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Social Entrepreneurship, Empowerment and Cohesion Project (SEECO)

Social Entrepreneurship Supports and Examples in Agri-Food in Türkiye and the World

April 2024

REPUBLIC OF TÜRKİYE
MINISTRY OF INDUSTRY AND TECHNOLOGY

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We are also grateful for the valuable contributions of the organizations we interviewed to gather ecosystem insights during the research phase of the report.

About SEECO

The Social Entrepreneurship, Empowerment and Cohesion (SEECO) Project is financed by the European Union FRIT II Financial Assistance Fund and coordinated by the Ministry of Industry and Technology and the World Bank.

The objective of the SEECO Project is to improve livelihood opportunities for women and youth in host and guest communities living in target areas in Türkiye. The project will contribute to the participation of women and youth in economic activities by supporting social entrepreneurship and local institutions providing services to local communities.

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Abbreviations

AI	Artificial Intelligence
R&D	Research and Development
EIT	European Institute of Innovation & Technology
IoT	Internet of Things
IPARD	Instrument for Pre-Accession Assistance Rural Development
KOSGEB	Small and Medium Enterprises Development Organization
OECD	Organisation for Economic Co-operation and Development
SOGEP	Social Development Support Program
TAGEM	General Directorate of Agricultural Research and Policies
TKDK	Agriculture and Rural Development Support Institution
TTO	Technology Transfer Office
TUBITAK	Scientific and Technological Research Council of Türkiye
TUBITAK BIGG	Scientific and Technological Research Council of Türkiye Individual Young Enterprise Program
TUBITAK MAM	Scientific and Technological Research Council of Türkiye Marmara Research Centre
TUGIP	Turkish Food Innovation Platform

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Purpose and Context of the Report

This report is part of a series of analytical reports prepared by SEECO to highlight social economy, social entrepreneurship and impact investment opportunities in Türkiye. The report aims to answer key questions such as the state of the social entrepreneurship ecosystem in the agriculture and food sectors, leading incubators and support programs, available investment options, the state of impact investing, barriers and opportunities for growth.

Methodology

Desk research methodology was used in the preparation of this report. Within the scope of the research, Turkish and English literature on the agriculture and food sectors was reviewed in detail. In addition, opinions of companies such as Doktar, Kybele's Garden, Fazla, Nanomik and Biftek.co, which are among the important actors of the sector, were obtained and their experiences and contributions in the sector were evaluated. In addition, the expert opinions of Yiğit Kazancıoğlu, Vice Rector of Yaşar University, contributed to the methodological richness of the report. The sectoral observations and experiences of Foodback, EIT Food Türkiye Hub, are reflected in the relevant sections, adding additional depth to the report.

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Executive Summary

This report analyzes the current state of the social entrepreneurship ecosystem in the agriculture and food sectors in Türkiye and offers ideas for improving the ecosystem by assessing entrepreneurship opportunities in the sector. Incubators, support programs and investment options operating in the agriculture and food sectors have been examined, and recommendations on the main challenges faced in the sector have been developed in line with the lessons learned from international best practices. The report draws attention to the fact that existing public support is effective in R&D processes, but insufficient in the market access and growth stages of startups.

This study is based on a literature review, in-depth interviews with stakeholders in the sector and analysis of existing data. During the research process, social entrepreneurship activities, investment opportunities and ecosystem support structures in Türkiye's agriculture and food sectors were analysed. In addition, successful practices in social entrepreneurship and impact investing at national and international level were reviewed and strategies to improve the ecosystem in Türkiye were identified. However, this report is not based on extensive field research and only provides a general assessment in light of available data.

Featured Findings

- Social entrepreneurship in the agriculture and food sectors is in its infancy and the potential in this area has not been fully utilised.
- Social entrepreneurs face challenges in accessing finance; the limitations of existing impact investment and social finance instruments constrain growth.
- While public support is useful in the R&D phase, it is insufficient in the market entry and commercialization processes of enterprises.
- The lack of a legal and regulatory framework to support social entrepreneurship prevents enterprises from operating in a sustainable manner.
- The social entrepreneurship ecosystem in Türkiye does not benefit enough from international knowledge and experience, making it difficult for initiatives to expand into global markets.

Recommendations

- Mainstreaming impact investing and social finance instruments can increase access of social enterprises to funding sources.

- Legal regulations for social entrepreneurship should be developed to support the sustainability of initiatives through tools such as tax incentives and donation mechanisms.
- It would be beneficial to expand training, mentoring and business development programs for entrepreneurs and to create platforms to increase information sharing.
- Grants and incentives need to be diversified to support startups in the commercialization phase.
- It is recommended to strengthen cooperation between universities and public institutions to attract young entrepreneurs to the sector.
- Waste management and resource efficiency should be improved by promoting circular economy and sustainable agriculture projects.
- Strengthening the connectivity of the social entrepreneurship ecosystem with international networks can facilitate learning from successful global practices.

This report aims to provide a perspective for stakeholders in the sector to assess entrepreneurial opportunities and gain insights on the development of social entrepreneurship.

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Chapter 1: Overview of Türkiye in the field of agriculture and food

In the 21st century, agriculture and food entrepreneurship has become a natural member of the social entrepreneurship ecosystem, which prioritizes creating benefits for the environment and society and providing lasting solutions to environmental and social problems on an equal footing with making a profit. The climate crisis poses a great threat to the agriculture and food sectors, and at the same time these sectors are among the biggest triggers of the climate crisis. Given the importance of a healthy and safe food system for all life, it is understandable that agriculture and food tech startups are increasingly becoming a part of impact entrepreneurship ecosystems around the world.

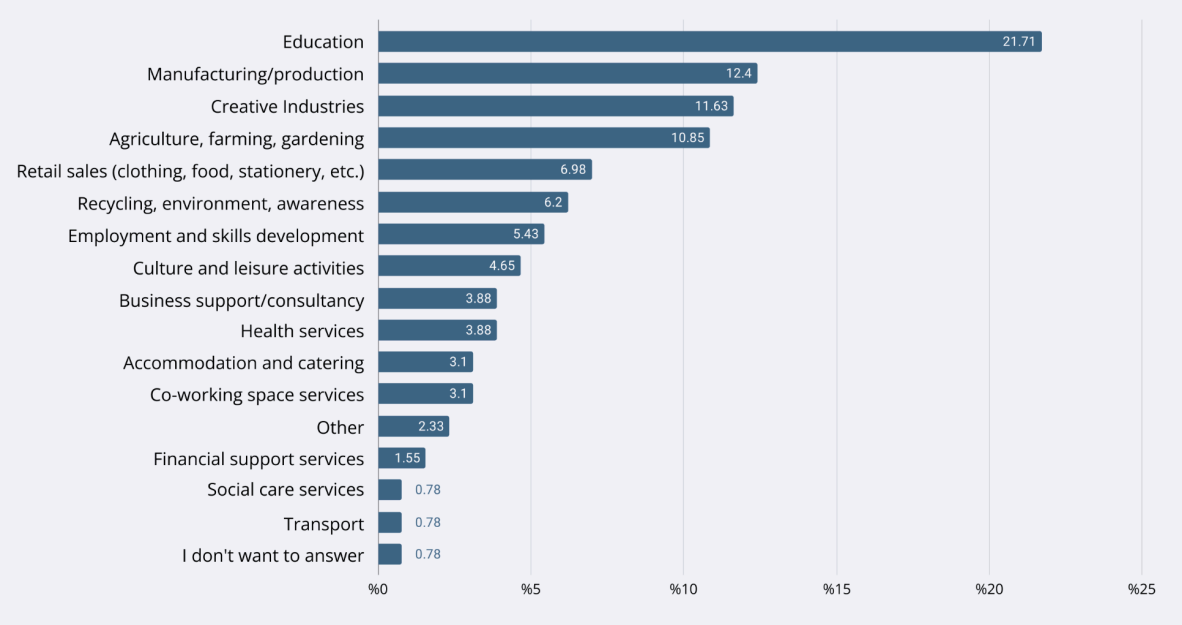
Today, when we think of "agricultural and food technologies", more concepts come to mind than they would have 4-5 years ago. Agricultural and food technologies, whose boundaries and sphere of influence are expanding day by day, have been limited to smart technologies, the internet of things, and information communication technologies in the past, while today they cover a wide range of areas such as functional foods, personalized nutrition, beekeeping technologies, and smart irrigation.[1] In Türkiye, there are also initiatives that produce technology in these areas, albeit in limited numbers.

According to 2019 data, agriculture, farming and horticulture was identified as the 4th sector among 16 sectors with a share of 10.85% in Türkiye's social entrepreneurship ecosystem[2]. While evaluating this rate, it should not be ignored that food enterprises may be included in sectors such as "manufacturing/production" and "retail sales". Because while "agriculture" is evaluated as a separate heading in this study, "food" enterprises are not evaluated under a separate heading. Based on this, it can be estimated that agriculture and food entrepreneurs have a share of around 15% in the Turkish social entrepreneurship ecosystem. A more recent mapping study identified food (21.6%) and agriculture (12.4%) as the most common sectors among 1500+ social enterprises, with a combined share of 34%.[3] One of the most important obstacles to social entrepreneurship in agriculture and food, as can be deduced from the data in the paragraph above, is the limited number of studies on the subject and the fact that these studies do not always confirm each other. One of the major reasons for this is that there is no general acceptance of the concept of "social enterprise" and there is no set of conditions for which businesses are considered "social enterprises". Similarly, there are differing definitions

[1] Türkiye Agri-Food Ecosystem Maps
[2] The State of Social Enterprises in Türkiye, British Council, 2019
[3] Türkiye 1505 Social Enterprise Number Mapping Study

and acceptance of "food enterprises" and/or "agricultural enterprises". As mentioned above, in some cases, enterprises operating in sectors such as retail sales, manufacturing/production and recycling, and environment may or may not be evaluated as food-agriculture enterprises based on their relationship with food and/or agriculture. Our approach in this report is to consider all social enterprises that touch the food and agriculture sectors in some way (e.g. an enterprise that produces raw materials by upcycling for the textile sector, but uses food waste as input) within the agriculture and food entrepreneurship ecosystem.

Fig. 1 - Main Sectors in which Social Enterprises Operate



Distribution of social enterprises by sector according to the survey conducted with 248 social enterprises as part of the British Council's 'State of Social Enterprises in Turkey' report in 2019. Source: The State of Social Enterprises in Türkiye, British Council, 2019

Social entrepreneurship has played a critical role in the agriculture and food sector during the pandemic.[4] Social entrepreneurship models have been used to increase the resilience of rural communities during the COVID-19 pandemic. In this context, various policy recommendations and projects have been developed to make food systems resilient to crises and support social

[4] COVID-19 Rapid Impact Assessment in Agri-Food Sector and Rural Development in Türkiye, UNDP Türkiye, 2021

entrepreneurs. These efforts aimed to strengthen rural communities both economically and socially.
Some of the research, results and recommendations made within the scope of the **"COVID-19 Rapid Impact Assessment in Türkiye's Agri-Food Sector and Rural Development Areas"** report prepared by UNDP Türkiye are listed below.

- Develop and promote marketing and supply chain tools to enable small producers, including women farmers, to access traditional and other agricultural and food supply chains,
- Develop a strategic investment program and incentives to increase storage capacity and prevent sudden price fluctuations,
- Promote the use of smart technologies in all aspects of agriculture and food systems,
- Establish a policy coordination platform to harmonize and develop policies across the various parts of agri-food systems,
- Preparation of a needs-based capacity building program to improve farmers' digital skills,
- Implement rural development projects and programs to overcome rural poverty and ensure the sustainability of rural areas.

Although this report was written for the case of pandemic, the findings and policy recommendations on social entrepreneurship were also valid for the case of February 6 Earthquakes in Türkiye. Local agriculture and food producers affected by the earthquake used social entrepreneurship, marketing and digitalization to restart their economic activities. Organizations such as the United Nations and the European Union (EU) have also provided financial and in-kind support to develop the region in these areas.

Although there have been important developments in Türkiye in the fields of agriculture and food in relation to social entrepreneurship, the R&D and innovation power of these sectors has not yet reached the desired level. Türkiye is among the OECD countries with the lowest value of R&D relative to gross national product.[5] In 2021, while the OECD average ratio of R&D expenditures to GDP was 2.9, this ratio was 1.4 in Türkiye.[6] In 2022, the investment in all R&D activities in Türkiye was approximately 199 billion TL.[7]

Opportunities such as international collaborations and technology transfer can be effective to increase R&D and innovation in the agriculture sector.

[5] Agriculture and Food 2020: Analysis of the Agriculture and Food Sector in the Context of Sustainable Growth, 2020
[6] World Development Indicators by World Bank Group
[7] TÜBİTAK Research and Development Activities Survey, 2022

In this regard, as Foodback, the policy recommendations we have observed and compiled with our experience and learnings in the ecosystem regarding mechanisms to increase added value in the agriculture and food sectors are as follows:

- Supporting technology/digitalization investments that will increase added value and productivity,
- Supporting entrepreneurship; attracting qualified labour to agricultural production,
- Designing inclusive policies in agricultural technologies,
- Creating well-designed, sustainable, scalable and replicable agricultural technology clusters,
- Public institutions collaborate with initiatives to develop effective solutions and projects on food waste,
- Digitalization of the production process or part of the supply chain and the creation of pilot projects where all stakeholders will learn from each other in an open innovation environment.

In addition, creating and supporting an entrepreneurial ecosystem for products that manufacturers can sell directly can strengthen their position in the market. The production and marketing of innovative products (such as functional products) has the potential to create added value in terms of introducing local products to the world.

Section 2: List of entrepreneurship programs and support in the field of agriculture and food in Türkiye

2.1. Public Support

In Türkiye, there are various public programs that support social entrepreneurs in the agriculture and food sector. These programs may vary depending on the legal entity of the social enterprises operating in the agriculture and food sector. Initiatives operate under various legal entities such as cooperatives, joint stock companies and limited liability companies. As there is no single ministry or institution dealing with social enterprises or food/agriculture initiatives, there is no single structure for support in these areas. Depending on the legal entity, product, scale and stage of food and agriculture enterprises, support is provided through different structures such as Small and Medium Enterprises Development Organization (KOSGEB), Development Agencies and Scientific and Technological Research Council of Türkiye (TÜBİTAK).

2.1.1. Ministry of Agriculture and Forestry

The Ministry of Agriculture and Forestry runs various programs to support agriculture and rural development in Türkiye. The Ministry carries out some of these activities through **the Agriculture and Rural Development Support Institution (TKDK)** and EU-funded projects such as the **IPARD** program. It also supports entrepreneurs through different investment and grant programs.

- **IPARD Program and TKDK Activities:** IPARD provides grants to entrepreneurs and small enterprises for rural development projects in agriculture and food sectors. The program aims to harmonize agri-food enterprises with EU standards, diversify economic activities in rural areas and bring young farmers into the sector. Areas of support include modernization of agricultural enterprises, processing and marketing of food and agricultural products, rural tourism and recreational activities, and renewable energy and environmental sustainability projects. Under the IPARD program, which has been running since 2007, 44.7 billion TL grants have been provided to 25,243 projects so far. For the IPARD III period, which will start in 2024, 785 million Euros of grant support is planned across Türkiye.[8] Under this program, TKDK supports projects by making calls for different investment areas throughout the year:
    - **Investment Supports:** Financial support is provided for areas such as food production, renewable energy, rural tourism and beekeeping.
    - **Special Calls and Announcements:** Announcements are made for specific sectors, the projects that apply are evaluated and funding is provided to those that meet the appropriate criteria.
- **Support for Rural Development Investments Program (KKYDP):** KKYDP aims to support modernization investments for rural development. It provides 50% grant support for new facility installations, capacity increase and technology renewal projects. In 2024, the project upper limit for new facility investments was set at 14 million TL.[9]
- **Individual Irrigation Systems Support:** This support program, which aims to increase the income level of producers in rural areas, provides a 50% grant for individual irrigation systems investments. The project budget can be up to 3 million TL and applications are made to provincial directorates.
- **R&D Support Program:** The Ministry provides grants for R&D projects in priority agricultural areas (e.g. plant health, animal husbandry, aquaculture). Up to 100% grant

[8] European Commission Implementing Decision of 14.3.2022 adopting the IPARD III program of the Republic of Türkiye for 2021-2027
[9] Money Magazine, 2014

support is provided to universities and research institutions such as TÜBİTAK, while this rate is up to 70% for private sector organizations.[10]

With these supports, the Ministry of Agriculture and Forestry aims to promote rural development, sustainable agriculture and agriculture-industry integration. Projects carried out in cooperation with universities, public and private sectors contribute to the creation of a sustainable agricultural ecosystem.

2.1.2. Scientific and Technological Research Council of Türkiye (TÜBİTAK)

TÜBİTAK supports research and development activities in the field of science and technology in Türkiye and offers various support programs for entrepreneurs. These are designed to encourage innovative projects, strengthen R&D efforts and increase sectoral competitiveness. Some of TÜBİTAK's main support programs for food and agriculture entrepreneurs are listed below.

- **R&D Support Programs**[11]: TÜBİTAK provides R&D support to projects aiming to develop innovative products, services or processes in the food and agriculture sector. This support can be in various forms such as financial support of projects, technical consultancy and provision of necessary infrastructure.
- **Technology Transfer Offices**[12]: TÜBİTAK helps entrepreneurs and researchers commercialize the technologies they develop through technology transfer offices (TTOs) established in universities and research institutions. These offices provide support in patenting, licensing and technology transfer.
- **Entrepreneurship Support**[13]: TÜBİTAK offers various entrepreneurship programs to support innovative business ideas. These programs provide mentoring, training and financial support to start-ups. For example, TÜBİTAK 1512 Individual Young Initiative (BIGG) Program supports entrepreneurs with innovative business ideas.
- **International Cooperation Supports**[14]: TÜBİTAK offers various programs to encourage international collaborations. These programs allow entrepreneurs in Türkiye to develop joint projects with similar organizations abroad.

[10] Rural Development Investments Support Program 2023-2024 Application Period Agriculture Based Investments Application Guide
[11] 1501 - TUBITAK Industrial R&D Projects Support Program
[12] 1513 - Technology Transfer Offices Support Program
[13] 1512 - Entrepreneurship Support Program (BiGG)
[14] Horizon Europe Program

- **Sectoral and Thematic Programs**[15]: Special programs for specific sectors such as food and agriculture are also offered by TÜBİTAK. These programs support projects that develop solutions to specific problems in the sector.

For the most recent activities of TÜBİTAK in agriculture and food entrepreneurship, the Annual Report for 2023 was analysed. According to the Annual Report, a cooperation protocol was signed between TÜBİTAK and the General Directorate of Agricultural Research and Policies (TAGEM). With this protocol, under the heading of "Agricultural Research", common priority R&D and innovation topics were identified, and two different calls were opened targeting university-public-private sector collaborations in order to ensure that the potentials of ecosystem stakeholders reach Türkiye's food security and sustainability targets and to use R&D resources more effectively. Projects within the scope of the call are co-funded with TAGEM through a co-financing model. A total of 71 projects were decided to be supported within the scope of Agriculture Calls opened in cooperation with TÜBİTAK-TAGEM. The total amount transferred to these projects in 2023 was 35.7 million TL.[16]

According to TÜBİTAK 2023 Annual Report, research and development activities in the fields of "Gene Engineering and Biotechnology" and "Food Technologies" from the "Sub-Program Experimental Development Activities" were carried out under the Vice Presidency of Life Sciences. In 2023, 29 externally funded projects totalling 76 million TL were initiated. By the end of the year, 22 projects totalling approximately 11 million TL were completed. During the year, 83 projects totalling 2,183 million TL were carried out. The types of projects carried out nationally and internationally include EU, Public, Private, TARAL and Investment Program.

Some of the activities related to the projects carried out in 2023 are summarized below.

- **Utilization of Agricultural Waste:** In the project initiated to transform agricultural wastes and residues into value-added products with the principle of zero waste, it is aimed to obtain essential oils from citrus fruits left in the garden, to use the waste from this process for pectin production, and to use the waste from this process for soil improvement agent and biogas production. In addition, planning studies have been carried out to obtain pectin from apple peels and qualified starch and phenolic substances from avocado peels and pits, and to use their wastes as biogas and soil improvement agents and to evaluate them up to zero waste.
- **Sour Yogurt Production:** Within the scope of developing yogurt strains to produce traditional sour yogurt, determining appropriate combinations and designing application

[15] 1711 - Artificial Intelligence Ecosystem Call
[16] TUBITAK 2023 Annual Report, 2024

methods, project studies on "Sour Yogurt Production" were carried out and licensed to the private sector.

- **Turkish Food Innovation Platform:** The Turkish Food Innovation Platform (TÜGİP), which aims to create a communication network and clustering platform for all actors in the food and beverage sector, continued its efforts to become a leading platform in R&D and innovation for the food sector.
- **Research Center for Smart Applications in Food Supply Security:** The Smart Applications in Food Supply Security Research Center project was initiated in 2023, which enables different research groups to develop applications and produce solutions together, consisting of closed system production rooms and cabins suitable for horizontal, vertical, irrigated-irrigated, soil-soilless agriculture, together with the Climatized Simulation Laboratory for Smart Agriculture, Food and Warehouse Applications.
- **Innofood Project:** INNOFOOD is an EU-supported project under the leadership of TÜBİTAK and aims to improve the R&D and innovation capacity of the food sector in Türkiye. The Food Innovation Center established in Gebze within the scope of the project provides research infrastructure to businesses with 9 pilot production lines and advanced analysis laboratories. Sustainable production, reducing food losses and developing value-added products are encouraged by focusing on SMEs through the TÜGİP platform. Contributions are also made to the regional innovation ecosystem with research centers in Şanlıurfa, Gaziantep and Giresun.

2.1.3. Small and Medium Enterprises Development Organization (KOSGEB)

KOSGEB is one of the public institutions from which SMEs and enterprises benefit the most. KOSGEB provides financial support to these organizations in areas such as business start-up support, business development support, personnel, machinery and equipment, software and service procurement. These supports offered by KOSGEB also help entrepreneurs operating in the food and agriculture sectors to realize their projects and grow.

- **Entrepreneur Support Program:** Within the scope of the support program, it is aimed to ensure the sustainability of newly established enterprises, with priority given to the sectors determined in line with strategic priorities. Within the scope of the support program, within the scope of Business Establishment support; 100% non-refundable establishment support of 10.000 TL per real person business and 20.000 TL per capital company business is provided for 36 months, and support for personnel expenses in the amount of 1-month gross minimum wage is provided for 36 months. Within the scope of business development support, 80% reimbursable personnel expenses support

amounting to 1.500.000 TL for 36 months, Machinery-Equipment and Mold Expenses Support, Software Expenses Support, Service Procurement Expenses Support (training, consultancy and guidance, certification, testing and analysis, marketing, design, industrial property rights expenses) are provided.[17]

- **Strategic Product Support Program:** The purpose of the support program is to support investment projects aimed at increasing the production of high value-added products in medium-high and high-tech sectors in Türkiye and products that are critical for the development of these sectors within the scope of the *Technology-Oriented Industrial Move Program* carried out by the Ministry of Industry and Technology. Within the scope of the program, investment projects are supported up to a total of 6,000,000 TL, of which 1,800,000 TL is non-refundable and 4,200,000 TL is refundable. Project expenses to be supported include machinery-equipment support, software expense support, personnel expense support, reference sample expense support and service procurement support. [18]
- **Cooperation Support Program:** The aim of this program is to contribute to the development of a culture of cooperation between small and medium-sized enterprises with each other or with large enterprises and to establish collaborations that provide mutual benefit and competitive advantage. Within the scope of the support program, the total upper limit is 5.000.000 TL within the framework of the Operator Establishment Model and the total upper limit is 10.000.000 TL within the framework of the Project Partnership Model. [19]

2.1.4. Development Agencies

Regional development agencies under the Ministry of Industry and Technology develop regional strategies, implement projects and contribute to the implementation of regional development policies in cooperation with local stakeholders. Development Agencies support various projects under the topic of "Agriculture and Rural Development". The main mission of the activities for the development of the rural economy in line with the *National Rural Development Strategy (2021-2023)* is to increase competitiveness in the agriculture and food sector and to diversify economic activities in rural areas. There are 17 development agencies carrying out activities under the heading of Agriculture and Rural Development.[20] With the SOGEP - Anatolians in Anatolia project to be carried out by development agencies financed by the Ministry of Industry and Technology, it is aimed to support local producers, to keep traditional culture alive and to

[17] Entrepreneur Support Program
[18] Strategic Product Support Program
[19] Cooperation Support Program
[20] Development Agencies, Agriculture and Rural Development

discover local potentials. In this framework, it is aimed to reveal innovative entrepreneurial opportunities for entrepreneurs and cooperatives and to support local and regional development by making the agricultural abundance of our lands, the pantry-filling accumulation of our culinary culture, the diversity and richness of the skills of our artisans visible through stories.[21]
The areas it supports include agriculture and food, and the stakeholders it supports include entrepreneurs. In total, 26 development agencies have hundreds of projects across Türkiye, some of the prominent projects in agriculture and food are listed below:

- **Ankara Development Agency (Carrying Innovation to Rural Areas project):** Since its inception in 2010, the Ankara Development Agency has implemented various programs aimed at reducing intra-regional imbalances. To date, it has supported a total of 301 projects in this field. The projects supported have mainly focused on the development of agriculture-based industry and diversification of economic activities. In 2016, Ankara Development Agency and the Hungarian Innovation Agency carried out the project "Bringing Innovation to Rural Areas". A total of 750 people living in rural Ankara benefited from the trainings organized in cooperation with the Agency, the Hungarian Innovation Agency, the Turkish Patent and Trademark Office and the Ministry of Economy through the "Bringing Innovation to the Countryside" project carried out in partnership with the Ankara Development Agency and the Hungarian Innovation Agency. The Ankara Rural Innovation Roadmap prepared within the scope of the project was the first strategy prepared for rural areas at regional level in Türkiye.[22]
- **Çukurova Development Agency (SOGEP Projects in Adana and Mersin): The Increasing Women's Employment in Innovative Food Supply Practices** project in Adana, Seyhan aims to increase women's employment in food supply chains and support women entrepreneurs.[23] In Aydıncık, Mersin, within the scope of the **Alternative Agricultural Practices and Training Center** project, it was aimed to disseminate alternative agricultural methods and contribute to regional development by providing training in this field.
- **Eyüpsultan Municipality Agriculture 4.0 Policies Application and Research Center (Istanbul Development Agency)**[24] **:** Within the scope of the project led by Eyüpsultan Municipality in partnership with Kadir Has University, it is aimed to increase added value in agricultural areas in Istanbul in line with sustainable agriculture targets, to carry out pilot studies targeting technology-supported development and sustainability, to ensure the production of services and goods with high knowledge intensity in the agricultural

[21] SOGEP - Anatolians in Anatolia Project, 2024
[22] Bringing Innovation to Rural Areas Project
[23] KADEM, 2022
[24] Eyüpsultan Municipality Agriculture 4.0 Policies Application and Research Center, 2021

sector, to bring together universities, non-governmental organizations, public, producers and food entrepreneurs using information and communication technologies, and to develop policies and practices regarding Türkiye's integration into the Agriculture 4.0 process.

2.2. European Union Grants

EU support and grants are one of the most important resources for agriculture and food entrepreneurs in Türkiye. Entrepreneurs, especially those with English language proficiency, often take advantage of EU programs and opportunities. Horizon Europe, the 9th Framework Program of the European Union, aims to support science and innovation activities with a budget of 95.5 billion euros between 2021 and 2027. The EU encourages all research activities in line with the Union's objectives to strengthen the scientific and technological basis of the EU and increase its competitiveness by creating a European research area where researchers, scientific knowledge and technology circulate freely. This incentive mechanism has been carried out through multi-annual R&D and innovation financial support established through framework programs since 1984. Türkiye has been participating in multi-annual framework programs in the field of R&D and Innovation since 2003. The objectives of the Horizon Europe program include strengthening the EU scientifically and technologically, increasing Europe's innovation capacity, competitiveness and employment, meeting community priorities, and sustaining Europe's socio-economic models and values. Among the 5 Missions of the Horizon Europe Program determined by the Commission, there are Climate Change Mission, Oceans and Waters Mission, Climate Neutral and Smart Cities Mission, Soil Health and Food Mission, Cancer Mission. Any natural or legal person (SMEs, industrial organizations, research centres, universities, public institutions, non-profit organizations) with the operational and financial eligibility to carry out the R&D tasks specified in the proposed project can apply to the Horizon Europe program. Can apply to the Horizon Europe Program.

The 6th cluster of the Horizon Europe Program entitled "Food, Bioeconomy, Natural Resources, Agriculture and Environment" and the grant calls opened under this cluster provide support to institutions and individuals working in the field of food and agriculture. [25]

Similarly, the European Institute for Innovation and Technology (EIT) is an EU institution for innovation and entrepreneurship. Founded in 2008, EIT was established to support innovation ecosystems, bring together the knowledge and innovation triangle (businesses, education and research) and increase Europe's global competitiveness. EIT offers a wide range of support to initiatives operating in the field of agriculture and food and continues this support under the EIT

[25] Horizon Europe Program

Food community. EIT Food has been active in Türkiye since 2018 and its local activities are carried out by Impact Hub Istanbul.

2.3. Acceleration Programs

In Türkiye, there are many acceleration programs for social entrepreneurs in agriculture and food. These programs help entrepreneurs grow by providing training, mentorship and financial support.

- **Empowering Women in Agrifood (EWA) Türkiye**[26]: Supported by the EIT Food, the EWA program is implemented in Türkiye by Impact Hub Istanbul's food and agribusiness platform Foodback. The program accepts women entrepreneurs working in the agriculture and food sectors. The program includes entrepreneurs in the food and agriculture sectors; agricultural technologies, food processing, food safety & traceability, waste management, new generation food & beverage. The program provides entrepreneurs with 1-1 mentoring support for 6 months, trainings with experts, a prize worth 15,000 euros to the winning entrepreneurs at the end of the program, the opportunity to participate in EIT Food's acceleration programs in Europe and grow their business. The EWA Türkiye program will be in its 5th year in 2024. In 5 years, the program has reached 50 women entrepreneurs developing technology in the field of food and agriculture and has provided over €70,000 in total prize support.
- **Kök Projekt**[27]: Kök Projekt is a sector-focused startup accelerator and corporate innovation partner company. It supports entrepreneurs in the food, agriculture, water and energy sectors. It works in collaboration with companies, public institutions, investment funds, NGOs and academia to strengthen agriculture and food entrepreneurship.
- **Viveka**[28]**:** Viveka operates as an accelerator and innovation center supporting the entrepreneurship ecosystem in Türkiye. The organization provides support to entrepreneurs from the idea stage to the growth stage. Viveka provides various supports such as mentoring, training, financing and business networking to entrepreneurs who aim to realize their innovative business ideas. The Brew Future program run by Viveka helps entrepreneurs working in areas such as sustainability, technology and social innovation to strengthen their business models. Among the 10 startups selected for the program are Biolive, which produces raw materials for end products such as POSM materials by developing environmentally friendly biomaterials from olive pits, and Ecording, an app that mobilizes consumers with environmentally conscious tasks such

[26] Empowering Women in Agrifood (EWA) Türkiye, 2024
[27] KOK Project
[28] Viveka

as recycling deposit bottles. Another program of Viveka that supports agriculture and food entrepreneurs is VBiGG (Viveka Individual Young Entrepreneurship Program). The program offers financing, mentoring and training support to young entrepreneurs who want to develop their innovative business ideas. In the field of "Sustainable Agriculture and Nutrition", one of the 6 main topics of the program, entrepreneurs are offered an investment opportunity of 900,000 TL.

- **Hackquarters (Tenity)**[29]: Tenity Istanbul is an innovation and acceleration centre designed specifically for financial technology entrepreneurs, providing mentorship, training, business networking and financing support to entrepreneurs with innovative projects in this field. Tenity Istanbul helps entrepreneurs develop and grow their business models, while supporting them to achieve success in local and global markets. WorkupAgri, run in collaboration with Tenity Istanbul and İşbank, is an agriculture-focused startup program that aims to support the growth of technology startups that develop agricultural technologies and have sustainable and scalable business models. In the program, startups with a solution that increases efficiency, protects nature or contributes to climate action by using smart technologies in areas such as energy, water saving, fertilization, spraying, spraying logistics, production, supply chain in the agriculture vertical are selected and offered mentorship from experts in their field, business development with İşbank and group companies, access to a wide national and international business network and opportunities to meet with investors.

2.4. Private Funds and Investment Companies

According to recent data from Crunchbase, there are 57 institutions headquartered in Türkiye that have invested in food and agriculture, with different types of investor institutions such as investment offices, incubation programs, venture capital and corporate venture capital. However, this number does not mean that there is regular investment in the food and agriculture sector, or that institutions are investing in this area on a regular basis. This figure also includes institutions that have invested in the food and agriculture sector only once. Current data shows the number of investment institutions that are still active.

These investors have invested in ventures of different sizes, ranging from early-stage startups in the food and agriculture sector, to seed-stage projects and late-stage ventures.

These investments and funds make a significant contribution to the realization and growth of entrepreneurs' projects. Below is a list of some of the most prominent private funds and investment companies in the food and agriculture sector:

[29] Hackquarters (Tenity)

- **Galata Business Angels (GBA):** As Türkiye's first angel investment network, it brings together high-potential entrepreneurs and experienced investors. It invests in startups based on criteria such as growth potential, business model, team quality and competitive advantage. GBA aims to contribute to the international success of startups in various sectors. It has invested in Agrovisio, Fazla Gıda, Pubinno, which operate in the food and agriculture sector in Türkiye. Galata Business Angels invested a total of USD 2.2 million in 11 startups in 2021. Galata Business Angels, which invested 294 thousand dollars in Fazla Gıda, made 18.2% of its investments in the agri-food sector the relevant year. Galata Business Angels took part in Agrovisio's second investment round in 2021 with a valuation of 2 million euros.
- **Startup Wise Guys (SWG):** Founded in 2012 in Estonia, SWG is a global accelerator fund. SWG aims to support entrepreneurs and help them achieve global success. SWG invests in B2B technology-focused early-stage startups. To date, SWG has invested in more than 440 startups and realized 15 successful expansions. The accelerator fund has invested in Turkish startups Agrovisio and Freshsens in the food and agri-tech space. SWG invested 10 million TL in Agrovisio in 2021 in a pre-seed investment round and 10 thousand dollars in a seed round. SWG invested 1.7 million TL in Freshsens, a local agricultural technologies startup.
- **Founder One:** Founder One is an impact investment fund that invests in early-stage impact startups. It has made 31 investments so far, including in agri-food tech startups. The fund has invested in Forfarming, Wastepresso, Tarlam and Yenir, which operate in the field of agri-food technologies. It invested 3 million TL in ForFarming, which offers accessible and smart solutions to increase the efficiency and quality of producers' production with SaaS solutions. Wastespresso, which upcycles coffee waste by using it as raw material for the first time in Türkiye and manages the coffee waste of companies with the micro waste management system it has developed, received an investment of 3 million dollars from the impact investment fund Founder One. Tarlam, which focuses on soilless agriculture technologies, received an investment of 100 thousand dollars from Founder One. Yenir, which focuses on food waste, participated in Founder One's second investment round in 2023 at a valuation of over 5 million dollars.
- **Türkiye Development Fund (TKF):** An investment fund managed by the Development and Investment Bank of Türkiye. TKF aims to support the development of the country by providing capital and structured financing to companies with high growth potential that will contribute to Türkiye's economic growth. The fund invests in technology and innovation-oriented initiatives, innovative and advanced technologies, regional development and projects that will create added value. The TKF's sub-funds include the Technology and Innovation Fund, the Innovative and Advanced Technologies GDP Fund, the Regional Development Fund, and the Development Participation GDP Fund.

These funds aim to support businesses operating in Türkiye's strategic sectors through venture capital and growth capital investments. The Fund participated in the $6 million investment round of Fazla.[30]

Section 3: Social entrepreneur ecosystem in agriculture and food

The social entrepreneurship ecosystem in agriculture and food in Türkiye has demonstrated various success stories through public and international support mechanisms. The innovative projects and business models developed by the initiatives respond to the challenging dynamics of the agriculture and food sector and contribute to the growth of the ecosystem.

We have included the experiences of five prominent startups in Türkiye's agriculture and food sector to share the opportunities they have benefited from and the challenges they have faced: **Doktar Technology, Biftek, Nanomik, Fazla** and **Kybele's Garden.**

Doktar Technology is a Turkish agricultural technology company founded in 2017 in Istanbul and Izmir. The company focuses on providing digital solutions to major agricultural challenges such as resource inefficiency, low crop yields and environmental impact. It leverages artificial intelligence (AI), internet of things (IoT) and big data analytics to enhance precision agriculture and enable farmers to optimize their decisions, reduce costs and increase sustainability.

Doktar's founding purpose is to revolutionize agriculture by making it data driven. Its products help farmers monitor their crops, track pests and provide real-time insights to improve crop yields and resource management. The company initially entered the market with products such as Sprout (agricultural sensor station) and PestTrap (digital pest monitoring system), and later expanded its product range with tools such as Orbit (crop monitoring app) and SoilScanner (digital soil analyzer).

It is one of the social enterprises in Türkiye that has benefited most effectively from public support programs. To date, the company has successfully completed **8 approved R&D projects,** the majority of which were supported by TÜBİTAK. It also continues its activities with the support of institutions such as KOSGEB, Science Parks and Development Agencies. It has also actively benefited from the Ministry of Trade's export supports, and has managed to increase its business capacity.

Currently, Doktar's main goal is to help farmers **transition to more sustainable practices and increase productivity through smart agricultural technologies.** These efforts are in line with

[30] Türkiye Development Fund, 2023

global initiatives such as the EU Green Deal and aim to reduce carbon emissions in the agricultural sector.

Doktar has participated in various projects with major companies such as **Cargill**, supporting them to implement sustainable agricultural practices. Its technology solutions provide farmers with the necessary tools to monitor crop health, optimize input use and improve overall farm management.

In this way, Doktar is pioneering digital transformation in the agricultural sector with its innovative technologies by effectively utilizing public support in Türkiye.

Another example, **Biftek.co**, addresses the environmental and ethical issues associated with traditional meat production. The company addresses issues related to high water use, large land requirements, greenhouse gas emissions and antibiotic use in conventional meat production. Its main initial goal was to develop a sustainable and affordable growth media supplement for lab-produced meat. This growth medium was developed as an alternative to the expensive fetal bovine serum traditionally used and offers a more environmentally friendly and economical solution.

Biftek.co's patented product, a microorganism-based growth media supplement, has a formula free of animal products and antibiotics and supports the growth of bovine muscle stem cells, enabling the production of meat in a laboratory environment. The company's main strategy is to supply this patented growth medium to cultured meat production companies and to increase international collaborations in this field.

Currently, Biftek.co's primary goal is to further reduce the costs of cultured meat production and make this technology accessible worldwide. In this way, it aims to respond to the global demand for protein and eliminate the ethical concerns associated with factory farming.

Biftek.co has made significant progress by benefiting from investment and support programs in the US and Canada such as Big Idea Ventures, TRAngels and Cult Food Science. However, in Türkiye, Biftek.co had difficulties in finding a public interlocutor and opening a branch office, which it completed through its own efforts. Although it has not received public support in Türkiye, it aims to become an influential player in cultured meat production thanks to its international collaborations and patented technology.

Nanomik is a social enterprise that was founded in Istanbul in 2014 with zero capital and has since grown with the support of the Ministry of Industry and Technology's

Techno-Entrepreneurship Capital Support (TGSD) and TÜBİTAK. The company develops natural and biotechnological products for agriculture, animal health and food preservation. They first launched Mikoks, a microencapsulated biofungicide that filled an important gap in the agricultural sector. Over time, Nanomik has expanded its product portfolio to offer solutions in different areas such as bio-insecticides and food preservation solutions.

Nanomik is a startup that has managed to grow with the support of various local and foreign investors to develop its R&D activities and advance its technology. The company emphasizes the need for more support in Türkiye, especially for the costly process of license applications in the agricultural sector. In addition, Nanomik was selected for the EU-backed deep technology accelerator program called S3E Charge and aims to accelerate its international growth journey through this program.

Nanomik, which has grown thanks to support from various sources such as the Ministry of Industry and Technology, TÜBİTAK and the Development Fund of Türkiye, aims to bring natural bio-fungicide and insecticide solutions for sustainable agriculture to a wider audience.

Kybele's Garden is a social enterprise that was incorporated in Ankara in November 2021 with TÜBİTAK BİGG support and has been operating in METU Technopark since then. It carries out studies for agriculture, food and cosmetics sectors with algae biotechnology. With the raw materials they obtain from algae, they offer sustainable solutions such as organic fertilizers and derivatives in agriculture, natural dyes in food and cosmetics, vegan protein, vitamins and antioxidants. In this way, it develops projects that reduce carbon footprint with environmentally friendly alternatives.

The company pioneers projects scaled globally with algae-based biophonic agriculture and fermentation technologies and develops cosmetic products in the B2C model under the Biorenda Cosmetics sub-brand. Within the scope of Kybele's Garden project, it has successfully completed process management with more than 100 companies. Although the algae sector is dependent on imported products, it is aimed to reduce this dependency and to achieve export-oriented growth with the domestic products developed.

It secured company capital with TÜBİTAK BİGG and KOSGEB support and received a USD 250,000 pre-seed investment to increase team capacity. The company notes the need to improve regulations, especially for biotechnology companies. In addition, it has established strong relationships with the Investment Office of the Presidency of the Republic of Türkiye and various ministries. In 2023, the initiative increased their visibility on a global scale by entering the FoodTech500 list and was accepted into the LIF Global program.

FAZLA is a social enterprise that launched its first donation operation in Istanbul in 2017 with the aim of finding a solution to food waste, a major problem in the retail sector. The main purpose of the company is to separate the food that is considered as waste in the stores of retail companies due to the proximity of cosmetics and TETT/SKT (Recommended Consumption Date/Expiry Date), but still consumable, and deliver them to those in need within the framework of the food banking law. Initially offering only donation services in Türkiye, Fazla has since expanded its services to include resale, animal feed and recycling. Today, Fazla is expanding its activities by offering donation and resale services in Spain.

Having received an investment from the Türkiye Development Fund in the first quarter of 2023, Fazla has received a total of 10 million dollars worth of investment to date. These investments were provided by angel investors and local and foreign investment firms. In the next investment round, Fazla aims to have strategic discussions with impact-oriented local and foreign investment firms and focus on sustainable projects.

Although Fazla does not benefit from technology centers, it actively engages with the Ministry of Environment, Urbanization and Climate Change and the Ministry of Agriculture and Forestry in public processes. Although the company did not experience difficulties in the first contact in investment processes, it observed that some public support was lacking, but this did not hinder its growth strategies.

Currently, their primary goals are to continue to grow in Türkiye and Spain, and to expand their donation and resale services to Portugal and other countries. Fazla has received support by participating in various local and foreign grant programs and competitions and continues to make a difference in its sector.

Foodback has had the largest agri-food social entrepreneurship ecosystem in Türkiye for 7 years. When the journeys of the entrepreneurs in its network are analysed, it has been observed that TÜBİTAK and KOSGEB supports are of vital importance especially during the product development period of R&D-oriented entrepreneurs. However, it has been observed that these supports are generally limited to the R&D period and are not sufficient for the entrepreneur to create a commercial value.

The experiences of these social enterprises operating in agriculture and food in Türkiye reflect the diversity of the ecosystem and the challenges they face. By leveraging national and international support, these enterprises develop innovative solutions and play an important role in the social economy. Public support should not only be limited to the R&D period but should also play an important role in the commercialization phase of the initiatives.

Public support should not be limited to grants but should become sustainable collaborations. Entrepreneurs who develop projects that are beneficial to public health, develop solutions to the obesity problem, provide democratic access to food for the public or develop projects that will increase the agricultural productivity of our country can work one-to-one with the public. Both the space for the entrepreneurs to develop their business and awareness-raising activities can be developed together.

Chapter 4: Agricultural productivity & entrepreneurship in Türkiye

Organizations operating in the agriculture and food sector in Türkiye face serious problems due to lack of technology, lagging behind the times and difficulties in recruiting talented young people. These problems negatively affect the productivity of the sector and weaken the competitiveness of institutions. So, can we create a win-win solution for all stakeholders by supporting agri-food entrepreneurship with the cooperation of institutions and the public? We consulted Yaşar University Vice Rector Prof. Dr. Yiğit Kazançoğlu on this question.

"Shortcomings in digitalization and transition to modern agricultural techniques limit the ability of institutions to adapt to market demands and global competition. Supporting entrepreneurship as a solution to the problems in the agriculture and food sector can revitalize the sector by paving the way for innovation. In cooperation with the public and private sectors, startups focusing on agricultural technologies can implement innovative production methods, digitalization and sustainable agricultural practices. These initiatives can not only increase efficiency in production, but also offer better quality products at lower costs. In addition, incentives and grant programs to be provided to the entrepreneurship ecosystem can attract young talents to the sector, which can increase the dynamism and competitiveness of the agriculture and food sector.

Supporting entrepreneurship will contribute to the modernization of agriculture and the acceleration of technological transformation in the sector in the long run. A different suggestion that could provide a solution is different cooperation models that can be established between the public sector and universities. Universities can develop new technologies and innovative agricultural practices through sector-oriented research and development activities, while public institutions can provide financial and logistical support to these projects and encourage the transformation of academic knowledge into practical applications. Public-university cooperation, especially in areas such as agricultural technology, sustainable agriculture and digitalization, can close the knowledge and technology gap in the sector. Moreover, solutions developed at universities can be widely implemented by the public sector, and young entrepreneurs can take part in these projects and get involved in the sector. This cooperation will play a key role in modernizing agriculture and increasing the global competitiveness of the food sector.

In this context, Yaşar University has taken a step towards solving the current problems in the agriculture and food sector with the recently established Faculty of Agricultural Sciences and Technologies. The main vision of the faculty is to promote a sustainable, innovative and technology-based transformation in Türkiye's agricultural sector, increasing its competitiveness both nationally and globally. The faculty aims to train future agricultural professionals by combining modern agricultural technologies, sustainable agricultural practices and food safety standards. Strategically, it plays a critical role to produce technological solutions to increase productivity in agricultural production, to promote environmentally friendly and sustainable agricultural practices and to support the entrepreneurship ecosystem in this field. It also aims to strengthen public-university-industry cooperation and serve as a bridge that will enable academic research to produce applicable solutions for the sector. The faculty aims to provide solutions not only to Türkiye's agricultural development but also to global challenges such as food security and climate change.

In addition to the goal of digital transformation, universities have a great role to play in the agri-food ecosystem in terms of entrepreneurship and in increasing the activities carried out with a multiplier effect. In this way, each institution will be able to showcase its own competencies on a common ecosystem ground and stakeholders will be able to produce qualified services and workforce in a quadruple helix structure that will feed each other. Of course, the importance of the community factor that feeds the sustainable and circular understanding in addressing all these factors cannot be denied. Care is taken to feed the agri-food studies carried out within the faculties and administrative units of Yaşar University from the theme of social entrepreneurship. In this context, a structuring was made within our university and the Social Entrepreneurship and Impact Office was established. The aim of the established centre is; to ensure that social entrepreneurship and social impact are clear, understandable and applicable for all stakeholders, to conduct needs analysis studies in the field of social entrepreneurship and social impact by considering regional priorities, to strengthen the capacities of existing institutions in the field according to the identified needs, to provide consultancy for social enterprises to carry out studies with high positive impact, to establish the Aegean Region Social Entrepreneurship Network, to establish the network's connection with other networks in Türkiye and the world, to guide both social enterprises and non-governmental organizations in implementing impact-oriented studies. With the centre, an effective social entrepreneurship map has been created within the agri-food sector. In this context, we collaborated with Izmir Metropolitan Municipality and the Department of Agricultural Services, and categorized the activities planned to be carried out and designed them to support innovation and entrepreneurship.

In summary, if the opportunities in the field of public and private agriculture and food can be well monitored, the technological transformation in the sector can gain momentum by making it possible to support entrepreneurship in the sector in activities that can be carried out with different public-university cooperation models, and it can become easier to solve the problems that are likely to be encountered with planned cooperation models. It will be possible for these cooperation models to create a scenario that provides gains for all parties in the long term in terms of both economic growth and sustainable agricultural practices."

Chapter 5: Agrifood entrepreneurship ecosystem in the world

5.1. Entrepreneurship Ecosystem and Supports

Agri-food entrepreneurs around the world are innovating in many different areas. Some agri-food tech startups target end consumers, farmers and users, while others target producers and other actors in the food supply chain. Agri-tech often includes real-time sensors, seeding or harvesting robots, farmer platforms, apps, media tools and financial instruments. They aim to categorize products for small, medium or large-scale farmers, and to overcome shortcomings of farmers in purchasing, marketing or training. All initiatives that develop new generation food products and production models, create innovations in the supply chain, and provide consumer information are also included in this ecosystem.[31]

Some examples of large-scale initiatives that have received investment in the world are listed below:

Table 1 - Agriculture & Food Startups Who Have Received Investment			
Vertical Farming	AEROFARMS AeroFarms (USA)	SQUARE ROOTS Square Roots (USA)	agro urbana AGRICULTURA VERTICAL AgroUrbana (Chile)

[31] Laurens Klerkx, Pablo Villalobos, "Are AgriFoodTech start-ups the new drivers of food systems transformation? An overview of the state of the art and a research agenda", C. 40, 2024, Global Food Security,

Plant-based Protein	Impossible Foods (USA)	The Vegetarian Butcher(Netherlands)	Those Vegan Cowboys (Netherlands)
	Wild Type Foods (USA)	NotCo (Chile)	

Agricultural Robots	Small Robot Company (United Kingdom)	Pixel Farming Robotics (Netherlands)		SwarmFarm (Australia)
Agricultural Product Technologies	AgroSmart (Brazil)	Hello Tractor (Nigeria)	Agroconsultas (Argentina)	AgroMatch (Chile)

Agri-food technologies are a field that requires data, research and many years of R&D. We can say that there is a serious focus of influence in this field. Increasing awareness of the climate crisis and animal rights has recently led to a growing interest in this field. We observe that many entrepreneurs are trying to create innovation in this field by taking academia or an academic partner with them. Programs such as Team Up[32] in the world stand out as important programs that help the right people come together and produce solutions.

As in Türkiye, we see entrepreneurs emerging from technology and impact-oriented ecosystems around the world. Technoparks, co-working spaces and support venues create a long-term impact by providing physical space and bringing entrepreneurs together with investors and

[32] EIT Food Team Up

potential partners in their field.[33] Universities, government programs, science parks, incubators within large corporations, independent incubators and incubation centres serve startups working in this field on a large scale. For startups that need more agricultural space, such as robotics or fertilizer technologies, test fields are provided through programs such as Test Farms.[34] In these areas, entrepreneurs have the opportunity to test their technologies on the agricultural products of their choice and in the seasons of their choice on a long-term basis.

Apart from incubation centres, events where entrepreneurs come together also play a significant role in accelerating developments in this field. Global networking events are growing very strongly in Switzerland, the Netherlands, the UK and the US. These events not only inform the ecosystem about trends, but also make the countries where they are organized a technology hub in this field. Some of the leading events in the field of agriculture and food entrepreneurship are listed below:

Table 2 - Agriculture & Food Entrepreneurship Events		
FOODHACK	Foodhack	USA, Switzerland
fft future food-tech INNOVATION & INVESTMENT FROM FARM TO FORK	Future Food Tech	USA
World FoodTech Expo 2024	World Food Tech Expo	Korea
AgriFutures evoke AG.	EvokeAg	Australia
WORLD AGRI-TECH INNOVATION SUMMIT London, Sept 30 – Oct 1, 2024	World Agri-Tech Innovation Summit	England

[33] Laurens Klerkx, Pablo Villalobos, "Are AgriFoodTech start-ups the new drivers of food systems transformation? An overview of the state of the art and a research agenda", C. 40, 2024, Global Food Security,
[34] EIT Food Test Farms

AGRI-FOOD TECH EXPO ASIA 2024	Agri Food Tech Expo Asia	Singapore
FARM & FOOD 4.0 INNOVATORS NETWORK	Farm & Food 4.0	Germany

Incubators, accelerators and ecosystem builders also play a critical role in the growth of the global agri-food entrepreneurship ecosystem. These structures accelerate the innovation process by providing entrepreneurs with the resources, mentorship and networks they need at the early stage. While incubators support the maturation of new ideas and the development of business models, acceleration programs help startups overcome the challenges they face during the growth phase. These programs also provide early-stage or idea-stage entrepreneurs with support in many different areas such as company formation, idea development, business plan development, finding the right partners, identifying the right markets, developing marketing strategies, and legal support.[35]

Ecosystem builders bring together stakeholders in the sector, increasing opportunities for collaboration and supporting the overall development of the sector. By providing entrepreneurs with critical services such as financing, training and market access, these programs and structures contribute to increased innovation and sustainability in the agriculture and food sector. They also promote knowledge and experience sharing within the ecosystem, increasing entrepreneurs' chances of success. As a result, incubation and acceleration programs and ecosystem developers make a significant contribution to the growth and strengthening of agriculture and food entrepreneurship on a global scale.

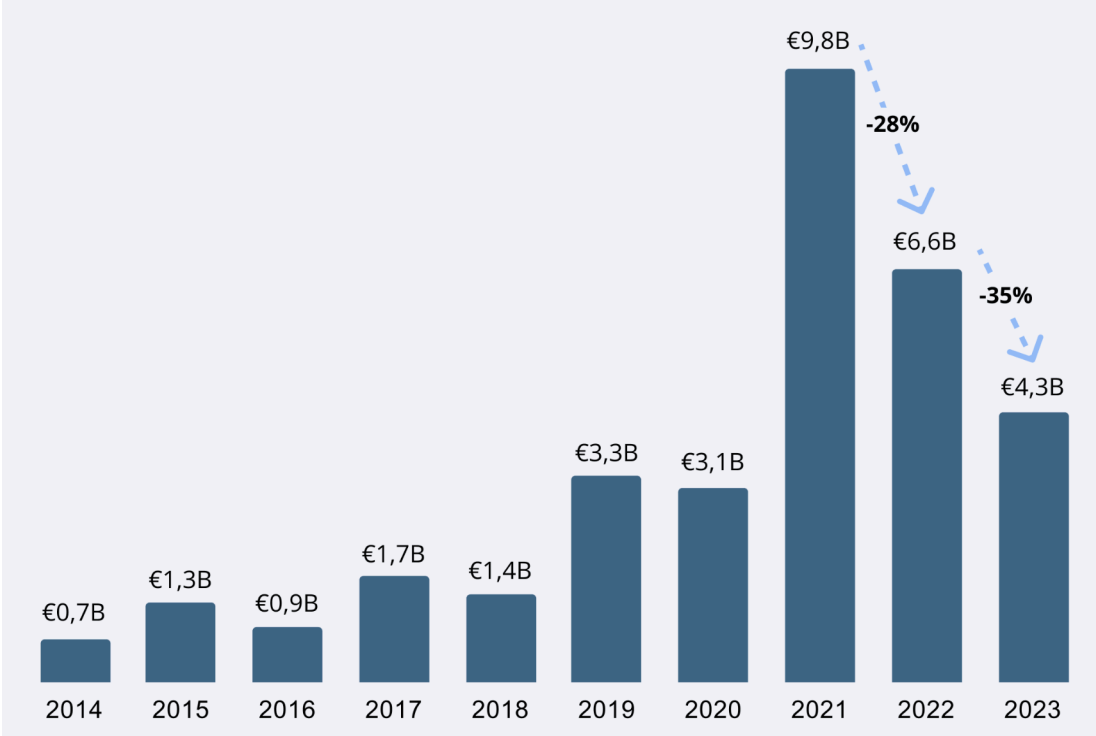
Listed below are some of the most prominent incubators, accelerator programs and ecosystem builders on a global scale:

[35] Laurens Klerkx, Pablo Villalobos, "Are AgriFoodTech start-ups the new drivers of food systems transformation? An overview of the state of the art and a research agenda", C. 40, 2024, Global Food Security,

Table 3 - incubators, accelerator programs and ecosystem builders		
FOUNDER INSTITUTE	Founder Institute	USA
leaps by BAYER	Bayer Leaps	Germany
LELY	Lely Startup Challenge	Netherlands
JOHN DEERE	John Deere Startup Collaborator	USA
BASF	BASF Start-up Science	Germany
Shoots by Syngenta	Shoots by Syngenta	Switzerland
Deloitte.	Deloitte FoodTech Accelerator	Switzerland
MYLKCUBATOR	Pascual Mylkcubator 2.0	Spain
DANONE MANIFESTO VENTURES	Danone Manifesto Ventures	France
Unilever FOUNDRY	The Unilever Foundry	England
Feed & Food Tech Challenge	Nutreco Feed and Food Challenge	Netherlands
CoLab Tech	Mondelez Co-Lab Tech	USA
eit Food	EIT Food	Europe

5.2. Investment Trends

Fig. 2 - Investments in Food Tech Startups in Europe



Change in investments in food tech startups in Europe between 2014 - 2014.
Source: Foodtech in Europe - 2024, DigitalFoodLab

According to the Digital Food Lab[36], sponsored by Nestle, investment levels for food tech entrepreneurs in Europe remain strong, despite factors such as the temporary effects of the pandemic fading and economic uncertainties. This is an indication of the potential of the sector and the capacity of entrepreneurs to develop innovative solutions.

The graph shows the annual distribution of investments in food tech startups in Europe from 2014 to 2023. Investments started with €0.7 billion in 2014 and peaked at €9.8 billion in 2021. The increased interest in food supply technologies during this period, driven by the pandemic, pushed the amount invested in 2021 to an extraordinary level.

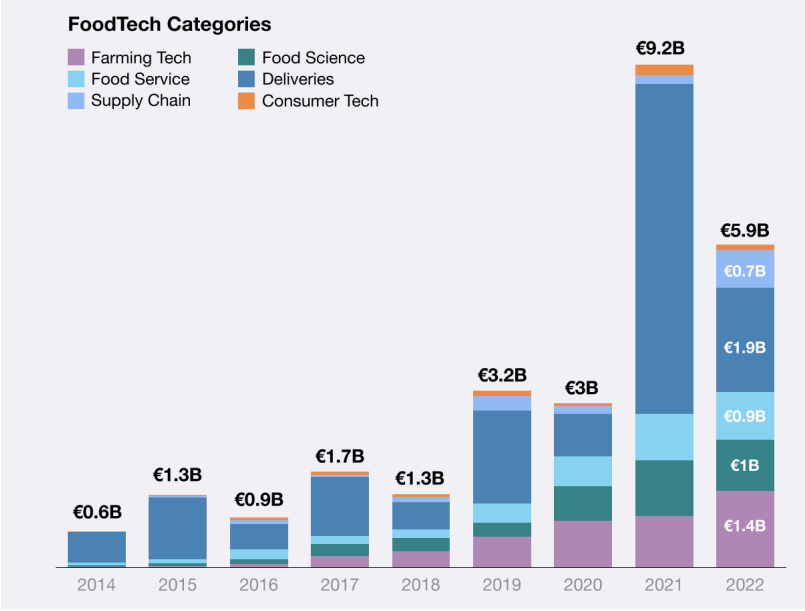
[36] Foodtech in Europe - 2024, DigitalFoodLab

However, in 2022, investments fell by 28% to €6.6 billion, and in 2023, the decline continued, falling by 35% to €4.3 billion. This represents a 56% reduction from the peak in 2021. Despite this, the amount of investment in 2023 is higher than in 2020, suggesting continued growth in the sector in the long term.

Despite the decline in investments, more early-stage startups are on investors' radar. This suggests that investors in the sector are willing to invest in more startups and are confident in their long-term potential. In 2023, the largest investments in Europe were made in the UK, France and Germany. These countries continue to attract the majority of food technology investments in Europe.

The graph below shows the sub-categories under which investments in agriculture and food are distributed between 2014 and 2022. The most invested categories are delivery, agricultural technologies and food science. In 2021, the delivery category reached the highest amount of investment due to the pandemic, but in 2022, this area experienced a major decline. Agri-tech, on the other hand, showed a significant increase in investment in 2022. Food science also attracts consistently high investment. These categories stand out as the areas of most interest and investment in the agriculture and food sector.

Fig. 3 - Investment Trends by Food Tech Categories



Change in investments in food tech startups in Europe between 2014-2014 -Source: Investment, Innovation Hubs & Trends Report on the State of the European Foodtech Ecosystem, DigitalFoodLab, 2023

Section 6: Report conclusion and recommendations

The social entrepreneurship ecosystem in agri-food has become an increasingly important area in Türkiye. The challenges faced by entrepreneurs and their successes demonstrate the diversity and dynamism of this ecosystem. Support from institutions such as TÜBİTAK, KOSGEB, Development Agencies as well as international funds and accelerator programs enable entrepreneurs to develop innovative solutions. However, improving the accessibility of public support and processes is a critical need for further development in this area. Recommendations for the development of social entrepreneurship in agriculture and food are listed below:

1. **Increasing public, institutional and entrepreneurial Collaboration:** New mechanisms should be created for entrepreneurs to collaborate more efficiently with public institutions, especially in projects requiring high R&D. These collaborations can be realized under several headings: investment, spatial support, technology support and recognition. Some of the successful examples we have seen in European countries show us that the public sector can provide great support indirectly or through universities and research centres. Entrepreneurship-oriented growth funding to universities will lead to more laboratory support and research funding in this area, thus creating more resources for R&D. It is also important that the public sector, in cooperation with institutions, directs technical facilities to work with entrepreneurs. In this way, especially early-stage startups will get through the initial growth phases much faster, will use the investment for commercial sustainability, and will not have to allocate additional financing for the technological equipment that institutions will offer them. We can see how important it is to share technical facilities to avoid economic loss and to use the allocated budgets efficiently from the fact that institutions in the UK, the Netherlands and the US market support innovation by establishing their own entrepreneurship programs. These programs have enabled the world's biggest startups to come to life. Organizations also develop innovative food products together with entrepreneurs, providing a competitive advantage.
2. **Supporting early-stage startups with programs and mentors:** It is crucial to support early-stage startups quickly before they fall into the "failure" pool. Startups at this stage usually make slow progress due to lack of team and finance. In particular, we see that innovation and technology-oriented startups go through a long R&D period to reach commercial sustainability. During this time, it is very important for them to work with experienced teams to determine their go-to-market strategies, take their first commercial steps, and create MVPs that can attract investors in their R&D processes. Increasing support for programs such as Empowering Women in Agrifood (EWA), which work with

early-stage innovative entrepreneurs and offer business development support, will enable these startups to survive and grow.

3. **Increasing the number of investment funds focusing on early-stage startups in agrif-food:** We experience that investors shy away from investing in this field due to the long R&D period. However, our research shows that the global trend is shifting towards investors making more but smaller investments in this area. The fact that systems that work on deep technology and believe that its economic contribution will be important for countries after a certain period, which will have a greater long-term impact in the sector, have started to be implemented in countries such as the UK and the Netherlands, sets an example.
4. **Attracting the global ecosystem to Türkiye:** Global programs and funds should be encouraged to attract the vibrant startup and investor ecosystem to Türkiye. Organizing global conferences in Türkiye together with local ecosystem developers will contribute to the recognition of agri-food initiatives and projects. These conferences and fairs are of great importance for not only entrepreneurs but also institutions to benefit from global support and innovation projects.
5. **Attracting global investors:** Promotional activities should be carried out for investors to come together with global investors and invest more in Türkiye. In addition, new investment opportunities should be created in this area by developing different financial models. We see that it is important for global investors to understand the economic picture in Türkiye correctly and be aware of the opportunities here, and that it is important for the financial leaders of Türkiye to come together with global investors and develop solutions together. We have experienced how the EIT Food team in Portugal and the municipality worked together to transform a village into a sustainable agricultural village for investors around the world, creating a very successful testing ground for agricultural entrepreneurs working in the field, and we believe that this example can be applicable to Türkiye.
6. **Technology centres and test fields:** Especially agri-tech startups need to test their technologies with different products in order to grow. They also need to make certain analyses during the growth phase of these products. Technology centres and test areas are very valuable for the product development stages of these initiatives. They both get the chance to test different types of products and collect data over a long period of time.

These recommendations identify the steps that need to be taken to strengthen the social entrepreneurship ecosystem in Türkiye's agri-food sector. Sustainable growth can be achieved through the collaboration of entrepreneurs, public institutions and international actors.