadership, organizations, technology and innovation. It is envisaged that the interview would take approximately 45 minutes.

Data collected will be treated confidentially and anonymized. Data will be stored on an encrypted external hard drive or flash drive and kept in a locked secure place when not in use.

Any material in hard copy form will be placed in a locked cupboard. Only my supervisor and I (and in exceptional cases, examiners) will have access to this data.

The findings which emerge from this research may be published (e.g., in a dissertation, academic journals) and/or presented (e.g., during conferences, meetings). Your name (or any other identifying information) will not appear when the findings are reported.

Participation in this study is entirely voluntary; in other words, you are free to accept or refuse to participate, without needing to give a reason. You are also free to withdraw from the study at any time, without needing to provide any explanation and without any negative repercussions for you. Should you choose to withdraw, any data collected from your interview will be erased if this is technically possible (for example, before it is anonymised or published), unless erasure of data would render impossible or seriously impair achievement of the research objectives, in which case it shall be retained in an anonymised form.

If you choose to participate, please note that there are no direct benefits to you/there are the following direct benefits to you. Your participation does not entail any known or anticipated risks.

Please note also that, as a participant, you have the right under the General Data Protection Regulation (GDPR) and national legislation to access, rectify and where applicable ask for the data concerning you to be erased.

All data collected will be retained until the completion of the dissertation until graduation and possible publication not exceeding one year. After this period, all data will be securely deleted.

A copy of this information sheet is being provided for you to keep and for future reference.

Thank you for your time and consideration. Should you have any questions or concerns, you may contact myself or my supervisor on the details provided below.

Yours Sincerely,

Joseph Vella
Joseph.vella.22@um.edu.mt
79777234

Dr Marie-Louise Mangion
marie-louise.mangion@um.edu.mt
2340 3761

# Appendix 7: Interview Consent Form

**INTERVIEW CONSENT FORM**

Title of research project:

**Agriculture in Malta – Can the fruit and vegetable farming community be competitive?**

**Declaration by Participant:**

- I confirm that I have been given a copy of the information sheet and consent form for the above-mentioned study. I have had the opportunity to read and consider the information provided, and to ask questions; any questions have been answered in a satisfactory manner.
- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without any penalty.
- I understand that the data collected will be securely stored and accessible only to the researcher, and potentially to her supervisor, examiner, and reviewer/s. I have been informed that data will be erased/destroyed within 6 to 10 years of completion of the study.
- I understand that the data collected will be anonymised / pseudonymised and that I will not be identifiable in any publications, reports, or presentations arising from this research.
- I understand that under the General Data Protection Regulation, I have the right to access, rectify and where applicable erase any data concerning me.

**Please tick as appropriate:**

- I consent to be interviewed for the purposes of this study.

  ☐ YES ☐ NO

- I consent for this interview to be audio-recorded for the purposes of this study.

  ☐ YES ☐ NO

Name of Participant: _____

Signature: _____ Date: _____

Name of Researcher: Joseph Vella

Email address: joseph.vella.22@um.edu.mt Phone Number/s: 79777234

Name of Supervisor: Dr. Marie-Louise Mangion

Email address: marie-louise.mangion@um.edu.mt