



YAŞAR UNIVERSITY
GRADUATE SCHOOL

MASTER IN BUSINESS ADMINISTRATION THESIS

**THE IMPACT OF AGRICULTURAL COOPERATIVES
ON CIRCULAR ECONOMY AND SUSTAINABILITY IN
THE CONTEXT OF FOOD SUPPLY CHAIN MODELS**

İREM BALCIOĞLU

THESIS ADVISOR: PROF. (PHD) ERHAN ADA

MASTER IN BUSINESS ADMINISTRATION

PRESENTATION DATE: 27.05.2021

BORNOVA / İZMİR
MAY 2021

ABSTRACT

THE IMPACT OF AGRICULTURAL COOPERATIVES ON CIRCULAR ECONOMY AND SUSTAINABILITY IN THE CONTEXT OF FOOD SUPPLY CHAINS

Balciođlu, İrem

MA Proficiency in Business Administration

Advisor: Prof. (PhD) Erhan ADA

May 2021

This study examines the impact of agricultural cooperatives on circular economy and sustainability in the context of food supply chains. The agricultural cooperatives' impact is explored by reviewing the literature and conducting a survey study. According to the 25-question survey study including Yes/No, open-ended and 5-point Likert scale questions made with the participants from 14 agricultural cooperatives, 2 producer unions, 1 agricultural cooperative union and aquaculture cooperatives association, it is found out that agricultural cooperatives do contribute to sustainability and circular economy, however, more awareness, green technology usage and incentives are needed to increase the amount of contribution in the future. In that regard, The Agricoop Supply Chain Model is proposed to help to solve these issues.

Keywords: agricultural cooperatives, producer unions, circular economy, sustainability, food supply chains, agricultural cooperatives union, agricoop supply chain model

ÖZ

TARIMSAL KOOPERATİFLERİN GIDA TEDARİK ZİNCİRLERİ BAĞLAMINDA DÖNGÜSEL EKONOMİ VE SÜRDÜRÜLEBİLİRLİK ÜZERİNE ETKİSİ

Balcıođlu, İrem

Yüksek Lisans Tezi, İngilizce Tezli İşletme Yüksek Lisansı

Danışman: Prof. Dr. Erhan ADA

Mayıs 2021

Bu çalışma, tarımsal kooperatiflerin gıda tedarik zincirleri bağlamında döngüsel ekonomi ve sürdürülebilirlik üzerindeki etkisini incelemektedir. Tarımsal kooperatiflerin bu iki faktör üzerindeki etkisi, literatür taranarak ve anket çalışması yapılarak incelenmiştir. 14 tarım kooperatifi, 2 üretici birliđi, 1 tarım kooperatifleri birliđi ve su ürünleri kooperatifleri birliđinden katılımcılar ile yapılan Evet/Hayır, açık uçlu ve 5 puanlık Likert ölçekli soruların yer aldığı 25 soruluk anket çalışmasına göre; tarım kooperatifleri sürdürülebilirliğe ve döngüsel ekonomiye katkıda bulunmaktadır; ancak gelecekte katkı miktarını artırmak için daha fazla farkındalık, yeşil teknoloji kullanımı ve teşviklere ihtiyaç vardır. Bu kapsamda, bu konuların çözümüne yardımcı olması için bir Tarımsal Kooperatif Tedarik Zinciri Modeli önerilmiştir.

Anahtar Kelimeler: tarım kooperatifleri, üretici birlikleri, döngüsel ekonomi, sürdürülebilirlik, gıda tedarik zincirleri, tarım kooperatifleri birlikleri, tarımsal kooperatif tedarik zinciri modeli

ACKNOWLEDGEMENTS

First of all, I would like to thank my supervisor Prof. (PhD) Erhan Ada for his guidance and patience during this study.

I would like to express my enduring love to my parents, who are always supportive, loving and caring to me in every possible way in my life.

İrem Balciođlu

İzmir, 2021

TEXT OF OATH

I declare and honestly confirm that my study, titled “THE IMPACT OF AGRICULTURAL COOPERATIVES ON CIRCULAR ECONOMY AND SUSTAINABILITY IN THE CONTEXT OF FOOD SUPPLY CHAINS” and presented as a Master’s Thesis, has been written without applying to any assistance inconsistent with scientific ethics and traditions. I declare, to the best of my knowledge and belief, that all content and ideas drawn directly or indirectly from external sources are indicated in the text and listed in the list of references.

İrem Balcıođlu

27.05.2021

TABLE OF CONTEXT

ABSTRACT.....	v
ÖZ.....	vii
ACKNOWLEDGEMENTS.....	ix
TEXT OF OATH.....	xi
LIST OF FIGURES.....	xv
LIST OF TABLES.....	xvi
SYMBOLS AND ABBREVIATIONS.....	xvii
CHAPTER 1 INTRODUCTION.....	1
1.1. The Scope of Cooperatives.....	1
1.2. Formation and Types Of Cooperatives.....	4
1.2.1. Classification of Cooperatives.....	10
1.2.2. Agricultural Cooperatives As Food Supply Chains.....	12
1.3. The Structure and Formation of Agricultural Cooperatives.....	16
1.3.1. Cooperative Unions and Producer Unions as Agricultural Organizations.....	17
CHAPTER 2 CIRCULAR ECONOMY AND SUSTAINABILITY.....	21
2.1. Circular Economy and Its Relation to Sustainability.....	22
2.1.1. Bio-Based Industries and Sustainability.....	24
2.1.2. Carbon-Neutrality and Sustainability.....	25
2.1.3. Green Initiatives, Products and Manufacturing.....	26
2.2. The European Union and Circular Economy Plans.....	28
2.2.1. Management Tools in Circular Economy.....	30
2.2.2. Steps Towards Circular Economy.....	33
2.2.3. The Relation Between Agricultural Cooperatives and CE.....	35
CHAPTER 3 FIELD STUDY (SURVEY) FOR THE ANALYSIS OF IMPACT OF AGRICULTURAL COOPERATIVES ON CE AND SUSTAINABILITY.....	40
3.1. Research Methodology.....	40
3.1.1. Data Collection and Analysis.....	42
3.1.2. Open-Ended Questions Part of 5-Point Likert Scale Questions.....	57

3.1.3. Statistical Analysis	65
3.2. Supply Chain Model Proposal	73
3.2.1. Agricoop Supply Chain Model Proposal	73
3.2.2. Results and Recommendations	78
3.2.3. Challenges in Conducting Field Study	82
CONCLUSIONS AND FUTURE RESEARCH	83
REFERENCES	86
APPENDIX 1 – Survey	98

LIST OF FIGURES

Figure 1.1. The Cooperative Model	19
Figure 3.1. Pie chart for the frequency table of Question 1 (Question 19 in the survey).....	66
Figure 3.2. Pie chart for the frequency table of Question 2 (Question 20 in the survey).....	67
Figure 3.3. Pie chart for the frequency table of Question 3 (Question 21 in the survey).....	68
Figure 3.4. Pie chart for the frequency table of Question 4 (Question 22 in the survey).....	69
Figure 3.5. Pie chart for the frequency table of Question 5 (Question 23 in the survey).....	70
Figure 3.6. Pie chart for the frequency table of Question 6 (Question 24 in the survey).....	71
Figure 3.7. Pie chart for the frequency table of Question 7 (Question 25 in the survey).....	72
Figure 3.8. The Agricoop Supply Chain Model Proposal.....	74

LIST OF TABLES

Table 3.1. Frequency table for Question 1 (Question 19 in the survey).....	65
Table 3.2. Frequency table for Question 2 (Question 20 in the survey).....	66
Table 3.3. Frequency table for Question 3 (Question 21 in the survey).....	67
Table 3.4. Frequency table for Question 4 (Question 22 in the survey).....	69
Table 3.5. Frequency table for Question 5 (Question 23 in the survey).....	70
Table 3.6. Frequency table for Question 6 (Question 24 in the survey).....	71
Table 3.7. Frequency table for Question 7 (Question 25 in the survey).....	72

SYMBOLS AND ABBREVIATIONS

ABBREVIATIONS:

ICA: International Co-operative Alliance

UNSG: UN Secretary-General

ESRC: Economic and Social Research Council

OPD: Common Market Organization

CE Circular Economy

CES: Circular Economy System

CSA: Community Supported Agriculture

NCDC: Nebraska Cooperative Development Center

AFSC: Agri-food Supply Chains

NCUT: National Co-operative Union of Turkey

WTE: Waste to Energy

USDA: US Department of Agriculture

NGCs: New Generation Cooperatives

GHG: Greenhouse Gases

EBRD: European Bank for Reconstruction and Development

TBL: Triple Bottom Line

TMM: Turkey Materials Marketplace

EMAS: The EU Eco-Management and Audit Scheme

BREFs: Best Available Techniques Reference Documents

DAU: Maritime Waste Application

OSGB: Joint Health Security Unit

CHAPTER 1

INTRODUCTION

This paper aims to investigate the role and contribution of agricultural cooperatives to the circular economy and sustainability in the context of food supply chains. Within this light, the pillars of sustainability and circular economy and the EU action plans regarding the transformation of sectors into sustainable and circular working mechanisms are taken into account. Thus, upon consideration of these elements of circular economy and sustainability; a 25 question survey is conducted using a mixed-method involving quantitative and qualitative methods to further analyze the impact of agricultural cooperatives on sustainability and circular economy. For the qualitative part of the survey, a semi-structured interview technique is preferred for understanding the participants' perspectives in a broader view on the subject matters; on the other hand, for the quantitative part, 5 point-Likert scale questions are given to the participants to contribute to the analysis with numerical context involving tables and pie charts. Detailed information involving the full version of the survey is found in the Appendix. As a result of the literature review and the survey, *The Agricoop Supply Chain Model Proposal* (in Figure 3.8.) is given by adapting the existing working structure of cooperatives (Figure 1.1.) to the "Triple Bottom Line" approach in order to build a working structure in line with circular economy and sustainability elements for potentially increasing the existing contribution of agricultural cooperatives to sustainability and circular economy.

1.1. The Scope of Cooperatives

Cooperatives are business models, which are found in the world frequently. There are various classifications and definitions of this business model. Despite the cooperatives known today being formed in recent times, the concept of cooperatives was present in earlier times for creating a force and survival through coming together within the framework of a common goal (Zeuli & Cropp, 2004). The cooperatives are blended into daily life so evenly that everyone has an idea of what cooperatives are and how

they work. Their presence is additionally a result of the support given by municipalities, districts and the governments in the world for forming a union based upon participation, cooperation and solidarity (R.O.T. Environment and Urbanization Ministry, n.d.). As seen from these overviews that the cooperatives are found the most in sectors, where there is a need for mutual assistance, solidarity and cooperation. There are various cooperative types regarding the primary sector of conducting business. One of the biggest and most seen cooperative types is “Agricultural Cooperatives”.

Having an integrated workforce and power have always been essential in agriculture. This is noticeable in history considering the state of the economy depending on the use of the lands and thus farming before the industrialization era. Through working in cooperation following organized duties and a determined plan, the required work can be realized more effectively and at the same time efficiently; furthermore, by having the workforce and the economic power, people in this union, as referred to as cooperatives today, can lead the prices in the market and the sector in general (Cook, 1995; Cotterill, 1987; Sexton, 1990; Staatz, 1987). As evident from numerous examples in the world, individuals and/or groups, who got the control through influencing people in the same beliefs and/or due to their economic advantage, can direct and shape the market and sector as they desire. Moreover, with an adamant workforce and enough capital, the required work can get accomplished in less amount of time, and the tasks, which were not accomplished due to the high cost and/or the absence of enough labor force, can be concluded successfully in a cost-efficient and effective manner with less labor force.

Within this perspective, the term “Producer Unions” comes into perspective. Producer Unions have aims such as ensuring the development of agricultural production, guiding the producers in technical and economic terms, providing all kinds of agricultural inputs to the producers, protecting the rights of the producers, conducting necessary researches, and performing farmers’ training and extension services (Karamürsel et al., 2008). Producer Unions are organizations formed by the farmers engaged in all kinds of plant and animal production by coming together around product and product groups. Producer Unions have an important place in the organization and support of producers, especially in western countries, and they continue their activities successfully from past to present (Karamürsel et al., 2008). Producers come together to establish cooperatives and unions to protect their common interests, to carry out

their activities in mutual aid and solidarity, in other words, to provide affordable input before the season, to evaluate the products they produce most appropriately and to provide the financing they need (Cenkış, 2008).

Cooperatives also establish unions to become stronger, protect their common interests, coordinate their work and benefit from economies of scale (Cenkış, 2008). Supra-unit cooperatives have developed in all countries where cooperatives have developed. Just as it is beneficial for individuals to act together in cooperatives; cooperatives act together and as a consequence, cooperatives benefit from acting together. For this reason, the cooperative movement in a country can only be established with the formation of supra-scientific cooperatives. For instance, there were many units of agricultural cooperatives in Sweden before 1930; however, only in 1930 and later on, with the establishment of central unions of various agricultural cooperatives, have the agricultural cooperatives become a movement in Sweden and reached their present level of development. In all countries where cooperatives have developed, unit cooperatives have needed higher organization among themselves at various levels. In these countries, it is only thanks to this federative organization that cooperatives can fight big middlemen, loan sharks and industrialists across the country and around the world and eventually can gain the opportunity to be useful (Mülayim, n.d.).

Both cooperatives and unions have a crucial impact on the business world. Nowadays, with a constantly changing environment, the rates of unemployment are increasing and employed workers are feeling unsatisfied and under-represented in their jobs when they work alone. Cooperatives and unions provide a feeling of trust by being a viable and strong formation that producers can rely on to reach their goals. “For over 160 years now, cooperatives have been an effective way for people to exert control over their economic livelihoods. They provide a unique tool for achieving one or more economic goals in an increasingly competitive global economy. As governments around the world cut services and withdraw from regulating markets, cooperatives are being considered useful mechanisms to manage risk for members in Agricultural or other similar cooperatives, help salary/wage earners save for the future through a soft-felt monthly contribution that is deducted from the source, own what might be difficult for individuals to own by their efforts, strengthen the communities in which they operate through job provision and payment of local taxes.” (Bello Dogarawa, 2005, p.1). In doing so, cooperatives help the community economically as well (Bello

Dogarawa, 2005, p.1). With content producers, the efficiency increases and so does the economy in general.

1.2. Formation and Types of Cooperatives

The term “cooperative” is extensively known in daily life. However, its definition differs according to the background, sector and market. In Turkey, according to the definition of R.O.T. Environment and Urbanization Ministry (n.d.), cooperatives are economic entities that are established with the aim of fulfilling the needs of people with cooperation and protect the benefits of the members and shareholders. Cooperatives are legal entities that exist with the purpose of fulfilling the needs and requirements of people with solidarity and cooperation with the minimum cost possible. Cooperatives not only provide people with the collaboration they need in order to carry their business that they couldn’t have done individually and but also contribute to the development of the society (R.O.T. Environment and Urbanization Ministry, n.d.). According to Law No. 1163 on Cooperatives published on the official gazette of Turkey in 1969, cooperatives are defined as having a legal personality based on partnership including capital partnership established by real and legal persons to provide and protect certain economic interests of their partners and especially their needs related to their professions and livelihoods through mutual assistance, solidarity and guaranty with their labor and monetary contributions (Resmi Gazete, 1969). As understood from this cooperative definition, their advantage lies in providing and organizing the work to be accomplished within a union, when, otherwise, it would be inefficient and ineffective to finish the job individually.

The cooperatives’ history demonstrates that people around the different parts of the world have been uniting for achieving a common and determined goal. Even in the earlier periods, prehistorical times, this tendency was evident in coming and working together for food gathering and hunting instead of everyone focusing and fulfilling their own needs independently (Zeuli & Cropp, 2004). Nonetheless, the cooperatives’ history known presently was shaped closer to this century. In this light, the earliest times, when the cooperatives were shaped to their basic structure was the 17th-18th era in North America and Europe, whereas the business model we are familiar with today was pioneered by the “Rochdale Society” in the 19th era by starting the movement of the “contemporary cooperative model” (Zeuli & Cropp, 2004). From that

time, for encouraging cooperative formation; governments have been providing conveniences and incentives in order to popularize them. These incentives have been especially detected in England when the founders of the cooperatives codified and brought together guidelines and principles to encourage new laws regarding cooperatives to accelerate their development in early periods (Zeuli & Cropp, 2004). This effort was successful since now it is possible to see cooperatives almost all over the world. The development of cooperatives in the modern sense in Turkey took place in the Republic period. Since long before the proclamation of the Republic, Atatürk, who have shown great interest in the cooperative structure, made a great effort in both forming the cooperative idea and taking action since 1920 by submitting the draft Cooperative Company law to the Parliament with his signature as President of the Assembly in order to spread and empower cooperatives (Hacısüleyman & Gülbahar, 2019). In the first years of the Republic, great importance was attached to the cooperative movement, and it was accepted that cooperatives were a necessary and useful form of organization for producers and laws were enacted in this direction (İnan, 2008).

There are distinctive definitions of cooperatives is and what it involves. Because there are various definitions, there is not one explicit definition, which is accepted by the whole world. Nonetheless, ICA's ("International Co-operative Alliance") definition has been widely accepted by the cooperative leaders around the world by virtue of the ICA's influence due to having members from organizations throughout the world; in that regard, ICA can be considered as an authority for determining the scopes, values and principles of the cooperatives. ICA underlines the definition of cooperatives as associations found by persons who come together voluntarily to work towards their joint cultural, social and economic needs in a democratic manner (1995).

In this regard, by this definition itself, it is evident that cooperatives trigger cooperation within their members while focusing on common goals. As the UN Secretary-General (UNSG), (2009) report of 2009 advocates the idea that cooperatives are meant to be self-governing and lead democratically in order to focus on environmental, social and economic related goals. Furthermore, they support and lead towards social integration and cooperation among its members. The principles of cooperatives established by the ICA Commission published in 1966 (Lambert, 1966) prepare a base for the UN

report aforementioned in signifying the main characteristics of an effective cooperative ("Cooperative identity, values & principles | ICA", n.d.):

- **Open membership.** This characteristic underlines that all members should become a member voluntarily; all persons should be able to become members when desired and the services should be used with no restrictions by any members.
- **Democratic organization.** This characteristic signifies that the power of the cooperative should stay among members. Members should have equal rights regarding participation in taking decisions and voting without focusing or giving regard to the size of their shares.
- **The distribution of savings or surplus to members in line with the transactions.** This characteristic shows that even though making profits is not the main target, since cooperatives are business enterprises, the surplus income should be distributed to its members.
- **Provision of education and maintaining cooperation among cooperatives.** This characteristic explains the need for education regarding new tools and technics to do business and to cooperate with different cooperatives in order to expand the culture of cooperatives and to facilitate the workload without depending on external forces & stakeholders.

The 4th characteristic is especially visible in Turkish Cooperative law no 1163, where mutual assistance and solidarity is the key for cooperatives (1969). In order to have mutual assistance from members and uniting for a common goal, it is necessary to feel the connection to work for the same goal as other members in the cooperative. Therefore, because it is voluntarily done, it is possible to leave it when wanted. This freedom is what differentiates the cooperative from other business models.

According to the definition of the US Department of Agriculture (USDA) in 1987, there are primary principles regarding cooperatives, which are ownership and control of the user and distributing the benefits in a proportional manner (Dunn, 1987; Zeuli & Cropp, 2004). In Accordance with the definition of USDA (1987), Zeuli and Cropp explain that the first principle signifies the contribution of the cooperative members to the financing of the cooperative, thus owning it (2004). In their article called “Cooperatives: Principles and Practices in the 21st Century”, Zeuli and Cropp explain

the principles respectively. In that regard, for the first principle, members are required to contribute and provide for the cooperative's capital; this contribution should be proportioned to the patronage provided by the member in the cooperative. This financing structure forms ownership of the cooperative jointly. Furthermore, the second principle, which is called the "user-control" signifies the users, in that case, members, who vote to choose the decisions that the cooperative is going to make. Usually, rights regarding voting are linked to the status of being a member, which gives the member to have one voting right regardless of the patronage of the member, however, some countries permit the "proportional voting". In this model of voting, members have different numbers of voting right in relation to the amount of business they transformed into the cooperative one year prior instead of every member having one vote regardless of their transactions to the cooperative; however, there is an up limit to the number of votes a member can gain to prevent the monopolization of the voting and thus management of the cooperative by a small group of members only. The third principle called "benefits' distribution" regarding the basic use, refers that the members of the cooperative should jointly share costs, risks and benefits in proportion to each members' patronage. This proportional sharing should be transparent and feasible. As seen from these three principles, the members come forward as a joint force to make decisions, provide capital and share the outputs of the business activity and thus they are the owner of the business. They operate and unite towards a certain goal. This unison comes alive in the form of solidarity and cooperation, thus where the word "cooperative" derives from (2004). According to Evans and Meade:

"A cooperative is an organization in which those who transact with (i.e. "patronise") the organization also own and formally control the organization, and derive significant benefits from those transactions over and above any financial returns they derive from their investment in the organization" (2006, p.1).

From this context, it is seen that various stakeholders including customers, suppliers, producers etc. can be the owner. Accordingly, that is the reason why there is such an extensive definition of cooperatives involving cooperative types, their main sectors of operation, bargaining activities, marketing, input supply, lobbying, process management and logistics. This definition contains new and traditional models of cooperatives (for instance, NGCs: "New Generation Cooperatives") or hybrid forms

that put a big importance on the return of the investments) (Evans & Meade, 2006). As seen here, there are “significant benefits” of starting a cooperative rather than just a company that serves as a motivator. Numerous researches illustrate the advantages that cooperatives bring, on this subject matter, in comparison with the businesses owned by individuals or investors. In that sense, cooperatives act as organizations that are distinct in their nature, which adequately work on satisfying the society’s needs at an economic and social level by its plurality. In this framework, cooperatives work in a way that supports the communities’ development (Vieta & Lionais, 2015). According to Vieta and Lionais (2015), cooperatives are seen as essential tools at the organizational level to face the failures related to economic and social factors and to rejuvenate and develop communities in the local region in various contexts both regionally and nationally. This is coherent with the advantages behind cooperatives which is the transaction of goods & services in solidarity and mutual advantages of the partners and overall the society. Additionally, according to Majee and Hoyt:

“Cooperatives bring people together to meet a shared need through the operation of a democratically controlled business... and build capital in communities where they are located” (2011, p.50).

As seen from this statement, cooperatives provide capital in the region and overall in the country they are located in. Therefore, it is necessary to point out that they have crucial benefits not only to the society’s economy and thus welfare but also to its development. This showed itself during the economic crisis periods throughout the world in different countries. Examples include the resuscitation of the economy of the Basque region in Spain after the “Second World War”, by “Mondragon Group Cooperatives” (Vieta & Lionais, 2015). Furthermore, another example was the development of India’s economy especially after the independence era by giving importance to the sectors consisting of fishing, agriculture, housing, credit, weaving and so on with its cooperatives (Academic Foundation, 2008). Additionally, as a return to the rearing deindustrialization, Ohio, USA has decided to follow an integrated approach regarding cooperatives in order to contribute to the community development by bringing together the worker cooperatives with institutions to anchor them by using its existing capacity of the workforce in order to form a supportive net of mutual solidarity (“What Then Must We Do?: Straight Talk about the Next American Revolution,” 2013). In addition to creating networks, cooperatives help the economy

of the community especially in hard times due to being seen as models of business that come forward with their stable structure and nature (Vieta & Lionais, 2015). Within that light, it is clear from the examples aforementioned that the level of employment and reliability they give both to the employees and the customers and thus the community have helped holding the economy and the community together. The subjects of “’ How do cooperatives maintain this reliability and stability? What is the “cooperative advantage”” outlined by Spear (2000). According to Spear, the advantage of cooperatives is linked to their following abilities: a) responding to the failures within the market and the state; b) creating trust; c) generating an environment of motivation based on self-help; d) fostering civil society; e) supporting the participation of active stakeholders by working towards the creation of values belonging to the cooperative; f) forming a state of efficacy, effectiveness and efficiency in a social perspective by the externalities in economic and social factors (2000). These values formed within the cooperatives differentiates the cooperatives from the other business models due to the members internalizing more of the cooperatives’ work in comparison with unattached shareholders in other business models. Due to the motivations that are not just formed by earning more money and making profits in return, cooperatives tend to go for locations that an investor-owned company would not choose for not being viable enough. Additionally, cooperatives may prefer their workforce from the marginalized part of the population that are objected to the prejudice of not being productive enough in society (Novkovic, 2006, 2008). The reason behind these choices is the motivation behind the decisions, which is the welfare of the community (Vieta & Lionais, 2015). Thinking about the welfare of the community is what makes the cooperatives successful; in fact, there are various examples in the World that cooperatives with a deeper origin of vision regarding community interest and social welfare successfully continuing their operations and existence. However, there are other benefits of being a member of a cooperative rather than the output of contributing to social welfare. These benefits include lower prices in services and goods, improvement of the services, available varieties of inputs and thus more desired outputs within the market (Zeuli & Cropp, 2004). As seen here, there are social, economic and, at times, political backgrounds that serve as motivation for the start of the cooperatives.

To sum up, for a farmer/producer to join a cooperative; the disadvantages that come with the uncertainty level, local level market existence, competition, cost of

information especially in deserted places with none or limited infrastructure should exceed the advantages of selling his/her products individually. With high disadvantages, farmers most likely decide to come together and cooperate under the roof of a cooperative to diminish these unfortunate circumstances (Abate, 2018).

1.2.1. Classification of Cooperatives

Cooperatives differ in the sense of their business activity that they follow at the primary level. The first classification group is Cooperatives with Agricultural Production, which collectively is the production of food in the land that is owned by the community. The examples can be seen throughout the World, for instance in America (including the USA and countries in South America), Russia, Israel and so on. One of the most unique structures of these cooperatives is “Moshavim and Kibbutzim”, in which Moshavim stands for households that both own the land and make the decisions regarding their productions on their own; whereas Kibbutz signifies the landowner as the community and thus the decisions regarding production, equipment and land are taken in a collective manner (Zeuli & Cropp, 2004). In the case of one of the biggest economies in the world, the USA’s cooperative structure changes in a relative manner due to CSA (“Community Supported Agriculture”). With CSA, producers and the community members collaborate to share their obligations, responsibilities and views for the food production process. These members, which can also be seen as stakeholders, make payment annually for providing the production cost for the next production season and by doing so they get the benefit of acquiring a piece of the food that these farms produce per week during the season of growth (Zeuli & Cropp, 2004).

There are additional benefits in participating and being a member of this community and communities work as such in the world. There are uncertainties in the world, especially in the business sector. By investigating a business, product and service, the investors invest their capital, time and effort in order to get some kind of return from their investment. However, with threats coming from external forces and internal weaknesses that require an insightful analysis to determine, which can be quite costly to perform, the future of the business may not seem so bright and this can put pressure on the investors (which can be the producers, suppliers etc.). As seen from the CSA model, being a part/member of CSA-kind communities and thus cooperatives not only

takes away these pressures to some limit but also ensures the producers, suppliers and/or investors that their efforts will return to them (Zeuli & Cropp, 2004). The agricultural cooperatives will be the main classification that we focus in detail on this article in the upcoming parts, however, for this section, it is necessary to mention other classifications of cooperatives according to their business model that they perform primarily in order to give insight about the different models of cooperatives and their working system for understanding the cooperatives as a whole.

The second classification is for marketing cooperatives. As stated by Zeuli and Cropp (2004), as the “marketing” part of the cooperative shows, their primary focus is to do marketing with the produced products made by their members. In co-oplaw.org (n.d.), the marketing cooperatives are defined as:

“A marketing cooperative, sometimes known as a producer cooperative, allows its members, who produce the same or similar products, to cooperatively market and sell the products. Producer/marketing cooperatives are most commonly found in the agriculture industry; 30 percent of total agricultural production is marketed by co-ops.”

These cooperatives can also work as the cooperatives that bargain for a better status quo to provide to the members. This bargaining generally includes pricing and sales terms. Their bargaining power is visible due to coming together as a force in order to convince the relevant parties to the wanted price set/sales term. It is almost impossible to convince anyone let alone a government-related sector, to do anything individually or in small groups. As seen from daily life, it is required to have the consensus, or in some cases, everybody’s agreement in signatures even for making decisions for an apartment for instance. Then the apartment building manager and his/her teamwork for the discount for work that will be performed in the apartment in order for the residents (can be seen as the members of cooperative) to pay less and determine the terms of payment best suitable for the residents. By coming together and forming a cooperative, people with a common goal can have a voice, in this case in marketing and selling their products adequately.

Moreover, we have the purchasing cooperatives as the third classification of the cooperatives according to their primary sector classification. According to Zeuli and Cropp (2004), they give supplies to the members within the cooperative at competitive prices. For maintaining this, purchasing cooperatives choose to buy in large amount of

volumes to have “economies of scale” and to deduct from the overall cost. These cooperatives are favored due to the supplies they bring over involving feed, seed, equipment, petroleum-based products, fertilizers, hardware and building inventories/supplies. In addition to farming, these types of cooperatives can apply to sectors including household, garden equipment, oil etc. Moreover, the products can be sold to independent retailers. From the farmers’ perspective, on the other hand, these products can focus on the production phase and involve inputs such as soil treatments, rodenticides, preservatives, herbicides and fungicides.

Consumer cooperatives are customer-owned cooperatives that are managed in a democratic manner, with the objective of meeting the needs and aims of the members (Euro Coop, 2011). They are a type of purchasing related cooperatives that have served as businesses with the aim of their members to save money. Even though they not only serve the members but to the non-members as well, they put the prices higher for the non-member customers (Zeuli & Cropp, 2004). According to the Nebraska Cooperative Development Center (NCDC), Service cooperatives, as another cooperative type, contribute to meet the need within the community itself. Through service cooperatives, consumers gain the possibility of supplying their needs, negotiating power and distributing their earnings. Their organization allows members to have increased control over their offered services, additionally, housing cooperatives, as a typology of the service cooperative; allow uniquely owning a house by providing the customers with the possibility to separate the costs occurring due to owning a house. People, who want to be homeowners jointly and provide their home to others, come together in the form of an incorporated business. Units within the cooperative are prevented from being sold in order to earn a profit (University of Nebraska-Lincoln, n.d.).

1.2.2. Agricultural Cooperatives as Food Supply Chains

Agriculture is the main need of humanity and plays a crucial role in the economy of countries all over the world. It is one of the irrevocable sectors for humanity. The economy of the majority of countries is based on agriculture. Throughout the world, agriculture is run by small farmers (Dardak, 2015). According to FAO, the number of farms around the world reaches up to 570 million and 90% and more are carried out through families or individuals (2014). Furthermore, when the farming areas are

calculated, it is found out that the majority of the farms around the world are smaller than one hectare; whereas farming areas calculated as 1-2 hectares have 12% and areas with more than 50 hectares of size only take a place of 1% (IIASTS, 2014). The family led farms capture a big part of the overall agricultural land, moreover, they produce the majority of the food supplied around the world with almost 80% (Dardak, 2015).

When talked about agricultural production, various actors come into play and have crucial roles for the chain to work. In this regard, the departments necessary for agricultural production include input supply, production and processing, sales followed by a distribution (Parwez, 2014), which is known as the agricultural or “Food Supply Chain”. By combining the “food supply chain” and agriculture, the term “agri-food supply chains” is used to more specifically involve agricultural processes into the food supply chain structure. According to FAO, “Agrifood chains are the linked events in the agricultural production of food – the process being a chain of events from production to processing, trading, distribution and consumption. Literally ‘from field to fork.’” (n.d.) With its all different form, supply chains become more unpredictable due to ever-changing parameters in business sectors involving availability in raw materials, energy costs and exchange changes in currency (Norrman & Jansson, 2004; Neiger et al., 2007; Christopher and Holweg 2011; Vlajic et al., 2012). The “Agri-food” form of the supply chain (AFSC), which as a supply chain model involves all phases of a supply chain from production to distribution, holds its own susceptibilities by cause of the products’ shelf life and raw materials’ availability and quality (Dani & Deep, 2010). These issues may become more significant in the future based on climate change and weather conditions (Karl, 2009; ESRC Public Policy Seminar, 2012; Allison et al., 2009). Moreover, the world’s population is increasing expeditiously and this increase will become apparent in urban areas due to rapid urbanization (Kastner et al., 2012). On one hand, with the rising population, there will be more demand for food and as more people get wealthier, they will require a diet rich in dairy products, meat and processed foods (Suweis et al., 2015). This situation will put a tremendous burden on resources (Popkin, 1999; Godfray et al., 2010). In that regard, the producers will have to produce more to meet the needs of the population while delivering these products without any disruptions (Stone & Rahimifard, 2018). However, impacts coming from weather conditions, price fluctuations and restrictions in distribution channels will only increase the risk of potential disruptions over time (Morgan, 2016;

McMichael et al., 2007). In that regard, resilience is crucial in preventing disruptions (Stone & Rahimifard, 2018). In order to reach resilience, the AFSC should act as a system itself to actively react to the external and internal disruptions to continue its operations seamlessly (Machado et al., 2011). Acting as a system in that sense is involving the operational units within the system to minimize the dependency on the potential external disruptions and having the competitive advantage to become resilient.

Throughout the operational units of a supply chain, some external stakeholders and intermediaries play significant roles and thus their role directly affects the prices of the products. The intermediaries seem to play the role of a facilitator by taking the products from the producers/farmers and selling and distributing them to final customers/consumers. However, with the increasing number of intermediaries taking place during these processes, the farmers get less money and profit. These intermediaries could include, not limited to, processors, wholesalers of different sizes and retailers and so on. As a result of different traders taking place, the overall price of the product increases, due to increasing margin in each intermediary regarding marketing expenses. Thus, not only farmers/producers earn a little percentage of the end price of the product, but also the final consumer pays a lot more than they would be if bought from the producers directly through cooperatives with minimum to no intermediaries (Dardak, 2015).

Sachan et al., show in the Cooperative Supply Chain Model, the relation among cooperatives, retailers and farmers involving the processes of marketing, storage, processing and procurement. In this supply chain model, intermediaries are omitted and instead the cooperative acts as an intermediary that works for its farmers. By eliminating the intermediaries such as commission agents, traders and wholesalers; the cooperative functions as an intermediary itself among farmers and retailers and shapes the supply chain process (2005). An agricultural supply chain involves input supply, production and processing, sales followed by distribution (Parwez, 2014). In that regard, the input supply, production and processing are realized within the cooperative mechanism through farmers and sold and distributed to retailers (Sachan et al., 2005). Without a cooperative, in a regular supply chain, due to competition, new intermediaries gain control including retailers, shippers, packers and wholesalers. Furthermore, obtaining products from producers and/or shippers directly via large

supermarkets and distributors cause these supermarkets and distributors to come into prominence in this competition and get the most profits as operators due to being large-scaled. This situation causes small producers and farmers to not be able to compete and to settle for lower prices (Manalili, 2003). This lack of competition on producers' side is linked to the following factors: They are not in connection with various markets. The market requires products that have a longer shelf life and appeal to the demands of the customers seasonally since there is a constant demand coming from large scale markets. In order to reach that demand, the producers need to store their food and deliver it fast. Moreover, the product should be in a shape that the customer would want to buy in line with the market demand. Since producers alone are not as empowered to take these entire roles themselves, intermediaries come into play. By eliminating the intermediaries, cooperatives empower producers and let them unite to have a place in the competition from prices to working condition (Manalili, 2003).

Cooperatives around the world have shown their importance in contributing to the development of food security, cooperation and solidarity among members, economic growth and community in general (Dardak, 2015). As food supply chains or more specifically agri-food supply chains, agricultural cooperatives come into prominence with created values and developments including costumers along with producers (Dimitri et al., 2011). Through providing more affordable products to consumers and increasing the earnings of farmers and thus increasing their motivation into producing more products, the agricultural sector is positively affected and grown. As a crucial benefit of working under a cooperative, the agri-food supply chain is not only improved but also become faster in providing services with more quality due to a shorter waiting period in an inventory (Dardak, 2015).

In conclusion, agricultural cooperatives in the context of food supply chains draw apart from traditional supply chain models through eliminating intermediaries; working faster due to shorter waiting periods, which become longer with each intermediary; higher earnings for producers and lower prices for customers, due to not being dependent of intermediaries' determination of prices; higher quality of products with shorter waiting time for inventories; and working under a cooperative structure that creates a force with cooperation within the market.

1.3. The Structure and Formation of Agricultural Cooperatives

Cooperatives are based on the membership of voluntary approach, democracy, the contribution of the members in an equitable way, being autonomous and member-controlled, providing training and education for self-improvement, cooperation, thinking of social welfare and concerning about the community. As a cooperative, agricultural cooperatives not only include all of these characteristics aforementioned but also involve additional characteristics belonging to agricultural cooperatives.

In her article, René Mauget (2008) mentions that the beginning of the agricultural cooperatives, which the fruiterers of the Alps and Jura created in the twelfth century, can be considered as the first companies to be similar to the current agricultural cooperatives. Their purpose of starting a cooperative like structure was to solve the difficulty in communications in the high valleys, the pooling of milk (collection) and the making of cheese with easy conservation qualities (processing and marketing). According to Abate, in a lot of countries that are in their developing stage, farmers are supported by these cooperatives in order to manage their market-related transactions. Because of their collective nature, they are found to be a bargaining power in the market for farmers in order to play the matchmaker that regulates adjustments regarding service and pricing. The agricultural cooperatives become attractive for the potential members due to reducing the cost occurring during the transmission of information and the uncertainty of the market. For eliminating these issues, these cooperatives will organize agreements, which will foster economy-related efficiency through the members' active work towards value allocating, reducing uncertainties and providing rights concerning properties (2018). Moreover, as the "economies of scale" suggests, producing more amount of products will translate into lower cost. Accordingly, agricultural cooperatives seem necessary when the producing size is relatively small and the cost is high as a result. These bring out a monopoly situation that only one company that does the production gets the benefit from (Valentinov & Iliopoulos, 2013). So, farmers and producers choose to create a force that is their own by forming a cooperative (Rhodes, 1983).

Furthermore, in the cases of lacking services and markets, in order to fill the need that farmers feel necessary, the producers/farmers come together via cooperation and create a force together (Karantininis & Zago, 2001; Sykuta & Cook, 2001; Valentinov, 2007). As aforementioned, the existence of risk and uncertainty in the market and the sector

provides a basis for cooperative formation. The members of the cooperative get a price, which is more than the amount they can gain individually for their products, owing to the power of the cooperative coming from bargaining and having a voice in the market (Cook, 1995; Cotterill, 1987; Sexton, 1990; Staatz, 1987). Members also get the benefit from the dividends that are proportioned with their patronage.

1.3.1. Cooperative Unions and Producer Unions as Agricultural Organizations

The countries where the agricultural organization is most common and developed are the European Union countries. In the EU, agricultural organizations have an important place in the formation of policies for the agricultural sector and the implementation of these policies. Approximately 50% of the industry of agriculture industry is run by these organizations (Yılmaz, 2008).

Producer organizations in the EU have been established to adjust the production of the products included in the OPD (“Common Market Organization”) according to the demand in terms of quality and quantity, and to make long-term sales contracts between the producer and the buyer and to act in a way to create cooperation between all segments. The basic duties of the producer organizations, in general, are to ensure balance in the product market, to determine the sales conditions and to ensure that the producer regulates its production according to market conditions. In addition to these, the organizations established by agricultural producers in the EU are also related to activities such as production and marketing, informing the farmer about production and market conditions and protecting their interests. Producer organizations played an active role in environmentally friendly production and marketing, especially in the fruit and vegetable sector (Eraktan, 1997).

In the EU, there are agricultural organizations/cooperative unions that work actively with their members for their members. In that regard, the agricultural organizations that come into prominence within the EU are as follows:

COGECA (General Committee of EU Agricultural Cooperatives): It is the union of cooperatives within the EU. This organization presents and discusses its specific issues in the European Commission, the Council of Ministers, the European Parliament, the Economic and Social Committee and the Regional Committee. COGECA is engaged in the development of relations between cooperatives. It prepares the list of

cooperatives that export and import, conducts studies on cooperatives (taxation, cooperative law, and cooperative education) and organizes symposiums (Subaşı & Uysal, 2018).

COPA (EU Agricultural Organizations Committee): Within the scope of Copa, there are various organizations originating in the EU and in other countries of Europe involving Turkey, Iceland, Switzerland and Norway (Copa-Codega, n.d.). Among them are many farmer organizations such as chambers of agriculture, trade unions, farmers' unions and even cooperatives. COPA is the developer and advocate of the multifunctional and sustainable European Agricultural Model. COPA is represented on the European Commission. COPA holds meetings with commission members to discuss market patterns and annual product prices (Subaşı & Uysal, 2018).

CEJA (European Young Farmers Council): There are member national organizations around the EU within the scope of CEJA and it represents young farmers within Europe (Ceja, n.d.). CEJA regularly participates in agricultural committees of the European Commission. The main objectives are to be effective in the development of rural areas and agriculture in Europe, to improve the conditions of young farmers, to provide communication, to inform the society about the role of agriculture with training (Köroğlu, 2003).

National Co-operative Union Of Turkey” (NCUT): In the National Co-operative Union Of Turkey, cooperatives found within this umbrella organization are divided into their active economic sectors, including rural development, housing, transport, agriculture, and forestry (Duguid et al., 2015).

As a sum up, Cooperative Unions consist of cooperatives that come together to create a bigger force to work with their members for their members. In order to compete in the market and have a say in the agriculture-related decisions, it is crucial for producers to unite as cooperatives and cooperatives as umbrella cooperatives.

It is possible to group agricultural organizations into three groups in Turkey. The most important of these, and the first thing that comes to mind when farmers' organizations are mentioned, are organizations in the form of cooperatives:

- Agricultural Development, Irrigation, Aquaculture and Beet Growers cooperatives established in rural areas according to the Cooperatives Law numbered 1163.

- The Agricultural Credit Cooperatives and their higher units established according to the law numbered 1581.
- It is possible to add Agricultural Sales Cooperatives and Associations associated with the Ministry of Industry and Trade with the law numbered 4572.

Another important agricultural organization is the Chambers of Agriculture, which is one of the farmers' professional organizations. (Subaşı & Uysal, 2018).

Producer unions, found in the 3rd group, are organizations formed by the farmers engaged in crop and animal production in product and product groups. Producer associations have entered into force as of June 2004 with the law numbered 5200 (Turkish Law) to ensure the development of agricultural production, to guide the producers in technical and economic terms, to ensure the supply of all kinds of agricultural inputs to the producers, to protect the rights of the producers, to carry out the necessary researches, to perform farmer training and marketing services (Subaşı & Uysal, 2018). The purpose of the agricultural producer's union is to plan the production according to the demand, to improve the product quality, to dispatch products in accordance with the current norms and standards to the market, to take measures to increase the marketing power of the products on a national and international scale. They can be expressed as the gathering of agricultural producers based on product or product group (Aydoğan & Yulafçı, 2013).

The organizational model of a cooperative's existing structure is shown in Figure 1.1.

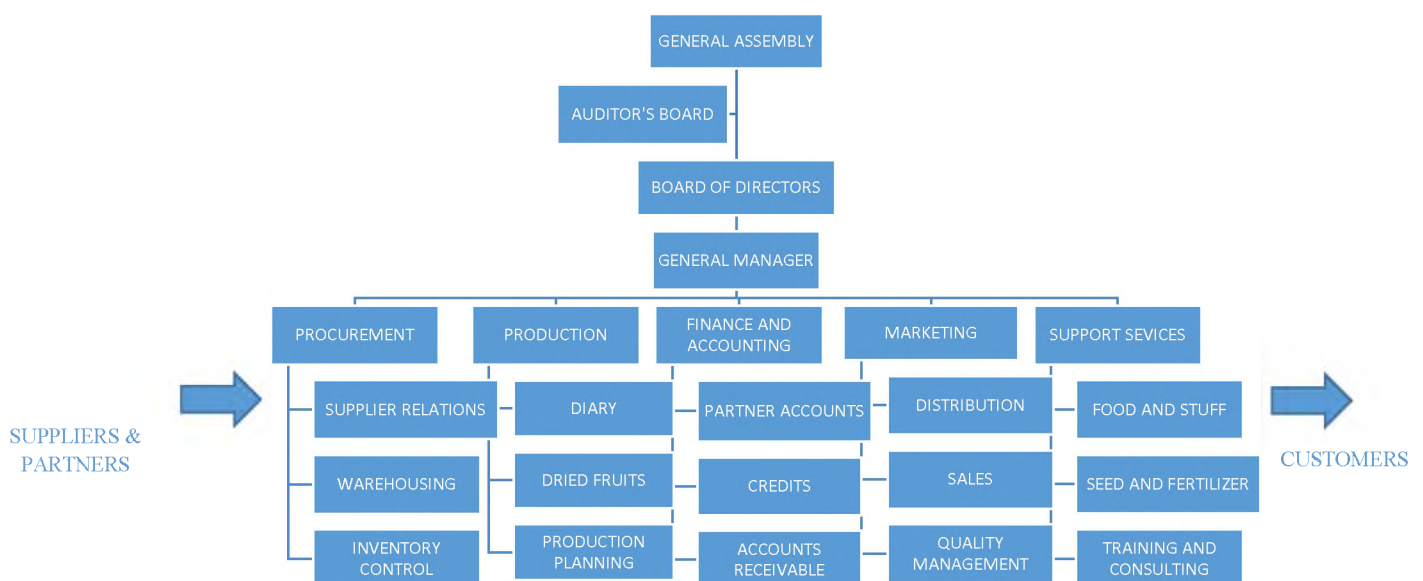


Figure 1.1. The Cooperative Model

In Figure 1.1., *The Cooperative Model* shows the already existing model in cooperatives' working structure in a more detailed manner. In the model, it is seen that there are five main operation phases. Firstly, the cooperative model starts with the partners' demands and suppliers' involvement in the cooperative. The procurement phase starts with buying raw materials, products and necessary items for production from suppliers and partners. In that regard, the relation among partners is the key in making these transactions. Furthermore, the storing of the materials procured and regular inventory controls come into prominence to be able to start producing on demand. For the second part, the production phase is initiated. There can be varieties of products to be produced within the cooperative from dairy to dry fruits. In that regard, production planning comes into prominence to effectively regulate and manage the production phase. Financing and accounting are crucial for the cooperative. Partners' accounts, their contribution, play an irrevocable role in maintaining the working structure of the cooperative seamlessly. Credits and accounts receivable come into play when additional financing is required. For the distribution and marketing phase; distribution of the products, their sales and quality control are vital to reach the customer and create a demand in return. In the support phase, the cooperative can support its partners in various ways including giving seeds and fertilizers as input supply support from more affordable prices, providing food aids and training and consulting regarding equipment usage, new technologies and marketing to its partners. The model involves customers at the end, and also at the beginning due to customers creating a demand for the cooperative to keep working.

As seen above, this model shows the already existing structure of the Cooperatives. Every phase follows the previous phase, as suppliers and partners and customers being vital parts of the structure. As a sum up, through involving the operational units of a supply chain internally through minimizing the intermediaries, agricultural cooperatives become more resilient towards external threats and have a voice in the competition.

CHAPTER 2

CIRCULAR ECONOMY AND SUSTAINABILITY

Sustainability is a concept that is highly visible in every aspect of life. There are various definitions regarding what it entails. In that regard, it can be briefly defined as meeting the desired needs without preventing future generations to do the same (World Commission, 1987). To achieve this, it is necessary to protect natural, economic and social resources. In addition to its link with the environment; sustainability is directly linked to economic development and social equity. The term itself has its roots in conservationism, social justice and internationalism as well as related movements in history. By bringing these ideas together, the term “sustainable development” has come into prominence towards the 21st century (Mcgill University, n.d.). It is defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987, p. 43). With the raise of this concept, sectors and businesses around the world are finding ways towards transforming their working structure into a sustainable one; thus increasing their contribution to sustainable development. In that regard, the concept of the circular economy comes into prominence for its direct relation to sustainability and sustainable development.

The circular economy, on the other hand, is a relatively new concept that has emerged around the 90s opposing the traditional economic approach (Fraccascia et al., 2019). It is built on the concepts of the supply chain that are based on a circular approach and sustainability. This approach involves reusing and recycling of the waste, providing a longer life period for products through repairing and remarketing, forming platforms for sharing information and reducing the information cost, sharing items for reuse and providing rentals to transform products into services (BCSD Turkey, n.d.). As seen here, the usage of sources and waste comes into prominence when talked about circular economy and sustainability. There are different applications and approaches around the world for transforming into a circular economy from a traditional one, which does not cover the use of waste or natural resources more than once.

Within the light of these definitions, the elements and pillars of the circular economy concept will be explained in detail through its relation with sustainability, established action plans and management tools in order to have a holistic view of what the concept entails.

2.1. Circular Economy and Its Relation to Sustainability

The CE (“Circular Economy”) has emerged as being an alternative model for the “linear economy model” in which the model was based upon the “taking, making and disposing of” approach respectively. The approach has come to prominence in order to provide a development that is sustainable, which includes stages such as reducing the usage of resources within nature, disposed wastes within the landfills and emitted gases (mostly greenhouse) released to the atmosphere by slowing down and closing up the resource-related cycles (by repairing, recycling, remanufacturing, maintenance etc.) (Fraccascia et al., 2019). From the start of the introduction of circular economy (Pearce & Turner, 1990), the circular economy concept has been found extremely useful and attractive due to its innovative outlook on the environment and industry and their relationship and its firm perspective on sustainability on a long-term level regarding processes including consumption and production. In recent years, it is described as: “an economic system that replaces the ‘end-of-life’ concept with reducing, alternatively reusing, recycling, and recovering materials in production, distribution and consumption processes” (Kirchherr, Reike & Hekkert, 2017, p.229). The advantages of CE include reducing the energy that is wasted, increasing the usage of resources within nature and providing a more defined control regarding the impacts consumption and production processes have on the environment (Marra, Mazzocchitti & Sarra, 2018). Various benefits come with adapting CES (“Circular Economy System”). According to Ayres (1989), the processes within the industries should be just like cycles within nature in order to support processes with regenerative quality and augment the effectiveness and efficiency of production and by-products. The resources within nature should be reused again in the industrial processes in a circular approach as mentioned by William and Braungart (2002).

Furthermore, when looked at the literature for further studies regarding the new concept that has emerged to the economy’s long-lasting need of using the waste and maintaining a sustainable environment by adapting a circular approach within the

industries, it has been found that there are 3 levels involved to define an approach to CE. These levels are “micro, meso and macro” (Marra, Mazzocchitti & Sarra, 2018). In that regard, micro signifies an individual level, whereas macro involves the meso systems’ population-related structure (Dopfer et al., 2004). These levels are mentioned to show the level of commitment and transition necessary from the outdated economies to a circular one from the smallest level to the broadest.

In a cooperative sense, one of the most important factors in maintaining sustainability is not only through social welfare, community and economy but also through providing sustainability at the product level (Marcis et al., 2018). In order to achieve the system of the circular economy, there are different ways and approaches found and continued being researched. According to Shu-Yuan Pan et al., WTE (“Waste-to-energy”), addresses the issues in the way of achieving CES including the demand for energy, managing the waste and emissions of GHG (“Green House Gases”) (Pan et. al., 2015). In that context, it can be pointed out that, CES is formed on the foundations of both creating an economy that is prosperous and sustaining an environment connected to nature and health (Tukker, 2015). To diminish the issues regarding the environment and the scarcity of resources, the environment and economy should have a relationship in a circular motion (Pan et. al., 2015). Furthermore, the foundations of CES must be on Reuse, Recycling, Reclamation, Recovery and Reduction (Principles of 5R) (Ellen Macarthur Foundation, 2012). In Turkey, BCSD Turkey provides a platform for the circulation of materials that consist of raw materials, which are for secondary usage within industries, as a part of the circular economy approach on reuse. The project called “Turkey Materials Marketplace” is conducted by BCSD Turkey. It is financed under the program called “Near Zero Waste”, which is a supporter of the EBRD (European Bank for Reconstruction and Development) projects regarding reducing the waste that is produced. By providing a digital platform for materials to circulate within the industries, TMM (“Turkey Materials Marketplace”) focuses on changing the traditional approach towards waste and recycling. Its platform organizes meetings and activities two times within a year and thus comes into prominence by being the most comprehensive network contributing to circular economy regarding the ecosystem and enriching the perspectives of its stakeholders in this subject within Turkey.

The circular economy theory provides the most useful operational model to realize sustainability objectives. In that regard, analyzing what circular economy entails

would only be complete by further looking at the elements of sustainability. For sustainability, there are many methods, tools and industrial practices such as; bio-based industries; carbon-neutrality; green initiatives, products and manufacturing; and plans and management tools for circular economy practices.

2.1.1. Bio-based Industries and Sustainability

In the subject of managing and reducing waste, bio-based products come into mind. Products, which are bio-based, are fully or partly originate from materials that have a biological origin. In that product group, fossil resources are excluded. There are varieties of sectors that use bio-based materials and products. In that regard, the EU has committed to the usage of bio-based materials and products to achieve sustainable development and a circular economy. Since these products are originated from raw materials, which are renewable rather than fossilized, they help to reduce the carbon dioxide level in the atmosphere and lower pollution due to reduced toxicity attributed to products of renewable resource characteristics; such as plastic materials that are biodegradable (European Commission, n.d.).

In the quest of searching for an alternative to fossil fuels, renewable resources come into prominence due to being available inexhaustibly, having the demand in the sectors to reduce greenhouse gases produced and maintaining carbon neutrality (Dam et.al. 2005). Around the world, governments are acknowledging the need to form a community and economy that are bio-based (e.g. USDA, 2000; Clinton, 2000 report), which are dependent on creating and maintaining a sustainable economy, society and development through the usage of renewable energy and products. In making a policy regarding this objective, the undeniable way is to promote and support sustainable sectors depending on “vegetable raw materials”. Agriculture based raw materials have been used in industries for a long time. People were using resources from plants for meeting their need for shelter, clothing, energy, equipment and tools and medicine (Spelman, 1994; Hardy, 2002). However, especially after the Industrial Evolution, fossil fuel consumption and “nonagricultural raw material usage” become prominent in the industries. From an economic perspective, in today’s world, because of the high cost coming from land use, investments and labor; vegetable-based raw materials seem limited. Due to how competitive industries today, focusing on agriculture would require competing for land with nature development, transport, recreation, spaces to

live etc. In order to overcome this and support agricultural and bio-based products, various parties must work together involving chemical industries, consumer organizations, governments, and agricultural sector, etc. In that regard, it is crucial and much needed to identify reliable raw products that are based on biomass to converse into products to substitute the use of fossil-based resources (Dam et.al. 2005). By supporting a bio-based economical structure, with the increasing population and thus increasing demand for energy, food, and raw material; a bio-based economical structure could be seen more frequently in the future (Shell Int., 2001; Clinton, 2000 Report).

Bio-based raw materials must be supported in the marketing phase as much as in the production phase. To achieve this, it is necessary to integrate various links to production processes and already established food product businesses and markets. The most prominent links to be integrated include adding value to the by-products, wastes and residues. In that regard, according to Dam et.al, “According to the principles of whole crop utilization and integrated plant conversion, residues coming from food production and processing can be valorized by various scenarios into fuel or by bio-cascading or bio-refining into raw materials for chemical industries” (2005). As understood from this statement, residues from producing and processing the food can be used in other industries. This not only reduces the waste amount and contributes to the waste management through using “vegetable-based raw materials”, but also contributes to a circular economy and thus sustainability.

2.1.2. Carbon-neutrality and Sustainability

One of the most prominent issues of the 21st century is undeniably climate change. Mitigating the effects of climate change would be a crucial challenge for future generations (Scrase et al., 2009). This problem is not only global but local. The biggest reason behind greenhouse gases is the emissions accumulated in the world’s atmosphere, including emissions coming from forestry, industries, waste at the local and global level and agriculture (Wilbanks & Kates, 1999; Bai, 2007; Bulkeley, 2013). In that regard, carbon neutrality comes into perspective on the subject of reducing emissions. Carbon neutrality shows the existing balance between the emitted carbon and absorbed carbon. The term “Carbon sequestration” shows the cycle of removing the carbon oxide found in the atmosphere and later on storing it (European Parliament,

2019). Carbon footprint is the total GHG involving methane and carbon dioxide, produced in relation to our operations (The Nature Conservancy, n.d.). In that context, to reduce our carbon footprint and reach zero emissions (net), GHG should be counteracted by carbon sequestration. The “Net-zero carbon emissions” goal is set by many countries around Europe, involving Hungary, France, Germany, Denmark and Sweden (European Parliament, 2019). To reduce carbon footprint, to achieve “net-zero carbon emissions” and to reach carbon neutrality, carbon offsetting is pursued. Carbon offsetting, in that regard, is related to offsetting emissions coming from one sector by decreasing the emissions in someplace else. This is done through investing in energy efficiency methods, renewable energy, low-carbon methods and technologies etc. (European Parliament, 2019). To sum up, a carbon-neutral state is reached by reducing the carbon footprint and reducing the carbon footprint is directly linked to investing and using renewable energy, low-carbon techniques and pursuing energy efficiency. Through pursuing these methods, the goal of carbon neutrality can be pursued and thus a sustainable development and circular economy at the local and global level can be supported.

2.1.3. Green Initiatives, Products and Manufacturing

During the discussions on the circular economy through the elements of sustainability, it wouldn't be complete without mentioning green initiatives, green products and green manufacturing. There are various green initiatives across the world. Examples include Green Peace as most likely the most famous one. However, there are individual or group efforts and initiatives all around the world involving “Green Wise Blog”, “Green Choices”, “My Zero Waste” etc. Furthermore, there are “Green Schools”, which takes the objective of maintaining, implementing and teaching the sustainability concept to their students. As a part of sustainability, renewable energy including solar energy, green products, reduction of carbon footprint, saving energy, green energy usage, biodiesel, electrical car, solar array, biomass plant, wind turbine, implementation of 3 R's (“Reduce, Reuse, Recycle”), environmental awareness, healthy living, eco-friendliness, disposal systems towards creating less waste and so much more are included in the curriculum of these schools. From the “University of Liverpool”, “London School of Economics”, “Barnes Primary School” to “Christow Community Primary School”, all these schools are working towards achieving sustainability and green production concepts through influencing students with aforementioned subjects

towards creating an aware society in terms of environmental issues (“Top 100 Green Initiatives”, 2018).

Moreover, there are green projects that involve implementing various goals towards reaching sustainability. In that regard, rainforests preservation (Eden Project), land use in accordance with sustainability (Chatham project), products produced regarding sustainability principles, environmentally friendly products, recycled products and vegan products, eco-friendly and eco-ethical brands in fashion and so on are used frequently as goals in projects across the world. In addition to these subjects, illegal activities regarding fishing, hunting, etc., which harms the environment, are targeted to be stopped in some projects. Topics including ethics, energy efficiency, inspiring society to trigger social changes towards a more aware and conscious world, using waste as a resource, organizing locals into creating a more sustainable lifestyle in micro level to macro level reaction, restoring furniture, and selecting products with combined functions and longer durability are involved in projects in order to lead the society and the world towards green production and sustainability (“Top 100 Green Initiatives”, 2018).

When talked about green projects and initiatives, it is crucial to mention the brands that are created with the objective of maintaining a sustainable and green product and production. Their brands come into prominence due to the quality and characteristics that separate them from competitors in the market. Consumers choose to pay for the ideology, ethical production, protection of the environment and sustainability when choosing eco-friendly products (“Top 100 Green Initiatives”, 2018).

In this regard, what is green manufacturing to begin with? According to the European Commission, green manufacturing signifies the process of manufacturing that causes less waste to occur in its production and creates less pollution by making the production phase greener. In this light, using fewer resources including finding and creating different methods to utilize less energy and water in the manufacturing process and manufacturing products that are more durable due to having more replicable parts involves the transition into a greener manufacturing system. In doing so, these products become a part of the circular economy. Since producing products with the aforementioned qualities can be costly in today’s world, especially for lower budget SMEs, The European Commission has come up with support mechanisms and schemes that are within the initiatives of the Commission to make it easier for SMEs’

to transform into green initiatives and entities in general (European Commission, 2018).

2.2. The European Union and Circular Economy Plans

According to the European Union, when providing a circular economy, products' value is used and in-use materials are targeted to be maintained for a period that goes as far as possible. It is aimed to use resources and wastes as little as possible and in the case of a product reaching an end in its life cycle, it is aimed to be used more times, in order to obtain benefits at an economic level, contribute and participate to the innovations taking place and create more jobs. Within this light, the European Union has taken steps to transform its economy into a circular one. In 2015, the European Commission has decided to act on building a circular economy and thus adopted a circular economy action plan. This plan involved actions towards promoting economic growth on a sustainable basis, supporting global competitiveness, and creating new jobs. Moreover, there were 54 measures regarding the product lifecycles in this action plan. (BNP Paribas, 2019). On March 4, 2019, the European Commission accepted a detailed report on the circular economy. This report involved the application of the "Circular Economy Action Plan". The report includes the accomplishments found in the "Action Plan" and underlines the possible issues for the future that needs to be solved in order to achieve a circular economy by taking into consideration minimizing the pressure put into the fresh water and natural resources and the overall economy (European Commission, n.d.).

Why does the European Union give importance to the Circular Economy? On their official website, it is signified that the Circular Economy enhances overall sustainability and the competitive nature of businesses. Additionally, Circular economy;

- Helps to preserve resources involving some that are scarce in finding and affected by fluctuations in their prices;
- Saves money and overall costs in industries;
- Opens new business-related opportunities;
- Creates new jobs that can be low-maintenance and high-skilled (especially for conducting R&D works);

- Supports and contributes to cohesion and social integration;
- Supports efficient resource usage and innovations; and
- Produces and exports products & services that are in the clean category across the world (European Commission, 2020).

Within this regard, the European Union has come up with “Areas of Action” in order to transform its economy into a circular one. For this purpose, in general, measures are determined for businesses, industries, entrepreneurs, SMEs, Cooperatives and other related parties to implement. These measures include products’ design, processing and manufacturing, waste transformation into usable resources, “secondary raw materials” investments, innovations etc. Furthermore, measures are determined for taking action toward specifically mentioned materials and relevant sectors: “Crucial raw materials”, plastics, “Food value chain”, demolition and construction, bio-based production and biomass, and regulations for fertilizers (European Commission, 2014).

For a more sustainable future, The European Commission has prepared an action plan intending to implement principles of sustainability. “A new Circular Economy Action Plan For a cleaner and more competitive Europe” has been established and published in order to create a more sustainable future. To do so, this Action plan shows measures to achieve this goal. As seen here, in order to achieve a circular economy, sustainability plays a crucial and inevitable role. For this reason, for a plan towards achieving a circular economy, sustainability is included as a part of CE. In this regard, the measures include; empowering customers and consumers and also public buyers, making sustainable products, focusing especially on industries that have a big potential of being circular due to high amount of resource usage and waste outcome, ensuring less amount of waste, explaining the circularity concept to societies in order to include them into this processes as cities and regions, and leading efforts in global level towards a circular economy (2020).

In this light, the Action Plans’ insights related to creating a sustainable product according to the sustainability principles are given including making products more durable and open to reusability, improving reparability, working towards diminishing the chemicals that are hazardous in the products, and increasing resource and energy efficiency. Additionally, increasing the content that is recyclable in the product, reducing the environmental footprints and carbon to a minimum, limiting single usage,

grouping products into their sustainability performance and rewarding the ones that are made suitable to sustainability principles are crucial steps in creating and maintaining sustainable products. Enhancing and maintaining circularity, creating an environment that is toxic-free and improving and supporting minimizing the wastes are highly important (2020). As seen from the works carried out by the European Union regarding the circular economy, guidelines are given based on circular economy and sustainability principles to lead the Union towards a circular economy.

2.2.1. Management Tools in Circular Economy

Making an evaluation related to the environmental impact of businesses is crucial in detecting the necessary steps to be taken for enhancing environmental performance. EMAS comes into prominence in this regard. The abbreviation EMAS refers to “The EU Eco-Management and Audit Scheme”. The Commission has developed EMAS as a management instrument regarding companies and organizations to report their performance related to the environment, to provide an evaluation opportunity and to give them means to improve their overall environmental performance. It is open worldwide, to every different kind of organization that desire to improve and enhance environmental-related performance. In this light, it includes the whole service and economic sector as well that can be applied all around the world. EMAS involves three categories, which are performance (environmental performance) related to decreasing the impact the relevant organization has on the environment; credibility related to the independent and external essence of the process of registration verified by the third party; and transparency related to making information available to the public. This can be achieved on an external level by an environmental statement and an internal level by the involvement of employees actively (European Commission, n.d.). This is a tool related to environmental management at a voluntary level. With EMAS, organizations including the ones that have a lower budget like SMEs can have almost identical benefits and access to support mechanisms as organizations that are larger in size and budget, including profiting from using less energy and saving costs from using fewer resources (European Commission, 2018).

EMAS is now seen as a management tool for organizations. This is because by using its objectives, organizations and companies can manage the environment while conducting their businesses. It is published under the “Regulation of the European

Parliament and the Council” and it is promoted within the EU. ISO 14001, on the other hand, comes into prominence as an “integral part” of EMAS. However, EMAS is more comprehensive in the sense that additional and external elements are taken into consideration to make sure that organizations constantly improve and enhance their engagement into maintaining good environmental performance and are being supported throughout this process (Office of the German EMAS Advisory Board, 2014).

Even though EMAS is more comprehensive regarding the environmental management of organizations, ISO 14001 is highly popular and also highly beneficial in leading organizations towards managing their responsibilities for the environment; found in “ISO 14000” family involving standards for environmental management of organizations. ISO 14001 identifies requirements and criteria and shapes a framework for organizations to manage their environmental responsibilities properly and effectively. This certificate can be obtained by organizations around the world regardless of their sector or activity. When obtained, it gives assurance and trust to all related parties that the related organization takes necessary measures to manage its environmental responsibilities and controls its environmental impact for the better. It is a global certificate with established standards that involves 171 countries around the world. ISO 14001 has three editions: ISO 14001:2015, which focuses on improving the environment-related performances by taking into consideration of related standards given; ISO 14004: 2016, which focuses on the general guidelines for the implementation of given standards; and ISO 14005:2019, which focuses on guidelines for phased implementation by maintaining “a flexible approach” (ISO, n.d.). In this light, since ISO 14001 is more popular in the world, there are facilitators for organizations that want to get certified in EMAS but already certified in ISO- 14001, due to both certifications having similar objectives regarding environmental management involving “initial environmental review” to identify the related organization’s environment-related characteristics (European Commission, n.d.).

Furthermore, there are phase tools regarding the production process, for instance, there are currently updated factsheets related to the phase of manufacturing within the circular economy and BREFs, which stands for “Best Available Techniques Reference Documents” so that companies and organizations can follow dedicated documents on the subject matter to have an understanding of what to accomplish in transforming

their entity into a green manufacturing one. In order to achieve this status, there are various steps to be taken from designing a product to using more durable and recyclable replacements in the products in accordance with the sustainability principles. By doing so, the aforementioned companies can and will reach sustainability and contribute to a circular economy (European Commission, 2018).

The European Union is working towards creating a circular economy and achieve sustainability by implementing the “Circular Economy Action Plan”, which was launched in 2015 first and renewed time by time. Today its 54 actions are either being implemented or already been delivered. In this regard, best practices regarding creating a circular economy have been launched to guide the European Commission and organizations towards achieving this target. “The Communication ‘Closing the loop - An EU action plan for the Circular Economy’” identifies the ‘Circular Economy’ as an economical system in which, the resources’, products’ and materials’ value are protected for the maximum capacity and waste generation is as minimized as possible (European Commission, 2015). In that perspective, the Commission has promoted best practices for the management of extractive wastes (EWMPs) for instance. From the “entry in force” of the “Extractive Waste Directive” since 2008, due to 12 years of implementing the best practices, a strong base of knowledge has been established within the EU. Furthermore, studies are being done by the Commission to best identify the best practices. In this context, the “guidance document” is based on 2 critical points as best practices:

- “The prevention or reduction of extractive waste production and its harmfulness;
- The recovery of extractive waste by means of recycling, reusing or reclaiming such waste.” (2019).

Even though this document is not binding from a legal perspective, its objective is to ensure the integration of “Circular Economy Principles” is made into EWMPs and spread the implementation of best practices. This document may seem as focusing on the extractive sectors, however, it is a good example in showing that reducing waste and controlling its generation are vital subjects in ensuring Circular Economy and sustainability in agriculture as well. Moreover, by taking example from the best practices given on this subject based on the established knowledge of practices, it

would be also possible to get more information regarding the best practice examples in other industries through supporting the circular economy approach in all industries.

2.2.2. Steps towards Circular Economy

The European Commission has prepared steps to achieve a circular economy. By starting the circular economy from the product's lifecycle including the design of the product, usage of resources, etc., not only the waste control is maintained and the overuse of resources is prohibited but also new businesses are made available and thus new opportunities for potential employment are created. To be able to maintain a circular economy starting from the manufacturing stage, The Commission has taken and introduced incentives in order to promote innovation towards using more up to date, eco-friendly and sustainable methods and parts starting from the manufacturing phase of the product. In that regard, three categories come into prominence: creating a more efficient design of the product, leading incentives, and improving the process of manufacturing and innovations in industrial processes. For the first category, designing a product by using materials that are durable, recyclable and less resilient to repair is crucial so that the product won't be thrown away and wasted due to not being able to be repaired and renewed. Additionally, by using energy-efficient design in production, not only resources will be used more smartly but also the cost will be reduced significantly in both personal use and commercial use. For the second category, leading incentives are related to producers in order to promote green manufacturing. With contributions made at a financial level, producers that wish to rearrange their manufacturing process towards a circular economy would be supported and convinced towards this goal. For the third category, by using the BREFs mentioned above, the Commission focuses on reducing resource usage and creating less waste in addition to managing them efficiently. This can apply to different sectors in the industry. Last but not least, by creating a symbiosis relationship of industries, the waste level can be dropped down to a minimum by using the waste made by one company in another business input. Moreover, to support innovations in industries, "the Commission supports innovative industrial initiatives under the financing programme Horizon 2020 and through Cohesion Policy funds". (European Commission, n.d.).

"The production phase of the circular economy" requires an effective and innovation-based process structure. By concluding these categories and steps,

consumers, businesses and the environment will gain benefit. For businesses, new business-related opportunities would emerge by using better and innovative designs due to the need for using new and up to date technologies and methods in materials. SMEs can benefit from saving money due to using energy-efficient materials and processes in the long term to invest in different technological developments, which will lead to better savings in the future. From consumers' perspective, due to using more energy-efficient and durable products, the cost related to energy usage will drop significantly and the less resilience towards repair will lead to using the product more than other products in the market, so overall, while the cost related to the usage of the product will drop, and the rate of value decrease of the product due to depreciation will be lower as a result of its durability, repair and recycling options. On the other hand, the environment will benefit from contributing to a circular economy by the mitigation of climate change and protection of the environment for living beings and generations coming by as a whole (European Commission, n.d.).

In addition to being a crucial part of the European Commission's plans towards reaching a circular economy; sustainability and green manufacturing are essential in the line of work of the UN. In that regard, Goal 12, which is found under the "Sustainable Development Goals", gives insights into the production phase of sustainability and green manufacturing and their importance. Goal 12 refers to the importance of the wise usage of water, energy and food that would change the life around the world in terms of life quality of people, mitigating climate change, benefiting the eco-system and preserving resources for future generations by maintaining sustainability and creating a circular economy. Production and consumption are directly related to the use of energy and resources. Within this regard, using infrastructure, making basic services available for need, providing a better life quality and creating new employments are included in these phases as a part of the sustainability principles. By implementing the sustainability principles in these phases; plans regarding development can be achieved; costs related to environmental, social and economic reasons that could occur in the future can be reduced; competitiveness at an economic level can be strengthened and poverty can be diminished (UN, n.d).

The UN underlines the importance of the consumption part in addition to the production part. The consumption part of this goal in addition to production shows the consumer side of the story since the consumption in a material level in addition to the

use of natural resources has increased and continues to do so all over the world. Pollution regarding air, soil and water comes into prominence as being a crucial issue for governments and the planet as an addition to this consumption trend. Sustainability is related to “doing more and better with less”. Therefore, by maintaining sustainability and embracing its principles, resource use can be reduced and thus the problems with overusing energy, water and food can be diminished and as a result, life quality for people and environment can be increased substantially. In order to do so, not only the production stage is crucial since it starts with the product; but also the consumers, who choose to buy products from the market, are needed to be educated on sustainability, on how to make a sustainable consumption and on how to lead a life with the principles of sustainability. It is a never-ending journey that not only includes the manufacturers but also the final consumer. By putting standards, required principles, labels and so much more, it would be easier to cause awareness in the public on an overall sustainable lifestyle from procurement to designing products to consumption (UN, n.d).

According to the “Sustainable Development Goals” determined by the United Nations, subjects involving inequality, environmental degradation, climate change, poverty, justice and peace are taken into consideration in achieving sustainable development around the world. There are 17 goals in total and it is aimed to achieve all of them by 2030 (n.d.). In accordance with these goals, the questions can be shaped to understand the relationship between agricultural cooperatives and sustainability. In that regard, especially Goal 12: “Ensuring sustainable consumption and production patterns” comes into prominence in understanding how the agricultural cooperatives contribute to sustainability and circular economy (UN, n.d.).

2.2.3. The Relation between Agricultural Cooperatives and CE

When both the cooperatives and producers’ unions, and the circular economy principles are taken into account, it is seen that these concepts serve the principles of sustainable products due to their goal and working structure. Circular production as a part of agricultural production involves using raw materials as animal feed and fertilizers, the quality of food components, irrigation and drinking water, reuse of wastes found in the manufacturing process and usage of biofuels during the production process (Rajput & Singh, 2020). As stated by Mojo, Fischer and Degefa (2015), throughout the world, the problems occurring due to the degradation of natural

resources and poverty have become more visible especially in countries that are in their developing state due to their economy depending mostly on agriculture. Therefore, it is generally suggested to the farmers/producers to be organized as an agricultural cooperative in order to become a force and solve problems occurring in the agricultural processes including marketing and production processes (Wanyama et al., 2008).

In that regard, the “Triple Bottom Line Approach” (TBL) comes into prominence. This approach shows three values that a business and/or investment can contribute to. These are “economic, environmental and social values”. This approach involves areas such as planning, real estate, finance and business, which are related to “economic development” (Hammer & Pivo, 2016). It is brought into prominence by John Elkington, who was a business consultant, for describing these three values of an investment that can arise out of a business’ “financial bottom line” in the 90s (Elkington, 2004). “The TBL approach aims to more accurately value assets and leverage resources so that capital is employed as efficiently and effectively as possible” (Hammer & Pivo, 2016, p.1). This approach is also mentioned as the “triple value adding: 3Ps (profit, planet, people)” (Roberts & Cohen, 2002) and “blended value” (Emerson, 2003). Because it involves people and the environment in addition to the profit, this approach is seen to be related to sustainable development; due to considering the upcoming generations’ needs (World Commission on Environment and Development, 1987). This need towards sustainability in businesses has come into prominence due to realizing that the existing patterns related to the development cannot go forward without harming the environment and the people living in it (Hammer & Pivo, 2016).

Even though the main purpose underlined within the agricultural cooperatives, as all business models, is related to economic gains, as expected by the participating members (Barton, 1989), there are benefits that come with organizing a cooperative and/or being a member of it that is not just linked to economic reasons but to non-economical ones due to their relationship with the development in sustainability, welfare and wellbeing of the society, in which factors including environmental, social and economic reasons occur interdependently (Wanyama, 2014). In a sustainable sense, the focus is more on the environment. However, when looked at the causes surrounding the environmental issues existing, it can be seen that their causes are mostly due to

economic reasons including lack of waste management, filter problems at the facilities etc. So, as this interdependence can be seen from this example, by analyzing the economic, environmental and social effects of cooperatives, their impact on sustainability and circular economy can be seen more transparently (Mojo et al., 2015). Upon the consideration of the values created by the cooperatives, their contribution towards sustainability and circular economy can be considered through the TBL approach.

There are different capital types such as human capital and social capital, and cooperatives can directly be in a relationship of cause and/or effect regarding these capital types. Social capital is related to the actions that are taken collectively and the outcomes that can be seen from this collective work including developments in socioeconomic and/or environmental context (Mojo et al., 2015). It is summed up as the completion of norms, social relationships and institutions existing at levels including macro, meso and micro levels (Rudd 2000; World Bank et al., 2002). By increasing the social capital, the sustainability process can be contributed by the virtue of collective action and what it brings (rules and norms to be organized and working in synch), in that regard; risks can be reduced, better access to services can be obtained, information cost can be reduced and collective action can be coordinated more efficiently (World Bank et al., 2002). For example, as stated by Mojo et al., social capital is directly linked to the action that has been taken collectively, which is within the core characteristics of cooperatives, especially in agricultural cooperatives. This is linked to being reliable enough to be trusted by the members and finding a common purpose that increases the performance within the cooperative due to acting as a motivator (2015). Instead of acting selfish and opportunistic, members can unite for a common purpose and thus create an environment of trust (World Bank et al., 2002).

Additionally, the concept of increasing the human capital is directly linked to the education and training that the cooperative provides to its members and workforce and by doing so, the information and knowledge can get accumulated within the cooperative and so does the human capital. This knowledge on the job contributes to the performance and by introducing more environmentally practices through training; the conditions linked to the environment in farming can get better by the training provided by the agricultural cooperatives (Mojo et al., 2015). By learning about the issues and new approaches and working collectively, it is possible to work towards

environmental problems. Since environmental-related problems have not occurred due to just the decision of one person, their solution will not be realized without collaborative work (Rudd, 2000).

Through working together in a united and collective manner and thus creating a social capital towards managing the natural resources more efficiently, protecting the environment and managing the waste, it is only possible to solve the environmental problems and stop the degradation of resources and thus develop sustainability and create a circular economy, in which all the processes work in relation to another and nothing goes unused. By increasing social capital and human capital and thus creating a collective work towards a goal not only provides trust and reliability by reducing uncertainties and risks but also provides a working mechanism, which is based on the circular economy. In that regard, agricultural cooperatives can and will contribute to sustainable development and generalization of the circular economy within the world for a better future if used more frequently.

In that context, by taking into consideration the characteristics of a circular economy and sustainability; there are some qualifiers for organizations, entities, cooperatives, and producer unions to explore in order to determine whether they are contributing to sustainability, green production and circular economy (European Commission, n.d.).

- Preserving resources involving some that are scarce in finding and affected by fluctuations in their prices;
- Saving money and overall costs by preserving resources and managing wastes;
- Saving money and overall costs in industries;
- Creating new jobs that can be low-maintenance and high skilled;
- Supporting and contributing to cohesion and social integration;
- Supporting efficient resource usage and innovations;
- Producing and exporting products and services that are in the clean category across the world;
- Working on increasing the efficiency of resources;
- Taking precautions to reduce carbon footprint;

- Reusing waste in other parts and processes in the cooperative (example: animal faeces as fertilizer in agriculture);
- Recycling wastes;
- Assuring the safety and gaining the best performance from the employees;
- Working with other cooperatives in a national or an international level (industrial symbiosis);
- Reducing pollution in the cooperative;
- Using green technology in the cooperative in tracking the progress of crops and products, mapping resources, irrigation etc.;
- Using bio-based feedstock to feed animals;
- Utilizing by-products;
- Separating wastes (Through a waste separation & collection system within the cooperative; ex: colored bins, waste collection points, product labels etc.);
- Using chemical-free pesticides;
- Following EU directives on circular economy and sustainability;
- Recycling the plastic packages after use;
- Obtaining ISO 14000 and EMAS certification and following their requirements;
- Following best available techniques.

These are the key topics to be considered in analyzing the contribution of agricultural cooperatives to sustainability and circular economy. They are determined through taking into consideration of the circular economy and sustainability elements aforementioned, circular economy action plan of the EU relevant to the agriculture sector and the management tools and best practices in relation to the environmental performances of the organization mentioned in this literature review. Therefore, by taking into consideration these topics, a 25-question survey is prepared, which consists of 3 parts: Y/N questions, open-ended questions and 5-point-Likert scale questions to analyze in detail the contribution of agricultural cooperatives to circular economy and sustainability.

CHAPTER 3

FIELD STUDY (SURVEY) FOR THE ANALYSIS OF IMPACT OF AGRICULTURAL COOPERATIVES ON CE AND SUSTAINABILITY

3.1. Research Methodology

The need and desire to research come into prominence with an interest towards a topic. The process of researching includes defining an objective, collecting, managing and interpreting the data and announcing the discoveries through frameworks by taking into consideration of the provided guidelines (Williams, 2007). By considering the research topic and the factors partaking during the research, researchers may choose different methods to conduct their researches accordingly. The most prominent methods include “quantitative, qualitative, and mixed research methods”. The quantitative method focuses on making the researches using figures and basing them on measured amounts. These figures involve statistical information and use numbers to show and interpret the findings. In this method, “close-ended questions” are chosen. This method is preferred when the researcher’s objective is to find out the relationship between variables on a numerical basis. Whereas, the qualitative method focuses on texts to show and interpret the findings. Statistical information and procedures are not involved in this method (Techo, 2016). This method involves the perspectives, voices and context of research participants (Creswell, 2003). The quantitative approach is more impersonal, and the textual and contextual basis of the research participants are neglected in comparison to the qualitative method. A researcher may want to use a method that involves both methods to further show and analyze the findings and describe the research. (Techo, 2016). The researcher decides which method or methods to use based on “the problem the research is based on”, the experience of the researcher, the audience, what the researcher aims to discover and interpret from the findings, how the researcher plans to show the information (numerical, textual or both) and how the researcher wants to collect the data (Creswell, 2003). In the mixed method involving both the qualitative and quantitative methods, the researcher can further understand the searched problem, research and analyze the findings and the data. In that regard, a more profound and detailed interpretation can be achieved using both the contextual and numerical research methods (Techo, 2016).

In the “qualitative research method”, designing questions is crucial in understanding the perspective of participants. In this regard, an interview has three types that come into prominence. These are “unstructured, semi-structured and structured”. Unstructured interviews own a lot of detail and have little to no structure. The topic numbers are limited and generally is asked to learn the point of view of the participant regarding the subject matter. In the “semi-structured interview type”, on the other hand, the interview includes “open-ended questions”. In this type of interview, the researcher can ask a follow-up question to further elaborate the answer. The semi-structured interviewing method is functional when especially more information is needed to elaborate on a subject matter. Structured interviews involve closed questions, where the possible answers to be given are limited. These interviews are structured to enable the researcher to ask the same questions with limited possible answers to the participants and they are highly standardized (Mathers et al., 2002).

I have preferred to use a mixed research method to further analyze the relationship between agricultural cooperatives and circular economy and sustainability on a numerical and textual basis. Working with data based on statistics show the interpretation of findings in a functional manner, whereas, by focusing on the perspectives of the participants, further analysis can be made on the research topic. By combining both methods, it was my objective to have a deep understanding of the relationship between agricultural cooperatives and circular economy and sustainability through conducting a survey study. I have preferred to use the “semi-structured interview method”. Even though the survey study has an overall structure, open-ended questions were crucial to learning more information and insights on each subject matter. In consideration of these points, Yes/No questions, 5-point Likert scale questions and open-ended questions were given to conduct a survey study that is comprehensive for the analysis of my thesis topic.

The focus of this research is to understand the impact of agricultural cooperatives on sustainability and circular economy in the food supply chains context. In that regard, there are four questions that this thesis is trying to find answers to:

RQ1: Are agricultural cooperatives contributing to sustainability and circular economy and sustainability in the existing model?

RQ2: What is the awareness level of the members of agricultural cooperatives regarding the sustainability and circular economy elements?

RQ3: In which areas are agricultural cooperatives have an impact on sustainability and circular economy?

RQ4: Are there areas of improvement in the existing agricultural cooperative model for increasing the contribution of agricultural cooperatives on sustainability and circular economy?

The 25 question survey consists of three parts in order to effectively answer these research questions: Yes/No Questions, Open-Ended Questions and 5-point Likert Scale Questions. The questions are designed taking into consideration of the circular economy and sustainability elements in relation to the sector of agriculture as explained in the literature review of this thesis. In that regard, yes/no and open-ended questions are especially crucial in understanding the areas agricultural cooperatives have an impact on sustainability and circular economy, through encouraging the participants to give examples and elaborate on the related question. Whereas, the 5-point Likert scale questions, are important for analyzing the awareness level of the members regarding the sustainability and circular economy elements. In the statistical analysis of 5 point Likert scale questions, the participants' answers are shown in frequency charts and pie tables in order to show the awareness level of participants regarding the subject matter. Together, it is aimed to find answers for whether the agricultural cooperatives are contributing to sustainability and circular economy in the existing model and the existence of areas of improvement in the existing agricultural cooperative model for increasing the contribution of agricultural cooperatives on sustainability and circular economy. In this perspective, the survey starts with a brief explanation of the survey and its purpose for participants. The questions take place in their respective categories for keeping the answers in a logical framework for the participant, thus making it easier to answer questions accordingly and making the interpretation process overall easier for the researcher.

3.1.1. Data Collection and Analysis

The demographic of this survey consists of members of 14 agricultural cooperatives, 2 producer unions, 1 agricultural cooperative union and aquaculture cooperatives association in Turkey. The participants from 14 agricultural cooperatives and 2

producer unions are chosen in producer markets, organic bazaars due to being a member of an agricultural cooperative/producer union and having the necessary insight and knowledge regarding the working mechanisms of their cooperative and being highly involved in the cooperative work. An Agricultural Cooperatives Union and Aquaculture Cooperatives Association are chosen due to involving various cooperatives under their umbrella related to agriculture and having a collected insight and knowledge on the agriculture-based cooperative work. The gender and age of the participants were ignored in the analysis due to the focus of this research. The cooperatives of the participants are as follows: Tire Mountain Products Agricultural Development Cooperative, Bayındır Natural Products Agricultural Development Cooperative, Özbek Köyü Agricultural Development Cooperative, Urla Agricultural Development Cooperative, Ödemiş Kaymakçı Agricultural Development Cooperative, Seferihisar Orhanlı Agricultural Development Cooperative, Menemen Belen Agricultural Development Cooperative, Ödemiş Çaylı Agricultural Development Cooperative, Ödemiş Pirinççi Agricultural Development Cooperative, Kemalpaşa Agricultural Development Cooperative, Bornova Agricultural Development Cooperative, Tire Karateke Irrigation Cooperative, Alaşehir Women Initiative Production and Operation Cooperative, Küçük Menderes Ornament Plants Production Cooperative, Ödemiş Ornament Plants and Arboriculture Cooperative, Aquaculture Cooperatives Association, Köy-Koop (Village Cooperative) İzmir Agricultural Development and Other Agricultural Cooperatives Union and Common Life Eco-social Production Cooperative.

The questions are sent online to the Cooperatives Union and Aquaculture Cooperatives Association and given in hand to the 16 agricultural cooperatives/producer unions and later gathered, due to the pandemic circumstances. The survey is conducted within the period of November 2020 to January 2021. A brief explanation of the survey's purpose, its scope and how to answer the questions are given at the beginning of the survey and the questions are grouped into three parts to make it easier for the participants to answer and the researcher to analyze the answers. The questions involved in the survey are mentioned in the analysis of each question below (a copy of the survey study in detail is found in Appendix 1-Survey):

Question 1:

The survey starts by asking the participant to define their institutions. There are categories involving “Agricultural cooperative, Food supply chain, Union and Other”.

In this regard, the answers are as follows: 14 Agricultural Cooperatives, 2 producer unions, 1 agricultural cooperative union and 1 aquaculture cooperatives association. Due to operating in the agriculture sector and within the framework of the agricultural cooperatives, all of these agricultural organizations are involved under the umbrella of the agricultural cooperatives group.

Question 2:

The second question, “Does your cooperative help preserving resources involving some that are scarce in finding and affected by fluctuations on their prices” is asked to understand further on participants’ cooperatives’ use of the resource, especially those which are scarce. The answers are mostly yes and no (70% “yes” and 18% “No”) and the undecided answer is given by 3 participants. In the case of the “Yes” answers, further explanation is wanted from the participants. In that regard, there are different answers further explaining how the cooperatives help to preserve the scarce resources. The answers are as follows:

- The fuel for the tractors, animal feed for the animals and fertilizers for the crops are given as forward sales to its members and partners after harvesting (Çaylı Agricultural Development Cooperative).
- For protecting the scarce resources, the related supply chain is contacted for cooperation. Collaboration between supply chains, cooperatives and other institutions are crucial for improving the conditions of agricultures, creating values, using scarce resources efficiently and effectively and protecting the environment as much as possible (Kemalpaşa Agricultural Development Cooperative).
- Solar energy is used for electricity and cooperatives are chosen first for collaboration for other resources. For getting affected least from the fluctuations in pricing, it is crucial for the members to work with the cooperative’s decisions first (by using the products occurring throughout the production in other parts of the cooperative, such as using the animal waste as a form of fertilizer, following the pricing policies of the cooperative etc.) and then work closely with other cooperatives in using scarce resources. Thus, by

doing so, the cooperative and solidarity perspective can continue and the cooperatives can get affected by the fluctuations the least amount (Tire Mountain Products Agricultural Development Cooperative).

- The cooperative is producing its compost fertilizer, and vermicomposting for example. These are the two products that the cooperative is using the most and frequently. Therefore, the effectiveness of the cooperative lies in being able to produce the products themselves. The cooperative not only protects the resources it uses by producing it but also doesn't get affected by the fluctuations in the pricing of these products due to not being dependent on the external sector (Belen Agricultural Development Cooperative).
- We strive to provide external support to our Unit Cooperatives as much as our Association can by making joint projects with local governments, such as animal feed support, solar panels for electricity etc... (Köy Koop-İzmir Agricultural Development and Other Agricultural Cooperatives Union)

Question 3:

The 3rd question aims to find out whether the mentioned cooperatives save money and overall costs by preserving resources and managing wastes. The participants mostly answered the question as “Yes” (60%) and “No” (22%). However, there are more undecided choosers than the second question. One of the participants answered the questions as “We are working on it”. For the “Yes” answer, further explaining which tools and methods the cooperative uses is asked. In that regard the answers are as follows:

- The wastes are used to produce compost fertilizers for crops. By doing so, the cooperative not only manage the wastes but also uses the waste as a crucial input in the production of the crops, thus reduces the cost overall and contributes to sustainability and circular economy together (Belen Agricultural Development Cooperative & Urla Agricultural Development Cooperative).
- The cooperative saves money and reduces costs by using recycled packaging and using our wastes in different parts within our cooperative such as plant wastes as animal feed and animal waste as fertilizer (Tire Mountain Products Agricultural Development Cooperative).

- We save from overall costs and our partners contribute to this savings through their activities. For instance, obtaining fertilizer from plant and animal-based waste, obtaining fuel from the olive pomace, etc. (Köy Koop-İzmir Agricultural Development and Other Agricultural Cooperatives Union).

Question 4:

The fourth question's focus is on understanding the cooperatives' ability to save overall costs in industries. The question asks for information on the initiatives the cooperative takes place for saving money. In this question, the ratio of "Yes" (54%), "No" (25%) and "Undecided" answers are similar to the 3rd question. There are some crucial answers from the participants, who answered the question as "Yes". The answers are given below:

- The cooperative reduces the costs and saves money by buying the products from the producers (members) of the cooperative. In this regard, the importance and value of being a member of a cooperative and working towards a certain goal together pay off. The cooperative makes sure to put our producers first and by doing so, members can produce their products with ease without concerning about going through unfair bargaining and feeling forced to accept unfair private trading. By diminishing the intermediaries between the cooperative and the producers, both parties can get paid fairly and in higher amounts (Alaşehir Women Initiative Production and Operation Cooperative).
- The cooperative supplies the products from the common producer, therefore the mutual trust, lack of intermediaries and fair pricing decision between parties ensures overall cost reduction and saving money (Common Life Eco-social Production Cooperative).
- The cooperative rents equipment and tools for the use of farmers. In doing so, the productivity increases, the same job can be done in shorter periods and more jobs can be done within the cooperative in the same amount. Thus, the overall costs are reduced, productivity is increased and money is saved (Kemalpaşa Agricultural Development Cooperative).
- When we look at our work program, we have to go to the villages (neighborhoods) related to the transactions made with the affiliated unit cooperatives, which is a routine work every month, as well as for product

delivery from there and works on different issues. In that regard, we are trying to create savings by scheduling both our personnel and vehicle fuel program in a single day and retrench our general costs (Köy Koop-İzmir Agricultural Development and Other Agricultural Cooperatives Union).

Question 5:

The fifth question asks the participant whether or not they are reusing their waste in other parts of their cooperative (example: animal faeces as fertilizer in agriculture). In case of saying yes, the participants are asked to give examples of how they use their waste and in which part of their cooperative the wastes are reused. The majority of the answers are “Yes” (80%) for this question with “No” (15%) and “Undecided” answers. Detailed answers from the participants are as follows:

- The cooperative uses animal waste for fertilizing our land full of crops. In doing so, the cooperative reduces the cost of its one of the main inputs to use for its crops (Tire Mountain Products Agricultural Development Cooperative & Ödemiş Pirinççi Agricultural Development Cooperative).
- The cooperative uses the crops in not desired state as manure (Bornova Agricultural Development Cooperative & Çaylı Agricultural Development Cooperative).
- According to the participant from Ödemiş Ornamental Plants and Arboriculture Cooperative, the cooperative is using plant-based wastes as fertilizer within the cooperative.
- We are using olive oil pomace as fuel and animal waste as manure within our association (Köy Koop-İzmir Agricultural Development and Other Agricultural Cooperatives Union).

Question 6:

Question six focuses on whether the participants use waste separation and collection system within their cooperatives (Ex: colored bins, waste collection points, product labels etc.). In that regard, the majority of the answers are 60% “No” and 30% “Yes”, the rest being “Undecided”. However, even though the majority of the answers are “No”, there are a significant amount of answers explaining that they are sending their

waste to waste collecting centers owned by public or private domains. Detailed answers from the participants are as follows:

- The cooperative separates battery, cartoon boxes and plastic as a part of reducing waste and reusing them (Bornova Agricultural Development Cooperation).
- The participant from the Ödemiş Ornamental Plants and Arboriculture Cooperative mentioned that they are separating and containing waste paper, glass and plastics individually, and recycle them through recycling factories.
- According to the representative of Aquaculture Cooperatives around Turkey; in the fishing, ports found all regions of 230 Aquaculture Cooperatives; after leaving the port, fishing vessels completing their activities on the same day and returning to the port are obliged to operate their wastes to the Blue Card System within 48 hours following the day they return to the port, and to deliver their wastes to the waste reception facility or waste receiving vessel. In addition, the waste transfer form and blue card printing processes were also removed, enabling transactions to be carried out online digitally and monitored simultaneously, thus eliminating the use of paper and plastic cards. With the “Maritime Waste Application” (DAU), municipalities and the representatives of the Coast Guard Command, whose authority has been delegated in the follow-up of ship wastes, can simultaneously monitor the waste disposal procedures of the ships through the same application and perform the necessary inspections.

Additionally, some of the answers stated that even though, they do not have a waste separation and collection system within their institution, they are willing to work on that subject:

Question 7 & 8:

The 7th and 8th questions are analyzed together due to being similar in nature. These questions aim to figure out whether the participants’ cooperatives are ISO 14000 and EMAS certified.

The answers are mostly “No” (85%) and “Undecided” (15%). Especially since the EMAS certification has recently come into prominence in addition to ISO 14000 certification. However, two answers, in particular, are pleasantly surprising in regards to ISO 14000 certification. For Ödemiş Pirinçci Agricultural Development

Cooperative and Seferihisar Orhanlı Agricultural Development Cooperative, the answers are “Yes” for the ISO 14000 certification. Moreover, the answer from the Köy-Koop İzmir specifically mentioned that some of their affiliated unit cooperatives have ISO 22000 Food Certificate. None of the participants claimed to have an EMAS certification.

Question 9:

This question aims to find out the plastic usage of cooperatives in the packaging of their products and if so, how do they recycle them afterwards. The answers are as follows (some of the answers are given by more than one participant/cooperative):

- The cooperative does use plastics in the packaging and the plastics used in the packaging is recycled afterwards (Bornova Agricultural Development Cooperative & Seferihisar Orhanlı Agricultural Development Cooperative).
- The cooperative collects plastics in waste collection divisions for recycling and reusing the plastic (Kemalpaşa Agricultural Development Cooperative).
- 2 cooperatives suggested that they prefer glass instead of plastics.
- The cooperative gives plastic waste to the Municipality (Municipality’s waste collection locations) for recycling (Bayındır Natural Products Agricultural Development Cooperative).
- According to the participant from the Ödemiş Ornamental Plants and Arboriculture Cooperative, the cooperative uses plastics for the conservation of plants and trees during transportation and till they are planted into the soil. However, the cooperative wants to work on recycling projects through municipalities to recycle the pots and plastics that are no longer in use.
- Although we know that it is unhealthy in our product packaging, we use plastic packaging. Plastic packaging is preferred for its transportation, shipping and, regrettably, its lower price. This is demanded by consumers, not producers. We do not have any work on recycling (Köy Koop-İzmir Agricultural Development and Other Agricultural Cooperatives Union)

Question 10 & 11:

The 10th question aims to understand what cooperatives feed their animals with. By asking this question, the focus is to elaborate on whether or not the cooperatives use

the waste from crops for feeding the animals and thus contribute to the circular economy and sustainability. Furthermore, Question 11 focuses on bio-based products, which are products obtained from renewable sources such as agro residues. In that regard even though many of the participants are not familiar with the term “bio-based”, they use bio-based products to feed their animals without noticing. In that regard, the answers are as follows (many of these answers belong to multiple cooperatives):

- The cooperative uses vegetable and fruit wastes and according to the season uses hay and wet weed as animal feed (Bornova Agricultural Development Cooperative).
- The cooperative feed the animals with their wheat and silage that they are producing (Özbek Köyü Agricultural Development Cooperative).
- The cooperative gives animals roughage (Kaymakçı Agricultural Development Cooperative).
- The cooperative feeds the animals with hay, clover, barley and corn (Bayındır Natural Products Agricultural Development Cooperative).
- Within the cooperative; green waste, wheat and barley are used to feed the animals (Urla Agricultural Development Cooperative).
- According to the participant from Ödemiş Ornamental Plants and Arboriculture Cooperative, bio-based products are crucial due to being biologically dissolvable and decomposable plastics in nature. Encouragement and incentives in their usage are one of the highly important projects for a less polluted nature on a global level. In that regard, they are planning on using more such products.
- The cooperative uses corn silage, dry fodder and clove to feed the animals (Küçük Menderes Ornamental Plants Production Cooperative).
- One of the participants, who is a member of the Çaylı Agricultural Development Cooperative in Ödemiş mentioned that even though he does not have animals himself to feed, other members of the cooperatives who do have animals, feed them with silage and cattle feed, which they are preparing themselves.
- There are mostly stockers or milkers within our unit cooperatives. As a producer organization, cattle involving stockers and milkers are fed with products such

as concentrate feed, alfalfa, silage and hay, as they are generally a closed system; although there are not many small cattle in our region, they graze on the pastures in the spring and in winter they eat concentrate feed, alfalfa and straw in the yards. Additionally, they are fed with whatever plant they can find according to seasonal precipitation (Köy Koop-İzmir Agricultural Development and Other Agricultural Cooperatives Union).

Question 12:

Question 12 focuses on the carbon footprint of cooperatives and ask what precautions they take to reduce their carbon footprint. In that regard, the term “carbon footprint” was confusing for some of our participants and they required some explanation in terms of what the terminology entails. The answers are as follows:

- The participant from the Özbek Köyü Agricultural Development Cooperative mentioned that at an individual level within the cooperative, he takes precautions to reduce his carbon footprint, but he didn't elaborate on what he does to achieve it.
- The cooperative utilizes the potential wastes and thus, reduces the number of wastes by transforming them into usable inputs within the cooperative (Belen Agricultural Development Cooperative).
- As a member of the Ödemiş Pirinçci Agricultural Development Cooperative, the participant mentioned that they do not use agrochemicals in pest control.
- The cooperative focuses on managing wastes and recycling them to follow sustainable agriculture to reduce its carbon footprint and be more sustainable in its production (Bornova Agricultural Development Cooperative & Urla Agricultural Development Cooperative-recycling).
- The participant from the Common Life Eco-social Production Cooperative mentioned that they are working towards using renewable energy in their operations.
- As a member of Bayındır Natural Products Agricultural Development Cooperative, the participant underlines that they are collecting their wastes collectively to render them into compost to use to feed animals.

- The member Kemalpaşa Agricultural Development Cooperative, on the other hand, mentioned that he uses vehicles with Diesel exhaust fluid to reduce the air pollution caused by diesel engine.
- As far as we know, vehicle traffic, which is the most common in carbon footprint, is the precaution we take for now, such as travelling on foot or with one vehicle when necessary instead of many vehicles (Köy Koop-İzmir Agricultural Development and Other Agricultural Cooperatives Union).

In addition to these answers, 3 participants from different cooperatives mentioned their desire to inform themselves more on how to reduce carbon footprint and techniques and equipment and tools that can be used during the processes as a cooperative. There is a significant willingness in learning more about the sustainability and circular economy elements.

Question 13:

Question 13 asks the cooperatives about what they are doing to reduce pollution in their cooperative. In that regard, different pollution types can be thought over when answering the question. Thus, the participants seem to involve different pollution types in answering the question. The answers are as follows:

- As a member of the Çaylı Agricultural Development Cooperative, we are using recyclable packaging in the products to reduce soil pollution.
- By recycling and reusing wastes, the cooperative reduces the amount of waste and thus overall pollution (Bayındır Natural Products Agricultural Development Cooperative).
- Our cooperative manages its wastes so that they are recycled and/or reused within the cooperative's other parts/phases. Moreover, we are focusing more on using solar energy and natural gas instead of diesel oil to reduce air and soil pollution (Tire Mountain Products Agricultural Development Cooperative)
- As a producer of the Belen Agricultural Development Cooperative, I am not using chemicals in our crops, thus minimizing the soil pollution in our products (a similar answer came from the Ödemiş Pirinççi Agricultural Development Cooperative).

- As the Bornova Agricultural Development Cooperative, we are trying and aiming to raise environmental awareness within our cooperative and its members.
- According to the representative of Aquaculture Cooperatives around Turkey, in the fishing ports found all regions of 230 Aquaculture Cooperatives in Turkey; Under the name of “Maritime Waste Application” (DAU), the entire process from sending the waste originating from fishing vessels to a licensed waste reception facility or waste receiving vessels and sending the waste to disposal is monitored instantly and online with the Marine Waste Application, thus, sea pollution due to vessels are prevented.

Question 14:

The 14th question aims to elaborate more on the use of by-products within institutions that have participated in the survey. Therefore, the question asks about the utilization of by-products. The answers are as follows:

- As the Alaşehir Women Initiative Production and Operation Cooperative, we are producing grapes, however, as a by-product, we are using its leaves as vine leaves preserved (a similar answer regarding using the leaves of the grapes came from Bayındır Natural Products Agricultural Development Cooperative). Moreover, the participant from Belen Agricultural Development Cooperative underlined that the producers in the cooperative utilize by-products as food products and market them in producer markets as others cooperatives do as well.
- According to the participant from the Ödemiş Ornamental Plants and Arboriculture Cooperative, the manufacturing of all by-products are made with a marketing focus.
- In the cooperative, we are utilizing the peel of fruits as animals feed and as fertilizer in our crops’ soil (Tire Mountain Products Agricultural Development Cooperative). By doing so, not only the waste amount is kept at a minimum, but also the cooperative contributes to sustainability and circular economy (a similar answer came from the participants from Urla Agricultural Development Cooperative and Kemalpaşa Agricultural Development Cooperative).

Question 15:

Question 15 focuses on the usage of agricultural pesticides and asks the question: What does your cooperative use against pesticides? The question continues asking whether the cooperative is using agricultural pesticides and if not, what do they use to prevent pesticides that reduce the yield of the marketable products. This question is linked directly to the pollution question due to the use of agricultural pesticides polluting the soil first-hand. There are two groups of answers in general. The first group explains that they are not using agricultural pesticides or chemicals in their products but focus on using the organic and/or natural pesticides that they make themselves. The second group, on the other hand, underlines the fact that they are using agricultural pesticides to fight against pesticides, which reduce their yield significantly. However, they specifically mention that they are following the suggested amount of use in the guidelines. The answers are as follows:

- The participant from the Seferihisar Orhanlı Agricultural Development Cooperative mentioned that they as producers do not use agricultural pesticides and produce their natural insecticides/pesticides from plants themselves instead.
- As being a member of Alaşehir Women Initiative Production and Operation Cooperative, the participant specified that they are using licensed pesticides, which are not harmful to human health and do not leave residues on the product and soil. Examples are “bordo mix” and “gülleci bulamacı” (chemical-free farming solutions that consist of lime-sulfur slurry, which is also known as calcium polysulfide). In addition to this answer, a participant from the Küçük Menderes Ornament Plants Production Cooperative signified that they are using Sulphur slurry in their products as an organic alternative to agricultural pesticides in the fight against pesticides. Moreover, another similar answer has come from Urla Agricultural Development Cooperative, as mentioned by this cooperative’s member, the producers in this cooperative use natural self-made concentrated slurries in their products to avoid using chemicals. Another answer, in line with the first group, has come from Tire Mountain Products Agricultural Development Cooperative, the member of this cooperative has mentioned that the producers/farmers, use lime, copper sulfate, Sulphur and wood vinegar.

- Another answer regarding natural pesticide use has come from Belen Agricultural Development Cooperative. However this time the focus was on beekeeping. In honey making, for bees, fungi, bay leaves and incense are used to fight pesticides and viruses.

For the second group, the answers belonging to the participants from cooperatives including Bornova Agricultural Development Cooperative, Bayındır Natural Products Agricultural Development Cooperative, Ödemiş Pirinççi Agricultural Development Cooperative, Ödemiş Kaymakçı Agricultural Development Cooperative, and Kemalpaşa Agricultural Development Cooperative, mentioned that the producers are using agricultural pesticides, however, they are prescriptive and licensed pesticides and they use them in their recommended amount and time.

- We do not use pesticides since we do not have production-based work as an institution, however, our partner producers have to use pesticides to fight pests (Köy Koop İzmir Agricultural Development and Other Agricultural Development Cooperatives Union).

Question 16:

The 16th question focuses on the manufacturing of products that are clean and asks the question of how cooperatives produce and export products and services that are in the clean category across the world. In that regard, the answers are found below:

- The participant from the Ödemiş Kemalpaşa Agricultural Development Cooperative expressed that they are exporting cherries and peaches abroad.
- Participants from cooperatives like Belen Agricultural Development Cooperative mentioned specifically that even though they are not exporting their products and sell them domestically since they are not using pesticides and chemicals during their production, their products are in the clean category.
- The member of Ödemiş Pirinççi Agricultural Development Cooperative stated that since they are not using agricultural pesticides but use their fertilizer coming from other processes of the cooperative and separate their wastes, their products are considered in the clean category. Moreover, they are specifically exporting trees, sapling and flowers.

- We are not exporting yet, but the biggest goal ahead is working towards it. There is a memory in our past that this could be done. We will achieve this as soon as possible (Köy Koop İzmir Agricultural Development and Other Agricultural Development Cooperatives Union).

Question 17:

The 17th question asks whether the cooperatives recycle their wastes and if so, how. Additionally, the question asks about the scale of recycling. The answers are as given below:

- The majority of the answers were mentioning that the scale of their cooperative regarding recycling their wastes is small and medium (including Tire Mountain Products Agricultural Development Cooperative, Küçük Menderes Ornamental Plants Production Agricultural Development Cooperative, Bornova Agricultural Development Cooperative, Ödemiş Pirinççi Agricultural Development Cooperative, Belen Agricultural Development Cooperative and Kemalpaşa Agricultural Development Cooperative).
- The participant from the Bayındır Natural Products Agricultural Development Cooperative, specified that they are reusing their wastes as compost, whereas the member of the Ödemiş Pirinççi Agricultural Development Cooperative mentioned that they are reusing their wastes as fertilizer within the cooperative.
- The participant from the Köy-Koop İzmir answered the question as follows: As an association, we do not have a waste unit that we can recycle, however, recycling is done in our cooperatives, albeit on a small scale. We have already given examples of recycling in a few places above (Köy Koop İzmir Agricultural Development and Other Agricultural Development Cooperatives Union).

Question 18:

The 18th question focuses on green technology, which involves technology that does not need fossil fuel to work; the most used ones being solar energy and wind energy. In that framework, the question asks how the cooperatives use green technology in their cooperative in tracking the progress of their crops and products, mapping their resources, irrigation etc. The answers are as follows:

- The participants from the Ödemiş Pirinççi Agricultural Development Cooperative and Tire Mountain Products Agricultural Development Cooperative mentioned that they are using solar and wind energy in their processes and activities within the cooperative.
- The participant from the Seferihisar Orhanlı Agricultural Development Cooperative specified that they are using solar energy in irrigation.
- As a member of the Bornova Agricultural Development Cooperative, the participant explained that the cooperative has obtained the okra of Bornova and muscatel grape as a geographical indication, which involves qualified, traditional food that belongs to the defined geography. By obtaining this indication, it shows that the aforementioned product is produced naturally as it was traditionally, in harmony with nature. Thus, green and natural manufacturing is evident in obtaining a geographical indication.
- As an association, we do not have a production-based structure, we organize the promotion, marketing and packaging of the products produced by unit cooperatives. On our unit cooperatives' level, however, during the production phase, unit cooperatives are using green technology in areas such as drying with geothermal and solar energy, obtaining electricity from the solar energy, and using these green energies in areas such as irrigation, cooling and drying (Köy Koop İzmir Agricultural Development and Other Agricultural Development Cooperatives Union).

3.1.2. Open-ended Questions Part of 5-point Likert Scale Questions

This part consists of two parts. In the first part, the answers to the open-ended questions required regarding a further explanation are given; whereas, in the second part, where the participants have answered the 5 point-Likert scale, frequency tables and pie charts for each question are shown at the beginning of the second part. The frequency tables and pie charts are numbered from 1 to 7 including seven 5-point Likert scale questions numbered 19 to 25 in the survey. In that regard, it should be considered that Question 19 equals Question 1; whereas Question 25 equals Question 7 in frequency tables and pie charts given in the statistical analysis part, and the rest of the questions under this section are distributed accordingly as well.

Question: 19:

Question 19 asks the question of how does the participant's cooperative support and contribute to cohesion and social integration. In this regard the answers are as follows:

- The participant from the Tire Mountain Products Agricultural Development Cooperative mentioned that the cooperative works in cooperation with other cooperatives, especially on the packaging process. The parts of the cooperative work together in cohesion to achieve optimum performance in the packaging process.
- According to the participant from the Ödemiş Ornamental Plants and Arboriculture Cooperative, in the cooperative, all member producers work in coordination, continuously in touch and most importantly on a trust base. Communication-based processes within the framework of harmony and social inclusion are crucial for maintaining the continuity of production and marketing and preventing blockages in the processes. Thus this is one of the long-term strategies that the cooperative is following.
- The participant from the Küçük Menderes Ornamental Plants Production Agricultural Development Cooperative, specified on the survey that the cooperative works with the human resources to create a cohesive and integrated work environment. Similarly, Bayındır Natural Products Agricultural Development Cooperative focuses on treating every member equally and creating an inclusive work environment.
- As a member of Ödemiş Pirinççi Agricultural Development Cooperative, the participant answered the question specifying that they are organizing social events to integrate every member to the cooperative and maintain an inclusive environment, where the members feel belonging to their organization (similar answers have come from the participants from the Common Life Eco-social Production Cooperative and Alaşehir Women Initiative Production and Operation Cooperative).
- The participant from the Belen Agricultural Development Cooperative highlighted that the cooperative supports collective work and give training on-site to support inclusion and cohesive work throughout the organization, and thus creates a cooperative culture in every member.

- The participant from the Köy-Koop İzmir answered the question as follows: As can be understood from the name of our institution, Köy-Koop İzmir Union is an integrative structure that brings together the villager and the city dweller, the rich and the poor, the illiterate and the uneducated, most importantly, WOMEN AND MEN. We are fully in this integration (Köy-Koop İzmir Agricultural Development and Other Agricultural Cooperatives Union).

Question 20:

This question aims to find out more regarding whether the cooperative supports efficient resource usage and innovations. The further explanation includes giving information regarding the existing methods and/or R&D studies on productive resource use. The answers are as follows:

- To use the resources more proficiently and proactively, the cooperative rents tractors and agricultural equipment and tools. By doing so, the producers get the chance to use the resources efficiently by using their time efficiently and save time, labor effort and energy. Thus, the producers can take care of more products for a shorter amount of time, and productivity increases as a result of this (Kemalpaşa Agricultural Development Cooperative).
- Our cooperative collaborates with cooperatives that are in line with our cooperative (sister cooperatives). By collaborating with them, the spirit of cooperative continues and the resources are used proficiently due to maintaining low waste. In conclusion, with collaborating, new ideas, methods, techniques and resources can be used together, thus by reducing the intermediaries and ensuring fair pricing (cooperative level), and maintaining low waste; resources are ensured to be used proactively and the innovations are supported through collaborative thinking and sharing ideas (Tire Mountain Products Agricultural Development Cooperative).
- Our cooperative supports the farmers by providing a harvesting machine. By using machines and technology, more harvest can be done in a short amount of time, thus increasing the productivity of resources used can be achieved. We are aiming to use more innovations and technology in the future (Çaylı Agricultural Development Cooperative).

- Our cooperative uses machines and equipment from the equipment pool/machinery commonly with other cooperatives. As a crucial benefit of cooperatives, they are providing machinery from the pool, so the producers can use them commonly and effortlessly without having to pay for it. Thus, our producers can achieve the needed machinery to use the resources more effectively and productively (Urla Agricultural Development Cooperative).
- In beekeeping, for extracting honey, and in agriculture for extracting olive oil commonly, rendering plants are installed. By using these rendering plants, extracting honey and olive oil is done faster and more efficiently and effectively. Thus, the resources are used productively (Bornova Agricultural Development Cooperative).
- Our cooperative supports and encourages co-op farming. As a result, the collaboration and solidarity spirit is kept alive. Labor force can be found easily for the farmers that need it fast. With more labor force, resources are used more efficiently in a shorter amount of time and more work can be done with low personal labor, thus by helping each other, all the farmers' products within the cooperative get the chance to be maintained properly and effectively. All members of the cooperative get their work done on time and productively and efficiently (Belen Agricultural Development Cooperative).
- Yes, of course... In the past, our Izmir Metropolitan Municipality worked with our common tool and equipment park idea. In our work with our unit cooperatives, we are focusing on sharing rather than owning within the overall cost savings. The main ingredient of cooperatives is COOPERATION (Köy-Koop İzmir Agricultural Development and Other Agricultural Cooperatives Union).

Question 21:

Question 21 aims to understand what the cooperatives do to assure safety and gain the best performance from their employees. The employees and members of an institution are the keys to achieve sustainability. They are the ones that trigger and maintain a change towards a circular economy and a sustainable future. Although there are different answers regarding what the cooperatives do to ensure security and gain the

best performance, they can put into groups according to their similar context. The answers are as follows:

- For achieving the best performance, there were similar answers from the participants regarding what their cooperative do to achieve the best performances. These answers involve information sharing, rewarding and premiums, motivational speeches, creating a workplace that everyone can work in harmony, leading members working in areas that they have expertise and interest in (for example Bornova Agricultural Development Cooperative).
- According to the participant from the Ödemiş Ornamental Plants and Arboriculture Cooperative, securing health and job security creates a trusted environment among the producers and thus their performance and engagement to the institution increase. The first curial factor increasing the effectiveness of manufacturing in any job is to respect the job itself and the ones who are doing it. The cooperative's primary methods for optimum manufacturing are making sure that there is nothing that affects the health of the producers negatively in the workplace and foreseeing and taking precautions against issues that may occur during working.
- To ensure safety within the cooperative, the answers mostly include following the general job security rules and guidelines and making the production places in the cooperative safe for the producers (Alaşehir Women Initiative Production and Operation Cooperative), and giving job security training (Bornova Agricultural Development Cooperative).
- All our employees are provided with social security, and a doctor visit is provided in our office every month by the OSGB ("Joint Health Security Unit"). Regarding performance, the personnel works in line with their duties and responsibilities (Köy-Koop İzmir Agricultural Development and Other Agricultural Cooperatives Union)

Question 22:

Question 22 aims to find out how the institutions separate their wastes. This question is linked to other questions regarding whether the institutions use plastics and recycle them, reuse the waste in other sections of the cooperative, waste separation and collection. In that regard, these question aims to find out the methods and materials

that the cooperatives use in separating their wastes more elaborately. The answers are as follows:

- Green wastes and agro residues become forage to animals (Bornova Agricultural Development Cooperative).
- The wastes in the cooperative become fertilizers for our products (Bayındır Natural Products Agricultural Development Cooperative).
- Cardboards and plastics are the two most separated wastes within the cooperative.
- The main separation within the cooperative is as “wet and dry (fertilizer materials’ characteristics), paper and metal” (Ödemiş Pirinççi Agricultural Development Cooperative).
- The cooperative has 3 main separation categories: “recyclable”, “non-recyclable” and “organic” (Belen Agricultural Development Cooperative).
- The cooperative separates wastes as plastic, metal etc. (Kemalpaşa Agricultural Development Cooperative).
- The cooperative separates glass, paper and metal in general (Tire Mountain Products Agricultural Development Cooperative).
- According to the participant from the Ödemiş Ornamental Plants and Arboriculture Cooperative, they are separating wastes according to their category and through necessary steps, the wastes are reused in the soil.
- The wastes are separated into domestic wastes and chemical wastes. Household wastes can be decomposed in nature, whereas chemical wastes are harmful to nature, and their decomposition takes many years (Köy-Koop İzmir Agricultural Development and Other Agricultural Cooperatives Union).
- According to the representative of Aquaculture Cooperatives around Turkey, in 230 Aquaculture Cooperatives, through the cooperation with the Municipality, paper, glass and plastic waste bins are used for zero-waste management in Turkey. In addition, in 42 cooperatives where fish are sold, waste is collected with an agreement made with private companies for fish waste. Wastes such as bilge water and motor oil are disposed of by private companies or municipalities.

For the method, there are no specific answers, however, the participant from the Urla Agricultural Development Cooperative specified that they are separating the wastes by hand. In this case, the participant, who has taken this survey, is a member of the cooperative and is a farmer himself, like many producers/farmers, he also separates their waste by hand. It is worth mentioning that, since many farmers, like in this example, separate their wastes by hand, and do that in union with the other producers (members) of the cooperative. This shows that there is an internalized consciousness related to separating wastes and recycling linked within the cooperative culture.

Question 23:

The 23rd question aims to find out what do institutions currently work on to increase the efficiency of your resources. Most of the participants underline the fact that they do indeed work towards increasing the efficiency of their resources. There are crucial answers regarding what they do to achieve it. With this question, the answers showed that there are different interpretations regarding what efficiency is in terms of using the resources efficiently. The answers are found below:

- As producers, we are trying to follow the best practices in farming and implement good agriculture practices (Bayındır Natural Products Agricultural Development Cooperative).
- As a cooperative, we are working towards how to market cooperatives' products more efficiently. Since the products are produced using the resources, it would directly affect the efficiency of resources' usage if products left unsold, thus it would mean having a surplus of resources due to lower demand for manufacturing (Küçük Menderes Ornamental Plants Production Cooperative).
- According to the participant from the Ödemiş Ornamental Plants and Arboriculture Cooperative, they believe that through continuous field study and following the market, their resource usage efficiency is increased.
- The members of the cooperative try not to create waste. Producers/farmers follow through recycling and reusing side products within the cooperatives for not creating wastes and for contributing to a sustainable working mechanism in the cooperative (Çaylı Agricultural Development Cooperative)

Question 24:

The 24th question focuses on creating high-skilled jobs within the cooperative. Therefore, the question asks the participants: How does your cooperative create new jobs that can be low-maintenance and high skilled? The question aims to find out more about new job opportunities linked with cooperatives. The answers are as follows:

- The participant from the Bornova Agricultural Development Cooperative explained that they are following R&D works and focusing on projects, which create high-skilled jobs within the cooperative.
- Some participants mentioned the products that they are specifically focusing on and thus they are creating high-skilled jobs regarding the production and development of these products. Cooperatives involving Tire Mountain Products Agricultural Development Cooperative, Ödemiş Pirinççi Agricultural Development Cooperative and Küçük Menderes Ornamental Plants Production Cooperative specified that they are creating high-skilled jobs on manufacturing natural products and natural marmalade, all types of plant and tree propagation, and greenhouse growing respectively.
- The participant from the Tire Karateke Irrigation Cooperative specifically explained that they are creating jobs in drying installations, especially in silage making.
- As a member of the Alaşehir Women Initiative Production and Operation Cooperative, the participant answered the question underlining that the cooperative works with specialists in their field for the processes within the cooperative, thus create high-skilled jobs for these specialists within the cooperative to lead the cooperative forward.
- New jobs are created by evaluating both internal and external projects, provided that our institution operates in the field of activity (Köy-Koop İzmir Agricultural Development and Other Agricultural Cooperatives Union).

Question 25:

The 25th question focuses on the EU directives on sustainability and circular economy. In this framework, the question is: How do you follow EU directives on circular economy and sustainability (For-example: low-carbon-footprint, recycling, waste management, reusing of products etc.)? The answers are as follows:

- The participants from the cooperatives involving Belen Agricultural Development Cooperative, Alaşehir Women Initiative Production and Operation Cooperative and Bornova Agricultural Development Cooperative, mentioned that they are trying to keep up with the directives and guidelines through training and online.
- Additionally, the participants from the Tire Mountain Products Agricultural Development Cooperative and Bayındır Natural Products Agricultural Development Cooperative explained that they are following the directives especially regarding recycling (the participants from the Tire Mountain Products Agricultural Development Cooperative, specifically underlined that they are focusing on recycling on the packaging.).
- According to the representative of Aquaculture Cooperatives around Turkey, especially for fishing boats in the Mediterranean and the Aegean Sea, cooperatives are encouraged by the cooperatives for the use of boats with solar energy. 28 fishing boats in Antalya and Muğla have limited diesel consumption by operating only with solar energy.

In addition to the examples given regarding the subjects covered by the EU directives, answers are specifying that the mentioned cooperative is working towards being more involved in these subjects. One of these answers are as follows:

- We cannot say that we are doing this institutionally, but there are some things we do individually, that we would like to work on more (Köy-Koop İzmir Agricultural Development and Other Agricultural Cooperatives Union).

3.1.3. Statistical Analysis

Table 3.1. Frequency table for Question 1 (Question 19 in the survey)

		Q1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	2	11,1	11,1	11,1
	Fair	6	33,3	33,3	44,4
	Good	5	27,8	27,8	72,2
	Excellent	5	27,8	27,8	100,0
	Total	18	100,0	100,0	

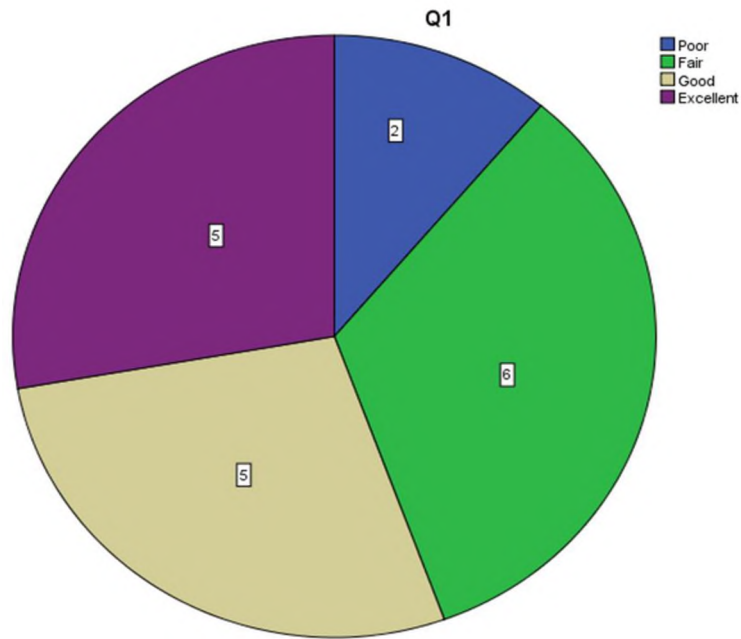


Figure 3.1. Pie chart for the frequency table of Question 1 (Question 19 in the survey)

The second part of Question 19 asked the question: “What is the impact of this support and contribution to cohesion and social integration on your cooperative?” to the participants. As seen in this table, all of the participants have answered the question. There was 5 possible answer; 1 to 5; 1 being very poor and 5 being excellent. For this question, none of the participants has chosen 1 (very poor). In that regard, the most chosen answer was 3 (Fair) with 33.3%. However, the cumulative percent involving 4 (Good) and 5 (Excellent) (55.6%) exceeds the cumulative percent coming from the answers 2 (poor) and 3 (fair) (44.4%). Therefore, the mean of this question is found as 3.72. This shows that for this question, the mean of the answers was close to the “Good” category.

Table 3.2. Frequency table for Question 2 (Question 20 in the survey)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very poor	1	5,6	5,6	5,6
Poor	6	33,3	33,3	38,9
Fair	2	11,1	11,1	50,0
Good	4	22,2	22,2	72,2
Excellent	5	27,8	27,8	100,0
Total	18	100,0	100,0	

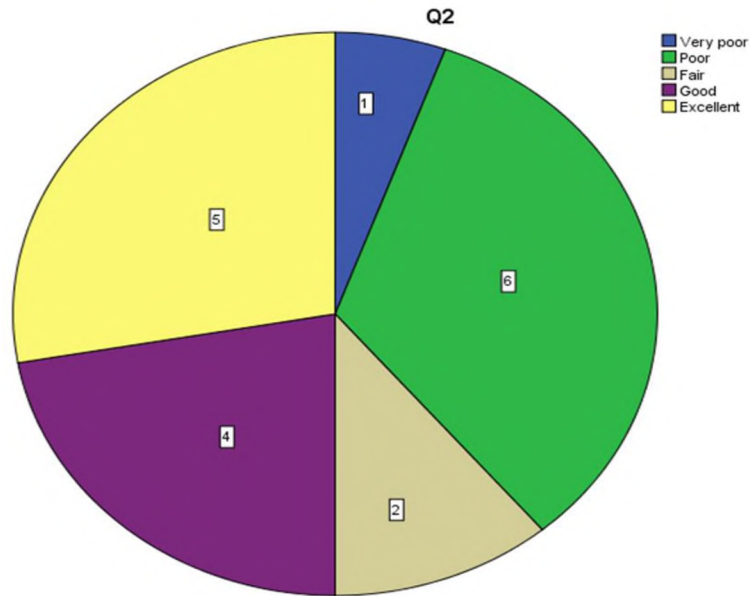


Figure 3.2. Pie chart for the frequency table of Question 2 (Question 20 in the survey)

The second part of Question 20 asked the question: “What is the impact of supporting efficient resource usage and innovations on your cooperative?” to the participants. As seen in this table, all of the participants have answered the question. There were 5 possible answers; 1 to 5; 1 being very poor and 5 being excellent. In that regard, the most chosen answer was 2 (Poor). The cumulative percent involving 4 (Good) and 5 (Excellent) (45%) exceeds the cumulative percent coming from the answers 2 (poor) and 3 (fair) (44.4%), even though these values are closer to each other than the Question 19. Therefore, the mean of this question is found as 3.33. This shows that for this question, the mean of the answers was close to the “Fair” category.

Table 3.3. Frequency table for Question 3 (Question 21 in the survey)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Poor	1	5,6	5,6	5,6
Fair	3	16,7	16,7	22,2
Good	5	27,8	27,8	50,0
Excellent	9	50,0	50,0	100,0
Total	18	100,0	100,0	

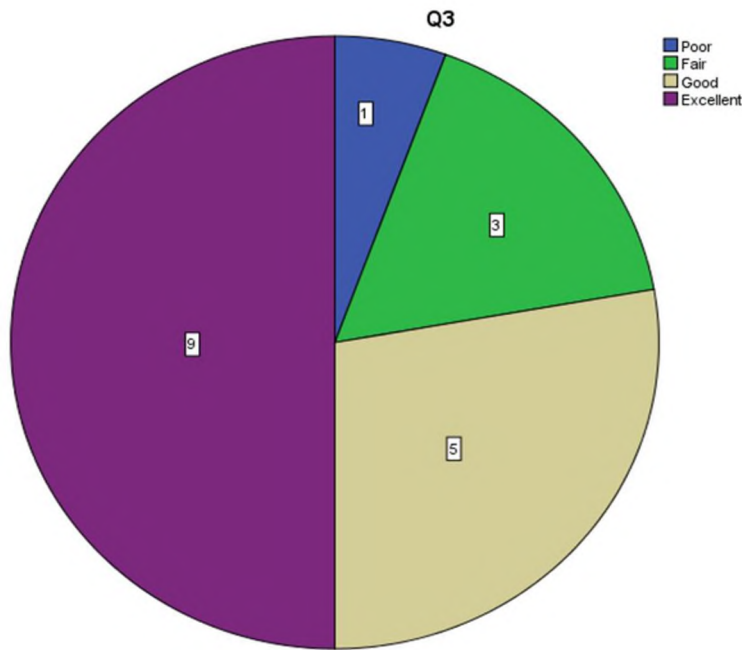


Figure 3.3. Pie chart for the frequency table of Question 3 (Question 21 in the survey)

The second part of Question 21 asked the question: “What is the impact of assuring safety and implementing the best performance practices on your cooperative?” to the participants. As seen in this table, all of the participants have answered the question. There was 5 possible answer; 1 to 5; 1 being very poor and 5 being excellent. For this question, none of the participants has chosen 1 (very poor). In that regard, the most chosen answer was 5 (Excellent). The cumulative percent involving 4 (Good) and 5 (Excellent) exceeds the cumulative percent coming from the answers 2 (Poor) and 3 (Fair). Moreover, the percent of answer 4 (Good) is the same as the answer 5 (Excellent) as 50%. Due to the fact that there is no 1 (very poor) answer and the answer, 5 is half of the given answers; the mean of this question is found as 4.22. This shows that for this question, the mean of the answers was exceeding the “Good” category.

Table 3.4. Frequency table for Question 4 (Question 22 in the survey)

		Q4			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	2	11,1	11,1	11,1
	Poor	2	11,1	11,1	22,2
	Fair	4	22,2	22,2	44,4
	Good	6	33,3	33,3	77,8
	Excellent	4	22,2	22,2	100,0
Total		18	100,0	100,0	

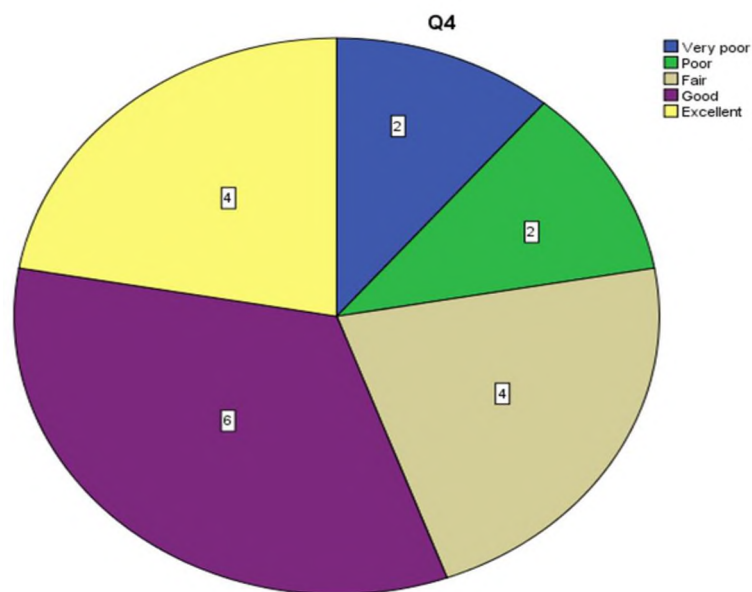


Figure 3.4. Pie chart for the frequency table of Question 4 (Question 22 in the survey)

The second part of Question 22 asked the question: “What is the impact of separating your wastes on your cooperative?” to the participants. As seen in this table, all of the participants have answered the question. There were 5 possible answers; 1 to 5; 1 being very poor and 5 being excellent. In that regard, the most chosen answer was 4 (Good); 3 (Fair) and 5 (Excellent) following closely. The cumulative percent involving 3 (Fair), 4 (Good) and 5 (Excellent) (77.7%) shows that the majority of the answers are accumulated towards the upper half of the scale; however since answer 3 (Fair) has a significant amount of participant answers (33%), the mean would not be as high as the 1st or 3rd question. Therefore, the mean of this question is found as 3.44. This shows that for this question, even though the mean of the answers were more close to the

“Fair” category, it is almost halfway in the “Good” category.

Table 3.5. Frequency table for Question 5 (Question 23 in the survey)

		Q5			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	1	5,6	5,6	5,6
	Poor	4	22,2	22,2	27,8
	Fair	3	16,7	16,7	44,4
	Good	8	44,4	44,4	88,9
	Excellent	2	11,1	11,1	100,0
	Total	18	100,0	100,0	

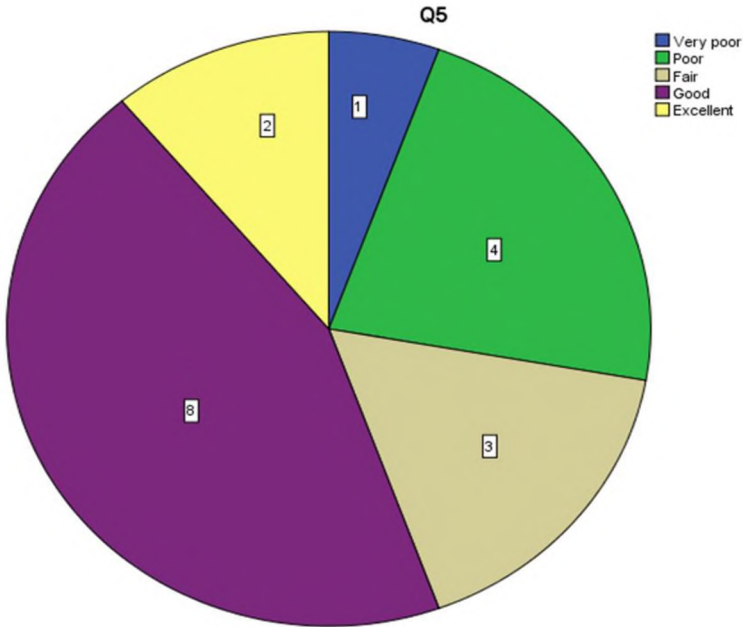


Figure 3.5. Pie chart for the frequency table of Question 5 (Question 23 in the survey)

The second part of Question 23 asked the question: “What is the impact of working on to increase the efficiency of resources on your cooperative?” to the participants. As seen in this table, all of the participants have answered the question. There were 5 possible answers; 1 to 5; 1 being very poor and 5 being excellent. In that regard, the most chosen answer was 4 (Good). The cumulative percent involving 2 (Poor) and 3 (Fair) (38.9%) is close to the percent coming from answer 4 (Good) (44%). Therefore, it is seen that the answers would have been accumulated towards the bottom half of the scale, if not for the majority of the answers being in the 4 (Good) category. This would decrease the mean closer to 3 (Fair). In that line, the mean of this question is

found as 3.33. This shows that for this question, the mean of the answers was close to the “Fair” category.

Table 3.6. Frequency table for Question 6 (Question 24 in the survey)

		Q6			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Poor	7	38,9	38,9	38,9
	Fair	3	16,7	16,7	55,6
	Good	6	33,3	33,3	88,9
	Excellent	2	11,1	11,1	100,0
	Total	18	100,0	100,0	

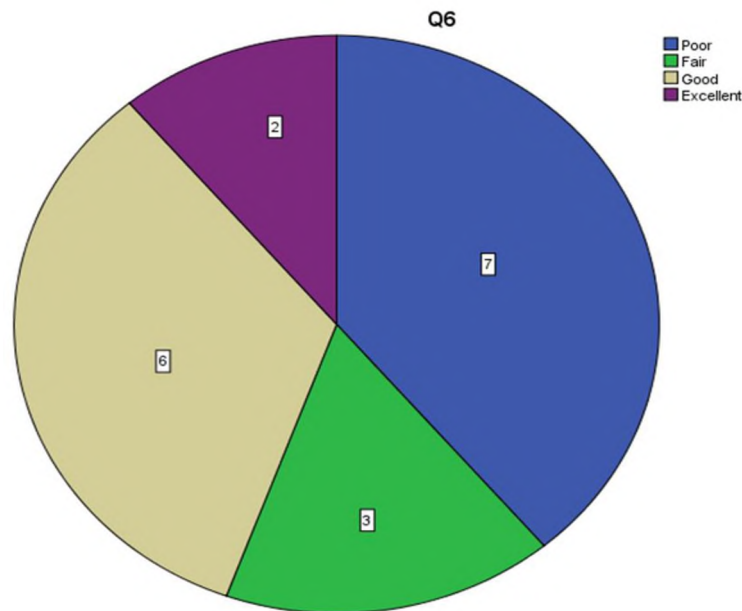


Figure 3.6. Pie chart for the frequency table of Question 6 (Question 24 in the survey)

The second part of Question 24 asked the question: “What is the impact of creating high-skilled jobs on your cooperative?” to the participants. As seen in this table, all of the participants have answered the question. There was 5 possible answer; 1 to 5; 1 being very poor and 5 being excellent. For this question, none of the participants has chosen 1 (very poor). In that regard, the most chosen answer was 2 (Poor). The cumulative percent involving 4 (Good) and 5 (Excellent) (44.4%) exceeds the percent coming from the answer 2 (poor) (33%); however, by adding the answers coming from the answer 3 (fair) (16.7%); their effect on the mean would decrease. Therefore, the mean of this question is found as 3.16. This shows that for this question, the mean of

the answers was close to the “Fair” category and when compared with the previous five questions, this question has the lowest mean so far.

Table 3.7. Frequency table for Question 7 (Question 25 in the survey)

		Q7			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Very poor	3	16,7	16,7	16,7
	Poor	10	55,6	55,6	72,2
	Fair	2	11,1	11,1	83,3
	Good	3	16,7	16,7	100,0
	Total	18	100,0	100,0	

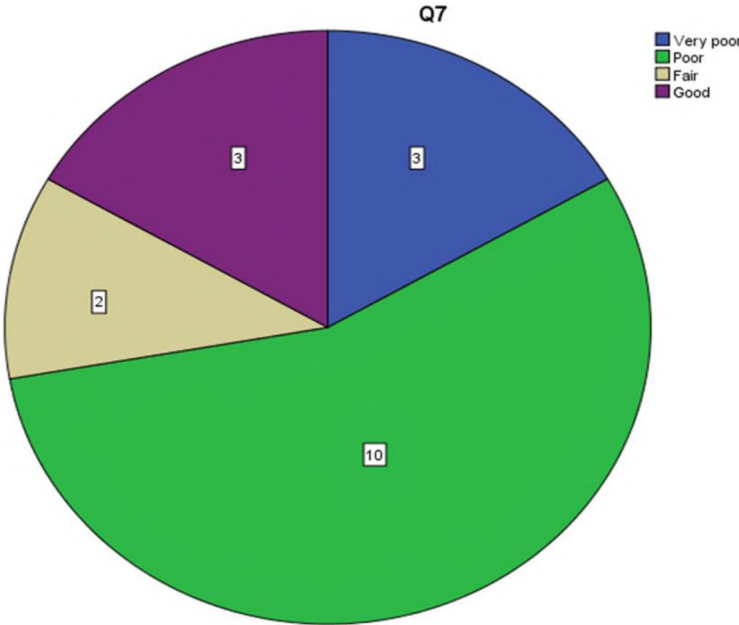


Figure 3.7. Pie chart for the frequency table of Question 7 (Question 25 in the survey)

The second part of Question 25 asked the question: “What is the impact of following EU directives regarding circular economy and sustainability on your cooperative?” to the participants. As seen in this table, all of the participants have answered the question. There was 5 possible answer; 1 to 5; 1 being very poor and 5 being excellent. For this question, none of the participants has chosen 5 (Excellent). In that regard, the most chosen answer was 2 (Poor). The cumulative percent coming from the bottom half of the answers involving 1 (Very Poor) and 2 (Poor) (72.2%) exceeds the cumulative percent coming from the answers 3 (Fair) and 4 (Good) (27.8%). Therefore, the mean of this question is found as 2.27. This shows that for this question,

the mean of the answers was close to “Poor”. This calculation shows that the final question has the lowest mean amongst all 5-point Likert scale questions.

These results signify the importance level of each questions’ impact on the cooperative according to the participants. According to these results, Question 3 comes into prominence with the highest mean of 4.22, exceeding the “Good” category. Question 1 follows Question 3 as the second-highest mean with 3.72, being close to the “Good” category. Question 4, 2, 5 and 6 show results closer to the “Fair” category with Question 4 being the highest and Question 6 being the lowest of this group with means of 3.44 and 3.16 respectively. Having the lowest mean of the questions, Question 7 comes forward as being close to the “Poor” category with the mean of 2.27.

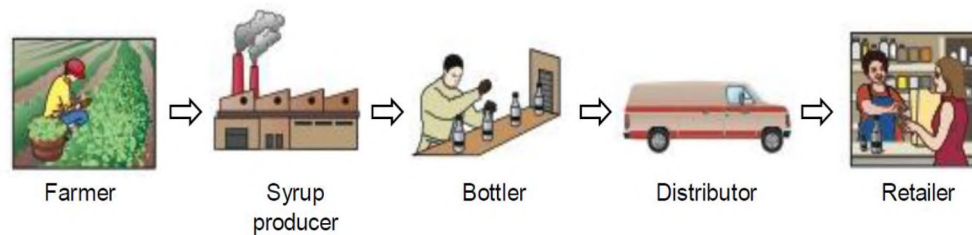
These results can be seen more clearly through pie charts of the 5-point Likert scale questions’ frequency tables for each question.

3.2. Supply Chain Model Proposal

In consideration of the survey results, it is seen that there is a need for the existing *Cooperative Model* given in Figure 1.1 to be adapted to the TBL approach in order to eliminate issues found in the way of fully contributing to sustainability and circular economy. In that regard, a new model is proposed taking into account the subjects that need to be working on to ease the transformation of the working mechanism of the cooperatives towards a circular economy and sustainability.

3.2.1. Agricoop Supply Chain Model Proposal

According to the results of the field study, the traditional cooperative model is adapted to the cooperative supply chain model to satisfy the “Triple Bottom Line” towards circularity and sustainability in Figure 3.8.



<u>Suppliers</u>	<u>Cooperative</u>	<u>Other Services</u>	<u>Distribution & Marketing</u>	<u>Sales</u>
Partners	Diary Processing	Credit and Loan	Producer's Transport Vehicle	Retail stores
Cooperatives	Agriculture products processing	Training	Cooperative's Transport Vehicle	Other retail
Farmers	Water Products and Meat Processing	Consulting	Logistics Companies	Online Sales
Municipalities & Public Agencies	Product Planning	Input Supply Support	Grocery Store Chain Transport Vehicle	Cooperative Owned Sales Centers
Quality Control	Quality Control	Other aids (tuition support, food aids, etc.)	Quality Control and Management	Quality Control

Figure 3.8. The Agrocoop Supply Chain Model Proposal

In Figure 3.8. *The Agrocoop Supply Chain Model Proposal* that I am proposing is the elevated version of the already existing *Cooperative Model* given in Figure 1.1. *The Agrocoop Supply Chain Model Proposal* starts with its suppliers which can involve cooperative partners, other cooperatives, farmers/producers, and municipalities and public agencies. Then, the cooperative comes into play involving the phases of procurement and production seen in the *Cooperative Model* in Figure 1.1. In that phase, the products may vary according to the cooperatives' working product groups from dairy products, agricultural products to meat and water products involving agriculture and livestock within its structure. Quality control of the product starts with the supply of the raw materials, crops, products etc. This can be done by food engineers, contracted universities/institutions (if necessary), and/or authorized experts. The product control can be done before the harvest, on the farm (for example taking olives/potatoes from its field), during the harvest and/or during the processing of the crop/product (for example making cheese from milk; through processing the milk by

the cooperative). In the Procurement part of the cooperative phase, the cooperative can pay its partners the price of the product (olive) or a defined ratio of the sold price of the processed product (olive oil) (or provide a defined amount of the processed product) or provide input supply from a more affordable price, give tuition support to partners' kids, food aids etc. and keep the cash flow in the cooperative longer for future expansion and investments. For the supply of the raw materials, crops and products; the farmer/producer can bring the product to the cooperative via their own vehicle, the cooperative can collect the product by its own vehicles and/or the producer can bring their product to the product collection centers (to the closest one to the producer). In the final step of this phase, in the production units, the products are processed (from unprocessed crops/products (olive) to processed product (olive oil)) in the facilities of the cooperative. Furthermore, the rest of the products procured are stored in cold storage depots according to supply and demand. In that regard, production planning comes into prominence in order to assure an effective and efficient working structure within the cooperative.

The cooperative gives other services to its partners which may include providing a letter of guarantee to its members who want to get credit from the agricultural bank or agricultural credit cooperative (to members); providing consultation and training for new techniques in agriculture and live stocking, production methods etc.; giving input supply support (providing the needed input from an affordable price to its partners including fertilizers, seeds, pesticides, fuel, drip irrigation pipes etc.); granting tuition support to partners' kids, and giving food aid to its partners (as mentioned above, these services can be given as payment to the producers in order to keep the cash flow within the cooperative for future investments and expansion). For the distribution and the marketing phase, the producer/cooperative can use its own transport vehicles or an agreement can be made with logistics companies and/or the transport vehicles of the market chains/grocery store chains. In that phase, reverse logistics play a crucial part including waste management, recycling, reselling and reusing of the materials and products. Quality management plays a crucial role during all phases of *The Agricoop Supply Chain Model Proposal* from procurement to sales for ensuring the quality of the products and thus increasing their life-cycle. For the sales phase, the products can be sold at sales centers owned by the cooperative, through online sales, retail and other retail stores.

In regard to this explanation of *The Agricoop Supply Chain Model Proposal*, an example of this Structure can be given based on the operational structure of the İğdeli Agricultural Development Cooperative.

- The product is taken to the nearest product collection centers by the producers;
- Quality control is done by the food engineers and milk technicians;
- The milk is procured from the producer for at least equal or above the market price defined by the government (input supply support can be given from a more affordable price and tuition support to the partners' children, food aids etc. can be provided to members, in order to keep the cash flow within the cooperative for increasing the credibility to make investments);
- Quality control is done by the food engineers and milk technicians;
- The milk is brought to the cooperative facilities;
- The milk is processed by the relevant experts (cheese, yoghurt, milk, butter) to ensure a continuous quality;
- Quality control is done by the food engineers, milk technicians following the hygiene standards;
- The Packaging and distribution of the products include sales centers owned by the cooperative, grocery store chains (Pehlivanoğlu, Barış market, Pekdemir), İzmir Metropolitan Municipality's People's Market etc.

Additional information:

- All producers are partners of the cooperative;
- Cooperative partners receive input supply support (fertilizers, fuel, seed support) from a more affordable and fixed price;
- Food aid is given to partners;
- Tuition support is given to partners' children;
- If the partner wants to get a personal loan, the cooperative gives a letter of guarantee to be given to the agricultural bank or agricultural credit cooperative.

In a summary, the shorter the value chain from the producer to the consumer, the more economical the consumer reaches the product and the producer sells the product at its

value. The primary requirement of the producers whose product comes to harvest time is to perform the harvesting process. Without a cooperative structure, if they do not have the necessary equipment and employees, the producers receive service from outside and add this service to the lean price of their product, and then, if their products needed to be transported to the market or to the sales place, the logistics cost is reflected in the products. In addition, if the product is to be sold after being transformed into a product, the extra product is included in the business and operations chain such as grading the products according to sizes for packaging, cold air requirements, processing and packaging. In this case, these are also added to the unit product price. However, producers can perform all these works and transactions under the roof of a cooperative. Since all members of the cooperative benefit from the transactions carried out under the roof of the cooperative, a unit cost advantage occurs and they can give more competitive (affordable) prices.

In addition, the market value increases even more as the production volume increases in total. One advantage of cooperatives is the reduction of input costs. Pre-season wholesale purchases of inputs and/or producing the inputs within the cooperative for all members minimize the risks that may arise when inputs become expensive. In addition, to the extent that the privileges provided by the cooperative to its members increase, the circulating cash remains within the cooperative. In this way, the need for credit is reduced and additional resources are created for new technology investments. (Some cooperatives provides fuels, markets, fertilizer and storage units-input supply- to its partners from reasonable/affordable prices and keeps the surplus of revenues inside the cooperative to keep the cash flow in the cooperative; and thus the credibility of the cooperative is increased; therefore the cooperative can invest in technological developments such as renewable energy). Through reverse logistics, the products are ensured to be recycled, reused or resold and thus waste is managed and kept at a minimum (Elmas & Erdoğmuş, 2011). Valorizing the by-products and recycling throughout the phases also ensures the management of wastes. By integrating cooperatives into the supply chain, the fuel consumption can be reduced through planning the delivery and distribution of the products collectively on schedule through certain vehicles (the vehicles can even be environmentally friendly based on the investments to be made with the cash flow of the cooperative aforementioned and the stakeholders' contributions) for reducing the unnecessary vehicle circulation and thus

reducing the carbon emissions. Moreover, through defining collection locations, the product delivery/distribution can be done on foot, thus eliminating a big portion of the carbon dioxide emissions. Last but not least, by reducing the intermediaries and involving the cooperative more into the supply chain, the overall carbon footprint is reduced and the input supplies can be obtained inside the cooperative without depending on the foreign resources and intermediaries. As seen from this proposed new model, the contribution of cooperatives to sustainability and circular economy can be increased substantially by adapting the existing working structure of cooperatives to the TBL approach.

3.2.2. Results and Recommendations

The survey is made by participants from 14 Agricultural Cooperatives, 2 Producer Unions, 1 Agricultural Cooperative Union and Aquaculture Cooperatives Association. 25 questions are asked involving saving costs, usage of scarce resources, collaboration, recycling and reusing waste, waste management, collaborative work, creation of jobs, renewable energy usage, following EU directives regarding sustainability and circular economy, exporting products within the clean category, increasing efficiency, reducing pollution, providing safety and gaining best performances within the cooperative and increasing social inclusion and cohesion within the workplace. All of these subjects are part of sustainability and circular economy, and thus they are asked to find out the contribution of cooperatives (agricultural cooperatives) on sustainability and circular economy.

According to the interpretation of the answers made by using percentages, open-ended questions, frequency tables and pie charts; it is found out that the agricultural cooperatives do contribute to sustainability and circular economy. The 25-question survey includes key components of the circular economy approach and sustainability. In that regard;

According to the answers, it is seen that agricultural cooperatives are successful in and working on preserving scarce resources, separating wastes, reusing wastes in other parts of the cooperative in a circular motion (such as fertilizers in crops), valorizing by-products, using natural pesticides to fight with pests in crops, recycling wastes, contributing to cohesion and social integration in the workplace, maintaining workplace safety and gaining the best performance from workers.

However, there need to be further improvements on awareness regarding;

- **Bio-based products.** Even though the farmers are using vegetable-based, natural raw materials for feeding their animals, most of them are unaware of using bio-based raw materials. Furthermore, more awareness regarding bio-based products should be made, such as on biodegradable plastic usage, to encourage using biodegradable in packaging to reduce waste overall.
- **Waste separation systems.** There are agricultural cooperatives that are working with municipalities and private companies to manage their waste for waste disposal and separation; however more support needs to be given by the private and public companies, municipalities and government to establish more available waste separation units to ease the process for waste management.
- **Certification and EU directives on sustainability and circular economy.** There seemed to be a lack of certificates in the cooperatives as mentioned by the participants. However, through certification, it would be easier to inspect the processes within the cooperative and make necessary changes for a circular economy and sustainable development. Therefore, awareness regarding the certificates should be made to encourage cooperatives into obtaining certificates. Moreover, even though agricultural cooperatives are following the circular economy approach and sustainability principles, there is unawareness regarding what EU directives entail. The awareness should be made with the help of boards within the cooperatives to bring closer agricultural cooperatives to EU directives, which would increase the contribution to the circular economy and sustainability.
- **Investments in green technology, efficient resource use, promoting innovations, new machinery, equipment and tools, the efficiency of resources, creating high-skilled jobs.** These factors are directly linked to each other. From the answers, it is seen that the cooperatives working with Municipalities regarding machinery, equipment and tools tend to use their resources more efficiently and effectively. In that regard, this cooperation approach should be supported with new green technology incentives regarding machinery, equipment and tools from the government, municipalities, private and public sector so that the overall carbon footprint can be reduced more

effectively, at an accelerated level. By doing so, more high-skilled job creation can be achieved within cooperatives and innovation works would become more frequent.

In that regard, with the *Agricoop Supply Chain Model Proposal*, in consideration of the "Triple Bottom Line" approach, the contribution of agricultural cooperatives to circular economy and sustainability can be increased substantially. This can be achieved through the elements of the proposed new model below:

- **Involving multi-stakeholders into the process and creating a cooperation environment.** As a result, the members of the cooperatives can reach the necessary equipment, tools and resources more easily. Thus, new technological equipment and tools can be used towards maintaining sustainability and CE through involving different stakeholders in the process of buying, adapting and maintaining these advancements. Moreover, the equipment and tools and resources can be used in a circular manner among cooperatives and stakeholders and thus they can get reused, repaired, recycled and resold within this community of cooperation.
- **Including cooperatives more into the process and reducing the intermediaries.** As a result, the carbon footprint gets reduced by eliminating the additional carbon footprints of different actors during the supply chain.
- **Paying the members through "other services" in order to keep the cash flow inside the cooperative.** Through keeping the cash flow inside the cooperative, the cooperative can invest in renewable energy and new technologies for transforming the working structure into a greener one thus contributing to the wellness of the people and the environment. As a result of these investments, in addition to contributing to the well-being of people and the environment, the cooperative can get profits due to reducing the reliance on outside resources such as energy and fuel. Moreover, this will directly affect transformation towards sustainable development and circular economy.
- **Providing training regarding the sustainable practices and circular economy concept in the cooperatives.** This can solve the lack of awareness problem seen as a result of the analysis of the field study.

- **Valorizing the by-products and minimizing the wastes.** The wastes can be managed more efficiently and effectively through involving reverse logistics, recycling and quality management throughout the supply chain phases.
- **Recycling the packages of the products.** Recycling throughout the phases including packages contributes to the major part of waste management.
- **Ensuring quality control in all phases and thus increasing the life of the products substantially and minimizing waste as a result.** Quality control has two major benefits. The first of them is related to increasing the life expectancy of the product, thus the waste is minimized. The second, the more long-term related benefit is increasing the trust of customers towards the products of cooperatives. Thus, more demand is created by the customers for products of the cooperatives. The increased demand ensures the *Cooperative Supply Chain* to be adapted by more cooperatives and acts as an incentive to other sectors into transforming their working structure and economy into a more sustainable and circular one. The demand is necessary for this model to be sustainable around the world.
- **Providing the reverse logistics.** By doing so, the products can be valorized with maximum efficiency in the longer term.
- **Reducing fuel consumption and carbon emissions.** Through eliminating intermediaries and receive/deliver/distribute products through scheduled vehicles, fuel consumption and thus the overall carbon emissions can get reduced substantially. Moreover, due to the cash flow kept in the cooperative as mentioned above, the cooperatives can invest in greener technology, which can reduce carbon emissions in all phases of *The Agricoop Supply Chain Model Proposal*.

By adapting to this new model, all of the aforementioned points need working on of the field study can be realized, the working structure can be transformed into being fully compatible with sustainability and circular economy concepts and the overall contribution of the agricultural cooperatives to CE and sustainability can be increased substantially through this proposed model.

3.2.3. Challenges in Conducting Field Study

There have been some challenges in conducting the survey based on external factors. For the external part, the most prominent factor was the Covid-19 pandemic. Due to the unusual circumstances related to the pandemic since 2019, the survey could not be done face-to-face. Even though the survey is prepared in a way that explains the scope and the context of the survey, in the beginning, asks more detail to the participants with open-end questions and explains some possibly unknown terminology within the survey, since the researcher cannot be physically with them to clear every possible obscurity, there might be lack of elaboration/information given on the subject matters in comparison to a face-to-face interview.

CONCLUSIONS AND FUTURE RESEARCH

The International Cooperatives Alliance (n.d.) signifies cooperatives as being associations found by people coming together voluntarily to work towards their joint cultural, economic and social needs in a democratic manner. The members of cooperatives work together within this structure to achieve better results in the sector. In this context, one of the most important and popular types of cooperatives is agricultural cooperatives. The circular economy approach has emerged to provide a sustainable development involving the stages of resource use reduction, waste management and reducing emissions and greenhouse gases and slowing down and closing up the resource-related cycles (by, recycling, repairing, remanufacturing, maintenance etc.) (Fraccascia et al., 2019). The circular economy has been considered beneficial and agreeable due to its outlook on sustainable development and innovative perspective on industries and the environment. The attractiveness of this approach has influenced and affected many institutions around the world, one of the most active working institution being the EU. It is seen that reaching a circular economy is through embracing sustainable development. Agricultural cooperatives come into prominence due to involving circular economy and sustainability within their natural structure. In this context, the contribution of agricultural cooperatives to the circular economy and sustainability is examined through a 25-question survey study.

In consideration of the survey results, it is seen that agricultural cooperatives contribute to the circular economy and sustainability. However, it is clear that there needs to be more focus on investing in green technology, following EU directives and progresses on these subjects, finding bio-based materials, products and fuels and raising awareness on these subjects within the cooperatives. In that regard, governments, local communities, municipalities and related stakeholders should work together to support and invest in green technology and awareness in the cooperatives to accelerate these processes. Because through cooperatives, which are naturally inclined towards maintaining sustainability and circular economy due to their working structure, as seen in this survey study, can a community and country reach a circular

economy, which not only benefits the industries due to valorizing every product in the institution with waste management but also protects the environment for future generations.

As a result of this assessment involving both the literature and the survey results, the existing *Cooperative Model* (Figure 1.1.) shown in the first Chapter, is adapted to the cooperative supply chain model to satisfy the “Triple Bottom Line” towards circularity and sustainability and *The Agricoop Supply Chain Model Proposal* (Figure 3.8.) is proposed in that regard. Through this model, some points come into prominence in enhancing the sustainability of the supply chain and transforming its economy into a circular one. These points involve the following aspects:

- Involving various stakeholders and thus maintaining a pool of the equipment, tools and resources for all members of the cooperative and establishing cooperation among cooperatives;
- Creating a solidarity environment for the circulation of resources, equipment and tools;
- Using the by-products and reducing waste through recycling and reusing;
- Reducing the carbon footprint through investing in new equipment and tools in greener category, renewable energy and eliminating the intermediaries and thus reducing the carbon footprint caused by these actors;
- Reducing the energy and fuel consumption through defining collection locations and a number of vehicles for the delivery, distribution and transferring of the products in a collective manner;
- Ensuring the reuse and recycling of the products through reverse logistics and waste management;
- Ensuring the quality of the products in every phase of the supply chain and thus increasing the life of the product; and
- Giving training and consultation to the partners of the cooperative for new techniques, technologies, equipment and tool usage for easing into greener production methods within the cooperatives.

In conclusion, agricultural cooperatives do contribute to the sustainability and circular economy with their existing structure; however, some areas need working on especially in raising awareness on the aforementioned subjects. In that regard, my proposed model is adapted to the TBL approach considering this need to adapt to the sustainable and circular element elements, which can solve these issues seen as a result of the survey. In order to see the impact of this new proposed model on cooperatives, its adaptation should be mainstreamed among cooperatives. It is the initial proposal of this model. Alterations can be done to make the model most suitable for the sector, environment and conditions of the cooperatives through further studies. Through adapting to this model and working towards enhancing the lacking areas of cooperatives aforementioned, the contribution to sustainability and circular economy can be increased and thus wellbeing of the people and the environment can be maintained for future generations.

REFERENCES

- Abate, G. T. (2018). Drivers of agricultural cooperative formation and farmers' membership and patronage decisions in Ethiopia. *Journal of Co-Operative Organization and Management*, 6(2), 53–63. <https://doi.org/10.1016/j.jcom.2018.06.002>
- Academic Foundation. (2008). *Kerala development report*. New Delhi.
- Allison, E. H., Perry, A. L., Badjeck, M. C., Neil Adger, W., Brown, K., Conway, D., Halls, A. S., Pilling, G. M., Reynolds, J. D., Andrew, N. L., & Dulvy, N. K. (2009). Vulnerability of national economies to the impacts of climate change on fisheries. *Fish and Fisheries*, 10(2), 173–196. <https://doi.org/10.1111/j.1467-2979.2008.00310.x>
- Aydođan, M. & Yulafçı, A. (2013). *Samsun İlindeki Tarımsal Üretici Örgütlerinin Yapısal Sorunlarının Belirlenmesi*. (Report No. TR83/2013/DFD/007) Black Sea Agricultural Research Institute. Retrieved May 4, 2021 <https://www.oka.org.tr/assets/upload/dosyalar/samsun-ilindeki-tarimsal-uretici-birliklerinin-yapisal-sorunlarinin-belirlenmesi.pdf>
- Ayres, R.U., (1989). Industrial metabolism, In N.A. Engineering *Technology and Environment*, pp. 23-49. Washington, DC: *The National Academies Press*.
- Bai, X. (2007). Integrating Global Environmental Concerns into Urban Management: The Scale and Readiness Arguments. *Journal of Industrial Ecology*, 11(2), 15-29. doi: 10.1162/jie.2007.1202
- Barton DG. (1989). What is a cooperative? In: COBIA, D. W (ed.) *Cooperatives in agriculture*, pp. 1–20. Englewood Cliffs NJ: PrenticeHall
- BCSD Turkey. (n.d.). *Circular Economy*. Retrieved May 2, 2021 from <http://www.skdturkiye.org/en/surdurulebilir-sanayi-ve-dongusel-ekonomi>
- Bello Dogarawa, Ahmad. (2005). *The Role of Cooperative Societies in Economic Development*. (p.1). University Library of Munich, Germany, MPRA Paper. 10.2139/ssrn.1622149
- Benton, T., Gallani, B., Jones, C., Lewis, K. and Tiffin, R. (2012). *Severe weather and UK food chain resilience*. Detailed Appendix to Synthesis Report U.K. Government Office for Science Rep.
- BNP Paribas Corporate & Institutional Banking. (2019). *Sustainable Finance Approach in a Circular Economy*. Germany. Retrieved May 4, 2021 from https://icew.de/wp-content/uploads/2019/10/BNPParibas_Final.pdf
- Bulkeley, H., (2013). *Cities and Climate Change*, first ed. Routledge, Abingdon (UK). C40, 2016. Copenhagen, Denmark. C40 Website. Retrieved May 4, 2021 from

- http://www.c40.org/cities/copenhagen/blog_posts.
- CEJA. (n.d.). *Who we are*. Retrieved May 2, 2021, from <https://www.ceja.eu/who-we-are/organisation>
- Cenkış, Seçkin. (2008). Tarım Satış Kooperatifleri ve Birlikleri ile Bu Kuruluşlardaki Sermaye Yapısı. *Lebib Yalkın Mevzuat Dergisi*. (p. 1-5) Retrieved May 4, 2021 from <http://koop.gtb.gov.tr/data/53bea0b6f293708e6804becd/Tar%C4%B1m%20sat%C4%B1%C5%9F%20kooperatifleri%20ve%20birliklerinde%20sermayee.pdf>
- Christopher, M., & Holweg, M. (2011). “Supply Chain 2.0”: managing supply chains in the era of turbulence. *International Journal of Physical Distribution & Logistics Management*, 41(1), 63-82. doi: 10.1108/09600031111101439
- Clinton (2000) Report: White House: The Executive Order (No. 13134). *Developing and Promoting Biobased Products and Bioenergy*, ordered by William J. Clinton. Retrieved May 4, 2021 from <https://www.govinfo.gov/content/pkg/CFR-2000-title3-vol1/pdf/CFR-2000-title3-vol1-eo13134.pdf>
- Cook, M. (1995). The Future of U.S. Agricultural Cooperatives: A Neo-Institutional Approach. *American Journal of Agricultural Economics*, 77(5), 1153-1159. doi: 10.2307/1243338
- ICA (n.d.). *Cooperative identity, values & principles*. Retrieved May 4, 2021, from <https://www.ica.coop/en/cooperatives/cooperative-identity>
- Copa-Cogeca. (n.d.). *Copa: Unity is strength*. Retrieved May 2, 2021, from <https://copa-cogeca.eu/about-cogeca>
- Cotterill, R. W. (1987). Agricultural cooperatives: A unified theory of pricing, finance, and investment. In *Cooperative theory: New approaches*, ed. J. S. Royer, 171–258. ACS Service Report 18 (July). Washington, D.C.: U.S. Department of Agriculture.
- Creswell, J. W. (2003). *Research design: Qualitative, quantitative, and mixed method approaches*. 2nd Edition, Sage Publications, Inc., Thousand Oaks.
- Dagne Mojo, Christian Fischer & Terefe Degefa. (2015). Social and environmental impacts of agricultural cooperatives: evidence from Ethiopia, *International Journal of Sustainable Development & World Ecology*, 22:5, 388-400, DOI: 10.1080/13504509.2015.1052860
- Dam, Jan & Klerk-Engels, Barbara & Struik, Paul & Rabbinge, Rudy. (2005). Securing renewable resource supplies for changing market demands in a bio-based economy. *Industrial Crops and Products*. 21. 129-144. 10.1016/j.indcrop.2004.02.003.
- Dani, S., & Deep, A. (2010). Fragile food supply chains: reacting to

- risks. *International Journal of Logistics Research and Applications*, 13(5), 395-410. doi: 10.1080/13675567.2010.518564
- Dardak, R.A. (2015). Transformation of Agricultural Sector in Malaysia through Agricultural Policy.
- Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control). *Official Journal of the European Union*. L 334/17.
- Dopfer, Kurt & Foster, John & Potts, Jason. (2004). Micro-Meso-Macro. *Journal of Evolutionary Economics*. 14. 263-279. <https://doi.org/10.1007/s00191-004-0193-0>
- Duguid, F., Durutaş G., Wodzicki M. (2015). The Current State of Women's Cooperatives in Turkey. Retrieved May, 4, 2021 from https://ailevecalisma.gov.tr/KSGM/PDF/Turkiyede_Kooperatifcilik_Kadin_EN_G.pdf
- Dunn, J. (1987). *Positioning farmer cooperatives for the future*. Washington, D.C.: U.S. Dept. of Agriculture, Agricultural Cooperative Service.
- Eco, Bilal & Falck, W. (2019). Development of a guidance document on best practices in the Extractive Waste Management Plans. 10.2779/061825.
- Elkington, J. (2004). Enter the triple bottom line. In Henriques, A., Richardson, J. (Eds.), *The triple bottom line: Does it all add up?* London, England: *Earthscan*, pp. 1-16
- Ellen Macarthur Foundation. (2012). *Toward the Circular Economy: Economic and Business Rationale for an Accelerated Transition*. Retrieved May 4, 2021 from <https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf>
- Elmas, G, Erdoğan, F. (2011). The Importance of Reverse Logistics. *International Journal of Business and Management Studies*, 3 (1), 161-171. Retrieved May 4, 2021 from <https://dergipark.org.tr/en/pub/ijbms/issue/26068/274692>
- Emerson, J. (2003). The Blended Value Proposition: Integrating Social and Financial Returns. *California Management Review*, 45(4), 35–51. <https://doi.org/10.2307/41166187>
- Eraktan, G. (1997). *Avrupa Birliği 'nde Meyve ve Sebze Sektörüne Yönelik Politikalar ve Türkiye 'nin Uyumu. Bahçe Ürünlerinde Muhafaza ve Pazarlama Sempozyumu*. Atatürk Bahçe Kültürleri Merkez Araştırma Enstitüsü, Yalova.
- ESRC Public Policy Seminar. (2012). *Global Food Systems and UK Food Imports: Resilience, Safety and Security*. UK. Retrieved May 4, 2021 from <https://esrc.ukri.org/files/news-events-and-publications/news/2013/global-food->

systems-and-uk-food-imports-resilience-safety-and-security/

Euro Coop. (2011). *Consumer Co-operatives: Democracy-Development- Employment*.

European Commission. (2014). *Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions towards a Circular Economy: A zero waste Programme for Europe /* COM/2014/0398 final */*. Brussels. Office for Official Publications of the European Communities.

European Commission. (2015). *Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. COM (2015) 614 Final. Closing the Loop - An EU Action Plan for the Circular Economy*. Brussels. Office for Official Publications of the European Communities.

European Commission. (2018). *Green Manufacturing – the Solution for Reducing Production Waste*. Brussels. Retrieved May 4, 2021 from <https://ec.europa.eu/growth/tools-databases/dem/watify/boosting/news/green-manufacturing-%E2%80%93-solution-reducing-production-waste>

European Commission. (2019). *Extractive Waste Management Plans Circular Economy Action*. Brussels. Office for Official Publications of the European Communities.

European Commission. (2020). *Communication from the Commission to the European parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A new Circular Economy Action Plan For a cleaner and more competitive Europe COM/2020/98 final*. Brussels. Office for Official Publications of the European Communities.

European Commission. (n.d). *Biobased Products*. Retrieved May 4, 2021 from https://ec.europa.eu/growth/sectors/biotechnology/bio-based-products_en#:~:text=Bio%2Dbased%20products%20are%20wholly,and%20paper%2C%20textiles%2C%20etc.

European Commission. (n.d). *Circular Economy, Closing Loop, the production phase of the circular economy*. Retrieved May 4, 2021 from https://ec.europa.eu/info/publications/production-phase-circular-economy_en

European Commission. (n.d). *First Circular Economy Action Plan: Implementation of the first Circular Economy Action Plan*. Retrieved May 4, 2021 from https://ec.europa.eu/environment/topics/circular-economy/first-circular-economy-action-plan_en#:~:text=In%202015%2C%20the%20European%20Commission,growth%20and%20generate%20new%20jobs.

European Commission. (n.d). *What is EMAS*. Retrieved May 4, 2021 from

https://ec.europa.eu/environment/emas/index_en.htm

European Commission. (n.d.) *What if an organisation is already ISO 14001 certified or using a non-formal EMS?* Office for Official Publications of the European Communities. Retrieved May 4, 2021 from: https://ec.europa.eu/environment/emas/pdf/leaflets/emasleaflet_en.pdf.

European Parliament. (2019). *What is carbon neutrality and how can it be achieved by 2050.* Retrieved May 4, 2021 from <https://www.europarl.europa.eu/news/en/headlines/society/20190926STO62270/what-is-carbon-neutrality-and-how-can-it-be-achieved-by-2050>

Evans, L., & Meade, R. (2006). *The role and significance of cooperatives in New Zealand agriculture.* [Wellington, N.Z.]: New Zealand Institute for the Study of Competition and Regulation.

Food & Agriculture Organi. (2014). *State of food and agriculture 2013.* Rome.

Food and Agriculture Organization of the United Nations (FAO). (n.d.). *Agri-food chains.* Retrieved May 3, 2021, from <http://www.fao.org/energy/agri-food-chains/en/>

Fraccascia, L., Giannoccaro, I., Agarwal, A., & Hansen, E. (2019). Business models for the circular economy: Opportunities and challenges. *Business Strategy and the Environment*, 28(2), 430-432. doi: 10.1002/bse.2285

Freitag, C. (n.d.). Taxation of Cooperatives and Their Patrons (Portfolio 744) | Bloomberg Tax & Accounting. Retrieved May 2, 2021, from <https://pro.bloombergtax.com/portfolio/taxation-of-cooperatives-and-their-patrons-portfolio-744/>

Fulton, L. (2016). Worker representation in Europe, WP: Labour research department and ETUI, produced with the assistance of the SEEurope network.

Global Climate Change Impacts in the United States. (2009). Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, (eds.). *Cambridge University Press.* New York.

Godfray, H., Beddington, J., Crute, I., Haddad, L., Lawrence, D., & Muir, J. et al. (2010). Food Security: The Challenge of Feeding 9 Billion People. *Science*, 327(5967), 812-818. doi: 10.1126/science.1185383

Hacısüleyman, D, Şanlı Gülbahar, B. (2019). SÜRDÜRÜLEBİLİR BÖLGESEL EKONOMİK KALKINMADA KOOPERATİFÇİLİĞİN ROLÜ: İZMİR TİRE SÜT MODELİ ÖRNEĞİ. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 24 (4), 947-967. Retrieved May 4, 2021 from <https://dergipark.org.tr/tr/pub/sduiibfd/issue/53006/706108>

Hammer, J., & Pivo, G. (2016). The Triple Bottom Line and Sustainable Economic

Development Theory and Practice. *Economic Development Quarterly*, 31(1), 25-36. doi: 10.1177/0891242416674808

Hardy, R.W.F. (2002). *The bio-based economy*. In: Janick, J., Whipkey, A. (Eds.), *Trends in New Crops and New Uses*. Proceedings of the Fifth New Crops Symposium, Atlanta, 2001, *ASHS Press*, Alexandria, VA.

Ingram, JSI; Wright, HL; Foster, L; Aldred, T; Barling, D; Benton, TG; Berryman, PM; Bestwick, CS; Bows-Larkin, A; Brocklehurst, TF; Buttriss, J; Casey, J; Collins, H; Crossley, DS; Dolan, CS; Dowler, E; Edwards, R; Finney, KJ; Fitzpatrick, JL; Fowler, M; Garrett, DA; Godfrey, JE; Godley, A; Griffiths, W; Houlston, EJ; Kaiser, MJ; Kennard, R; Knox, JW; Kuyk, A; Linter, BR; Macdiarmid, JI; Martindale, W; Mathers, JC; McGonigle, DF; Mead, A; Millar, SJ; Miller, A; Murray, C; Norton, IT; Parry, S; Pollicino, M; Quested, TE; Tassou, S; Terry, LA; Tiffin, R; Graaf, P; Vorley, W; Westby, A; Sutherland, WJ. (2013). *Food Security*, 5 (5). 617-636. <https://doi.org/10.1007/s12571-013-0294-4>

International Cooperatives Alliance. (n.d.), Cooperative identity, values & principles. Retrieved May 3, 2021 from: <https://www.ica.coop/en/cooperatives/cooperative-identity>

ISO (n.d.). *ISO 14000 family — Environmental management*. Retrieved May 3, 2021, from <https://www.iso.org/iso-14001-environmental-management.html>

Inan, İ. (2008). *Türkiye'de Tarımsal Kooperatifçilik ve AB Modeli* (2nd ed.). İstanbul: İTO.

Karamürsel, F., Öztürk, F, P., Bayav, A. (2008). Türkiye’de AB uyum sürecinde üretici birlikleri.

Karantininis, K., & Zago, A. (2001). Endogenous Membership in Mixed Duopsonies. *American Journal of Agricultural Economics*, 83(5), 1266-1272. doi: 10.1111/0002-9092.00277

Kastner, T., Rivas, M., Koch, W., & Nonhebel, S. (2012). Global changes in diets and the consequences for land requirements for food. *Proceedings of the National Academy of Sciences*, 109(18), 6868-6872. doi: 10.1073/pnas.1117054109

Kelly, M., & Ratner, S. (2009). Keeping wealth local: Shared ownership and wealth control for rural communities. *Report for the Wealth Creation in Rural America Project of the Ford Foundation*.

Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127, 221-232. doi: 10.1016/j.resconrec.2017.09.005

Köroğlu, S. (2003). Avrupa Birliğinde Ve Türkiye’de Tarımsal Örgütlenme AT

Uzmanlık Tezi. Retrieved May 3, 2021, from <https://www.tarimorman.gov.tr/ABDGM/Belgeler/%C4%B0DAR%C4%B0%20%C4%B0%C5%9ELER/uzmanl%C4%B1k%20Tezleri/SemihaTez.pdf>

- Lambert, P. (1966). The Conclusions Of The Commission On Co-Operative Principles Appointed By The I.C.A. *Annals Of Public And Cooperative Economics*, 37(2), 111-120. doi: 10.1111/j.1467-8292.1966.tb01685.x
- Machado, V. A. C., Machado, V. H. A. D. C., & Barroso, A. P. F. (2011). Supply Chain Resilience Using the Mapping Approach. In P. Li (Ed.), *Supply Chain Management*, pp. 161-184. InTech. <http://www.intechopen.com/articles/show/title/supply-chain-resilience-using-the-mapping-approach>
- Majee, W., & Hoyt, A. (2011). Cooperatives and Community Development: A Perspective on the Use of Cooperatives in Development. *Journal of Community Practice*, 19(1), 48-61. doi: 10.1080/10705422.2011.550260
- Manalili, N. (2003). Linking Farmers to Markets through Cooperatives Vegetables Supply Chain Redesign Options for Kapatagan, Mindanao, Philippines.
- Marcis, J., Bortoluzzi, S., de Lima, E., & da Costa, S. (2018). Sustainability performance evaluation of agricultural cooperatives' operations: a systemic review of the literature. *Environment, Development and Sustainability*, 21(3), 1111-1126. doi: 10.1007/s10668-018-0095-1
- Marra, A., Mazzocchitti, M., & Sarra, A. (2018). Knowledge sharing and scientific cooperation in the design of research-based policies: The case of the circular economy. *Journal of Cleaner Production*, 194, 800-812. doi: 10.1016/j.jclepro.2018.05.164
- Mathers, Nigel & Fox, Nick & Hunn, Amanda. (2002). Trent Focus for Research and Development in Primary Health Care Using Interviews in a Research Project.
- Mauget, R. (2008). Les coopératives agricoles. *Revue Internationale De L'économie Sociale: Recma*, (307), 46-57. doi: 10.7202/1021194ar
- Mcgill University. (n.d.). *What is Sustainability*. Retrieved May 3, 2021, from <https://www.mcgill.ca/sustainability/files/sustainability/what-is-sustainability.pdf>.
- Morgan, A., Morgan, N., & Salume, P. (2016). *Feeding London 2030*, pp. 7-15. UK Warehousing Association.
- Murray, A., Skene, K., & Haynes, K. (2015). The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context. *Journal of Business Ethics*, 140(3), 369-380. doi: 10.1007/s10551-015-2693-2

- Mülayim, Z. (1992). Kooperatif Kuruluşlarda Üst Örgütlenmenin Önemi ve Türkiye'de Sorunları. Retrieved May 3, 2021, from <https://dergipark.org.tr/en/download/article-file/9564>
- Neiger, D., Rotaru, K., & Churilov, L. (2007). Supply chain risk identification with value-focused process engineering. *Journal of Operations Management*, 27(2), 154-168. doi: 10.1016/j.jom.2007.11.003
- Norrman, A., & Jansson, U. (2004). Ericsson's proactive supply chain risk management approach after a serious sub-supplier accident. *International Journal Of Physical Distribution & Logistics Management*, 34(5), 434-456. doi: 10.1108/09600030410545463
- Novkovic, S. (2006). Co-operative Business: The Role of Co-operative Principles and Values. *Journal of Co-Operative Studies*, 39(1), 5-15.
- Novkovic, S. (2008). Defining the co-operative difference. *The Journal of Socio-Economics*, 37(6), 2168-2177. doi: 10.1016/j.socec.2008.02.009
- Office of the German EMAS Advisory Board. (2014). *From ISO 14001 to EMAS: mind the gap How to implement EMAS where ISO 14001 already exists: EMAS Info*. Retrieved May 3, 2021, from https://www.emas.de/fileadmin/user_upload/4-pub/UGA_Infosheet_From-ISO-14001-to-EMAS.pdf
- Pan, S. Y., Du, M. A., Huang, I. T., Liu, I. H., Chang, E. E., & Chiang, P. C. (2015). Strategies on implementation of waste-to-energy (WTE) supply chain for circular economy system: a review. *Journal of Cleaner Production*, 108, 409-421.
- Pan, S., Du, M., Huang, I., Liu, I., Chang, E., & Chiang, P. (2015). Strategies on implementation of waste-to-energy (WTE) supply chain for circular economy system: a review. *Journal of Cleaner Production*, 108, 409-421. doi: 10.1016/j.jclepro.2015.06.124
- Parwez, S. (2014). Food supply chain management in Indian Agriculture: Issues, opportunities and further research. *African Journal of Business Management*, 8, 572-581. doi: [10.5897/AJBM2013.7292](https://doi.org/10.5897/AJBM2013.7292)
- Pearce, D. W., & Turner, R. K. (1990). *Economics of natural resources and the environment*. New York: Harvester Wheatsheaf.
- Popkin, B. (1999). Urbanization, Lifestyle Changes and the Nutrition Transition. *World Development*, 27(11), 1905-1916. doi: 10.1016/s0305-750x(99)00094-7
- Producer and Marketing Cooperatives. (2014). Retrieved May 4, 2021, from <https://www.co-oplaw.org/knowledge-base/producer-cooperatives/>
- R.O.T. Ministry of Environment and Urbanization. (n.d.). *Kooperatif ve Kooperatifçiliğin Tanımı - İzmir Valiliği Çevre ve Şehircilik İl Müdürlüğü*.

- Retrieved May 3, 2021, from <https://izmir.csb.gov.tr/kooperatif-ve-kooperatifciligin-tanimi-i-1529>
- Rajput, S., & Singh, S. (2020). Industry 4.0 Model for circular economy and cleaner production. *Journal of Cleaner Production*, 277, 123853. doi: 10.1016/j.jclepro.2020.123853
- Resmi Gazete. (1969). *1163 sayılı Kooperatifler Kanunu*. Retrieved May 3, 2021, from <http://www.mevzuat.gov.tr/MevzuatMetin/1.5.1163.doc>
- Rhodes, V. (1983). The Large Agricultural Cooperative as a Competitor. *American Journal of Agricultural Economics*, 65(5), 1090-1095. doi: 10.2307/1240426
- Roberts, B., & Cohen, M. (2002). Enhancing Sustainable Development by Triple Value Adding to the Core Business of Government. *Economic Development Quarterly*, 16(2), 127-137. doi: 10.1177/0891242402016002003
- Rudd, M. (2000). Live long and prosper: collective action, social capital and social vision. *Ecological Economics*, 34(1), 131-144. doi: 10.1016/s0921-8009(00)00152-x
- Sachan, A., Sahay, B., & Sharma, D. (2005). Developing Indian grain supply chain cost model: a system dynamics approach. *International Journal of Productivity And Performance Management*, 54(3), 187-205. doi: 10.1108/17410400510584901
- Scrase I., Wang T., MacKerron G., McGowan F., Sorrell S. (2009) Introduction: Climate Policy is Energy Policy. In: Scrase I., MacKerron G. (eds) *Energy for the Future*. Energy, Climate and the Environment Series. Palgrave Macmillan, London. https://doi.org/10.1057/9780230235441_1
- Sexton, R. (1990). Imperfect Competition in Agricultural Markets and the Role of Cooperatives: A Spatial Analysis. *American Journal of Agricultural Economics*, 72(3), 709-720. doi: 10.2307/1243041
- Shell Int. (2001). *Energy Needs, Choices and Possibilities Scenarios to 2050*. Retrieved May 3, 2021, from https://www.shell.com/energy-and-innovation/the-energy-future/scenarios/new-lenses-on-the-future/earlier-scenarios/jcr_content/par/expandablelist/expandablesection.stream/1519772007338/13e227ab7fe802b9d15a8b0d572ecdc3ab481ff5/scenarios-energy-needs-choices-and-possibilities.pdf
- Spear, R. (2000). The Co-operative Advantage. *Annals of Public And Cooperative Economics*, 71(4), 507-523. doi: 10.1111/1467-8292.00151
- Spelman, C. A. (1994). *Non-food uses of agricultural raw materials: Economics, biotechnology and politics*. Wallingford, Oxon, UK: CAB International.
- Staatz, J. M. (1987). Farmers' incentives to take collective action via cooperatives: a

- transaction cost approach. *Cooperative theory: New approaches*, 18, 87-107.
- Stone, J., & Rahimifard, S. (2018). Resilience in agri-food supply chains: a critical analysis of the literature and synthesis of a novel framework. *Supply Chain Management: An International Journal*, 23(3), 207-238. doi: 10.1108/scm-06-2017-0201
- Subaşı, O., & Uysal, O. (2018). Tarımsal Üretici Örgütlenmeleri ve Üretici Birlikleri. In *International Erdemli Symposium*. Mersin.
- Suweis, S., Carr, J. A., Maritan, A., Rinaldo, A., & D'Odorico, P. (2015). Resilience and reactivity of global food security. *Proceedings of the National Academy of Sciences*, 112(22), 6902-6907.
- Sykuta, M., & Cook, M. (2001). Cooperative and membership commitment: A new institutional economics approach to contracts and cooperatives. *American Journal of Agricultural Economics*, 83, 1273–1279
- Techo, V. (2016). Research Methods-Quantitative, Qualitative, and Mixed methods. Retrieved May 4, 2021, from https://www.researchgate.net/publication/305215626_Research_Methods-Quantitative_Qualitative_and_Mixed_methods
- The Nature Conservancy (n.d.). *Calculate Your Carbon Footprint What's your carbon footprint? Use this interactive calculator to find out—and take action*. Retrieved May 3, 2021, from <https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/>
- Top 100 Green Initiatives. (2018). Retrieved May 4, 2021, from <https://www.greenmatch.co.uk/blog/2015/02/top-100-green-initiatives>
- Tukker, A. (2015). Product services for a resource-efficient and circular economy – a review. *Journal of Cleaner Production*, 97, 76-91. doi: 10.1016/j.jclepro.2013.11.049
- UN Secretary-General (UNSG). (2009). *Millennium Development Goals Report*. New York. Retrieved May 3, 2021 from https://www.un.org/millenniumgoals/pdf/MDG_Report_2009_ENG.pdf
- UN Secretary-General. (2009). *Cooperatives in social development*. A/64/132 (13 July 2009.) Retrieved May 4, 2021 from <https://undocs.org/A/64/132>
- UN. (n.d.). *Goal 12: Ensure sustainable consumption and production patterns*. Retrieved May 4, 2021, from <https://www.un.org/sustainabledevelopment/sustainable-consumption-production/>
- University of Nebraska-Lincoln. (n.d.). *Types of Cooperatives* | Nebraska Cooperative Development Center. Retrieved May 4, 2021, from

<https://ncdc.unl.edu/typescooperatives.shtml>

- USDA. (2000). *2000 Report*. Lexington, Kentucky: US Department of Agriculture Agricultural Research Service. Retrieved May 4, 2021 from <https://www.ars.usda.gov/southeast-area/charleston-sc/vegetable-research/docs/wrdg/2000-report/>
- USDA. (2011). *Understanding Cooperatives: Cooperative Business Principles Cooperative Information Report 45, Section 2*. United States Department of Agriculture Rural Development. Retrieved May 4, 2021, from https://www.rd.usda.gov/files/CIR45_2.pdf
- VALENTINOV, V. (2007). Why are cooperatives important in agriculture? An organizational economics perspective. *Journal of Institutional Economics*, 3(1), 55-69. doi: 10.1017/s1744137406000555
- Valentinov, V., & Iliopoulos, C. (2013). Economic Theories of Nonprofits and Agricultural Cooperatives Compared: New Perspectives for Nonprofit Scholars. *Nonprofit and Voluntary Sector Quarterly*, 42(1), 109–126. <https://doi.org/10.1177/0899764012436399>
- Vieta, M., & Lionais, D. (2015). Editorial: The Cooperative Advantage for Community Development. *The Journal of Entrepreneurial and Organizational Diversity*, 4(1), 1-10. doi: 10.5947/jeod.2015.001
- Vlajic, J., van Lokven, S., Haijema, R., & van der Vorst, J. (2012). Using vulnerability performance indicators to attain food supply chain robustness. *Production Planning & Control*, 24(8-9), 785-799. doi: 10.1080/09537287.2012.666869
- Wanyama, F. (2014). *Cooperatives and the Sustainable Development Goals: A contribution to the post-2015 development debate*. Geneva (Switzerland): ILO.
- Wanyama, F., Develtere, P., & Pollet, I. (2008). Encountering the Evidence: Cooperatives and Poverty Reduction in Africa. *SSRN Electronic Journal*. doi: 10.2139/ssrn.1330387
- What are Cooperatives - Co-opLaw.org. (n.d.). Retrieved May 3, 2021, from <https://www.co-oplaw.org/co-op-basics/what-are-cooperatives/>
- What then must we do?: straight talk about the next American revolution. (2013). *Choice Reviews Online*, 51(04), 51-2352-51–2352. <https://doi.org/10.5860/choice.51-2352>
- Wilbanks, T. J., & Kates, R. W. (1999). Global change in local places: how scale matters. *Climatic change*, 43(3), 601-628.
- William, M., & Braungart, M. (2002). Cradle to cradle: remaking the way we make things. *Choice Reviews Online*, 40(02), 40-0914-40-0914. doi: 10.5860/choice.40-0914

- Williams, C. (2007). Research Methods. *Journal of Business & Economics Research (JBER)*, 5(3). <https://doi.org/10.19030/jber.v5i3.2532>
- World Bank, Van Bastelaer, T., & Grootaert, C. (2002). *Understanding and Measuring Social Capital: A Multidisciplinary Tool for Practitioners (Directions in development (Washington, D.C.))*. The World Bank Group.
- World Commission on Environment and Development. (1987). *Our Common Future (Brundtland Report)*. Oxford: Oxford University Press. Retrieved May 4, 2021 from <https://www.are.admin.ch/are/en/home/sustainable-development/international-cooperation/2030agenda/un--milestones-in-sustainable-development/1987--brundtland-report.html>
- Yılmaz, H. (2008). Türkiye'de Tarım Politikalarının Demokratikleşmesi ve Alternatif Tarım Politikaları Oluşturulması Sürecinde Baskı Grupları Olarak Üretici Örgütleri. In *2nd National Economy Congress in memory of İzmir Economy Congress*. İzmir: DEÜ Faculty of Economic and Administrative Sciences. Retrieved May 4, 2021 from https://debis.deu.edu.tr/userweb/iibf_kongre/dosyalar/yilmaz.pdf
- Zeuli, K., & Cropp, R. (2004). *Cooperatives: Principles and practices in the 21st century*. Madison, WI: University of Wisconsin Center for Cooperatives.

APPENDIX 1 – Survey

Institutions' Contributions to Sustainability and Circular Economy Survey

This survey aims to find the correlation between your institution and its contribution to sustainability and the circular economy.

In this regard, the survey consists of three parts: Y/N questions, open-ended questions and 5-point Likert scale questions. Some questions would require further explanation in relation to the given answer.

Please answer each question as required in the question.

Thank you in advance for taking part in this survey.

1. Select one of the followings to identify your Institution.

Agricultural cooperative:

Food supply chain:

Union:

Other:

Y/N Questions:

2. Does your cooperative help preserve resources involving some that are scarce in finding and affected by fluctuations in their prices?

Yes / No / Undecided

If yes, please explain how your cooperative manages to do so.

3. Does your cooperative save money and overall costs by preserving resources and managing wastes?

Yes/ No / Undecided

If yes, please explain which tools and methods do you use.

4. Does your cooperative save money and overall costs in industries?

Yes/ No / Undecided

If yes, please explain if you have any initiatives focusing on this subject.

5. Are you reusing your waste in other parts of your cooperative (example: animal faeces as fertilizer in agriculture).

Yes/ No / Undecided

If yes, please give examples on how you use your waste and in which part of your institution do you reuse them in.

6. Do you have a waste separation & collection system within your cooperative?
(Ex: colored bins, waste collection points, product labels etc.)

Yes/ No / Undecided

If yes, please elaborate.

7. Is your cooperative ISO 14000 certified?

Yes/ No / Undecided

8. Is your cooperative EMAS certified?

Yes/ No / Undecided

Open-Ended Questions:

9. Are you using plastics in the packaging of your products? If so, how do you recycle them afterwards?
10. What are you feeding your animals?
11. What do you know about bio-based products?
12. What is your carbon footprint (released carbon dioxide to the atmosphere based on activities)? What precautions do you take to reduce your carbon footprint?
13. What are you doing to reduce pollution in your cooperative?
14. How do you utilize your by-products?
15. What are you using against pesticides?
16. How does your cooperative produce and export products & services that are in the clean category across the world?

Please give examples of these products & services.

17. How do you recycle your wastes?

What is your scale of recycling your wastes? Please elaborate.

18. How do you use green technology in your cooperative in tracking the progress of your crops & products, mapping your resources, irrigation etc.?

5-point Likert Scale questions

19. How does your cooperative support and contribute to cohesion and social integration?

Please elaborate on your short and long-term plans and strategies in this subject.

b- What is the impact of this support and contribution to cohesion and social integration on your cooperative?

1	2	3	4	5
Very Poor	Poor	Fair	Good	Excellent

20. What does your cooperative do to support efficient resource usage and innovations?

Please give examples of existing methods and/or R&D studies regarding efficient resource usage

b- What is the impact of supporting efficient resource usage and innovations on your cooperative?

1	2	3	4	5
Very Poor	Poor	Fair	Good	Excellent

21. What do you do to assure safety and gain the best performance from your employees?

b- What is the impact of assuring safety and implementing the best performance practices on your cooperative?

1	2	3	4	5
Very Poor	Poor	Fair	Good	Excellent

22. How do you separate your waste?

b- What is the impact of separating your wastes on your cooperative?

1	2	3	4	5
Very Poor	Poor	Fair	Good	Excellent

23. What are you working on to increase the efficiency of your resources?

b- What is the impact of working on increasing the efficiency of resources on your cooperative?

1	2	3	4	5
Very Poor	Poor	Fair	Good	Excellent

24. How does your cooperative create new jobs that can be low-maintenance and high skilled?

Please give further examples.

b- What is the impact of creating high-skilled jobs on your cooperative?

1	2	3	4	5
Very Poor	Poor	Fair	Good	Excellent

25. How do you follow EU directives on circular economy and sustainability? (For example low-carbon-footprint, recycling, waste management, reusing of products etc.)

b- What is the impact of following EU directives regarding circular economy and sustainability on your cooperative?

1	2	3	4	5
Very Poor	Poor	Fair	Good	Excellent