

**CHALLENGES AND FINANCIAL SUPPORT TOWARDS
SUSTAINABILITY FOR FARMERS IN
THE EUROPEAN UNION**

The image shows a large, faint watermark of the Mahidol University logo in the background. The logo is circular and features a central emblem with Thai script around the perimeter. The text "RAMITA PINSUWANNAKUB" is centered over the watermark.

RAMITA PINSUWANNAKUB

**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
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**CHALLENGES AND FINANCIAL SUPPORT TOWARDS
SUSTAINABILITY FOR FARMERS IN THE EUROPEAN UNION**

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CHALLENGES AND FINANCIAL SUPPORT TOWARDS SUSTAINABILITY FOR FARMERS IN THE EUROPEAN UNION

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ABSTRACT

This paper studies the financial support available in the European Union (EU) for farmers in member states. It explores the challenges of EU farmers in agricultural sectors in transitioning to sustainable farming and supporting the work of Murmuration. This paper studies the financial support available in the European Union (EU) for farmers in member states. It explores the challenges of EU farmers in agricultural sectors in transitioning to sustainable farming and supporting the work of Murmuration.

EU farmers, in their journey towards sustainable farming, demonstrate remarkable resilience. This study meticulously examines their challenges, including climate change, global market competition, political crisis, cost of production in new technology, environmental policy, and the sector's attractiveness as a career choice.

The paper provides recommendations for Murmuration to understand the factors for transforming the agricultural sector towards greater sustainability and the primary barrier to adoption by farmers. It also provides recommendations for EU farmers to gain awareness of the challenges, understand the financial support access, and enhance their performance to transition.

KEY WORDS: EUROPEAN UNION, FARMERS, FINANCIAL SUPPORT, SUSTAI

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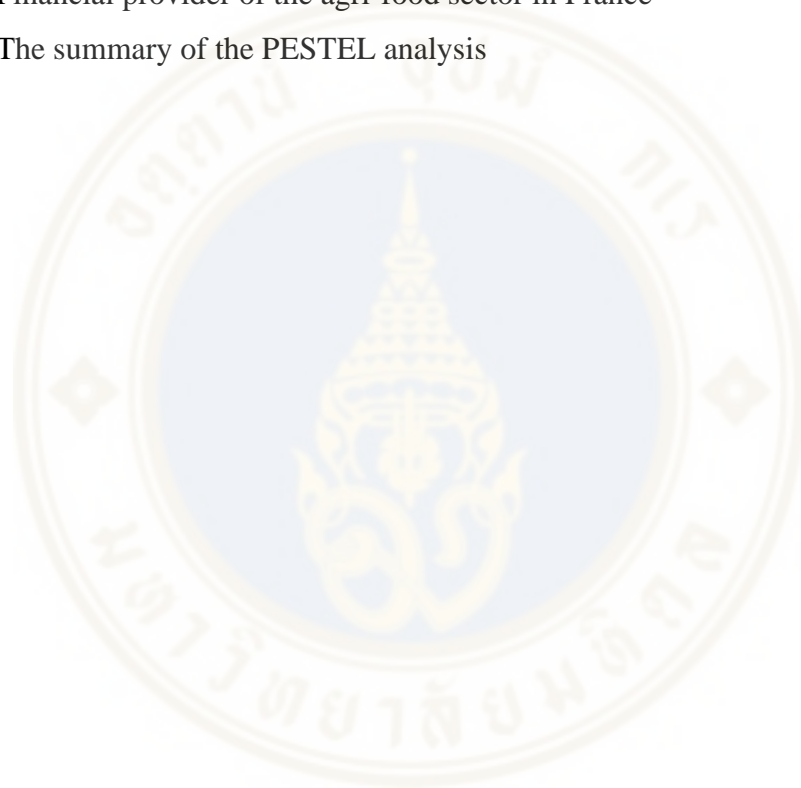
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CHAPTER I

INTRODUCTION

1.1 Background

The agricultural sector is essential for human life and connects people to nature and the environment. Agriculture provides vegetables, fruits, and livestock to feed billions globally. Without agricultural products, we would face hunger. Not only for food, but products such as cotton and wood can also be applied to clothes, furniture, and biofuels to make living more convenient. Agriculture helps farmers and entrepreneurs earn income and employment, especially in developing countries. Farming has been a way of life, shaping cultures and traditions worldwide.

Nowadays, there are risks and obstacles to the growth of agriculture. (European Commission. Directorate General for Agriculture and Rural Development., 2023). The main dangers are climate and weather-related challenges that impact water and soil resources, global competition, political crisis, cost of production in new technology, environmental policy, and attractiveness to work in the agricultural sector.

Due to previous problems and concerns that affect businesses in the agricultural sector, adaptation and transition to reach sustainability are essential factors for surviving in the industry. Large companies are easy to adapt to because they have more resources such as land, money, and experts, and they can quickly gain high profits from the new investment because the finished products are sold in large quantities. The price unit of cost is low. On the other hand, small-scale businesses need the support of the government or organizations, especially in finances and education, to overcome these obstacles and survive. (Survey on Financial Needs and Access to Finance of EU Agricultural Enterprises, n.d.)

In 2023, the value of agricultural production in the European Union (EU) was approximately 552 billion euros. (l'Europe, 2024). In 2020, the EU had 9.1 million farms, 38% of which were agricultural areas in European territory, and 10% of this agricultural area was organic farming. The average farm size was 17.1 hectares per farm,

and 64% of farms were smaller than 5 hectares. In 2022, the main harvests in Europe were wheat and spelled (126.7 million tons), beet (103.5 million tons), vegetables (59.8 million tons), corn (53 million tons), barley (52.0 million tons), and potatoes (47.5 million tons). EU is the leading region in terms of environmental protection policies.

The Common Agricultural Policy (CAP) was established in 1962 to increase food production, devastated by years of war. Moreover, the European executive presented the European Green Deal (EGD) in December 2019 as the new growth strategy of the EU to achieve climate neutrality by reducing greenhouse gas emissions, supporting Europe's ecological transition in agriculture, creating jobs, and improving the quality of life (European Commission, 2021).

1.2 Company Background

Murmuration is a start-up company that works as an environmental service dedicated to tourism stakeholders to quantify the human impact on the environment. It aims to prioritize the environmental dimension in every decision by developing a methodology that combines Earth observation satellites, such as the Copernicus satellites, with in-situ data and socio-economic statistics to assess the state of an ecosystem anywhere in the world. Approximately 20 indicators cover five crucial environmental themes (air, water, biodiversity, soil, and climate). Murmuration creates environmental monitoring dashboards for decision-makers and local authorities to aid in their decision-making process and improve their consideration of their territories' ecological conditions.

Currently, the start-up company is working on a project called Mara-Mediterra with universities and other companies, such as the University of Firenze (Italy), Dokuz Eylul University (Turkey), Egyptian Chinese University (Egypt), Lebanese University (Lebanon), Hellenic Agricultural Organization (Greece), Integrated Resources Management Company Ltd (Malta), and AMengagement ENvironnement HYDraulique industry (Malta) to explore the implementation of different sustainable farming practices across the Mediterranean and the adoption of these practices and to understand the factors for transforming the agricultural sector towards sustainability through the adoption of Nature Based Solutions (NBS) to combat water and land degradation which requires labor, time, and cost depending on the types of crop and land.

1.3 Problem Statement

According to the global warming crisis, climate change, and disruptive weather events, 12% of greenhouse gas emissions such as nitrous oxide (N₂O), carbon dioxide (CO₂), and methane (CH₄) are from the agricultural sector from the use of chemical fertilizer and pesticides, and waste (Sandrine Levasseur, 2023). The European Union encourages member states to follow the European Green Deal (EGD) and its strategies, including in the agricultural sector. Therefore, EU farmers should transition their farms to be sustainable. Every time a new policy is announced, the European Union studies and discusses both advantages and disadvantages for all stakeholders and prepares solutions and supports to decrease the negative impacts. However, farmers protested across Europe at the beginning of 2024 because of the prohibition of pesticide use and importation of agricultural products, which negatively affected the internal market (Farmers from 12 EU Countries Continue to Protest Agricultural Policies, 2024). Farmers encounter more obstacles in the transition to sustainable farming in the EU.

For example, farmers in France are unable to earn a living, especially small-sized farms, due to unfair competition from cheap imports from non-EU countries because they have less strict agricultural production standards than France, a lack of subsidies, and increased production costs for energy, fertilizer, and transportation from global inflation. The European Green Deal limits the use of chemicals and greenhouse gas emissions, which increases the price of EU products to more expensive than non-EU imported products. The government has also required French farmers to invest in new production methods (Loanes, 2024). Even though the FNSEA (Fédération Nationale des Syndicats d'Exploitants Agricoles in French or the National Federation of Farmers' Unions) is the largest union, it represents the interests of large-scale industrial farmers rather than small-scale farmers, mainly the export of agricultural products (FNSEA, 2024). However, Confédération Paysanne, the second-largest agricultural union in France, advocates for sustainable, small-scale farming practices. It opposes free trade agreements and factory farming (Confédération Paysanne, 2018).

Furthermore, one of the missions of the consulting project with Murmuration is a study of financial support availabilities for agricultural development to support EU farmers in transitioning to sustainable farming. EU farmers' current challenges and

obstacles are essential in analyzing their behaviors, decisions, and actions in the agricultural sector and presenting recommendations to the company.

1.4 Research Question

What are the challenges and financial support availabilities in agricultural sectors towards sustainability for farmers in the European Union?¹

1.5 Research Objectives

This study seeks to conduct a market study on the main reasons that impact and influence the EU farmers to transition to sustainability in the agricultural sector by exploring different financing possibilities.

Also, this research would help the company to understand the struggles of farmers in the EU in adaptation and transition to sustainability and help them access available funding to support their projects.

1.6 Research Scope

This research is a part of the consulting project, which is a project of the Toulouse School of Management, Université Toulouse Capitole I, as a part of the UE9 International Project Management & Consulting Projects course in Master 2 International Management. This consulting project consisted of 4 master's students and was conducted with a company called Murmuration and took place in Toulouse, France. The consulting project is from 8 January 2023 to 28 February 2023.

¹ European Union (EU) consists of 27 Member States which are Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, the Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, and Sweden.

1.7 Expected Benefit

The results from this research study would benefit the Murmuration company in understanding EU farmers' behavior and thoughts in the transition to sustainable farming and finding out financing possibilities in the EU, including the financial problems of farmers. Therefore, the company will reach more target customers, such as farmers and agricultural enterprises, and can advise them effectively.

Farmers in the EU are aware of challenges and obstacles in transition and have more possibilities for financial approval in funding and loans from banks and for success in farming transition to become sustainable.



CHAPTER II

LITERATURE REVIEW

One of the factors that will efficiently shift towards sustainable farming in the EU is the budget to implement new technology or purchase eco-friendly resources. This chapter discusses two main topics: the supply and demand sides in agricultural finance. The supply is the financial support available in the EU, and the demand is the farmer's financial needs.

2.1 Available Sources of Financing in Agricultural and Rural Development

In this part, I would like to divide financial availability to help farmers reach sustainable farming into three levels: the international level, the regional level, and the national level.

2.1.1 International Level

- International Fund for Agricultural Development (IFAD)

IFAD was established as an international financial institution in 1977 through United Nations General Assembly Resolution 32/107 (15 December 1977) (IFAD - International Fund for Agricultural Development | Knowledge for Policy, n.d.). It is a specialized agency of the United Nations and an international financial institution (IFI). It finances projects with low-interest loans and grants to help people in rural areas of developing countries access services, markets, technology, land, and other natural resources, increase agricultural productivity, and seek out other options for earning more income to improve the quality of their lives, eliminate poverty, hunger, and malnutrition (About IFAD, n.d.).

The total number of the fund's member states is 177 countries (Member States | IFAD Members Platform, n.d.), which are classified as three lists: List A, List B, and List C. List C is divided into three sub-list groups, as the table below

Table 2.1 Classification of IFAD Member States

Classification	Member States
List A (28 Member States)	primarily contributing developed countries
List B (12 Member States)	primarily contributing developing countries
List C	potential recipient countries
- Sub-list C1 (50 Member States)	- in Africa
- Sub-list C2 (55 Member States)	- in Europe, Asia and the Pacific
- Sub-list C3 (32 Member States)	- in Latin America and the Caribbean

The 2022 IFAD annual report states each member state's contributions and statements of loans and grants (International Fund for Agricultural Development, 2023). In the east and southern regions of Africa, 1,947.8 million USD is currently invested in 44 ongoing programs and projects in 17 countries such as Angola (2), Burundi (3), Comoros (1), Eritrea (2), Eswatini (2), Ethiopia (3), Kenya (4), Lesotho (3), Madagascar (4), Malawi (4), Mozambique (3), Rwanda (4), South Sudan (3), Uganda (3), United Republic of Tanzania (1), Zambia (2), and Zimbabwe (2). Moreover, 298.1 million USD for four new projects was financially approved in 2022 in Ethiopia, Madagascar, Rwanda, and Zimbabwe.

- IFAD Lending Terms

The Fund's resources are provided according to a Performance-Based Allocation System (PBAS) 2 and the Borrowed Resources Access Mechanism (BRAM) 3, which the Executive Board established (Financial Products and Financing Terms, n.d.).

IFAD provides financial support based on a country's gross national income (GNI) per capita (as per World Bank calculation using Atlas methodology) and a creditworthiness assessment.

There are three main terms of country eligibility: highly concessional (HC), blended (B), and ordinary (O). The country's lending terms are reviewed annually. This document will show the IFAD Lending term of each country in 2023 (IFAD, 2023). For example, Egypt is 'O', which means that the member state usually is not eligible for loans on highly concessional or blend terms.

The conditions for financing agricultural development are in this reference (International Fund for Agricultural Development, 2022).

2.1.2 Regional Level

CAP Fund

The Common Agricultural Policy (CAP) (CAP Funds - European Commission, 2024) is supported by two funds drawn from the long-term budget of the EU from 2021 to 2027 – **the European Agricultural Guarantee Fund (EAGF) and the European Agricultural Fund for Rural Development (EAFRD)**. According to CAP's strategic plan for 2021-27, the total financial amount is €386.6 billion divided into €291.1 billion (75%) from EAGF and €95.5 billion (25%) from EAFRD (Radley-Gardner et al., 2016).

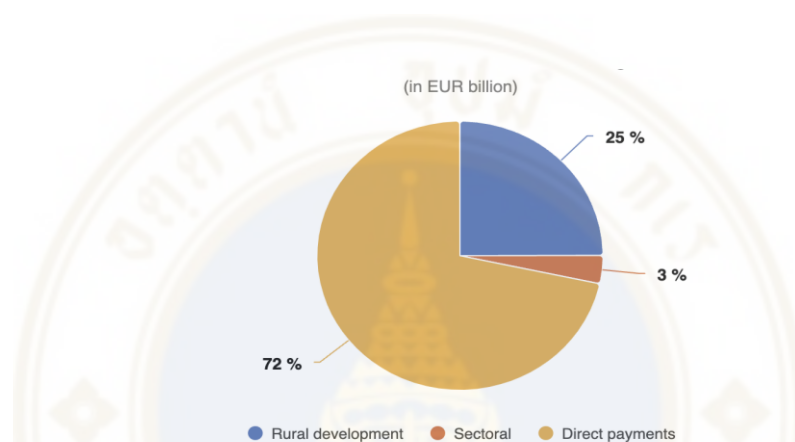


Figure 2.1 Planned financial allocations under the CAP Strategic Plans 2023-27

2.1.2.1 European Agricultural Guarantee Fund (EAGF)

The EAGF primarily finances income support for farmers and market measures agricultural products which are essential for socio-economic or environmental reasons such as fruit and vegetables, wine, agriculture, hops, olive oil and table olives, and other sectors (cereals, rice, sugar, dried fodder, seeds, flax and hemp, bananas, live trees and other plants, bulbs, roots and the like, cut flowers and ornamental foliage, beef and veal, milk and milk products, pigment, sheep meat and goat meat, eggs, poultry meat, and silkworms)

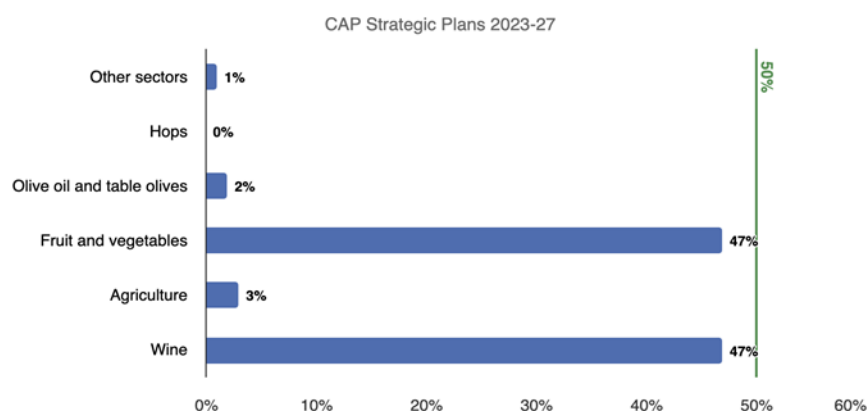


Figure 2.2 Planned financial allocations for sectors (EAGF)

2.1.2.1.1 General rules for farmers to receive income

- 1) Their farm must be located within the EU.
- 2) Minimum requirements to receive income support must be met. Income support is not granted for amounts lower than € 100 to € 500 (depending on the EU member state) or where the eligible area is less than 0.3 to 5 ha.
- 3) They must perform an agricultural activity (production, rearing, or growing of agricultural products, etc., or maintaining land in an excellent agricultural state) on a farming area (encompassing arable land, permanent crops, and permanent grassland) at their disposal.

4) They must meet the definition of an 'active farmer,' the requirements specified by the EU countries and relate to minimum levels of agricultural activity, lists of ineligible economic activities, plus-active and part-time farmers, and administrative burden reduction.

2.1.2.1.2 The level of income support

It may vary considerably from one farm to another, from one EU member state to another, or from one region to another. The EU operates an external convergence mechanism, which aims to progressively adjust income support payments per hectare in each member state, either upwards or downwards, to bring them closer to the EU average level.

2.1.2.1.3 Types of intervention in the form of direct payments

According to Regulation (EU) 2021/2115, two direct payment fields (Rachele, n.d.) exist.

- Decoupled direct payments

1) Basic income support for sustainability (BISS) is an annual payment per hectare. BISS is paid as a uniform amount per eligible hectare to an active farmer. The payments can be differentiated according to groups of territories with similar socio-economic or agronomic characteristics. This scheme aims to be a safety net by guaranteeing a minimum level of agricultural income for all active farmers. (European Environment Agency, 2023)

2) Complementary redistributive income support for sustainability (CRISS) is an annual extra payment for the first hectares of farmland for farmers entitled to essential income support. Each EU country can define the payment per hectare and the number of hectares per farmer. This scheme aims to redistribute direct payments from larger to smaller-sized farms. At least 10 % of the direct payment budget of each Member State must be used in this scheme.

3) Complementary income support for young farmers (CIS-YG) is an annual extra payment for new farmers. Each EU country can define the payment per hectare and the number of hectares per farmer. The requirements are the age limit between 35 and 40 years and the training and skills of potential beneficiaries.

4) Schemes for the climate, the environment, and animal welfare (eco-scheme) are the annual payment per hectare granted for eco-schemes. This scheme aims to help farmers whose agricultural practices benefit the climate, environment, and animal welfare. At least 25 % of the national direct payment budget must be used in this scheme.

- Coupled direct payments

1) Coupled income support (CIS) is an annual payment per hectare or animal. This scheme aims to improve competitiveness, sustainability, or quality. Different sectors, types of production, or types of farming have different payments depending on socio-economic or environmental reasons. CAP's strategic plan focuses on protein crops because it can reduce the import and use of nitrogen fertilizers.

2) Crop-specific payment for cotton (Cotton) is an annual payment per hectare of cotton located in Bulgaria, Greece, Spain, and Portugal.

2.1.2.1.4 Financial public planned expenditure for direct payments

According to the CAP Strategic Plans 2023-27, the total direct payments of EAGF is €189.15 billion distributed into six interventions (François Nègre, 2023), as shown in the following figure.

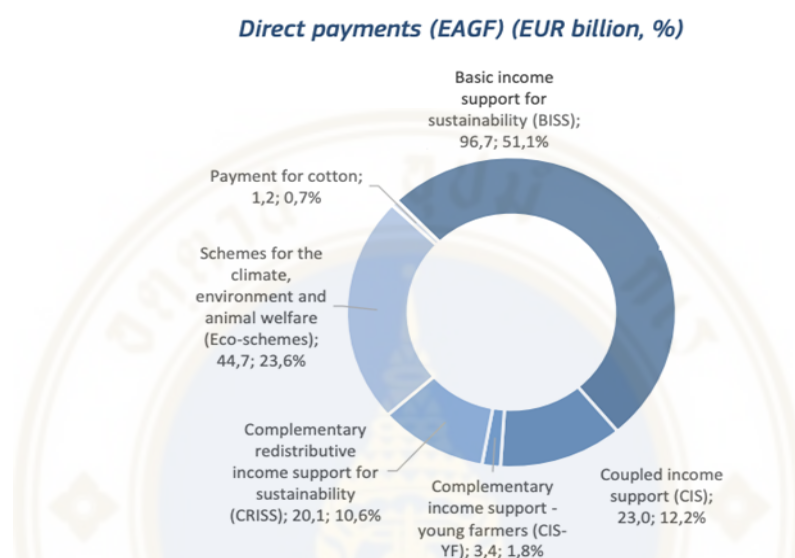


Figure 2.3 Planned distribution of direct payments fund (EAGF)

2.1.2.2 European agricultural fund for rural development (EAFRD)

The EAFRD supports income and market measures **by strengthening rural areas' social, environmental, and economic sustainability** (Rural Development - European Commission, 2024). It can also provide investment support for rural enterprises and projects through financial instruments, such as loans, microcredit, guarantees, or equity.

2.1.2.2.1 Financial public planned expenditure for rural development

According to the CAP Strategic Plans 2023-27, the total fund of EAFRD is shown in the following figure.

Rural development (EAFRD) (EUR billion, %)

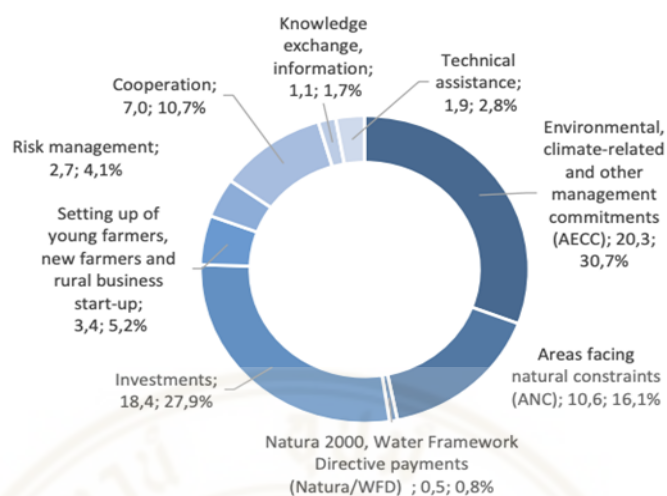


Figure 2.4 Planned distribution of rural development fund (EAFRD)

2.1.2.3 Other supports

Other support from the EU Commission (Market Measures Explained - European Commission, 2024) aims to stabilize agricultural markets, prevent market crises from escalating, boost demand, and help EU agricultural sectors to adapt well to market changes.

- Public intervention

EU countries' governments or agencies at the national level purchased and stored products. Then, products will be sold back in the market later. Public intervention aims to prevent product prices from dropping to unsustainably low levels. The product sectors are wheat, durum wheat, barley and maize, rice, beef and veal, butter, and skimmed milk powder.

- Storage of products by the private sector

During the lower market prices, the EU supports the private sector at the international level by paying for the storage cost of their products for a determined period. This will occur temporarily to reduce the impact of short-term oversupply. Currently, this support provides product sectors in white sugar, olive oil, beef, butter, cheese, skimmed milk powder, pigmeat, sheep and goat meat, and flax fiber.

2.1.3 National Level

According to a fi-compass Study on financial needs in the agriculture and agri-food sectors in 24 EU Member States (Fi-Compass Study on Financial Needs in the Agriculture and Agri-Food Sectors in 24 EU Member States | Fi-Compass, n.d.). It stated each EU member state's national and local support in agriculture and agri-food sectors.

France: From the fi-compass study, the report of France (Fi-Compass UE, 2020) presents the financing gaps and market analysis in the agriculture and agri-food sectors. Key financial providers in both sectors are as follows.

1. Key financial providers to the agriculture sector in France

Table 2.2 Financial provider of the agriculture sector in France

Type of financial provider	Main organisations
Commercial Banks	Crédit Agricole, Crédit Mutuel, Banque Populaire-Caisse d'Epargne (BPCE) and Crédit Mutuel Arkéa
Public bank and specialised national institutions	Bpifrance
Equipment and input suppliers	Machinery dealers, farm input suppliers or integrators
Cooperatives and local producer organisations	Agricultural cooperatives, other groups of producers, and private platforms selling seeds, pesticides and fertilisers
Cooperative banks guarantee funds:	Caisse d'Assurances Mutuelles du Crédit Agricole (CAMCA) and the Compagnie Européenne de Garanties et Cautions (CEGC) of Banque Populaire
Private mutual guarantee funds	Société Interprofessionnelle Artisanale de Garantie d'Investissements (SIAGI), SOGAL-SOCAMUEL, L'Interprofession Porcine d'Aquitaine (INPAQ), Fonds Viande Blanche'

2. Key financial providers to the agri-food sector in France

Table 2.3 Financial provider of the agri-food sector in France

Type of organisation	Finance providers
Commercial banks	Crédit Agricole, Banque Populaire, Caisse d'Epargne, Natixis, Crédit coopératif, BNP Paribas, Société Générale, Crédit Mutuel-CIC Group and Crédit Mutuel Arkéa
Public institution	Bpifrance
Private sector funds and mutual guarantee associations	Unigrains, Sofiproteol, SIAGI, SOCAMA

2.2 Financial Needs and Access to Finance of EU Farmers

Based on the report of the fi-compass study on financial needs in the agriculture and agri-food sectors from the point of view of EU enterprises. (Survey on Financial Needs and Access to Finance of EU Agricultural Enterprises, n.d.). The questionnaire responses were from 7,659 farms across 24 EU Member States. The report aims to provide an understanding of investment drivers, financing supply, financing difficulties, and the existing financing gaps for both sectors at the EU level.

According to the study, agricultural farmers would like to get accepted to bank loans for investment in new machinery, equipment, or facilities, working capital, and land investment or land purchase. However, the reasons for bank refusal are high investment risks, banking policy, lack of appropriate immovable collateral, the existence of other loans, and being economically unviable.

Structure and challenges for agricultural enterprises in the EU

1. Position in the supply chain pressures their profit margins due to higher costs and lower product prices.
2. Many agricultural enterprises are small in farm size and have limited profitability, which suggests that high investment is needed to increase the efficiency and competitiveness of EU agricultural enterprises.
3. Less young farm managers. Around half are over 55, and only 5.4% are under 35. Young farmers are more likely to invest in modernizing their agricultural holdings and need help accessing financial resources.
4. Difficulties in accessing land between the Member States.
5. Difficulties in accessing loans for investment and the situations are highly diversified at the Member State level, where high rejection rates are in Lithuania, Greece, Slovakia, Romania, Estonia, and Hungary.
6. More directly rejected loans by banks are due to banking policy limits on lending to farmers and investment risks being too high.

Farmers are interested in having long-term loans, working capital financing, and offers with flexible repayment.

CHAPTER III

METHODOLOGY

This chapter describes the process of the consulting project with Murmuration, which includes research design, problem definition, framework development, data collection, and data analysis.

This consulting project with Murmuration focused on the differences in financing possibilities, traditional so-called "Top-to-bottom" linked to state support across Europe or more innovative methods following a bottom-up approach. Moreover, the company would like to explore agriculture and food because anyone could support a farmer by setting up a participatory financing platform, i.e., crowdfunding with a recurring monthly donation amount. The farmer could then present a project to the community to request support from donations to help in the transition to sustainability.

3.1 Research Design

In a consulting project, Toulouse School of Management (TSM) has formed a group consisting of 4 members who have different cultural and academic backgrounds and experiences. We are interested in working with Murmuration company as our company tutor. We also have an academic tutor, Miss Geetika RAAMAN, a doctoral student at TSM.

Figure 3.1 shows the team members of this consulting project and the CEO of Murmuration starting from left to right as follows:

1. Miss Ines FERRON, a French student at TSM with an agricultural engineering background
2. Mr.Chanon PRIPATNANONT, a Thai student at TSM with a chemical engineering background
3. Mr.Tarek HABIB, the CEO of Murmuration
4. Miss Elisa ABERER, a French student at TSM with an agricultural engineering background

5. Miss Ramita PINSUWANNAKUB, a Thai student at TSM with an electrical engineering background

This consulting project took two months to complete from January to February 2024. The first week was a physical meeting at La Cité Toulouse, France. To monitor and report our progress, we have weekly online meetings with the CEO of Murmuration and submit weekly reports to the company and academic tutors. On the last day of the consulting project, we will have a final oral presentation at La Cité before submitting the final report.



Figure 3.1 A group photo of consulting project team members and the CEO of Murmuration

According to the goals and missions of this consulting project (as in Appendix C), team members discussed and divided into four parts: as follows.

1. a study on existing business models of sustainable farming
2. a study of financial support availabilities for agricultural development
3. a study from launching a survey to quantify the public opinion
4. a study of crowdfunding platforms

I was responsible for working on a study on financial availabilities in the European Union to support farmers in transitioning to sustainable farming. Moreover,

EU farmers' challenges and obstacles are essential in analyzing their behaviors, decisions, and actions in the agricultural sector and presenting recommendations to the company.

3.2 Framework Development of the Consulting Project

The methodological procedure to reach the goals and missions of this consulting project within two months is seven steps, one step per week, with the Gantt chart in Figure as shown below.

1. Preliminary project
2. First data collection
3. First analysis and content creation
4. Second data collection
5. Second Analysis
6. Synthesis and recommendation
7. Review and presentation

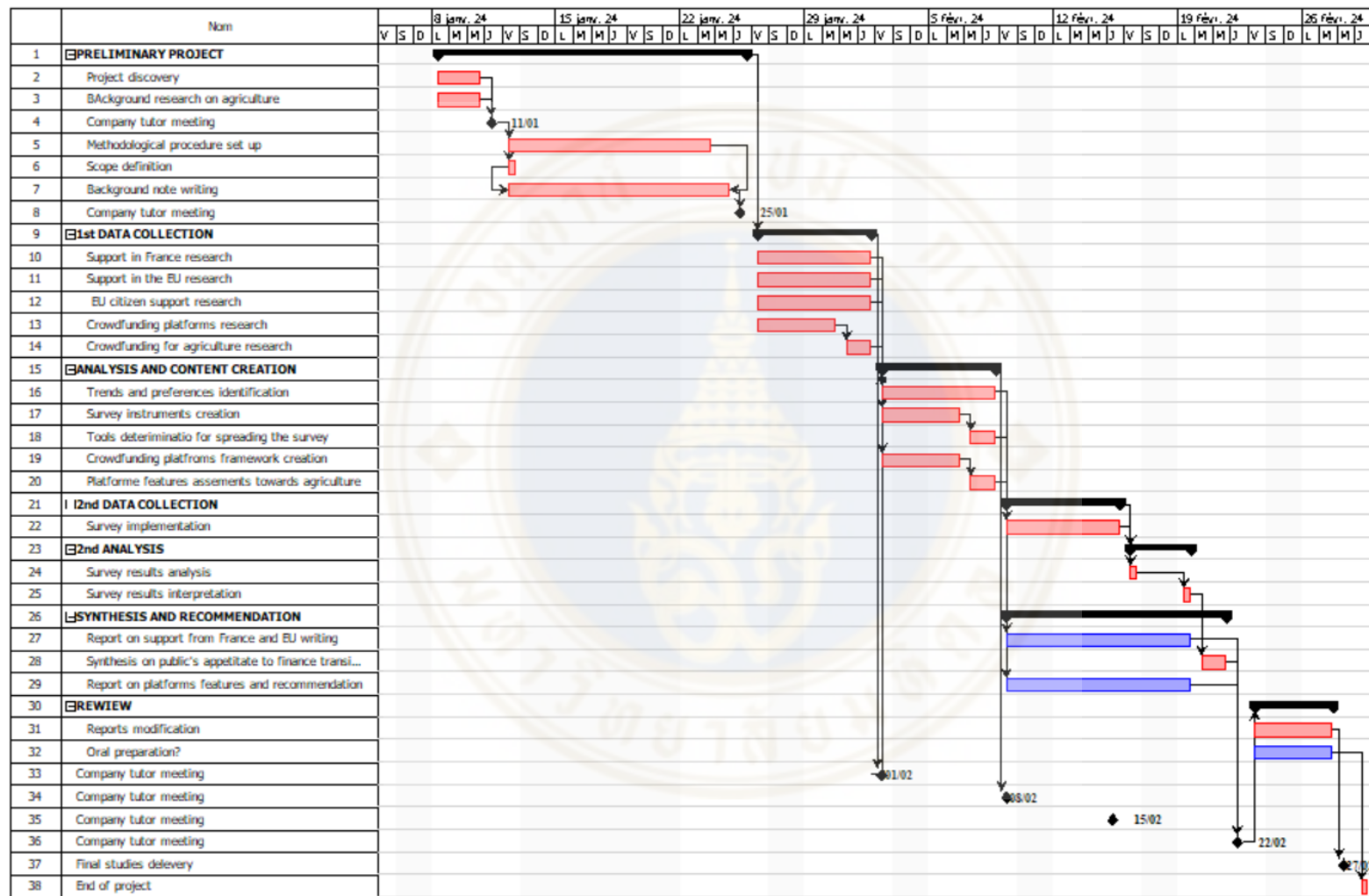


Figure 3.2 Gantt chart of the methodological procedure in the consulting project

3.3 Data Collection of this Research

As I was responsible for studying financial support availabilities in the EU that help farmers in the transition to sustainable farming, information was gathered from the internet and online articles such as financial availability at the international, regional, and national levels, including the report of previous years and the financial needs of EU farmers from the report of the fi-compass study.

Moreover, the statistical information at Member States levels used to support the analysis is from the World Bank database (geography and population) and Eurostat (number of farmers and the dashboard of EU estimated agricultural balance sheets). This information is free to access, reliable, trustworthy, and comparable.

3.4 Analysis

To understand the objective of the company, I read one of the Murmuration projects called Mara-Mediterra which is working with universities and other companies such as University of Firenze (Italy), Dokuz Eylul University (Turkey), Egyptian Chinese University (Egypt), Lebanese University (Lebanon), Hellenic Agricultural Organization (Greece), Integrated Resources Management Company Ltd (Malta), and AMengagement ENvironment HYDraulique industry (Malta). This project aims to study different countries in the Mediterranean area and the livelihood safeguard of rural communities and the environment through Nature-based Solutions (NbS) to combat water and land degradation in agroecosystems of each country around the Mediterranean. This project is in phase 6, aiming to gain practical knowledge and insights about the local context, set up the plan and manage an associated market analysis, identify the investment opportunities, and guide the mapping to funding institutions.

My responsible part in this consulting project would benefit this company project on a study about financial support availabilities for the agricultural sector in the EU and would help EU farmers who are the future customers of Murmuration in the transition to sustainable farming,

Because my focus is on the farmers in the EU, I also studied and analyzed the challenges, impact, and influence of EU farmers to be sustainable farmers by using PESTEL analysis to analyze six external factors.

During the research, I found that most information is online and publicized by the European Commission and Eurostat. Therefore, the data would be from reliable and transparent resources. However, the data is from multiple organizations; it would be limited and not updated.



CHAPTER IV

RESEARCH FINDINGS AND DATA ANALYSIS

In this chapter, the study presents the primary financial support for EU farmers and the challenges they face in the agricultural sector in transitioning to sustainability.

According to the data of the World Bank in 2021 in Appendix D, the percentage of agricultural land in the European Union is 40.8% (161,404.22 hectares). The population in the EU was 445.46 million in 2021, with a decline in population growth of 0.11% from 2020. In the future, the EU will face a decrease in the number of young farmers from a smaller population.

From the data of Eurostat in 2021 in Appendix E, the number of farmers in the EU is estimated at 9 million holdings, of which 41.17% is under 2 hectares, 21.24% is 2 to 5 hectares, and 12.37% is 5 to 10 hectares. Most EU farmers are small size.

Moreover, Eurostat shows information on EU estimated agricultural balance sheets at the Member state level (European Commission. Joint Research Centre., 2023) which are classified into arable crops (cereals, oilseeds, protein crops, sugar), specialized crops (olive oil, wine, fruits such as apples, oranges, peaches, and tomatoes), dairy (milk, dairy products such as drinking milk, buttermilk, and cream), meat, livestock numbers. In 2021, France was the largest producer in the European Union, producing crops at 22.72%, wine at 24.28%, fruits at 6.28%, and olive oil at 0.22% of the total production in the EU, as shown in Appendix F.

4.1 Financial Support in the European Union

Since the international level granted loans and supported developing countries, especially in Asia and Africa, the European Union partners with IFAD to contribute finances, develop projects in agricultural research, and support farmer organization networks with agricultural risk management to achieve the Sustainable Development Goals. (European Union, n.d.)

The significant financial support for EU farmers is direct payment from regional organizations, such as the CAP fund. In 2022, the European Agricultural Guarantee Fund (EAGF), as the direct payment from the CAP fund, budgeted €40.87 billion to 27 members, as in Appendix B1. The highest budget was given to France, which was €7.47 billion (18%), because France is the largest agricultural producer, and the main products from France are wine and cereal. From 2023 to 2027, EAGF planned to financial allocation in the wine sector for 47%. Therefore, this direct payment fund will significantly support the wine sector.

Moreover, this direct payment fund will be the basic income support for sustainability (BISS) as an annual payment per hectare for 51.1% or €96.7 billion. Each member state will have different allocations; for example, France will have €16.5 billion, the highest budget amount as in Appendix B1.1. A country with a larger agricultural area, more ability to produce more agricultural products, and more sustainable farming has a higher opportunity to gain funding.

In 2023 -27, the European Agricultural Fund for Rural Development (EAFRD) will distribute income and investment in 30.7% or €20.3 billion to environmental, climate-related, and other management commitments (AEC), 5.2% or €3.4 billion setting up of young farmers, new farmers, and rural business. This fund approved the highest budget to France, €1.849 billion in 2022, as in Appendix B2. Countries should develop agriculture that is related to climate change and environmental crises. The EU encourages new generations to do farming.

Accessibility of the CAP fund is limited to the EU member state only. This fund has high trustworthiness and a transparent, centralized mechanism for monitoring and reporting fund usage with a strong institution and administrative structure. The financial support in the agricultural sector is direct payment and budgets for research and projects related to sustainability and environmental schemes under environmental and safety regulations. More considerable funding will be given to more giant farming because the funding is evaluated by area in hectares, which can create an adaptation gap between small and large farming. Small-size farms will face higher challenges in the transition to sustainability. Farmers have also pointed out the unequal distribution of EU funding and subsidies, which benefits large rather than small farmers based on agricultural area. It is estimated that approximately 54.2% of all subsidies for the

agricultural sector in 2022 were assigned to the top 10% of Europe's largest corporates, while the smallest farms, which is 50% of all European farms, received a combined 6.3% of the subsidies (Igini, 2024).

National support is also available. For example, in 2022, France's agricultural subsidies of €9.4 billion will be divided into product and operating subsidies. (Institut national de la statistique et des études économiques, 2024)

4.2 PESTEL Analysis of EU Farmers

This model analysis is used to examine the opportunities and threats to EU farmers in transition to have sustainable farms from the external environments and help EU farmers plan the direction to improve performance and overcome upcoming threats. The model consists of 6 factors, which are: political (i.e., stability of government, war), economic (i.e., taxes, interest rates, inflation rates, economic growth, minimum wage rates), social (i.e., populations, ages, and education level, values, beliefs, attitudes, opinions, behaviors), technological (i.e., innovation, digitization), environmental (i.e. natural resources, climate changes, pollution, waste management), and legal (i.e. laws and regulations of a government, policies, measures).

4.2.1 Politics

The political crisis from the prolonged war between Russia and Ukraine and the Israeli–Palestinian conflict fluctuated energy prices such as fuel and fertilizers, which could increase the cost of production.

The trade agreements and import-export policies between two countries or multinationals influence the competitiveness of agricultural products in the national and global markets. EU member states can trade without tax. However, trade policy with non-EU countries depends on which product to import or export. For imports, the free trade of fertilizers and agricultural resources benefits farmers because of cost reduction. However, free trade for farm products could negatively affect EU farmers because the price of these products might be lower than domestic agricultural products. The sales of EU farmers might decrease, so they should decrease the price and lose profit. On the

other hand, free trade in exporting agricultural products will benefit EU farmers because they enter new markets and increase sales.

The stability and structures of government or organizations can disrupt agricultural production, food security, and market access. The stability of the European Union is solid because the EU is the world's first supranational organization consisting of 27 developed countries, has a single European free-trade market, uses the same currency, and owns regional development funds to support EU member states to compete in the global economy (Levy, 2017).

4.2.2 Economic

Economic and financial crises from the increasing global inflation rate cause an increase in production costs, including land and labor, especially in the EU, which has environmental and sanitary standards. EU farmers face higher costs from legislation concerning the environment, animal welfare, and food safety, which is higher than in other regions worldwide. Crop farms pay between 1% and 3.5% of their production costs. Pig and poultry farms pay 5 to 10%, and dairy, beef, and sheep meat farms pay 2% and 3%. Higher production cost is a challenge for competitiveness in the market. Farmers decrease selling price to gain more selling quantity, which causes a decrease in the profit of agricultural products and a reduction in turnover, which is annually below € 25,000. Each member state in the EU has different changes in the cost of production and selling price (Survey on Financial Needs and Access to Finance of EU Agricultural Enterprises, n.d.).

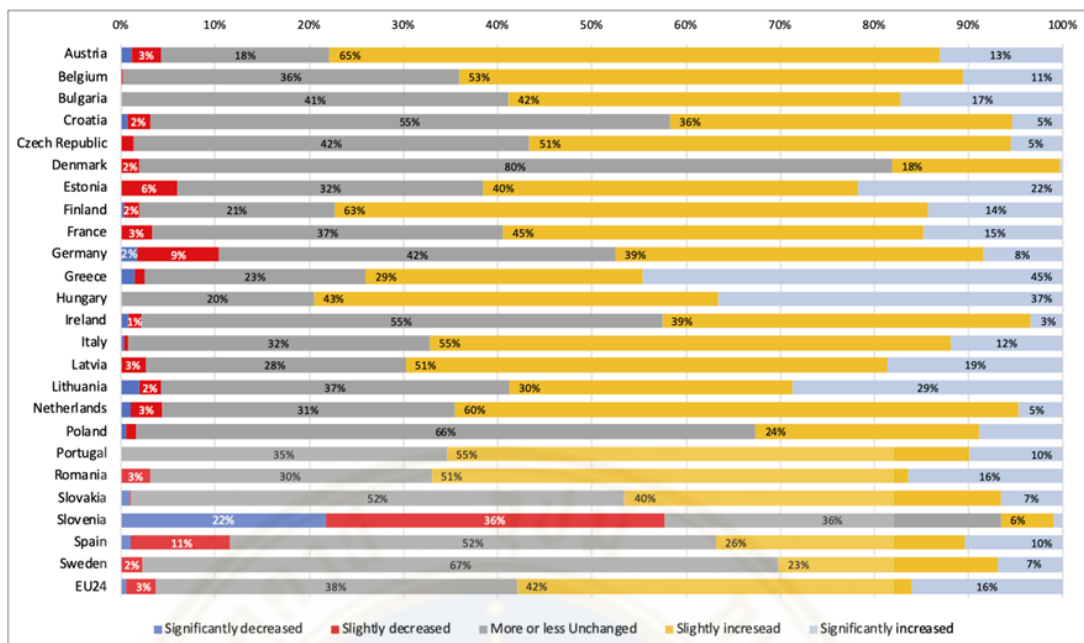


Figure 4.1 Difficulties of EU farmers in the cost of production in each member state

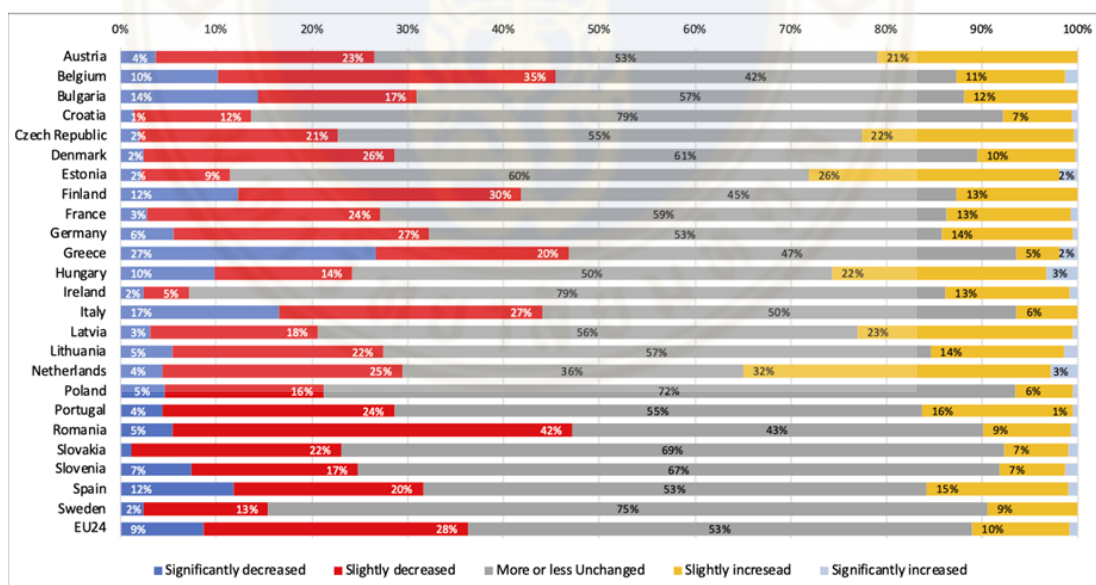


Figure 4.2 Difficulties of EU farmers in the selling price of production in each member state

4.2.3 Social

As consumers' preferences shift to more organic, sustainable, and locally sourced food, businesses should improve and adapt their agricultural practices and marketing strategies. Most consumers are young people aged 20 to 24 interested in organic food and sustainable development (Bogdan Chiripuci et al., 2022). Moreover, in the EU market, animal protein consumption customer behaviors are expected to decline and shift to consuming plant-based, especially oats and almonds (European Commission. Directorate General for Agriculture and Rural Development., 2023).

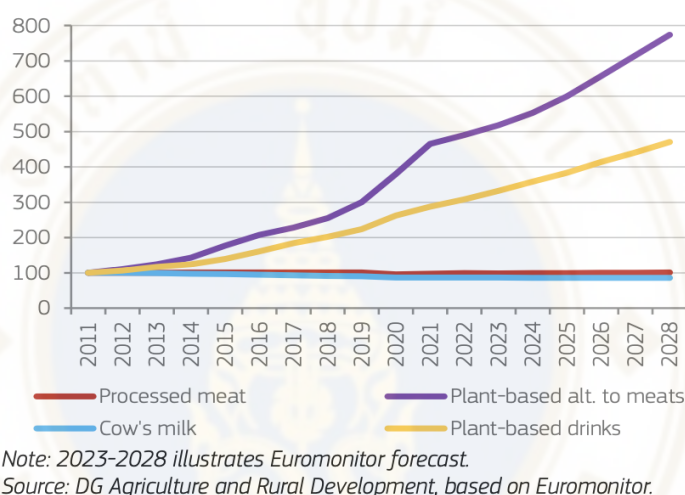


Figure 4.3 Volume growth of animal products and plant-based products

The decline in the rural workforce for agricultural production and the low attractiveness and income of occupations in the agricultural sector for young people causes agricultural labor to keep declining, depopulation in rural areas, fewer job opportunities, and high unemployment. Furthermore, farmers' incomes in the EU are around 40% lower than non-agricultural incomes. Because of lower income, young generations do not want to work in the agricultural sector. The percentage of young farmers under 35 years old is 5%, but 48% of managers are over 55. (Survey on Financial Needs and Access to Finance of EU Agricultural Enterprises, n.d.)

4.2.4 Technology

EU farmers can easily and conveniently access transition solutions to become economically competitive and apply sustainable techniques. New technology helps farmers produce more quality agricultural products with fewer resources and lower costs. Various innovations such as data analytics, machinery, robotics, and automation increase the opportunity to improve the resources such as shaping the landscape, conserving water resources to reduce inefficient evaporation from water and wind erosion, and implementing agriculture technology to be digitization to access more funding and expand into a new market. Moreover, biotechnology development has solutions for pest control, disease resistance, and crop improvement to increase the quantity and quality of agricultural products effectively.

4.2.5 Environment

Climate change, temperature rising, and disruptive weather events cause uncertainty in agricultural practices from natural resources such as water and soil that threaten agricultural products and food security by slowing the growth in agricultural productivity and shifting crop cultivation patterns (European Commission. Directorate General for Agriculture and Rural Development., 2023).

Moreover, land degradation from deforestation and soil erosion threaten the long-term sustainability of agricultural areas. Overuse of pesticides and disruptive ecosystems cause loss of biodiversity.

4.2.6 Legal

The policies of international organizations can approve the common ground of laws and regulations of member states to protect the world's nature, living things, and environment. European Union has a high intensity of stress in law and implementation. These policies on agricultural development and sustainability promotion will affect the projects and activities of farmers and local citizens in transitioning to sustainability. The Common Agricultural Policy (CAP) 2023-27 has the goals of the European Green Deal (EGD) that expects a reduction in the use of agricultural chemical inputs such as pesticides, fertilizers, and antibiotics and restrictions on growing genetically engineered crops (European Commission, 2021). Examples of the farmers' projects and activities

are using crop rotation techniques, encouraging organic farming, reducing chemical fertilizers and pesticide inputs, and implementing waste management to improve soil fertility, reduce the need for excessive resources, and reduce greenhouse gas emissions (Hazlegreaves, 2023). Not all EU farmers can implement projects to reach EGD because small-size farms need know-how, tools, and budget.

The following table 4.1 is the summary of the PESTEL analysis.



Table 4.1 The summary of the PESTEL analysis

PESTEL	Cause	Opportunity	Threats
1. Politics	1.1 prolonged war between Russia and Ukraine and the Israeli–Palestinian	-	<ul style="list-style-type: none"> • Cost of production increases from fuel and fertilizers
	1.2 The trade agreements and import-export policies with non-EU countries	<ul style="list-style-type: none"> • Cost of production decreases from free trade import of fertilizers and resources in agriculture • Easily enter new markets and sales increase from free trade export of agricultural products 	<ul style="list-style-type: none"> • Competition in the EU increases, and prices of agricultural products decrease from free trade import of agricultural products
	1.3 Stability and structures of government or organizations	<ul style="list-style-type: none"> • Capable of competing for global economy because the European Union is very trustworthy and transparent 	-
2. Economics	2.1 Global Inflation 2.2 High competitiveness in the market	-	<ul style="list-style-type: none"> • Cost of production increases • Selling prices decrease • Profit and turnover rate decreases

Table 4.1 The summary of the PESTEL analysis (Cont.)

PESTEL	Cause	Opportunity	Threats
3. Social	3.1 Consumers' preferences shift to organic food and sustainable development	<ul style="list-style-type: none"> • Demand for organic and plant-based protein increase 	-
	3.2 Decline of attractiveness and income of rural workforce in the agricultural sector	-	<ul style="list-style-type: none"> • Agricultural labor decline • Fewer job opportunities • High unemployment • Young generations don't want to work in this sector
4. Technology	4.1 Easy and convenient access to new technology	<ul style="list-style-type: none"> • New solutions for pest control, disease resistance, and crop improvement to increase the quantity and quality of agricultural products • Improve resources by shaping the landscape and conserving water • Digitization to access more funding and access to new market 	<ul style="list-style-type: none"> • Technology gap between small-size and large-size farms increase

Table 4.1 The summary of the PESTEL analysis (Cont.)

PESTEL	Cause	Opportunity	Threats
5. Environment	5.1 Climate change, temperature rising, disruptive weather	-	<ul style="list-style-type: none"> • Uncertainty in agricultural patterns by slowing the growth in agricultural productivity and shifting crop cultivation patterns
	5.2 Overuse of pesticides	-	<ul style="list-style-type: none"> • Land degradation and soil erosion • Loss of biodiversity
6. Legal	6.1 High intensity of stress in law and implementation from the European Green Deal (EGD) EU to reduce the use of agricultural chemical inputs and greenhouse gas emissions	<ul style="list-style-type: none"> • Crop rotation and organic farming increase • Implement waste management • Reduce the need for excessive resources 	<ul style="list-style-type: none"> • Small-size farms need know-how, tools, and budget more than large-size

4.3 Challenges of EU farmers in transition to sustainability

According to the PESTEL analysis, the significant challenges are finances, labor force, capability, and natural resources.

First, EU farmers need finance to implement or invest in technology to sustainably support them in the long run. Suppose the farmers would like to have sustainable farming. In that case, they must gain a higher profit than usual, borrow from banks, or receive financial support from the EU and the government to invest in machines or innovation for the first time at a fixed cost. Then, they must gain profit to invest as a variable cost in the following crop seasons. Because of prolonged wars and the inflation rate, the cost of fuel and energy increases. Also, the selling price of agricultural products is unchanged due to the competitiveness of the market and the free-trade import of the products. The profit and turnover rate of EU farmers are low. Therefore, it is not easy to invest in their profits to have sustainable farming without any financial support, especially for small-sized farms.

The CAP fund supports sustainability and prefers large-scale farms. For the next five years, the direct payment (EAGF) will primarily support wine for 47% of the overall budget and fruit and vegetables for 47%. The EAFRD fund will support agricultural development related to climate change and environmental crises. Farms whose agricultural products are wine, fruit, and vegetables will have a higher opportunity to get funded. For example, Italy, France, and Spain would have the chance to receive this direct payment because 80% of the wine production in the EU is from these three member states, as shown in Appendix F from Eurostat. On the other hand, it is more challenging for farmers whose qualifications need to meet the requirements.

Secondly, the less young EU generation would like to be farmers or managers in the agricultural sector because this low-attractive sector has low income, high pressure from laws and regulations, high costs, and is afraid of being rejected for funding. The European Council of Young Farmers (CEJA) wants to be the voice of young farmers and improve the working and living conditions of young people in the agricultural sector to overcome these challenges. (The Challenges of Young Farmers in the European Agricultural Sector: A Discussion with CEJA, n.d.) Therefore, encouraging new generations to be interested in sustainable agricultural farming is challenging.

The capacity and readiness for sustainable knowledge differ on large and small scales. Larger farms have more opportunities and capability to invest and transition to sustainability. Small farms have more challenges than large ones. The innovation gap will widen due to unequal capacity and funds because large companies have more ability and funds in transition.

Lastly, the nutrients and quality of natural resources, especially soil and water, needed to be protected from the impact of climate change, which would gradually cause land degradation and soil erosion and slow the growth of agricultural products.

According to the farmers' protests across Europe at the beginning of this year, Alan Matthews, a Professor Emeritus at Trinity College Dublin, Ireland, wrote an article about the reasons and farmers' responses to the protests (Matthews, 2024). The farmers are unsatisfied with low income, trade competition such as imports of lower EU standard products, and the burden of environmental regulation under the European Green Deal. The EU's response to these discontents will be one factor that could affect the European Parliament elections in June 2024.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

To accomplish the consulting project objectives to study support in the European Union for the agricultural sector, including business models and financial support availabilities, a study from a survey to quantify the general public's appetite to support this agricultural sector directly, and a study of crowdfunding platforms for content creators, the team members have connected all parts and presented our analysis to the company.

From the study on financial support availabilities in the European Union, the international level, such as the International Fund for Agricultural Development (IFAD), mainly supports developing countries. EU farmers cannot access this funding. However, they can receive funds from a regional level providing for EU member states only called the Common Agricultural Policy (CAP) fund and national level from financial providers such as commercial banks. The CAP fund focuses on research, innovation, and eco-schemes with the condition of more intense environmental and safety regulations. It is a centralized, strong institution with a transparent mechanism and system. The majority support of CAP funds from 2023 to 2027 is the European Agricultural Guarantee Fund (EAGF), which is the direct payment calculated by the area of agricultural area. Therefore, farmers who have larger areas have more annual funding and more opportunity to transition toward sustainability than small-sized farms. Even though most EU farmers are small-sized, they get less funding from CAP funds and are highly rejected by banks, especially those small farms with young managers. Moreover, from financial needs and access to finance of EU farmers survey, farmers face difficulties in accessing loans for investment because of the many documents required and the time taken.

Notably, the analysis of PESTEL of 6 external environments that impact EU farmers defines significant challenges in transitioning agriculture towards sustainability.

The priority challenge is financial difficulties in investing due to low-profit margins from competitiveness in the market and high costs from prolonged wars. Also, large-sized farms can receive more support than small-sized farms from CAP funds because the amount of funds depends on the size of the agricultural area. The EU farmers would ask for bank loans but are afraid of rejection. Other challenges are the low interest from younger generations of unattractive working conditions and income in the agricultural sector, broad knowledge and capacity gaps between large-sized and small-sized farms, and less soil and water quality from climate change threats.

I would like to recommend that the Murmuration Company and EU farmers resolve or lessen the obstacles in transitioning to sustainability as follows:

5.2 Recommendations to the Company

As Murmuration focuses on the agricultural sector in France and the EU, the recommendations are to gain more customers by supporting EU farmers towards sustainability.

First, the company could assign an employee responsible for publishing the survey from our consulting project to expand the perspectives of EU farmers needing financial support and interview them to define their current situations, obstacles, and challenges concisely.

While the company studies successful cases of giving agricultural products in a specific country, it could partner with the public sector or other private organizations to share tools and knowledge in the transition to sustainable agriculture. The company will benefit from these connections to efficiently guide EU farmers to relevant agencies.

The Target group of customers should be small-sized farms because 74.77% of EU farms in 2021 are smaller than 10 hectares. They have limited profitability and need higher investment than large-sized farms. To encourage EU farmers to be interested in transitioning to sustainable farming, the company should raise awareness of threats in the agricultural sector, such as climate change and consumer behaviors, share knowledge and resources about innovation, technology, and marketing, and show the successful farm and benefits of being sustainable to EU farmers. If EU farmers need more financial problems, the company should explain funding availability at regional and national

levels, including funding goals and processes for farmers to acknowledge, understand, and quickly follow in practice. Also, being an advisor would help farmers easily pass the criteria and qualifications for financial funding.

5.3 Recommendation to EU Farmers

The European Union encourages citizens to protect the environment and reduce the impact of global warming by announcing policies, laws, and measures to reduce greenhouse gas emissions. Additionally, the crisis from the prolonged war still exists, causing an increase in energy and fertilizer prices, which impacts the cost of agricultural production for EU farmers. The EU farmers should transition to sustainable farming, but it requires knowledge, tools, and financial resources.

Before applying for funding, EU farmers should understand their current position in the market, including available supply, competitors, demand for organic products, and the technological capability to expand to new markets to reach new customers and gain profit. They must be aware of climate change, political crises, global and national economics, and EU policy, which directly affect agricultural production and business profits.

Financial support is an essential factor in transition. Therefore, farmers should know the available amount, goals, strategic plan, and funding qualifications to be approved by the European Union from EAGF through direct payment and EAFRG through a loan under the CAP fund. For example, a small winery in France should apply for EAGF because it was planned for financial allocation in the wine sector in the next five years with qualifications such as an eligible area of less than 5 ha.

To encourage the new generation to work in the agricultural sector, EU farmers can cooperate with a school of agriculture at any university and be open to students' training and internships. The young generation will look forward to using the skills they have learned in school and having practical experiences. They will face the advantages of agriculture and be interested in working in the long run.

Collaboration and communication among farmers who live in the local society or with government officers or EU officers would educate, share knowledge, and get through problems together. This can solve the knowledge gaps between large and small-sized farms. To narrow the innovation and capability gaps, large-sized farms

can temporarily lend machines to small-sized farms if those machines are expensive to invest in.

Finding at least one sustainable farming model or an example that is successful in transition would encourage EU farmers to have sustainable farms. Also, crop rotation would preserve soil quality and water resources to contain nutrients for new agricultural production.

5.4 Recommendations for Thailand

Suppose Thailand would like to transition to sustainability in the agricultural business. In that case, Thai farmers must invest lots of money in new technology, machines, and systems and learn know-how from developed countries. Thailand can apply knowledge from the EU by creating awareness among farmers, reaching them, and encouraging young farmers to work in rural areas. The government of Thailand has to take a significant role to be the center in supporting sustainability projects for not only large companies but also small-size farming. The government provides mutual funds to assist farmers.

The collaboration between the public, private, and local community sectors should be implemented as a partnership to create a part of the community and encourage local research and development of agricultural technologies. Sources of funding should be diversified, trustworthy, and transparent. The third party can monitor and report.

The government or organization can invite sustainable agricultural expertise from developed countries to guide and teach basic sustainability knowledge to agricultural businesses, including management, marketing, environment, and technology, to efficiently manage resources and access to the broader market and funding.

5.5 Limited of This Study

1. Confidential and limited access to information on financial support in the agricultural sector

Financial reports from international organizations and CAP funds are available online for financial support. However, the reports of financial support availability and

approval at the national level cannot be found online. Therefore, this study focuses mainly on financial support from the EU.

The agricultural sector needs to be narrower. There needs to be detailed information that states the challenges in specific types of agricultural products. Each member state in the EU has different main agricultural products because of land and weather factors.

2. Limited Time and access to more details from EU farmers

Because the findings are only from an online platform and the report of the fi-compass study on finances is from the point of view of EU enterprises. It will be more effective and precise if the findings are also from interviews with EU farmers with different scale sizes, locations, and crops.

5.6 Future Work

Global warming is a worldwide crisis, and every country must be aware of the worst scenario. Sharing information and technology would be beneficial to all. This study focuses on farmers and financial support in the EU. Further actions can broaden the study to other continents, such as Africa, Asia, Oceania, North America, and South America. Farmers in each region might face similar or different challenges in transitioning to sustainability in this agricultural sector.

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Appendix A: General Information of European Union in the Agricultural Sector

As we know, global warming directly affects the climate every year. The rising temperature will affect agricultural areas. The quality of the products might be worse, and farmers have to change the products because of the quality of soil and nutrients and the changing crop season.

The map of the agricultural land intensity¹ is presented by the European Environment Agency (EEA) (European Environment Agency, 2017). The center of the continent has moderately and intensively used arable land. However, the northern part is non-agricultural land because of the cold climate.

Furthermore, the crop products produced in arable land cover 91 million hectares of cropland, as shown on the EU crop map. The map data is based on capturing the crop growing from Eurostat LUCAS and Copernicus Sentinel-1 from January to the end of July 2018. As a result, every field in the **EU is cropped with wheat, maize, rapeseed, barley, potatoes, sugar beets, and other crops** (19 types in total). (The EU Crop Map - European Commission, 2021).

¹ Land use intensity (LUI) is a known socioecological metric that attempts to calculate how much land is required to obtain a certain product.

Appendix B: EU Financial Reports in 2022

B.1 EAGF Financial Report

The annual EAGF financial reports stated budget procedures, monthly payments, the implementation of the budget, and control measures of each year since 2007 E(EAGF Reports - European Commission, 2024). For example, the 2022 report showed the EAGF monthly reimbursements of each EU Member State, as shown in the following figure.

Monthly reimbursements to EU member states in 2022

in EUR	2021.11 January	2021.12 February	2022.01 March	2022.02 April	2022.03 May	2022.04 June	2022.05 July	2022.06 August	2022.07 September	2022.08 October	2022.09 November	2022.10 December	2022 Complementary Payment	Financial year 2022	
BE	206 556 868.74	126 098 247.37	73 296 985.36	8 456 444.12	60 816 889.98	5 979 394.93	2 024 491.37	26 540 032.58	179 777.45	8 050 016.56	11 006 768.93	34 653 934.43	0.00	563 659 851.82	BE
BG	3 197 186.23	387 214 905.39	1 543 161.40	1 872 235.98	92 637 432.94	248 108 025.82	1 441 186.07	40 959 513.30	1 439 037.16	19 523 383.41	14 861 121.82	4 868 855.28	0.00	817 666 044.80	BG
CZ	305 671 159.01	146 287 506.54	123 234 218.08	195 481 630.09	40 023 733.17	9 304 912.90	2 107 058.47	2 060 958.09	12 316 880.68	1 368 720.62	21 574 043.53	11 226 193.06	0.00	870 657 014.24	CZ
DK	3 944 438.42	701 321 507.15	27 768 378.30	7 195 542.01	39 359 312.17	2 919 034.24	2 634 883.84	8 401 752.53	3 762 692.46	24 406 807.00	4 128 136.49	-5 588 824.56	0.00	820 253 660.05	DK
DE	5 055 571.99	4 576 103 080.99	24 142 275.30	8 885 035.65	9 571 381.52	4 681 337.26	9 535 633.10	5 643 770.39	4 647 841.11	7 693 457.90	93 973 615.97	35 501 020.33	0.00	4 785 434 021.51	DE
EE	172 646.88	189 774 927.03	489 209.69	83 593.15	201 414.36	19 752.63	23 558.78	17 681.79	68 230.76	46 991.20	2 553 699.28	14 908.44	0.00	193 466 613.99	EE
IE	765 252 815.04	372 477 653.92	6 309 104.27	4 331 257.56	2 328 317.23	1 250 424.83	-241 395.38	21 288 489.44	2 884 997.59	1 203 404.25	15 872 836.15	4 252 047.71	0.00	1 197 209 952.61	IE
EL	639 506 506.19	835 240 313.93	1 327 805.81	1 485 096.30	246 359 383.35	105 278 807.98	2 215 354.22	77 077 379.99	5 437 200.71	2 362 637.45	41 507 838.90	47 481 848.88	0.00	2 005 280 173.71	EL
ES	2 526 269 815.99	1 570 496 857.51	31 725 639.86	166 378 268.15	296 711 979.26	190 846 562.12	125 410 579.76	214 555 956.74	32 690 288.04	27 524 713.34	155 295 429.81	329 597 227.13	0.00	5 667 503 317.71	ES
FR	4 354 941 017.60	2 060 355 255.24	267 893 200.93	184 931 366.62	36 132 249.33	69 415 985.82	56 054 369.33	71 069 395.43	24 198 031.77	23 513 828.16	288 248 076.14	37 786 266.82	0.00	7 474 539 043.19	FR
HR	210 360 345.87	6 323 949.50	463 651.64	70 431 899.34	28 206 435.09	1 190 709.90	32 062 439.41	19 055 861.01	3 112 643.96	889 684.49	6 486 729.49	3 384 942.60	1 152.49	381 970 444.79	HR
IT	1 914 112 678.61	120 418 357.10	395 945 312.89	164 724 214.55	95 520 372.31	69 149 825.61	129 468 844.42	824 980 442.56	92 511 174.09	161 267 506.08	169 727 676.41	179 010 999.70	0.00	4 316 837 404.33	IT
CY	1 454 690.18	46 847 475.17	488 057.75	103 430.58	113 410.23	69 994.31	56 553.57	62 269.27	637 652.80	1 920 870.73	831 304.56	958 863.01	0.00	53 544 572.16	CY
LV	110 346 477.41	175 023 411.00	14 932 177.42	4 289 860.20	442 619.32	1 254 775.35	119 154.35	1 632 535.49	99 471.99	3 489 778.73	6 163 747.37	893 842.12	0.00	318 687 850.75	LV
LT	364 758 269.59	159 925 662.49	3 135 115.80	2 681 035.72	15 563 854.67	10 587 591.90	4 978 623.93	4 983 648.86	2 918 854.18	196 946.51	8 200 418.53	343 683.14	0.00	578 273 705.32	LT
LU	11 939.94	21 882 184.44	0.00	385 057.00	9 830 844.20	-678.96	183 523.53	40 115.41	976 433.23	776.00	524 334.59	30 621.00	0.00	33 865 150.38	LU
HU	638 850 795.52	193 204 197.55	197 250 026.41	24 648 382.08	154 862 708.05	22 427 546.12	12 957 402.96	10 289 048.78	6 178 295.38	4 336 299.56	23 452 331.15	41 764 800.43	0.00	1 330 221 833.99	HU
MT	13 406.88	11 638.50	0.00	0.00	4 894 836.65	34 602.01	15 037.31	-12 352.74	-22.99	43 265.05	15 588.73	3 920.00	0.00	5 019 919.40	MT
NL	301 474.95	634 750 876.72	951 009.39	9 305 126.99	4 053 363.40	4 184 231.06	1 392 924.83	9 189 947.87	632 154.09	6 118 059.14	31 217 938.36	3 766 084.81	0.00	705 869 191.61	NL
AT	478 639.27	668 004 878.57	126 248.02	1 863 420.45	1 705 374.96	2 135 547.87	898 997.45	1 286 368.46	1 478 304.59	21 489 977.06	12 910 082.47	6 778 388.11	0.00	719 156 227.28	AT
PL	2 124 081 124.57	84 373 840.88	359 972 443.99	455 961 777.58	244 819 832.16	61 133 019.57	11 581 574.98	3 794 433.57	1 547 020.05	33 242 946.72	16 449 378.47	6 146 609.84	0.00	3 403 104 002.38	PL

in EUR	2021.11 January	2021.12 February	2022.01 March	2022.02 April	2022.03 May	2022.04 June	2022.05 July	2022.06 August	2022.07 September	2022.08 October	2022.09 November	2022.10 December	2022 Complementary Payment	Financial year 2022	
PT	346 043 407.48	350 550 578.10	17 175 315.55	14 865 241.33	7 216 306.19	7 391 855.03	7 239 523.34	45 672 042.06	9 825 240.64	12 860 762.83	47 268 986.90	10 197 739.40	-8 998.72	876 298 000.13	PT
RO	1 081 213 597.87	596 266 106.66	48 767 611.15	30 466 634.97	15 769 502.26	5 479 750.43	19 481 431.85	79 066 411.11	3 555 330.19	1 572 709.15	55 211 496.73	9 916 874.75	0.00	1 946 767 457.12	RO
SI	-35 418.81	-1 022.08	104 418 613.83	12 882 060.56	14 181 753.40	507 100.12	782 201.12	219 556.42	152 652.22	287 281.19	6 440 864.88	141 243.59	0.00	139 976 886.44	SI
SK	22 625 502.98	300 218 293.83	-13 319.74	30 037 684.05	32 224 940.88	8 587 806.41	6 666 058.44	15 499 187.08	3 450 584.31	2 798 329.67	6 306 783.77	1 773 797.95	-912 404.16	429 263 245.47	SK
FI	463 441.95	459 585 646.69	225 964.42	829 761.88	781 010.61	363 930.49	290 326.35	57 965 166.23	1 348 911.79	611 750.52	8 248 433.45	1 352 451.56	0.00	532 066 795.94	FI
SE	2 862 360.31	664 962 285.96	5 641 012.46	2 319 619.63	917 836.65	920 368.65	12 802 540.55	306 722.68	1 236 813.26	5 783 502.53	2 239 029.54	3 621 966.37	0.00	703 614 058.59	SE
TOTAL	15 628 510 760.66	15 447 724 616.15	1 707 209 219.98	1 404 895 676.54	1 455 247 094.34	833 222 214.40	442 182 877.95	1 541 646 334.40	217 286 491.51	372 604 406.85	1 050 716 692.42	769 880 305.90	-920 250.39	40 870 206 439.71	

(BE) Belgium, (BG) Bulgaria, (CZ) Czechia, (DK) Denmark, (DE) Germany, (EE) Estonia, (IE) Ireland, (EL) Greece, (ES) Spain, (FR) France, (HR) Croatia, (IT) Italy, (CY) Cyprus, (LV) Latvia, (LT) Lithuania, (LU) Luxembourg, (HU) Hungary, (MT) Malta, (NL) Netherlands, (AT) Austria, (PL) Poland, (PT) Portugal, (RO) Romania, (SI) Slovenia, (SK) Slovakia, (FI) Finland, (SE) Sweden

B1.1 BISS Financial Allocation

Allocation of BISS in 2023-27

MS	BISS ('000 EUR)	BISS (share of DP)	average BISS/ha
Belgium-Wallonia	402 425	30%	143
Belgium-Flanders	564 622	54%	143
Bulgaria	1 991 340	48%	101
Czechia	1 274 906	31%	67
Denmark	3 096 130	75%	227
Germany	13 517 917	61%	147
Estonia	526 952	52%	110
Ireland	3 642 474	61%	165
Greece	4 274 575	49%	214
Spain	12 305 844	51%	128
France	16 524 522	48%	130
Croatia	712 063	38%	130
Italy	8 451 602	48%	167
Cyprus	155 219	65%	233
Latvia	853 280	50%	90
Lithuania	1 135 097	38%	82
Luxembourg	80 297	49%	132
Hungary	3 618 150	55%	147
Malta	18 154	42%	638
Netherlands	1 692 610	57%	180
Austria	2 387 972	70%	189
Poland	8 204 635	47%	120
Portugal	1 572 757	45%	81
Romania	4 822 415	49%	101
Slovenia	414 451	62%	184
Slovakia	943 344	47%	104
Finland	1 478 197	57%	130
Sweden	2 035 534	59%	138
EU-27	96 697 483	51%	134

B.2 EAFRD Financial Report

The annual EAFRD financial reports stated budget procedures, appropriation management, and budget implementation for each year since 2007 (EAFRD Reports - European Commission, 2024). For example, the report 2022 showed the EAFRD monthly reimbursements of each EU Member State as in the following figure.

EAFRD Monthly reimbursements to EU member states in 2022

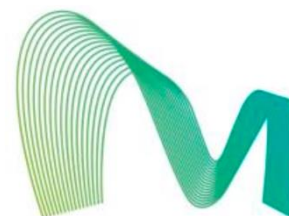
Payments effectively made between 01/01/2022 and 31/12/2022							
EAFRD 2014-2022 - Budget item 08.030102							(in EUR)
MS	Pre-financing	Prior to Q4 2021	Q4 2021	Q1 2022	Q2 2022	Q3 2022	Total
BE	0	0	23 289 064	6 184 056	50 492 909	11 631 914	91 597 943
BG	0	0	74 558 193	39 750 234	76 429 277	34 127 291	224 864 996
CZ	0	30 607	84 416 777	162 779 621	62 669 048	24 404 396	334 300 448
DK	0	376 977	41 787 859	21 661 266	23 566 391	12 612 061	100 004 555
DE	0	0	710 922 158	331 164 431	272 840 682	186 845 147	1 501 772 418
EE	0	0	11 691 866	57 640 389	10 799 616	12 771 163	92 903 033
IE	0	0	155 668 268	25 997 925	38 864 514	122 032 177	342 562 883
GR	0	0	354 645 223	65 283 590	119 251 997	324 920 378	864 101 188
ES	0	0	549 229 766	157 869 989	380 467 337	175 185 287	1 262 752 378
FR	0	195 484	973 178 895	467 005 403	232 175 948	176 856 929	1 849 412 659
HR	0	0	59 480 637	133 063 409	89 019 930	54 707 337	336 271 313
IT	0	0	938 373 460	202 109 133	285 980 333	204 041 940	1 630 504 866
CY	0	0	6 123 496	6 131 604	3 497 997	1 586 418	17 339 516
LV	0	0	36 521 244	22 380 826	21 885 300	22 506 053	103 293 424
LT	0	0	66 371 679	47 649 259	48 490 756	36 043 183	198 554 876
LU	0	0	9 276 136	9 490 502	2 638 525	376 575	21 781 738
HU	0	1 491 089	177 148 099	153 970 681	127 301 412	97 423 648	557 334 928
MT	0	0	4 269 562	1 840 489	1 481 696	2 195 178	9 786 926
NL	0	0	32 926 248	57 822 407	15 059 872	20 263 927	126 072 454
AT	0	13 560 848	212 967 775	35 634 006	98 807 897	49 401 890	410 372 416
PL	0	0	521 948 233	328 661 932	309 943 099	216 858 878	1 377 412 142
PT	0	3	291 046 715	64 290 689	57 767 865	74 433 092	487 538 364
RO	0	2 147 398	419 022 263	86 867 732	208 168 739	174 043 840	890 249 973
SI	0	0	43 133 080	13 661 022	52 641 897	20 706 093	130 142 092
SK	0	2 327	45 405 769	23 557 728	39 465 774	16 002 030	124 433 628
FI	0	0	148 410 208	20 980 388	47 481 587	163 926 355	380 798 537
SE	0	0	151 455 877	27 333 475	23 759 022	16 805 637	219 354 011
UK	0	0	187 543 937	70 021 111	16 649 241	17 268 841	291 483 129
Total	0	17 804 733	6 330 812 485	2 640 803 296	2 717 598 662	2 269 977 659	13 976 996 834

Abbreviation of each member state:

(BE) Belgium, (BG) Bulgaria, (CZ) Czechia, (DK) Denmark, (DE) Germany, (EE) Estonia, (IE) Ireland, (GR) Greece, (ES) Spain, (FR) France, (HR) Croatia, (IT) Italy, (CY) Cyprus, (LV) Latvia, (LT) Lithuania, (LU) Luxembourg, (HU) Hungary, (MT) Malta, (NL) Netherlands, (AT) Austria, (PL) Poland, (PT) Portugal, (RO) Romania, (SI) Slovenia, (SK) Slovakia, (FI) Finland, (SE) Sweden, (UK) United Kingdom

Appendix C: The Murmuration Company

MURMURATION's objective is to place the environmental dimension at the core of every decision. To do so, we have developed a methodology that combines data from Earth observation satellites, such as the Copernicus satellites, with in-situ data and socio-economic statistics to assess the state of an ecosystem anywhere in the world.



Context:

As part of a European project, we are exploring implementing different sustainable farming practices across the Mediterranean and farmers' adoption of these practices. This involves understanding the levers for transforming the agricultural sector towards greater sustainability, particularly in adopting Nature-Based Solutions (NBS). Adopting NBS requires a transformation effort and experimentation, which is quite costly for farmers. On the one hand, implementing some of these solutions requires more labor and, therefore, more cost. On the other hand, each type of crop requires experimentation with the optimal solution on the targeted land. In addition, the return on land could be more critical in the short term. Despite the gains from NBS adoption in the medium and long term, all these elements represent a significant barrier to adoption by farmers in the short term.

Project:

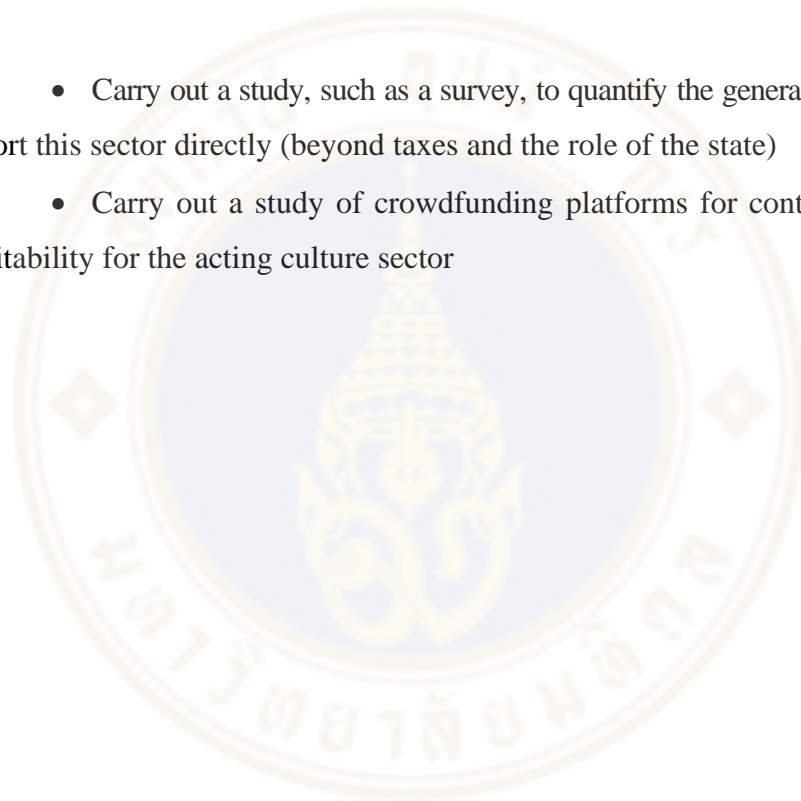
Different financing possibilities may exist, such as traditional so-called "Top-to-bottom" linked to state support (at the national, regional, or local level) across Europe or more innovative methods following a bottom-up approach. Agriculture and food is a subject that affects all citizens, one option that we wish to explore would be setting up a participatory financing platform (i.e. crowdfunding) where anyone could support a farmer (a little in the same way as Tipee for content creators on the internet) with a recurring donation amount per month. The farmer could then present his project to the community to request donation support to help him transition. This farmer perhaps in France but also internationally (EU or elsewhere)

Goals:

- Explore different top-to-bottom or bottom-up financing possibilities at the French and European level
- Explore different business model possibilities to support the transition of agriculture towards more Sustainability

Missions:

- Carry out a market study on support at EU and FR level for the agricultural sector
- Carry out a study, such as a survey, to quantify the general public's appetite to support this sector directly (beyond taxes and the role of the state)
- Carry out a study of crowdfunding platforms for content creators and their suitability for the acting culture sector



Appendix D: The Data of World Bank

D.1 The percentages of agricultural land in the European Union

The percentages of agricultural land in the EU in 2021

Member State	Total land (hectares)	Agricultural land (hectares)	% agricultural of total land
Austria	8,252.00	2,597.46	31.48%
Belgium	3,028.00	1,365.67	45.10%
Bulgaria	10,856.00	5,046.60	46.49%
Croatia	5,596.00	1,476.00	26.38%
Cyprus	924.00	123.13	13.33%
Czechia	7,718.68	3,529.80	45.73%
Denmark	4,000.00	2,618.00	65.45%
Estonia	4,275.00	987.00	23.09%
Finland	30,394.77	2,268.00	7.46%
France	54,755.70	28,553.75	52.15%
Germany	34,939.00	16,591.00	47.49%
Greece	12,890.00	5,867.19	45.52%
Hungary	9,126.00	5,043.69	55.27%
Ireland	6,889.00	4,337.00	62.96%
Italy	29,571.70	12,403.03	41.94%
Latvia	6,223.00	1,970.00	31.66%
Lithuania	6,261.00	2,937.80	46.92%
Luxembourg	257.45	132.81	51.59%
Malta	32.00	8.75	27.34%
Netherlands	3,367.00	1,812.00	53.82%
Poland	30,610.00	14,499.46	47.37%
Portugal	9,160.56	3,962.30	43.25%
Romania	23,008.00	13,079.00	56.85%
Slovak Republic	4,808.00	1,856.00	38.60%
Slovenia	2,013.64	610.96	30.34%
Spain	49,973.32	26,228.45	52.48%
Sweden	40,728.35	3,002.91	7.37%

D.2 The Population in the EU

The population in the EU

Member State	2020	2021	% change from 2020	2022	% change from 2021
Austria	8.92	8.96	0.44%	9.04	0.96%
Belgium	11.54	11.59	0.41%	11.69	0.86%
Bulgaria	6.93	6.88	-0.81%	6.47	-6.00%
Croatia	4.05	3.88	-4.17%	3.86	-0.60%
Cyprus	1.24	1.24	0.54%	1.25	0.59%
Czechia	10.70	10.51	-1.80%	10.67	1.58%
Denmark	5.83	5.86	0.43%	5.90	0.79%
Estonia	1.33	1.33	0.11%	1.35	1.35%
Finland	5.53	5.54	0.21%	5.56	0.27%
France	67.57	67.76	0.29%	67.97	0.31%
Germany	83.16	83.20	0.04%	83.80	0.72%
Greece	10.70	10.57	-1.21%	10.43	-1.35%
Hungary	9.75	9.71	-0.41%	9.64	-0.69%
Ireland	4.99	5.03	0.96%	5.13	1.87%
Italy	59.44	59.13	-0.51%	58.94	-0.33%
Latvia	1.90	1.88	-0.84%	1.88	-0.27%
Lithuania	2.79	2.80	0.21%	2.83	1.10%
Luxembourg	0.63	0.64	1.53%	0.65	2.04%
Malta	0.52	0.52	0.62%	0.53	2.43%
Netherlands	17.44	17.53	0.52%	17.70	0.96%
Poland	37.90	37.75	-0.40%	36.82	-2.45%
Portugal	10.30	10.36	0.63%	10.41	0.46%
Romania	19.27	19.12	-0.74%	19.05	-0.39%
Slovak Republic	5.46	5.45	-0.21%	5.43	-0.28%
Slovenia	2.10	2.11	0.27%	2.11	0.19%
Spain	47.37	47.42	0.11%	47.78	0.76%
Sweden	10.35	10.42	0.60%	10.49	0.68%
Total	447.69	447.18	-0.11%	447.37	0.04%

Appendix E: The Number of Farmers in the EU from Eurostat Data

The number of farmers in the EU in 2021									
UAAREA (Labels)	Total number of holdings	less than 2 ha	2 to 4.9 ha	5 to 9.9 ha	10 to 19.9 ha	20 to 29.9 ha	30 to 49.9 ha	50 to 99.9 ha	100 ha or over
Austria	110,780	7,300	15,210	18,830	25,480	15,190	16,080	9,760	2,400
Belgium	36,000	1,180	2,990	4,680	6,310	4,480	6,150	6,790	2,720
Bulgaria	132,740	57,250	22,280	12,230	9,810	5,690	6,650	5,740	7,630
Croatia	143,920	55,870	42,770	21,340	10,210	3,500	3,190	2,570	1,490
Cyprus	34,050	24,000	5,410	2,010	1,040	400	360	300	160
Czechia	28,910	4,110	2,720	4,390	4,300	2,320	2,570	3,030	5,000
Denmark	37,090	1,510	4,430	6,890	5,490	2,970	3,340	4,160	7,300
Estonia	11,370	220	720	2,910	2,260	1,000	1,040	1,040	1,930
Finland	45,630	590	560	6,140	8,810	6,150	7,940	9,250	5,950
France	393,030	38,220	34,500	34,280	36,990	24,170	39,750	77,880	102,740
Germany	262,560	9,570	7,990	44,760	52,520	25,020	35,970	44,690	38,100
Greece	530,680	247,350	140,230	71,080	37,250	13,460	10,180	4,760	990
Hungary	232,060	90,850	41,470	27,420	19,540	8,240	8,070	7,980	10,230
Ireland	130,190	1,280	6,090	15,920	30,870	23,000	27,390	19,760	5,880
Italy	1,130,530	437,840	275,500	159,940	109,310	44,980	40,960	32,160	17,340
Latvia	68,980	13,790	16,880	13,190	9,910	3,690	3,260	2,800	3,740

The number of farmers in the EU in 2021									
UAAREA (Labels)	Total number of holdings	less than 2 ha	2 to 4.9 ha	5 to 9.9 ha	10 to 19.9 ha	20 to 29.9 ha	30 to 49.9 ha	50 to 99.9 ha	100 ha or over
Lithuania	132,080	24,010	40,560	26,290	17,070	6,160	5,100	5,420	5,790
Luxembourg	1,880	140	120	160	160	100	170	470	520
Malta	7,650	6,030	1,070	220	40	:	:	:	:
Netherlands	52,640	3,790	5,350	6,890	8,100	5,600	9,020	9,460	3,080
Poland	1,301,490	242,310	434,210	282,460	192,520	61,270	44,260	26,310	13,950
Portugal	290,230	136,210	72,760	32,490	18,980	7,000	6,140	5,550	7,070
Romania	2,887,070	2,042,630	519,440	161,020	56,200	18,160	16,890	11,150	16,010
Slovakia	19,630	2,690	3,490	3,650	2,480	1,100	1,060	1,020	2,490
Slovenia	72,470	21,120	22,910	15,640	7,950	2,120	1,200	550	140
Spain	914,870	262,840	200,830	131,900	103,590	50,450	51,030	50,490	55,780
Sweden	58,790	520	750	5,050	14,800	11,890	5,450	5,750	6,560
Total	9,067,320	3,733,450	1,925,540	1,121,530	789,080	341,670	353,520	349,650	326,470
	%	41.17%	21.24%	12.37%	8.70%	3.77%	3.90%	3.86%	3.60%

Appendix F: Agricultural Product of each EU Member State

Agricultural Products by Member State in 2021

	Crop SUM				Olive oil			
	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area
EU	67563.676	465138.476	100%	6.88	4812.84408	12193.69	100%	2.53
Austria	950.5	8733.79	1.88%	9.19	-	-	-	-
Belgium	424.39	8923	1.92%	21.03	-	-	-	-
Bulgaria	2950.28	13783.75	2.96%	4.67	-	-	-	-
Croatia	-	-	-	-	-	-	-	-
Cyprus	26.74	51.67	0.01%	1.93	-	-	-	-
Czechia	1875.92	13775.81	2.96%	7.34	-	-	-	-
Denmark	1620.78	13143.31	2.83%	8.11	-	-	-	-
Estonia	495.14	1586.01	0.34%	3.20	721.23	912.97	7.49%	1.27
Finland	1049.82	3704.04	0.80%	3.53	2573.33408	7682.88	63.01%	2.99
France	11978.42	105883.57	22.76%	8.84	16.49	26.72	0.22%	1.62
Germany	7866.54901	75292.83	16.19%	9.57	19.94	23.87	0.20%	1.20
Greece	965.46	6297.63	1.35%	6.52	1095.45	2181.35	17.89%	1.99
Hungary	3441.67	18871.18	4.06%	5.48	9.5	14.74	0.12%	1.55
Ireland	327.89	3680.74	0.79%	11.23	-	-	-	-

	Crop SUM				Olive oil			
	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area
Italy	3556.41	27353.25	5.88%	7.69	-	-	-	-
Latvia	975.6	3808.1	0.82%	3.90	-	-	-	-
Lithuania	1855.32	7383.25	1.59%	3.98	-	-	-	-
Luxembourg	28.49	153.89	0.03%	5.40	-	-	-	-
Malta	-	-	-	-	-	-	-	-
Netherlands	292.6	8893.84	1.91%	30.40	-	-	-	-
Poland	9187.41	54168.7	11.65%	5.90	-	-	-	-
Portugal	206.48	997.15	0.21%	4.83	374.41	1350.24	11.07%	3.61
Romania	7243.82	34292.52	7.37%	4.73	1	0	0.00%	0.00
Slovakia	1037.38	6241.96	1.34%	6.02	1.49	0.92	0.01%	0.62
Slovenia	111.39	847.43	0.18%	7.61	-	-	-	-
Spain	7216.65	34710.31	7.46%	4.80975383	-	-	-	-
Sweden	1184.34	7964.8	1.71%	6.72509583	-	-	-	-

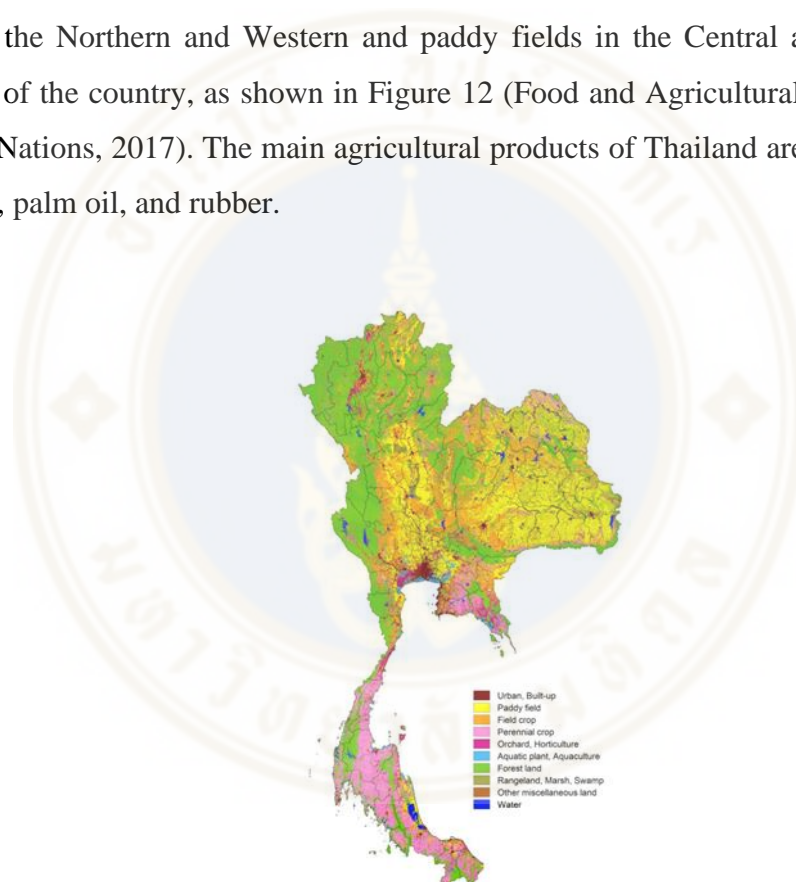
	Wine				FRUIT and Vegetable			
	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area
EU	3211.039	152932.005	100%	47.63	1193.213	40792.179	100%	34.19
Austria	44.913	2459.788	1.61%	54.77	6.73	267.76	0.66%	39.79
Belgium	-	-	-	-	5.98	532.41	1.31%	89.03
Bulgaria	60.077	841.207	0.55%	14.00	9.52	200	0.49%	21.01
Croatia	19.775	525.92	0.34%	26.60	5.52	86.04	0.21%	15.59
Cyprus	7.49	68.02	0.04%	9.08	2.14	38.02	0.09%	17.77
Czechia	17.776	578.543	0.38%	32.55	7.69	153.27	0.38%	19.93
Denmark	-	-	-	-	1.43	41.95	0.10%	29.34
Estonia	-	-	-	-	0.74	2.8	0.01%	3.78
Finland	-	-	-	-	0.71	45.48	0.11%	64.06
France	813.396	37131.757	24.28%	45.65	69.1	2561.13	6.28%	37.06
Germany	103.388	7964.97	5.21%	77.04	34.49	1106.4	2.71%	32.08
Greece	61.168	2415.579	1.58%	39.49	94.4	2693.24	6.60%	28.53
Hungary	61.533	2589.581	1.69%	42.08	31.1	641.01	1.57%	20.61
Ireland	-	-	-	-	0.72	19.63	0.05%	27.26
Italy	674.03	50231.566	32.85%	74.52	297.303	12104.649	29.67%	40.71
Latvia	-	-	-	-	3.2	13.5	0.03%	4.22
Lithuania	-	-	-	-	10.89	50.39	0.12%	4.63
Luxembourg	-	98.411	-	-	0.1	1.06	0.00%	10.60

	Wine				FRUIT and Vegetable			
	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area	area (thousand hectares)	production (thousand tonnes)	Production (%)	% production of area
Malta	-	11.108	-	-	-	11.01	0.03%	-
Netherlands	-	7.529	-	-	7.82	1125	2.76%	143.86
Poland	-	-	-	-	170.6	5026.9	12.32%	29.47
Portugal	192.029	6987.163	4.57%	36.39	52.71	2520.27	6.18%	47.81
Romania	180.378	4796.798	3.14%	26.59	73.32	1108.02	2.72%	15.11
Slovakia	14.642	338.49	0.22%	23.12	2.16	69.04	0.17%	31.96
Slovenia	14.866	581.21	0.38%	39.10	2.54	32.11	0.08%	12.64
Spain	945.578	35304.365	23.09%	37.34	300.8	10291.4	25.23%	34.21
Sweden	-	-	-	-	1.5	49.69	0.12%	33.13

Appendix F: Thailand

General information of Thailand

In general, Thailand is a developing country located in the center of Southeast Asia. In 2021, the agricultural area is 46% (0.235 million km²) of total land (0.511 million km²), and the population in Thailand is 71.6 million people, with 0.18% of population growth from 2020. Thailand has more agricultural area than the EU. Thailand has a hot tropical climate. Thailand's primary agricultural land use is forest land in the Northern and Western and paddy fields in the Central and Northeastern regions of the country, as shown in Figure 12 (Food and Agricultural Organization of United Nations, 2017). The main agricultural products of Thailand are rice, sugarcane, cassava, palm oil, and rubber.



The agricultural land use in Thailand in 2017

Law and regulations

For law and regulations, the Department of Climate Change and Environment (DCCE) in the Ministry of Natural Resources and Environment has drafted the Climate Change Act B.E.... to promote the development of carbon credit measures and mechanisms. Currently, the process is during the public opinion sessions, and we predict

that this act will be approved by 2024 (Manager Online, 2024). Moreover, the Ministry of Agriculture and Cooperatives has announced that it will solve the climate change crisis by setting the goal of reducing greenhouse gas emissions by 1 million tons in the agricultural action plan for climate change in 2023 – 2027 (Officer of Agricultural Economics, 2023). The laws and regulations of the EU can guide Thailand. The policies in the EU are more intense and more steps beyond Thailand. EU encourages other countries to implement carbon credit measures and mechanisms in commerce. A carbon credit can be a trade barrier because it can cause high import and export taxes.

Financial Support Availability in Thailand

1. Mutual Funds for Assisting Farmers

This mutual fund aims to assist farmers who produce all crops, focusing on marketing agricultural products and factors in production. The responsibility is under the Comptroller General's Department of Ministry of Finance.

In 2023, the committee approved funding of 1,193.52 million baht for agricultural products such as rice, root crops, fruits, shrimp, and livestock.

2. Measures from the Thailand government

When the price of agricultural products, such as rice, drops, farmers might not gain profit. Thai government approved measures in the unit of billion baht to stabilize rice prices for each harvest, including loans to farmers to delay the sale of rice and loans to cooperatives to buy rice until prices increase. Additionally, the government might modify its intervention policy on rice prices to improve farmers' incomes. The loan is from the Bank for Agriculture and Agricultural Cooperatives (BAAC).