EVALUATING SUSTAINABLE DEVELOPMENT STRATEGIES FOR THE TURKISH FLORICULTURE INDUSTRY AND ITS SUSTAINABLE FINANCING MECHANISMS

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TABLE OF CONTENTS

LIST OF SYMBOLS

AHP **:** Analytic Hierarchy Process

ANP **:** Analytic Network Process

BOCR **:** Benefits, Opportunities, Costs and Risks

GHG **:** Greenhouse Gas

R&D **:** Research and Development

RFID **:** Radio-Frequency Identification

SÜSBİR **:** Süs Bitkileri Üreticileri Alt Birliği

SWOT **:** Strengths, Weaknesses Opportunities, Threats

US **:** United States

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

Today, global problems that our planet and humankind faced, have reached non-ignorable levels. In this respect, sustainability, which has been an indispensable part of our lives for many years, increased its popularity and being used all too often, as a complementary concept to many cases. The concept of sustainability, which is mostly associated with environmental approaches, has evolved into policies under the title of sustainable development throughout the world, and has been transformed into an action plan that will cover the present and future generations by addressing the economic and social dimensions. It is clear that agriculture plays an important role in sustainability. Floriculture, which is the one of the significant agriculture-based industries, maintain its importance for many countries with its commercial position. Although Turkey has significant advantages with favorable climatic conditions, fertile lands and proximity to important markets, it can be seen that it's not a major player in the global floriculture market. In addition, there are serious public debates for quite some time, about the decline in the agriculture. The aim of this study is to determine strategies for the sustainable development of the Turkish floriculture industry, and thereupon to evaluate these strategies and sustainable financing mechanisms together with their economic, environmental and socio-political dimensions, under a multi-criteria decision-making model. Within the scope of the study, we have identified sustainable development strategies that can be applied to the industry, with the help of a comprehensive Strength-Weakness-Opportunities-Threats analysis, where we highlight the current situation of the Turkish floriculture industry, and individual expert opinions. The Analytical Network Process model that we developed in line with our goal, makes it possible to evaluate the sustainable floriculture approach under benefits, opportunities, costs and risks merits. We believe that the criterion system that we have identified and results we obtained, will draw an applicable strategic road map on behalf of Turkish floriculture and other similar industries.

ÖZET

Bugün geldiğimiz noktada gezegenin ve insanlığın karşı karşıya kaldığı sorunlar, artık göz ardı edilemeyecek noktaya gelmiştir. Bu doğrultuda, uzun yıllardır hayatımızda bulunan sürdürülebilirlik kavramının, günümüzde yaygın bir biçimde birçok olgunun yanında tamamlayıcı olarak kullanıldığı görülebilmektedir. Daha çok çevresel yaklaşımlarla ilişkilendirlen sürdürülebilirlik kavramı, dünya genelinde sürdürülebilir kalkınma başlığı altında politikalara evrilmiş, ekonomik ve sosyal boyutları da ele alınarak bugünü ve gelecek nesilleri kapsayacak bir eylem planı haline dönüştürülmüştür. Sürdürülebilirlik kapsamında tarımın önemli bir rolü olduğu aşikardır. Tarım-temelli, önemli endüstrilerden biri olan çiçekçilik, ticari konumu ile birçok ülke için önemini korumaktadır. Türkiye, elverişli iklim koşulları, verimli toprakları ve önemli pazarlara yakınlığı ile önemli avantajlara sahip olmasına rağmen, küresel çiçekçilik pazarında önemli bir oyuncu haline gelememiştir. Bunun yanında, ülkede tarımsal anlamda ciddi bir geriye gidiş olduğu toplum nezdinde tartışılır hale gelmiştir. Sürdürülebilir kalkınma hedefleri olan bir ülke olarak, tarım-temelli endüstrilerde sürdürülebilirliğin geri planda kalmaması adına çalışmalara ihtiyaç olduğu açıktır. Bu çalışmada hedefimiz, Türkiye çiçekçilik endüstrisinin sürdürülebilir kalkınmasına yönelik stratejiler belirlemek ve bu stratejileri ve sürdürülebilir finansman mekanizmaları ile birlikte ekonomik, çevresel ve sosyo-politik boyutlarıyla, çok kriterli karar verme modeli altında değerlendirmektir. Çalışma kapsamında, Türkiye çiçekçilik endüstrisinin güncel durumuna ışık tuttuğumuz geniş kapsamlı bir Güçlü-Zayıf Yönler-Fırsatlar-Tehditler analizi ve uzman görüşleri yardımıyla endüstri için uygulanabilecek sürüdürülebilir kalkınma stratejileri belirlemiş bulunmaktayız. Hedefimiz doğrultusunda geliştirdiğimiz Analitik Ağ Süreci modeli, sürdürülebilir çiçekçilik yaklaşımını faydalar, fırsatlar, maliyetler ve riskler başlıkları altında, tüm detayları ile değerlendirmeyi mümkün kılmaktadır. Çalışmamız içerisinde belirlediğimiz kriter sistemlerinin ve elde ettiğimiz sonuçların, Türkiye çiçekçiliği ve benzer diğer endüstriler adına uygulanabilir bir yol haritası çizdiğine inanmaktayız.

1. INTRODUCTION

Today, with an uncontrolled development process and consumption growth, and as a result of factors such as technological-industrial progress and increasing population-urbanization, disruptions in ecological balance began to be noticed thoroughly. It has been acknowledged by many communities that, the underlying reason for this disruption arises from overlooking or ignoring the connections between environment and development. At this juncture, the concept of sustainability, in the strictest sense of the word "maintaining the ability to be permanent while ensuring the continuity of productivity and diversity", has gain a place in the social memory.

When a research on sustainable development is carried out, most of the studies show that the point of origin is a report named "Our Common Future", prepared by the World Commission on Environment and Development (1987). One way or another the concept discussed, has been linked to this report. This report, also known as the Brundtland Report, briefly describes sustainable development as: The development that cover the needs of today without endangering the capability of next generations to cover their own needs. Towards the end of the 20th century, the concept of sustainable development, which has become a global action plan with international multilateral agreements, continues to be the focal point with its increasing importance and expanding awareness.

Sustainability is often used in conjunction with green and environmentally-conscious approaches. On the other hand, development, usually reminds the concept of economic development. Although the effect they create in perceptions are different, when these two concepts come together a powerful notion that needs to be evaluated in every

dimensions emerges. In most studies in the literature, sustainable development is generally evaluated in three main dimensions, which are economic, environmental and social or socio-political sustainability (Elkington, 1994; Tilman et al., 2002; Munier, 2005; Labuschagne et al., 2005; Scoones, 2007). In short, the concept of sustainable development, which provides a balance between economy, society and environment, enables a guiding conceptual framework for global, national, regional and institutional practices. Accordingly, the search for sustainable mechanisms in all areas have increased globally. Sustainability determinants have begun to attract the attention of researchers, and also sustainable financing mechanisms have become involved in the process.

As a signatory country to international agreements, sustainable development is on Turkey's agenda. For a while, Turkey is under a discussion about whether it is a developed country or a developing country. Although it appears to be in a complicated situation in terms of these agreements, the country is not in a position to move away from the concept of sustainability in the name of future generations.

In recent years, following a different strategy in the name of industrialization, Turkey started to experience problems in the sense of agriculture and even, discussions have been generated over becoming foreign-dependent rather than self-sufficient in many agricultural products. It is necessary to evaluate how this transformation in Turkey, which is regarded as the homeland of many agricultural products, affects the development and sustainability of the country. In particular, the importance of agricultural products in the transfer of resources to future generations is obvious. In this respect, there is a need for studies to support the sustainability of agricultural industries in the country.

Floriculture, which is an agriculture-based industry, has been evaluated as an industry worth for examination with a sustainability approach because of its substantial contribution to economic development in certain countries and its high value added products. Turkey is not known as an important player in world floriculture. However, it can be seen that due to its agricultural culture, it has a level open to development. In

addition, the floriculture industry presents a case worth examining in terms of logistics and finance, in accordance with the outcomes of our graduate program. It has been observed that, in Turkey generally academicians working in the field of agriculture were interested in the subject. We wanted to bring a different approach to the industry and put forward a mathematically equivalent study with one of the Multi-Criteria Decision Making methods, which is widely used in industrial engineering. In this direction, this study emerged for the purpose of "Evaluating Sustainable Development Strategies for the Turkish Floriculture Industry and its Sustainable Financing Mechanisms".

The general content of the study will be as follows:

In Chapter 2, the overall position of global floriculture and the basic concepts that will affect the sustainable development of the industry will be examined in depth. In addition, important examples will be introduced from countries where the floriculture industry has a significant impact. In Chapter 3, the current status of the Turkish Floriculture industry will be discussed in detail. In Chapter 4, we will give an overview of the Multi-Criteria Decision Making method we will use and the development of the model used in the study will be explained. In Chapter 5, the findings of the analysis will be presented and discussed. Finally, the overall results of the study will be evaluated in Chapter 6.

2. FLORICULTURE INDUSTRY

2.1. General Overview

Floriculture is a specialized sub-branch of horticulture. It mainly deals with the cultivation and farming of the products such as cut flowers (carnations, roses, orchids, snapdragons, etc.), potted plants (Easter lilies, begonias, cyclamens, etc.), bedding plants and foliage plants. As a commercial activity, floriculture can be defined as a deepen discipline of agriculture with advanced skills requirement, which involves the production of floricultural products for commercial purposes and their whole marketing activities (Sheela, 2008; Getu, 2009; Larson, 2013; Tuyl et al., 2014).

Flower usage for various purposes, is an event that goes long way back in history. According to scholars' findings, at least since the Neanderthal era (Solecki, 1975). Main subjects that floricultural products, esspecially flowers, have been used throughout history in perfumery, pharmacy, decoration, ornament, gastronomy, artwork and religious ceremonies (Tuyl et al., 2014). With the economic potential, as a result of several utilization areas and its cultural bond to human society, floricultural products gained a commercial position (Singh et al., 2017).

Commercial floriculture, following the growth in the floricultural market and demand increase, has become a significant economic activity in certain countries through the history. Commercial floriculture has been the motivation behind several financial mechanisms. Even more the floriculture market influenced the economics and finance field's approaches through a number of historical events (French, 2006; Steen, 2010;

Huylenbroeck, 2010). The prominent historical event, which has become a phenomenon in economics and finance field, is "Tulipmania". Tulipmania, also known as Dutch Tulipmania, is the speculative price increase in tulip bulbs, which begins by the end of 1636 where the bulb price cost more than a luxurious Dutch house, then followed by a sudden decrease in the beginning of 1637. Among the scholars this situation, basically where the assets value artificially surpasses its essential value, has been referred as "financial bubble" and Tulipmania is the oldest one ever recorded in the history (Garber, 1990; Thompson, 2007; French, 2006).

In the twentieth century, worldwide production of floricultural products has attained industrial levels (Mol et al., 1995). Nowadays floriculture industry become widespread around the world with approximately 150 exporter and 200 importer countries (which have trade values over 10 thousand US Dollars) according to the International Trade Centers (2018) statistics. In these statistics, with the product code 06, floricultural products have been defined as: "*Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage* ". Between the years 2013 and 2017, 06 coded products total global import value has been estimated over 94 billion United States dollars. The total export value in the same time period is over 103 billion United States dollars. Netherlands has been by far the leading country in exports. When the exporter countries list has examined, it could be clearly seen that there is a considerable amount of developing countries like Colombia, Ecuador, Kenya and Ethiopia at the top ranks. In imports, European countries have predominated the top importer countries list. This situation can be explained with the fact that European floriculture industry representatives have been moving their production operations to developing countries due to preferable production conditions, both environmentally and financially (Gebreeyesus, 2015). Also developed countries like United States of America, Japan, Russian Federation and Canada are at the top of the importer countries list.

Table 2.1. Top exporter countries list in floricultural products

Rank 2017	Exporter Countries	Exported values (Unit: US Dollars*1000)				
		2013	2014	2015	2016	2017
1	Netherlands	10715208	10966397	9186913	9732874	10137050
2	Colombia	1344652	1386108	1308583	1328138	1417127
3	Germany	1111287	1113281	941209	1012532	1057083
4	Italy	895900	882001	772899	833914	939416
5	Ecuador	841159	922210	824453	806932	890537
6	Belgium	1003866	901961	592923	603055	605973
7	Kenya	537952	621599	527756	555814	595627
8	Denmark	651536	585150	464315	476830	491731
9	United States of America	417632	421387	411245	427109	447246
10	Spain	347832	396544	316596	360082	409098
11	Canada	305553	333455	346062	366272	392366
12	China	275439	409950	299686	330000	338468
13	Ethiopia	187591	198701	217502	216156	221928
14	Taipei, Chinese	190583	206076	195574	194317	203840
15	France	175583	179799	148366	154174	165214
16	Lithuania	96049	134224	146163	139005	143184
17	Poland	174123	148325	136093	135115	141191
18	Malaysia	135681	134698	126784	139454	138909
19	Israel	186436	170401	138349	147976	133410
20	Costa Rica	155250	150721	147548	138882	132019
...	...	...	...	...	...	...
26	Turkey	76989	82993	77429	81614	85510
...	...	...	...	...	...	...
Total	**World**	**21723075**	**22027193**	**18849568**	**19813056**	**20894721**

Table 2.2. Top importer countries list in floricultural products

Rank 2017	Importer Countries	Imported values (Unit: US Dollars*1000)				
		2013	**2014**	**2015**	**2016**	**2017**
1	Germany	3466170	3511409	2951689	3031900	3212927
2	Netherlands	1993179	2118742	2153110	2262071	2356822
3	United States of America	1912913	1967406	2011797	2164141	2277851
4	United Kingdom	1699417	1839178	1631478	1591902	1550522
5	France	1322119	1291949	1107016	1152602	1212337
6	Italy	655861	662922	592637	580014	619597
7	Japan	643761	605622	553320	582834	585911
8	Russian Federation	960763	850405	718032	577756	567911
9	Switzerland	642641	632818	547920	557080	560400
10	Belgium	735926	680933	393233	443315	446282
11	Canada	406216	403177	382658	376650	409256
12	Austria	470583	482474	399933	360176	381643
13	Denmark	319651	335550	314194	329464	337245
14	Poland	299067	315172	262805	262146	300924
15	Sweden	345908	346959	264335	274594	288344
16	China	173378	189271	217333	226363	280863
17	Belarus	36053	44784	42208	116617	262308
18	Norway	288060	293292	245392	243849	261484
19	Spain	202705	242914	205456	231699	244130
20	Czech Republic	185310	189453	177784	183237	193757
…	…	…	…	…	…	…
31	Turkey	92501	92890	81385	87244	83023
…	…	…	…	…	…	…
Total	**World**	**19456385**	**19742197**	**17670345**	**18238956**	**19263288**

Globally, the floriculture industry has been constituted on a set of relationships among worldwide growers, laborers, dealers, consumers and researchers (Hughes, 2000). The global floriculture industry, due to its distinctive characteristics, has mostly been dependent on integrated systems and technical knowledge in every stage of its commercial activity. As a consequence of globalization, it has showed a marked improvement in business activity and competition capacity, moreover through the technological developments in production and post harvesting phase, followed by the improvements in logistics process and marketing activities (de Groot, 1998; Whitaker & Kolavalli, 2006; Xia et al., 2006).

The floriculture industry has been formed as an active, changeable and progressive supply chain network, which consists high variety of methods for planning, coordinating, conducting, observing and controlling in each stage of the chain with an emphasis on value delivery to consumers. The representatives of the floricultural supply chains, which mainly are; flower producers, flower auction companies, wholesale dealers, merchants, logistics intermediaries, florists, groceries, marketplaces, e-commerce websites, etc.; have been struggling with the unpredictability of both supply and demand, mainly due to the factors based on the perishable nature of floricultural products. In view of this fact, the management activities for floricultural supply chains can be considered closely related to agri-food and perishable supply chain management activities (Verdouw et al., 2013; de Keizer et al., 2015).

In order to ensure sustainable development, characteristics of the floriculture industry should be better understood and evaluated in depth. After identifying the historical development, global status and main representatives of the industry, we carry further the survey with a focus on academic studies that evaluate trends and developments in floriculture, under the titles of production, logistics, marketing, labor, finance and sustainability.

2.1.1. Production in Floriculture Industry

Production in floriculture is a dynamic area that requires different technical competencies due to the fact that there are many species and product groups throughout the industry. Therefore, instead of excessive technical details concerning agriculture and genetic engineering field, we have presented a general perspective in order to evaluate the production in the industry.

Flower breeding/cultivating process depends on several derivers. Firstly, elemental factors as; light, water, soil and climatic conditions, followed by primary materials as; seeds/bulbs and plantation supplies, and lastly the subsidiary materials as; agricultural pesticides, fertilizers and chemical substances (Liemt, 1999). The floriculture industry, performs mass-production on many product groups, mostly inside greenhouses (Verdouw et al., 2015). Greenhouses, provides convenient microclimate conditions by using energy sources (Singh & Tiwari, 2000), which fits the requirements of flower breeding/ cultivating process.

Developments in floricultural production have been highly dependent on greenhouse technologies such as heat systems, artificial lightening systems and so on, there are plenty of studies considering this issue in the literature. Considerable other high technology/technique requiring systems related to production can be summarized as; plant growing techniques like hydroponics/aeroponics, automated water irrigation systems, harvesting systems, genetic transformation methods, hybridization and seed germination techniques, pest management and fertilizer management activities (Souret & Weathers, 2000; Tanaka et al., 2005; Moe et al., 2005; McDonald & Kwong, 2005; Katsoulas et al., 2006; Rath & Kawollek, 2009; Ganguly et al., 2010; Larson, 2013).

Increasing day by day knowledge on the physiological, environmental and genetic structure underlying floricultural products; brings more consistent and reliable methods to the industry, enlarges the diversity of floricultural products characteristics and therefore initiates changes in production phases (Xia et al., 2006). In this sense, the importance of R & D activities and scientific research has a very valuable place at every stage of the industry's production. Obviously, the drivers related production is not limited to all these contributing causes, and due to their integrated nature, a certain amount of them will further be elaborated in the following sections.

2.1.2. Logistics in Floriculture Industry

In general, the logistics process is concerned with the coordination and planning of the material and information flow between production and consumption points. Therefore, it deals with the whole of activities such as logistics services, packaging, storage, stock management, distribution and so on (Christopher, 2011). Perishability, comes to the fore as a key feature affecting the logistics approach of the floriculture industry. In the post-harvesting phase, floricultural products maintain respiration and keep growing up. Due to product features; they are adversely affected by temperature change, humidity, microorganisms and impact-related effects (Liemt, 1999). In accordance with the properties that appear in the perishable products, the quality declines with the increase in the time interval following the production phase of floricultural products, which causes a serious depreciation. In addition, bouquets, which is one of the most widely used packaging/selling methods in the industry, offers a non-homogenous deterioration rate due to the diversity in its content (Keizer et al., 2017). In this context, it is seen that the logistics operations of the floriculture industry are generally evaluated under the heading of perishable products logistics and continues its development in this direction.

Nowadays, floricultural products are transported from various marketing channels to various distances and climates, which means that without better organization and coordination, increasing waste and reducing profits for all parts of the floriculture

industry cannot be avoided. Industry requires advanced infrastructure and logistical competences such as; cold chain facilities and equipment, warehouses and hubs, packaging services, intermodal transportation (especially air freight) and information technology. The use of low temperatures in floriculture is a phenomenon almost since the date of the industry has been formed, and as the industry evolves, its importance has increased day by day. Moreover, by the representatives of the industry and the researchers, low-temperature applications have been evaluated as the most significant driver that ensures the protection in the post-harvest phase of the floricultural products, which minimizes the quality loss. In order to maintain total quality, optimal temperature conditions for a wide variety of floricultural products and the optimal interval for holding and handling periods, which in floriculture case the vase life, have been specified in the literature (Rudnicki et al., 1991; Staby & Reid, 2005; Gebreeyesus & Sonobe, 2012).

The cold chain is a whole of systems that provides the basic technical conditions to maintain a low temperature environment to preserve the quality of perishable products. Cold chain logistics, which covers the large part of the post-harvest stages of the floriculture industry, is mainly based on air conditioning technology (Yan & Lee, 2009). Such systems like precooling (vacuumed, forced air, hydro), cold storage (air-conditioned warehouses, hub facilities, auction houses) and refrigerated transport (refrigerated air-cargo, marine, intermodal containers; trucks and railway wagons) as the main components of the cold chain logistics and such support technologies like; automatic identification systems (typically, RFID/Radio-Frequency Identification), devices like time/temperature indicators, isolative packaging technologies, electronic tracking systems and sensor networks helps to trace, check and maintain the conditions and the product quality all the way through the floricultural logistics networks (Kitinoja, 2013; Keizer et al., 2017).

Developments in floricultural logistics share similarity with floricultural production, on high dependence to other technological developments, which in the logistics case, cold chain technologies. In cold chain applications, preventing chain breakage is one of the most important targets. In case of floriculture, the industry representatives should invest

in system requirements to avoid breakage. Due various causes, some of these systems cannot be designed, built or owned by each representatives and should be outsourced in coordination. Therefore, floriculture industry broadly relies upon third and fourth party logistic providers. Recently the development of the logistic approach for the floricultural industry carries on with several logistic management concepts and virtualization studies. (Staby & Reid, 2005; Vorst et al., 2012; Gebreeyesus & Sonobe, 2012; Verdouw et al., 2013; Vorst et al., 2016).

2.1.3. Marketing in Floriculture Industry

In previous sections, the specific uses of floricultural products and the effect of globalization were mentioned. The aesthetic value of floricultural products has an important place in the marketing phase and quality parameter comes to the fore. The results of many studies in the literature about consumer preferences-habits reveal that industry has gone a long way in terms of marketing management (Behe & Wolnick, 1993; Palma et al., 2011; Raina et al., 2011; Wollaeger, 2015). Consumers are becoming more aware of their needs and desires, therefore they are demanding higher product quality options and service levels depending on the purpose of the purchase. Because of the increasing quality awareness of consumers, only the best quality of the floricultural products can be traded in the international market. High competition in the industry shows that less than the best quality products can only be sold to the least demanding and probable domestic consumers (Liemt, 1999; Sheela, 2008). Considering the demand-oriented approach, it would be correct to say that the market for floricultural products shows variability and uncertainty. It is observed that floricultural product groups are generally specialized in certain areas of use. Consumers do not only rely on long-lasting and reputable products, but also to products with different characteristics. Increasing usage areas and product characteristics (color, pattern, fragrance and medical use), season/climate related sales, special days (Valentine's Day, Mother's Day, etc.), changing customer behaviors and global competition are the factors that increase this fluctuation and brings different marketing strategies to the industry (Baourakis et al., 2000; Verdouw et al., 2010; Benschop et al., 2010; Raynolds, 2012].

Keizer et al. (2015), have defined three particular market types for the floriculture industry. The first one is “Detail”, the market type where the sales go through shops, which are specifically focused on floricultural products. The features have been utilized as; wide range of specialized products, a certain point-of-sale number and small sized daily based orders. Second one is “Retail”, the market type where the floricultural products are not the primary product in the selling space. The sales go through nonspecialized shops like supermarkets. The features of the retail market for floriculture industry have been utilized as; limited range of mass customized products, fewer sales points and larger sized weekly based orders. The third and last market type is “E-tail”, the web-enabling floriculture market. Utilized futures are; medium-high range of customized products, very large-scale of sales points and very small sized daily based orders in comparison with other two market types. It bears a resemblance to the detail floriculture market in some aspects.

Auction mechanisms have been used in the marketing stage of many agricultural products and one of them has been the most prominent marketing tool on behalf of the floriculture industry. From past to present, floriculture products have been marketed through the Dutch auction mechanism. This marketing mechanism, which emerged as a local cooperative, set an example for the marketing channels in many countries. In the Netherlands, which pioneered the mechanism, the system became a multi-national organization with many participants from many countries (Heck & Ribbers, 1997; Xia et al., 2006). In the following sections, the mechanism and Netherlands position will be discussed in detail. Looking at the direct marketing channels, the most prominent method in the floriculture industry is contracted production/farming. Fundamentally contracted production is, agreements made for production and procurement under predetermined agreements on the basis that the producers supplies floricultural products in certain quantities and quality standards. While producers guarantee the sale of their products with this channel, procurers obtain expected quality and quantity of the products in the most favorable prearranged conditions, by participating the production stage with technical and financial support (Mou, 2012).

Finally, the effect of e-commerce on floriculture should be mentioned. The type of trade, which is forecasted in the E-tail market, has changed the way of floricultural business. Although it enables the individual consumers to reach the floricultural products more easily, E-commerce have significantly increased the interaction and sales volume in the world floriculture market with the creation of virtual trading platforms and real-time auction systems. It has become an important factor leading to the formation of new marketing management activities inside the industry (Sheela, 2008).

2.1.4. Labor in Floriculture Industry

Like many other agriculture-based industries, floriculture has a labor-intensive feature. The industry provides employment for labor with many skill levels, in urban and rural areas. Along with lecturers and researchers, employees who provide the technological and technical competence required by the floriculture industry, can be considered as high-qualified labor. In addition to all technological innovations and technical skills that has been mentioned throughout the whole research, the industry is dependent on semi-qualified workforce in the stages of cultivating, harvesting, packaging and marketing. Due to the nature of flowers, all stages must be carried out quickly and precisely. During all these stages, mostly manual labor is required to avoid damaging the delicate nature of floricultural products. Especially, the harvesting stage is very labor-intensive. To ensure the quality, the harvesting procedure should be done many times by hand. Although, mechanical or robotic harvesting techniques are possible for certain product types, it is not possible to completely eliminate the human factor in the industry for many product groups (Whitaker & Kolavalli, 2006; Belwal & Chala, 2008; Mano et al., 2011; Muhammad-Lawal et al., 2012; Raynolds, 2012; Bac et al., 2014).

In the global arena, countries active in the floriculture industry show an alteration in terms of capital, entrepreneurship, labor and labor productivity. Although climate, flower diversity and technological superiorities are important factors that cause this differentiation, one of the most determinant factors that cause these variations is labor

costs. Many researchers, statistical data and scientific research show that labor-intensive floriculture products are produced in low-wage countries. Although this fact causes an increase in the distance to the main market and logistics costs, it is observed that the floriculture industry has shifted its production stage to developing countries with high labor force and lower capital requirements (Wijnands, 2005; Gebreeyesus, 2015).

It can be observed that the floriculture industry is more steady than the traditional farming because of the business circulation and therefore in the means of employment. However, working conditions can be considered as difficult due to many technical requirements, care and effort, as well as the side factors like high temperatures due to intense greenhouse use and high levels of pesticide exposition by the workforce. In the industry, where women are employed intensively, inadequate employee rights and low salary trend, which are not adequate despite these difficult conditions, have become the subjects considered through the industry representatives and academic researchers. Standardization studies carried out through the industry such as product codes, standards, certificates and initiatives; aim to reach a certain level on social issues and working conditions as well as environmental conditions (Gómez-Arroyo et al., 2000; Donohoe, 2008; Riisgaard, 2009; Raynolds, 2012).

2.1.5. Finance in Floriculture Industry

In literature, finance has been defined as a branch of science that encompasses the whole money managing activities. It covers all aspects of making money along with the decisions on the allocation of the funds needed and the effective use of these funds (Kaliski, 2009; Gitman et al., 2015). It can be said that the agricultural finance approach sheds light on the floriculture industry due to the fact that floriculture is an agriculture-based industry and it is not examined under a separate title. We have approached the issue from the value chain and supply chain finance concepts as we deal the floriculture industry as a chain throughout our study. Based on these facts, we will first give a brief overview on the financial characteristics and the financing instruments that the industry

possessed and thereafter we will define the cost items in the floriculture industry followed by the floricultural products price trends.

Agri-business enterprises count upon both equity and debt capital as a liquidity management resource to finance their business activities. In terms of financial character, floriculture can be considered as a capital-intensive industry on account of such capital outlays like agricultural lands, greenhouse-storage buildings, and high-tech machine and so on, which predominate the assets of many enterprises. The superiority of landed property in total assets and high repayment capacity of agricultural lands supported a wide agricultural land rental market. Land renting has been a worldwide common method for assigning a land to floricultural production. It has been stated in the literature that, the agriculture-based industries have an industrial property that to be able to pay their debt in a reasonable manner when financially examined, but they go through continuous liquidity and cash flow problems. Floriculture industry representatives should attach great importance to risk management. In addition to the risks arising from the nature of the products; contract-based obligations, credit viability, unexpected fluctuation in commodity prices, asset values, exchange and interest rates are only a few of many risk factors that the industry financially confronted (Barry & Robison, 2001). Miller & Jones (2010), classified the financial instruments that have been commonly used in an agricultural value chain. The instruments which have been identified are "trader credits, input supplier credits, marketing company credits and lead firm financing for product financing; trade receivables finance, factoring and forfaiting for receivables financing; warehouse receipts, repurchase agreements and financial leases for physical asset collateralization; crop/weather insurances, forward and futures contracting for risk mitigation; and securitization instruments, loan guarantees, joint ventures for financial enhancements".

After reviewing the financial characteristics and financing instruments, it can be seen obviously that each stakeholder in the industry has serious financing needs in different aspects. In order to understand the financing needs of the floriculture industry better, we have specified the overall cost items that the industry representatives faced through their

whole business activities. When the costs in the production phase are evaluated, the input costs constitute the majority. The overall outline of input costs are: Rent for land/land lordship costs; land preparation costs; seeds and plant material costs; irrigation, chemicals, fertilizers and pesticides costs; patent rights; greenhouse setup and automation costs; energy and fuel costs; agricultural machinery and equipment costs. In addition, R&D costs can be shown as the complementary cost of the production phase. The costs in the logistics phase can be summarized as: Outsourcing costs; handling costs; packaging material costs; holding costs; facility and technology costs (cold chain components) and therefore maintenance costs; energy costs; all transportation costs combined with fuel prices and cold chain investments; and the cost from product loss in the logistics chain. Furthermore, the costs incurred by customs procedures can be shown as a logistics-based cost. When the marketing costs are examined, the costs incurred by the auction system come to the fore. Since the auction system is basically integrated with the logistics network and act as a hub, we can also list the costs that we considered in terms of logistics. In addition to these, the costs of commissions, information, advertising, branding, certification and obligations arising from contracts can be shown in marketing costs. Labor costs and tax costs affect all stages in general. Education is another cost item affecting the industry in order to meet the need of qualified personnel (Wijnands, 2005; Tanaka et al., 2005; Runkle, 2006; Gebreeyesus & Sonobe, 2009; Joshi et al., 2011). Environmental costs will be discussed further under sustainability content.

As we mentioned earlier, the auction phenomenon in the floriculture industry stands out as an important factor in the price trend of the products. The Dutch flower auction have considered to be the place where commodity prices are determined around the world, thanks to the dominant role of Holland, which is the eponym of the system, in the floricultural products market. Basically, the Dutch auction, starts with the announcement of the entry price and then continues and ends with a continuous price reduction until any bidder approves the current price. This system, which was developed towards the end of the 1800s, aimed to save producers from their dependence on intermediaries and to provide them an equitable price and consequently continued to exist until the present day. As the auction system provides data related to prices, trend analysis studies have been

conducted in the literature with a focus on specific product groups. The general conclusion that can be drawn from these studies is that both the prices and the transaction volume of the floriculture products vary considerably. Many factors such as seasonality, quality, perishability, producer reliability and etc. have been defined as variables that lead to this variability (Kambil & Heck, 1995; Steen, 2010; Raina et al., 2011; Steen, 2014; Adam et al., 2017).

2.1.6. Sustainability in Floriculture Industry

In line with the definition of sustainability, the goal of the floriculture industry's sustainability approach is to reduce any change or disturbance to the environment while continuing efficiency, productivity and economic feasibility, protecting energy and resources and therefore improving life quality and providing reliable communities (Hall et al., 2009; Burnett et al., 2011; Wani et al., 2018). Under this definition, researchers have focused mainly on the sustainability of the production phase throughout the literature. The work carried out in the context of logistics is in the direction of establishing effective logistics networks and the sustainability of the cold chain.

Floricultural production has several environmental impacts that can be considered favorable and unfavorable. Such favorable impacts like, contribution to the oxygen level in the atmosphere by using carbon dioxide (in the daytime period) and improvement of the urban landscape quality, arise from the products characteristics that industry offers. On the other hand, floricultural production, due to its high resource requiring nature, contains unfavorable environmental impacts such as soil-water degradation, waste generation and air pollution (Lazzerini et al., 2016). We have explained the dependency of the production stage of the floriculture industry on both greenhouse technology and many inputs throughout the study. The presence of non-renewable and petroleum-based products in the aforementioned groups leads to one of the relevant discussion topic on sustainability in the floriculture industry. Research for different energy sources, crop cycles, soil protection, sustainable nutrient and pest management, efficient and productive

water usage, waste management, plastic recycling and compostable containers are other mentionable sustainable applications through the production phase (Russo et al., 2007; Hall et al., 2009; Dennis et al., 2010; Hall et al., 2010b; Wani et al., 2018).

Agricultural processes sustainability, is bound up with the carbon-footprints that evaluates the total volume of greenhouse gas emissions that generated by a business activity or accumulated over the products life cycle in a direct and indirect way (Dubey & Lal, 2009; Galli et al., 2012). Carbon-footprint's increasing influence has been taken into account not only with in scientific researches, but also in the green marketing strategies of industry representatives that are trying to use their pollution reducing allegations. The floriculture industry has the opportunity to obtain financial benefits from an effective carbon-footprint management by generating income from carbon markets and taking advantage of governmental incentives for greenhouse gas emissions. To determine the carbon-footprint of floriculture industry, carbon costs associated with whole supply chain components especially both production and logistics must be taken into consideration. Floricultural production in greenhouses leads to significant emission release and, if heat energy is needed in a significant period, greenhouse gas emissions from the heating energy surpasses other emission releasing activities in the production phase (Campbell et al., 2010; Marble et al., 2011; Wandl & Haberl, 2017].

Earlier, we have mentioned the importance and role of cold chain logistics in the floriculture industry. In cold chain logistics by comparison with traditional logistics, cooling technologies release a considerable amount of GHG emissions, combined with emissions from delivery vehicles during transportation phase, which ends up with an increase in greenhouse gases and the carbon-footprint. Therefore, how to reduce carbon-footprint in cold chain logistics has become an important issue in the current research areas. Responsiveness and sustainability approaches stand out in changing and evolving logistic needs. Responsiveness of the floricultural supply chain varies, for example under normal delivery planning and scheduling, the logistics process can implement cost-effective, less emission releasing and slow-paced intermodal transportations, however for urgent deliveries faster and costlier transportation types with high environmental impacts

are preferable. Additionally, progression in container shipments for floricultural products have been oriented by the sustainability related issues with other factors like the costs of the transport modes, increasing knowledge on containers and the best species to transfer and so on (van der Vorst et al., 2012; de Keizer et al., 2015; Wani et al., 2018; Wang et al., 2018).

In the global floriculture industry, certification programs for eco-friendly applications began in the nineteen nineties, and following that date a number of initiatives on certification, labeling, sustainability and research collaborations have emerged, similar to other agriculture-based industries, to adjust industrial activities, categorize and identify the products originated under greater ethical and ecological perception and also to improve environmental stewardship, as well as fair labor management activities and trade procedures for the industry. The impact of these initiatives, feedbacks to industry representatives and the factors leading to the implementation of sustainability studies in floriculture take a place in the literature (Riisgaard, 2009; Hall et al., 2010a; Burnett et al., 2011; Raynolds, 2012; Kazimierczuk et al., 2018). Finally, Wani et al. (2018) listed the factors affecting the floricultural sustainability practices of developing countries as "diversity in agricultural climate, land availability and fragmentation, information and technology access, perception of the producer, economic incentives, political constraints, institutions and extension services".

2.2. Country Based Survey in World Floriculture

When we conduct a country-based research on the floriculture industry, countries such as Netherlands, United States of America, Kenya, Ethiopia, Japan, Israel, Ecuador, Colombia, India, Italy and China stand out in terms of academic studies. It can be seen from this list, there are many countries with different development levels from different continents, and therefore we will focus on Netherlands and Kenya to have a more detailed look at the floriculture industry of countries with different development levels. The Netherlands will provide a broader understanding of world floriculture as the center point

of many details we have already mentioned in the industry overview. Kenya will be a good example for us to understand the place of the floriculture industry in the economy of a developing country and its contribution to the development.

2.2.1. Dutch Floriculture Industry

The starting point of floriculture in Netherlands has been considered as the end of 1500's, when the first tulips was imported from Turkey, formerly the Ottoman Empire and a short time later, tulip cultivation exploded. In the following centuries, floriculture in Netherlands has spread across the country with an expanding product range and has become a dominant figure in the name of the country's economy. Nowadays, the Dutch floriculture is known as the world's premier industry with a high-grade quality. Internationally, supply network of the floriculture industry has been gathered around auction events in Netherlands, which means many floricultural products went through these auctions and Dutch floriculture act as the essential trade hub for Europe and most of the remaining countries around the world (Verdouw et al., 2013; Karababa, 2015; de Keizer et al., 2017; Ahmed et al., 2018).

According to International Trade Centers (2018) statistics, the ratio of 06 coded floricultural products exported values from the Netherlands, to the worlds export values in the same products, can be estimated as %49.8 in 2014, %48.66 in 2015, %49.13 in 2016 and %48.46 in 2017. Although the data for 2018 are not fully determined worldwide, they are defined on behalf of the Netherlands. Netherlands in 2018 with 10,949,945,000 US dollars export and 2,698,265,000 US dollars import value, the trade balance value has been estimated as 8,251,680,000 US dollars in floricultural products. The maps shown in the next page (Figure 2.1. and Figure 2.2.) provides a great visual display of the Dutch influence on floriculture around the world.

Figure 2.1. Market map for the floricultural products exported by Netherlands (2018)

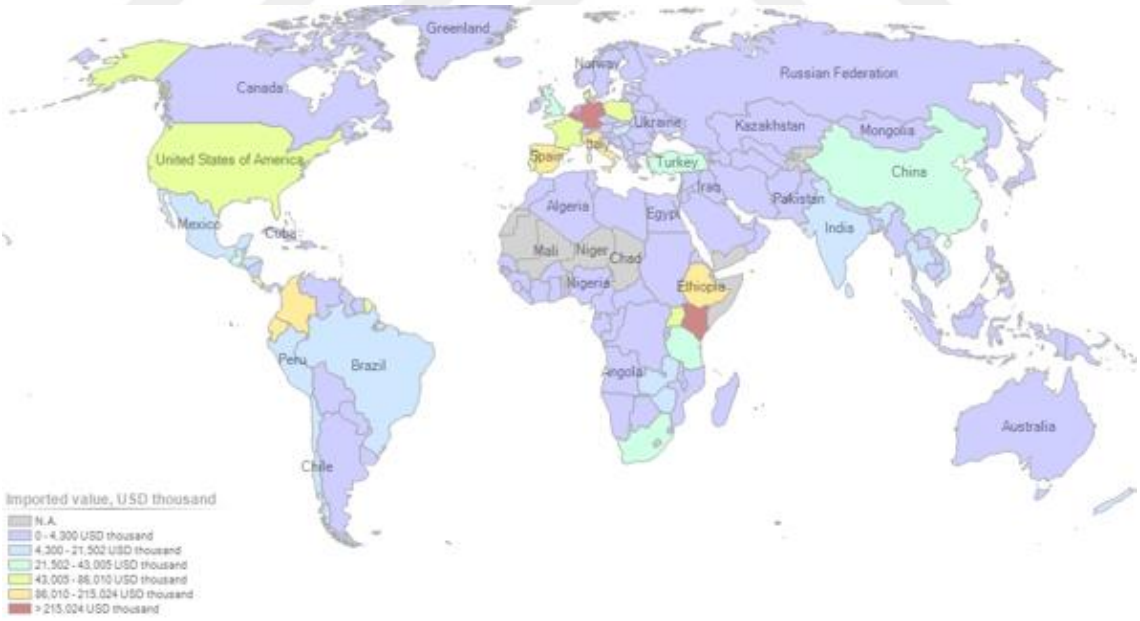


Figure 2.2. Market map for the floricultural products imported by Netherlands (2018)

The Dutch floriculture industry is world-famous as a strong cluster, in other words the geographical concentration of companies competing and cooperating with each other in the same field of activity, in this case floriculture (Porter, 1998). Considering the characteristics of the floriculture, the fact that a country with a small surface area such as the Netherlands which has no extra advantage in terms of climate, leading the industry should be a surprising result. The factors causing this leadership have been generally considered as innovative approaches in the value chain, supported with technology and special input creation that increase productivity in every aspect. The Netherlands's infrastructure is so prosperous that industry representatives from other countries are literally sending their floricultural products for processing, selling and even re-exporting (Porter, 2008). In the Netherlands, industry representatives are supported by a variety of services with regard to R & D and efficient distribution system connected to the most important production points and floriculture markets through intermodal transport networks. Basically, the issue is always the same, Netherlands success is related to the critical role of auctions and full-grown infrastructure (Kargbo et al., 2010).

Royal FloraHolland, the major actor in the global floriculture industry with over a hundred-year experience, is an organization constituted to handle the floricultural business activities in the Netherlands. FloraHolland, by including the one in Germany, incorporates in total six alternative marketplaces, where three of them contains auction centers. One of them is the world's largest flower auction in Aalsmeer, a municipal in Netherlands. The whole organization perform as a hub, where floricultural products provided by suppliers are stocked, managed, auctioned and transferred to customers. Apart from the auction system, it enables different sales types like direct sales. The focus is not on independent benefits, therefore FloraHolland doesn't act as an ordinary intermediary institution, and all operations within its organization are carried out to create a market for the members. This formation brings in reliable and global supply assurance, together with the best price development system for the floricultural products. FloraHolland provides a 7/24 operation service to the both domestic and international supplier members. It has formed an integrated logistics network developed for the entire supply chain, from the production facility to the consumer. While road and railway

transportation along with water channel transportation are preferred for the domestic producers and consumers as the delivery mode to the auction and market areas, an intermodal transport network with air and sea transportation intensity has been provided for the international arena. All these stages are supported with a perfect internal logistics management, containing innovative flower trolleys, RFID technology and a very well managed cold chain network and so on (Qin et al., 2010; Ahmed et al., 2018).

2.2.2. Kenyan Floriculture Industry

In Kenya, which has an agriculture-based economy, floriculture is one of the most remarkable and valuable industry that supports the economy. Floriculture, which ensures the large proportion of job creation in the field of agriculture, is an industry where hundreds of thousands employees are employed. It constitutes a significant proportion of the Kenya's national income by supporting millions of individual citizens. Floriculture has been indicated as one of the most foreign currency earner of the country along with tourism and the tea industries. Kenya's floricultural product exports, goes back to the time when they were British colonies. Kenya, comes up as a major actor in global floricultural production in 1980s, has significantly increased its production and trade volume to date, and recently is ranked 7th in the world with 595,627,000 US dollars according to International Trade Centers (2018) Statistics, in the export of floricultural products (Kangogo et al., 2013; Adeola et al., 2018; Kazimierczuk et al., 2018).

The geographic location of Kenya is full of useful climatic characteristics for the basic needs of the floriculture industry. In addition to different climatic zones, large and cheap agricultural lands constitute their competitive advantages. Nowadays, the global trend in consumption has evolved to cost-effective high quality products. Floriculture industry representatives in Kenya competes in the global market by using their relatively experienced and inexpensive workforce available, to keep production costs as low as possible. Studies that covers Kenyan floriculture states that, although air transport systems have kept Kenya as an important player in the market, transportation costs which

are very high have posed a challenge to meet the low price policy. Netherlands, therefore Dutch auctions, is the main market place for Kenya originated floricultural products. Also contracted marketing in collaboration with supermarkets is another important marketing channel for exports. Despite the power of the Kenyan floriculture industry in the international market, it is noteworthy that there is not enough interest in the domestic market (Whitaker and Kolavalli, 2006; Kargbo et al., 2010; Rikken, 2011; Adeola et al., 2018).

Kenyan floriculture industry has been developed with the collaboration of private industry as the driving force and the government in supporting role. Foreign investors and partners played a critical role in the initiation and expansion of the floriculture industry in Kenya and government's approach for foreign investment has paved the way for it. Kenya mostly relies on foreign countries for high technology, production materials and marketing. This has been the major challenge for the sustainable development of the industry. Kenya organized the floricultural industry under the relevant departments and non-governmental organization like Kenya Flower Council, which aims to improve the global position of Kenyan floriculture industry by providing successful sustainable business applications to all its partners. Also the industry is in force with numerous floriculture standards and certification studies. The barriers in the expansion of Kenya floriculture include political and economic unstability, water scarcity, transportation expenses and natural disasters. Alongside with these difficulties, the most important elements contributing to the breakdown of the Kenyan floricultural supply chain have been determined as inadequate logistics network design, workforce related activities and production technologies (Whitaker & Kolavalli, 2006; Kargbo et al., 2010; Kangogo et al., 2013; Adeola et al., 2018; Kazimierczuk et al., 2018).

3. TURKISH FLORICULTURE INDUSTRY

3.1. General Information

Turkish Floriculture industry, which is a sub-branch of the Turkish seed industry, has emerged in the mid-20th century with the commercial floriculture production in and around Istanbul. The influence of the state in other sub-branch seed industries, does not apply to the Turkish floriculture industry case. The industry has been mostly developed by private enterprises, firstly in the Marmara region followed by Aegean Region in the lastly in the Mediterranean Region it has continued to develop and spread to different locations. Today, especially in the cities such as Istanbul, Antalya, Izmir, Yalova and Sakarya it is observed that private enterprises operating on floriculture are concentrated. These enterprises also make a significant contribution to the Turkish agricultural economy. As in the world, the number of rural areas in Turkey also decreased, while the rate of urbanization is increasing rapidly. In urban areas, especially in the public spaces such as parks, floricultural products are widely used in order to meet the need for green space and landscaping. Following the demand growth, the number of companies operating in the floriculture industry has increased and serious amount of employment has been created. The floriculture industry makes significant contributions to both foreign trade and the gross national product in the Turkish economy. The floriculture industry is known as the industry that provides the highest added value in the unit area compared to other fields of the seed industry (Baudoin et al., 2007; Baris & Uslu, 2009; Kazaz, 2016; Aksu et al., 2016; TUSSİDE, 2017). On the following pages, important data are presented in tables, compiled from both the Turkish statistical institute (2018) and the International Trade Centers (2018) statistics, on the state of the industry to provide a better understanding of Turkish floriculture.

Table 3.1. Sowed area and production numbers in Turkish floriculture (2013-2018)

Ornamental plants 2013-2018	Year	Cut flowers	Indoor ornamental plants	Flowers bulbs	Outdoor ornamental plants	**Total**
Area sown (m2)	**2013**	11 046 812	1 104 968	552 770	32 421 167	**45 125 717**
	2014	11 373 741	1 081 413	567 505	35 995 684	**49 018 343**
	2015	11 826 160	1 465 383	612 585	32 293 087	**46 197 215**
	2016	12 014 172	1 312 793	597 305	34 877 416	**48 801 686**
	2017	11 748 365	1 650 710	426 885	36 263 071	**50 089 031**
	2018	11 920 217	2 081 527	493 930	37 306 970	**51 802 644**
Production (Number)	**2013**	1 025 983 070	36 094 158	33 012 460	348 426 162	**1 443 515 850**
	2014	1 025 490 294	41 448 776	30 059 530	456 026 600	**1 553 025 200**
	2015	1 036 147 373	40 810 719	27 200 330	451 142 538	**1 555 300 960**
	2016	1 041 173 195	38 150 927	25 337 330	409 239 917	**1 513 901 369**
	2017	1 050 584 960	56 049 665	21 833 825	490 559 391	**1 619 027 841**
	2018	1 055 783 642	60 149 981	88 657 000	507 183 040	**1 711 773 663**

Table 3.2. Top five cut flowers produced in Turkish floriculture (2013-2018)

Top 5 Cut Flowers 2013-2018	Year	Carnation	Rose (Cut)	Gerber daisy	Chrysant-hemum	Tulip
Area sown (m2)	**2013**	4 890 177	1 611 863	1 130 825	570 370	335 630
	2014	4 949 750	1 677 912	1 147 022	581 240	384 180
	2015	4 809 655	1 794 145	1 149 422	579 205	427 913
	2016	4 823 955	1 873 817	1 136 032	637 215	413 430
	2017	4 874 354	2 097 819	1 134 912	627 965	412 000
	2018	4 940 554	2 067 547	1 183 912	755 465	409 820
Production (Number)	**2013**	594 445 350	83 405 040	123 266 480	42 181 875	55 640 250
	2014	600 306 680	87 198 996	128 966 610	42 294 975	36 526 900
	2015	591 075 930	93 395 670	129 690 010	42 195 625	41 324 405
	2016	593 260 930	92 591 970	128 063 850	44 915 925	40 601 005
	2017	593 097 350	107 942 520	127 206 050	44 476 525	44 504 500
	2018	607 070 350	97 587 112	133 446 050	47 586 925	40 668 500

Table 3.3. Floricultural product exports of Turkey (2013-2018)

Importer Countries	**Exported values (Unit: US Dollars*1000)**				
	2014	**2015**	**2016**	**2017**	**2018**
Netherlands	16046	14052	16619	18238	23930
Uzbekistan	2386	1445	6461	11144	14137
United Kingdom	11118	10248	11366	11751	12227
Germany	9035	7313	7786	8573	9251
Azerbaijan	4491	2563	2563	4186	7834
Iraq	6617	5483	3854	4961	4619
Turkmenistan	11932	16466	8764	6356	3976
Georgia	607	1119	1580	2447	3582
Romania	2172	2038	1872	2673	2245
Bulgaria	1510	1628	2112	1893	2141
United States of America	807	1258	1185	1609	2102
Serbia	191	442	335	957	939
Cyprus	0	0	0	1278	894
Portugal	0	0	765	506	805
Spain	277	426	272	371	754
Kazakhstan	736	552	7788	815	675
Italy	335	1217	645	430	668
Ukraine	3783	1293	538	746	636
Greece	500	602	762	496	601
Poland	180	554	537	545	558
Russian Federation	4826	3636	25	133	537
...	...	...	...	...	...
Total	82993	77429	81614	85512	99303

Table 3.4. Floricultural product imports of Turkey (2013-2018)

Exporter Countries	**Imported values (Unit: US Dollars*1000)**				
	2014	**2015**	**2016**	**2017**	**2018**
Netherlands	34736	35379	37065	37374	29748
Italy	30705	24508	26152	23755	12957
Spain	3121	1465	4411	2504	3356
France	1359	1422	1029	1271	2773
Germany	5863	3540	4943	4307	1887
China	1560	1296	1026	2258	1864
Belgium	2430	2563	1688	2187	1513
Kenya	1488	1752	1576	1611	1273
Poland	170	335	556	991	707
Taipei, Chinese	481	971	917	859	538
Costa Rica	757	643	519	578	522
Guatemala	434	304	321	392	443
Hungary	3284	2358	2845	2501	395
Greece	340	114	149	228	347
Ukraine	99	222	70	265	291
Ethiopia	104	147	137	128	242
United States of America	241	857	774	194	197
Thailand	106	91	156	159	169
Bulgaria	294	150	277	64	159
Georgia	64	182	210	193	143
Israel	230	124	140	88	118
...	...	...	...	...	...
Total	92890	81385	87244	83019	60490

When the tables given for Turkish floriculture has been examined, it can be observed that in recent years, there has been an increase in exports and a decline in imports. In 2018, a positive result has been obtained in the trade balance. Countries such as Turkic Republics, Middle East countries, Balkan countries and Netherlands, United Kingdom and Germany are important export markets. Carnation production seems to constitute a large part of the Turkish floriculture industry. Nevertheless, there are not enough results on behalf of Turkey to be in a strong position in the world floriculture. Thanks to advantages such as several agricultural climate zones and proximity to nearby markets, Turkish floriculture enlarge its market every year. It is also rich in endemic floricultural product species. Compared to overseas, production costs are relatively low due to lower worker wages, less heating investments, geographical location and climate conditions. However, most of the floriculture organizations are not yet institutionalized, family-owned companies with low-level specialization and therefore, the share of the Turkish export rates remains low in the global floriculture market. Also insufficient marketing networks, high tax rates, low government support, high transportation costs, import dependency on input materials can be defined as the other significant causes in this issue (Baudoin et al., 2007; Baris & Uslu, 2009; Kazaz, 2016; Aksu et al., 2016; Wani et al., 2018).

When the physical structure of the nursery areas in the floricultural production has been examined, there is no problem in terms of location, soil conditions and irrigation. The technical design and appearance of the business infrastructure, greenhouse equipment and nursery areas are tolerable but not world class. In the production phase, both outdoor areas and greenhouses (glass and plastic greenhouses) are used. However, floricultural production areas consist of fragmented small lands. In addition, most of the land is rented. Problems such as rental area investments, long-term leases in rental areas, and the fact that most of the regions where production is made remain within the city development plans are the factors that prevent the increase in production areas. Turkey, is relatively backward in floricultural products improvement studies. Looking at the current situation there are only 45 registered types. Especially in flower seeds, the industry is completely dependent on imports. As the import rates in the industry are also high, the importance

given to R & D activities is not at the desired level. R & D activities in the industry are generally carried out by public research institutions. These organizations are responsible for national-based data collection and evaluation, improvement and adaptation studies, creation of infrastructure and the gene pool for breeding studies, conservation and development, preparation of production and growing pack of new varieties for Turkey. One of the basic needs of the industry are trained intermediate staff. In Turkey, vocational high schools try to meet these requirements. Also the faculties of agriculture and forestry provides education to technical workforce. Operating and investment credits are granted to the producers who are engaged in the production of floriculture products in the private industry, authorized seed establishment and/or contracted producers. Also There are incentives and supports such as; diesel and fertilizer support, farm accounting data network system participation support; good agricultural practices support, R&D projects support, agricultural funding support, greenhouse modernization, modern pressurized irrigation and young farmer support (TÜSSİDE, 2017).

Turkish floriculture industry, compared with the leading countries in this field in the world is a fairly new industry. In accordance with the law no. 5553 on seed growing, Turkey Seed Growers Association was established. SÜSBİR (The Ornamental Plants Growers Union), which operates under this union, has been operating since 2008 to defend the rights of the floricultural producers, which is the most important link of the value chain and to increase the competitiveness of the industry. Although the trade history of the floricultural products is old, it is relatively new to have a legal basis. With the etic Regulation on the "Production and Marketing of Ornamental Plant Propagation Materials" in 2015, the floriculture industry has obtained legal regulations regarding the production and marketing rules of ornamental plants and reproductive materials, legal obligations of producers, production control and inspection (TÜSSİDE, 2017).

In the following section, SWOT analysis will be carried out to provide a more in-depth analysis of the Turkish floriculture industry.

3.2. SWOT Analysis of Turkish Floriculture Industry

SWOT (strengths, weaknesses, opportunities and threats) analysis is an approach to help form strategies. A list of the strengths and weaknesses of an organization as demonstrated by the analysis of its resources and capabilities, as well as a list of opportunities and threats identified by an analysis of its environment (Dyson, 2004; Stacey, 2007). As we proceeded in the study, we first conducted a SWOT analysis to shed light on the current situation of the Turkish floriculture industry. We consolidate the SWOT results from existing studies related to Turkish floriculture (Baudoin et al., 2007; Zencirkiran & Gürbüz, 2009; Baris & Uslu, 2009; Kazaz, 2016; Aksu et al., 2016; Yeler et al., 2016; Gülgün, 2016; Tapkı et al., 2018), policy documents (TUSSİDE, 2017) and expert opinions. We also had the opportunity to use all the knowledge and observations we have obtained so far. All steps of the analysis have been divided in 6 main topics, namely; production, logistics, marketing, labor, environmental, and political.

3.2.1. Strengths

Production

1. The existence of natural resources. (S3)
    - Fertile lands
    - Water resources
2. Various suitable climatic characteristics which enables product differentiation. (S4)
3. High production quality in significant products. (S5)
4. A certain level of production and development. (S6)

Logistics

1. Appropriate geographic location. (S1)

- Proximity to potential markets

2. Availability of transportation types. (S2)

- Air freight
- Sea freight
- Railroad and Road transportation

Marketing

1. Relatively modern marketing system. (S8)

- Auctions in domestic market
- Contracted production for export

2. High added value in the unit/area ratio. (S9)

Labor

1. Low-cost labor. (S10)

2. Occupational organizations. (S11)

3. Well-equipped industry representatives compared to other agricultural industries. (S12)

Environmental

1. Relatively environmentally sustainable industry (S13)

Political

1. The existence of industrial laws and sub-legislations. (S14)

3.2.2. Weaknesses

Production

1. Inadequate product variety. (W5)

2. Inadequacies in production infrastructure. (W6)

3. High technology costs. (W7)
    - Greenhouse setup and automation
    - Agricultural irrigation systems
    - Machinery and equipment.
4. High input costs. (W8)
    - Fertilizer
    - Agricultural pesticide
    - Irrigation
    - Energy
    - Fragmented and Rental lands
5. Difficulties in product standardization. (W9)
6. Inefficient pre/post-harvest technologies and its applications. (W10)
7. Capital inadequacy and financing problems. (W11)
8. Import dependence in seeds. (W12)
9. Lack of data and poor data flows in the production process. (W13)
10. Lack of research and development activities. (W14)

Logistics

1. Transportation problems. (W1)
    - Losses between intermodal transportation
    - High fuel prices
    - High-cost air freight
2. Infrastructure disabilities in logistic systems. (W2)
    - Lack of cold chain in transportation
    - Inadequate use of RFID
3. Storage and packaging issues. (W3)

- The lack of hubs/auction centers with cold chain components.
- Inadequate packaging and disinfection that improves vase life.

4. Custom bureau procedures. (W4)

- High delay rate in customs.
- High customs clearance charges.
- Demurrage and detention charges.

Marketing

1. Lack of an auction system for export. (W15)

2. Weak consumption in domestic market. (W16)

3. As yet unpublished quality standards. (W17)

4. Unfair competition from high informal production. (W18)

5. High middleman commissions. (W19)

Labor

1. Lack of qualified personnel. (W20)

2. Insufficient intermediate staff. (W21)

Environmental

1. High perishability ratio and yield loss. (W22)

2. Inefficient greenhouses and transportation activities, therefore high carbon emission release. (W23)

3. Misapplication of agricultural spraying and irrigation. (W24)

Political

1. Insufficiencies in inspection (W25)

2. High tax rates (W26)

3.2.3. Opportunities

Production

1. Indigenous floricultural production with R&D activities. (O4)
2. Presence of areas that can be allocated to floricultural production. (O5)
3. Efforts to establish organized production areas. (O6)
4. Downward trend in floricultural production in Europe due to high costs. (O7)
5. Chance to produce in natural environment. (O8)
6. Richness in endemic species. (O9)

Logistics

1. Developing export-oriented auction and logistics systems. (O1)
    - Modernization of existing hubs/auctions,
    - Establishing a major auction center like Floraholland
    - Cold Chain incentives.
2. Search for alternative means of transportation. (O2)
    - Bringing on sea transportation with refrigerated container
3. Turkey's new logistic related initiatives. (O3)
    - New Istanbul airport
    - High-speed rail line.
    - Freight villages.

Marketing

1. Relatively young industry in Turkey. (O10)
2. Presence of unsaturated foreign markets. (O11)

3. Exports to Middle East and Gulf Countries, Central Asia and Turkic Republics (O12)

4. Increasing importance on landscaping in domestic market. (O13)

5. E-commerce becomes widespread in floriculture market. (O14)

6. The necessity and importance of green areas for quality living standards. (O15)

7. Increasing the market share of exports by choosing the types and types suitable for the market demand (O16)

Labor

1. Youth bulge (O17)

2. Sufficient amount of educational institutions (O18)

3. Flexibility and durability provided from family-owned businesses (O19)

Environmental

1. The existence of studies that aim sensitizing environmental protection and sustainability in the production and use of floricultural products. (O20)

2. Increasing demand for green products (O21)

Political

1. Registration and Lobbying activities. (O22)

2. Ongoing European Union negotiations. (O23)

3. Floricultural products insurance legislations (O24)

3.2.4. Threats

Production

1. High and increasing costs due to external dependence on raw materials. (T4)

2. High electricity and water tariffs compared to other industrial enterprises. (T5)

3. Inadequacy in information flow and lack of technical information in enterprises. (T6)

4. Turkey's narrow point of view on R&D activities. (T7)

5. Patent rights. (T8)

Logistics

1. No direct route to the Middle East and Gulf countries for sea transport. (T1)

2. Negligence in Post-harvest packaging and other processes, insensitivity to comply global standards. (T2)

3. Delays in cold chain progress and failure to follow the trends in this respect. (T3)

Marketing

1. Uncertainty and fluctuation in demands (T9)

2. Perishable products risks (T10)

3. Dependence mostly on a single product (carnation) in export. (T11)

4. The luxury perception of floricultural products (T12)

Labor

1. Downtrend in low-cost labor. (T13)

Environmental

1. Global warming, seasonal differentiation (T14)

2. Low willingness to accept environmentally sustainable practices. (T15)

Political

1. Insufficient fertilizer and fuel support applied to the industry. (T16)

2. Political and commercial instability. (T17)

3. Volatile exchange rates (T18)

3.3. TOWS matrix of Turkish Floriculture Industry

As our goal in this study is to evaluate sustainable development strategies for the Turkish floriculture industry, firstly we have developed strategies that can be implemented by using the TOWS matrix, which is one of the strategy development tools. TOWS matrix is an approach to connect factors that has been determined in the SWOT analysis, to develop new strategies. 4 different strategy processes are used in the TOWS matrix, which are; "WT" minimize both weaknesses and threats, "WO" minimize the weaknesses and maximize the opportunities, "ST" maximize strengths to deal with threats and "SO" maximize both strengths and opportunities (Weihrich, 1982; Dyson, 2004).

Table 3.5. TOWS Matrix for sustainable logistics strategies in Turkish floriculture

	STRENGTHS **S1.** Appropriate geographic location. **S2.** Availability of transportation types.	
OPPORTUNITIES **O1**. Developing export-oriented auction and logistics systems. **O2.** Search for alternative means of transportation, **O3.** Turkey's new logistic related initiatives	**STRATEGIES** **SO1:** Developing export-oriented logistics systems in conformity with Turkey's advantageous geographic location. (S1-O1) **SO2:** Developing efficient intermodal transportation networks. (S2-O2-O3) **WT1:** Catching the trends in cold chains systems. (W2-T3) **WT2:** Improving Storage and Packaging practices to comply global standards (W3-T2) **WO1:** Facilitating customs transactions (W4-O1)	**THREATS** **T1.** No direct route to the Middle East and Gulf countries for sea transport **T2**. Negligence in Post-harvest packaging and other processes, insensitivity to comply global standards **T3.**Delays in cold chain progress and failure to follow the trends in this respect.
	WEAKNESSES **W1.** Transportation problems. **W2.** Infrastructure disabilities in logistic systems. **W3.** Storage and packaging issues. **W4.** Custom bureau procedures	

Table 3.6. TOWS Matrix for sustainable production strategies in Turkish floriculture

	STRENGTHS **S3.** The existence of natural resources. **S4.** Various and suitable climatic characteristics which enables product differentiation**.** **S5.** High production quality in significant products. **S6.** A certain level of production and development.	
OPPORTUNITIES **O4.** Indigenous floricultural production with R&D activities. **O5.** Presence of areas that can be allocated to floricultural production. **O6.** Efforts to establish organized production areas. **O7.** Downward trend in floricultural production in Europe due to high costs. **O8.** Chance to produce in natural environment. **O9.** Richness in endemic species.	**STRATEGIES** **SO3:** Using the existing resources to produce in natural environment. (S3-S4-O8) **WO2:** Increasing the R&D activities with a special interest on endemic species and native seeds. (W12-W14-O4-O9) **WO3:** Modernizing production systems (O5-O6-W6-W10-W13) **WT3:** Minimizing the technology and input costs by supporting domestic initiatives (W7-W8-T4-T5) **WT4:** Working on patent issues and product standardization (W9-T8)	**THREATS** **T4.** High and increasing costs due to external dependence on raw materials **T5.** High electricity and water tariffs compared to other industrial enterprises. **T6.** Inadequacy in information flow and lack of technical information **T7.** Turkey's narrow point of view on R&D activities **T8.** Patent rights
	WEAKNESSES **W5.** Inadequate product variety. **W6.** Inadequacies in production infrastructure. **W7.** High technology costs **W8.** High input costs. **W9.** Difficulties in product standardization. **W10.** Inefficient pre/post-harvest technologies and its applications. **W11.** Capital inadequacy and financing problems. **W12.** Import dependence in seeds. **W13.** Lack of data and poor data flows in the production process. **W14.** Lack of research and development activities.	

Table 3.7. TOWS Matrix for sustainable marketing strategies in Turkish floriculture

	STRENGTHS **S8.** Relatively modern marketing system **S9.** High added value in the unit/area ratio.	
OPPORTUNITIES **O10.** Relatively young industry in Turkey. **O11.** Presence of unsaturated foreign markets **O12.** Exports to Middle East Countries, Gulf Countries, Central Asia and Turkic Republics **O13.** Increasing importance on landscaping in domestic market. **O14.** E-commerce becomes widespread in floriculture market. **O15.** The necessity and importance of green areas for quality living standards. **O16.** Increasing the market share of exports by choosing the types suitable for the market demand	**STRATEGIES** **SO4:** Giving prominence to floriculture among other agriculture-based industries due to increasing demand and high profitability (S9-O15-O13-O11) **WO4:** Establishing export-oriented auction system associated with E-commerce practices. (W15-O14) **WO5:** Reducing middleman commissions and informal production to watch the domestic competition (O10-O13-W18-W19) **ST1:** Increasing contracted production with wide range of countries to avoid uncertainty in demand and dependency (S8-T9-T11) **WT5:** Publishing quality standards to minimize perishable losses and product returns (W17-T10) **WT6:** Increasing domestic consumption by reversing the luxury perception of floricultural products (W16-T12)	**THREATS** **T9.** Uncertainty and fluctuation in demands **T10.** Perishable products risks **T11.** Dependence on a single product (carnation) in export. **T12.** The luxury perception of floricultural products
	WEAKNESSES **W15.** Lack of an auction system for export. **W16.** Weak consumption in domestic market. **W17.** As yet unpublished quality standards. **W18.** Unfair competition from high informal production. **W19.** High middleman commissions.	

Table 3.8. TOWS Matrix for sustainable labor strategies in Turkish floriculture

	STRENGTHS **S10.** Low-cost labor. **S11.** Occupational organization. **S12.** Well-equipped industry representatives compared to other agricultural industries.	
OPPORTUNITIES **O17.** Youth bulge **O18.** Sufficient amount of educational institutions **O19.** Flexibility and durability provided from family-owned businesses	**STRATEGIES** **SO5:** Expanding family-owned businesses with low-cost labor (S10-O19) **WO6:** Canalizing the youth to floricultural education to meet the industry's workforce requirements. (O17-O18-W20-W21)	**THREATS** **T13.** Downtrend in low-cost labor.
	WEAKNESSES **W20.** Lack of qualified personnel. **W21.** Insufficient intermediate staff.	

Table 3.9. TOWS Matrix for environmentally sustainable strategies in Turkish floriculture

	STRENGTHS **S13.** Relatively environmentally sustainable industry.	
OPPORTUNITIES **O20.** The existence of studies that aim sensitizing environmental protection and sustainability in the production and use of floricultural products. **O21.** Increasing demand for green products	**STRATEGIES** **ST2:** Constituting restrictive industrial practices to improve the environmental awareness and willingness (S13- T15) **WO7:** Minimizing the deterioration rate of floricultural products at every stage of the supply chain (O20-W22-W23) **WT7:**Developing good agricultural practices by considering global warming (W24-T14)	**THREATS** **T14.** Global warming, seasonal differentiation **T15.** Low willingness to accept environmentally sustainable practices.
	WEAKNESSES **W22.** High perishability ratio and yield loss. **W23.** Inefficient greenhouses and transportation activities, therefore high carbon emission release. **W24.** Misapplication of agricultural spraying and irrigation.	

Table 3.10. TOWS Matrix for sustainable political strategies in Turkish floriculture

	STRENGTHS **S14.** The existence of industrial laws and sub-legislations.	
OPPORTUNITIES **O22.** Registration and Lobbying activities. **O23.** Ongoing European Union negotiations. **O24.** Floricultural products insurance legislations	**STRATEGIES** **WT8:** Increasing industry-based incentives and implementing low tax rates (W26-T16) **WO8:** Intensifying lobby and registration activities to activate insurance and audit practices (O22-O24-W25) **SO6:** Adapting the existing floriculture legislation's to EU legislations (S14-O24)	**THREATS** **T16.** Insufficient fertilizer and fuel support applied to the industry. **T17.** Political and commercial instability. **T18.** Volatile exchange rates
	WEAKNESSES **W25.** Insufficiencies in inspection **W26.** High tax rates	

Table 3.11. Consolidated results of TOWS Matrix for sustainable development strategies in Turkish floriculture

Logistics Strategies
SO1: Developing export-oriented logistics systems in conformity with Turkey's advantageous geographic location.
SO2: Developing efficient intermodal transportation networks.
WT1: Catching the trends in cold chains systems.
WT2: Improving Storage and Packaging practices to comply global standards
WO1: Facilitating customs transactions
Production Strategies
SO3: Using the existing resources to produce in natural environment.
WO2: Increasing the R&D activities with a special interest on endemic species and native seeds.
WO3: Modernizing production systems
WT3: Minimizing the technology and input costs by supporting domestic initiatives.
WT4: Working on patent issues and product standardization
Marketing Strategies
SO4: Giving prominence to floriculture among other agriculture-based industries due to increasing demand and high profitability.
WO4: Establishing export-oriented auction system associated with E-commerce practices.
WO5: Reducing middleman commissions and informal production to watch the domestic competition
ST1: Increasing contracted production with wide range of countries to avoid uncertainty in demand and dependency
WT5: Publishing quality standards to minimize perishable losses and product returns
WT6: Increasing domestic consumption by reversing the luxury perception of floricultural products
Labor Strategies
SO5: Expanding family-owned businesses with low-cost labor
WO6: Canalizing the youth to floricultural education to meet the industry's workforce requirements.
Environmental Strategies
ST2: Constituting restrictive industrial practices to improve the environmental awareness and willingness
WO7: Minimizing the deterioration rate of floricultural products at every stage of the supply chain
WT7: Developing good agricultural practices by considering global warming
Political Strategies
WT8: Increasing industry-based incentives and implementing low tax rates
WO8: Intensifying lobby and registration activities to activate insurance and audit practices
SO6: Adapting the existing floriculture legislation's to EU legislations

4. METHODOLOGY

After gaining insight into the Turkish floriculture industry and developing several sustainability strategies, we have reached the stage of selecting an analysis method in line with the main purpose of the study, namely, "Evaluating Sustainable Development Strategies for the Turkish Floriculture Industry and Its Sustainable Financing Mechanisms". From the very beginning, the aim was to identify the strategies that could be applied and determine the most important one in order to draw a sustainable road map to Turkish floriculture. The data we obtained with SWOT analysis and TOWS matrix approaches played an important role in providing criteria and alternatives that will contribute to this way. From this point on, the study has become a multi-criteria decision making problem.

Linking multi criteria decision making approaches to SWOT analysis, provides statistical priorities for SWOT outputs and make them evaluable in same scale. Also this collaboration allows to evaluate the alternative decisions, in this case the strategy alternatives developed from the TOWS matrix, for all SWOT output. Multi criteria decision making methods improve SWOT and TOWS approaches, so that all strategies get a general priority. In this respect, the Analytic Hierarchy Process (AHP) is the most frequently used method, together with SWOT (Kajanus et al., 2012). The study of Kurttila et al. (2000), is the first to use AHP and SWOT analysis as a hybrid approach. Their aim was to enhance the quantitative basis of the process of strategic planning by using the characteristic of AHP, which is to make qualitative decision aspects measurable through pairwise comparisons. They used this hybrid method on forest certification case. Following this study, the hybrid method has been used in many other studies for different purposes. For example; Shrestha et al. (2004) used the method for silvopasture adoption

potential exploration, Kahraman et al. (2007) for e-Government strategies prioritization, Wickramasinghe et al. (2010) for sustainable tourism revival plan development and Görener et al. (2012) for manufacturing firm's significant strategic factors determination.

While the use of the AHP with SWOT has become widespread, the use of the Analytical Network Process (ANP) in a similar hybrid method has been naturally unavoidable. Yüksel & Dagdeviren (2007), mentioned the necessity of using a SWOT analysis taking the potential dependence into account between factors and proposed a hybrid approach that uses the ANP to measure the dependence between the strategic factors. They have applied this hybrid methodology on a textile company and draw a conclusion that the dependency between SWOT outputs, affects all of the weights and also changes the alternatives priorities. As in the AHP-SWOT method, there are many other studies using this hybrid approach in the literature, again with various purposes. For example; Ostrega et al. (2011) used the hybrid method for environmental impact minimization in mining, Catron et al. (2013) for bio energy development, Shahabi et al. (2014) for steel scrap industry strategy prioritization and Zhao et al. (2016) for rare earth industry prioritization.

In our literature review, we find out that the AHP and ANP methods were applicable on intangible data but the SWOT would not provide a sufficient analysis in the financial dimension, as much as we want. For this purpose, another analysis method, BOCR, has attracted our attention. "Benefits, Opportunities, Costs, and Risks (BOCR) " analysis can be defined as a decision-making tool derived from benefit-cost analysis and considered as a relative financial approach. BOCR analysis is very similar to SWOT analysis in some respects (Wijnmalen, 2007; Šimelytė et al., 2014). We have decided that this analysis, which has been frequently used together with the ANP method, will contribute more in every sense to our intended research and we advanced our work in this direction. In the following sections, a detailed introduction of ANP-BOCR analysis and a comprehensive literature survey will be provided.

4.1. Analytic Network Process with Benefits, Opportunities, Costs and Risks

The Analytic Hierarchy Process (AHP) is a multi-criteria decision making approach originated by Thomas L. Saaty in early 1970s (Harker, 1987) and has been implemented to numerous divergent decision problems till this day. AHP has been defined as a prevalent measurement theory, helps to derive relative priorities in multi-level hierarchical formations (Saaty & Vargas, 2006). Analytic Network Process (ANP) generalizes AHP, in other words, AHP is a subset of ANP, with the acceptance of the factors independency. ANP is an important approach to reduce the boundaries of hierarchical frameworks and its mathematical outcomes (Saaty, 2004). ANP, uses the measures of proportions based on binary/pairwise comparisons, likewise AHP; but yet, it doesn't enforce a rigid hierarchical framework as AHP does, and it creates the multi-criteria decision problem using a feedback system approach (Karsak et al., 2003). In the comparison phase, individual perceptions represent the relative effect of one of the two factors on a third factor in the system according to a criterion. ANP basically evaluates the outcomes of the decision problem, through the supermatrix approach, where the inputs are these individual judgements (Saaty, 2004a).

ANP, can be used for a simple decision problem which consists a single network, but also, it can be used to handle a complex problem, considering the benefits, opportunities, costs, and risks (the BOCR merits) of a decision, as separate networks. This approach, which can be shortened as ANP-BOCR, provides an in-depth analysis that includes the positive (B-O) and negative (C-R) aspects of a decision and synthesizes the decision alternatives through the help of strategic criteria (Saaty, 2004b). In his study, Saaty (2004b) outlined the ANP-BOCR process from the beginning, defining and understanding the decision problem, to performing sensitivity analysis at the final stage, in 12 steps. During the model development, we will explain the basic components such as strategic criteria, nodes, clusters, Supermatrices, formulas and etc. more in detail, which has been mentioned in this outline. In the literature, ANP-BOCR method has been

applied in many fields with many different purposes in various studies. The following two table 4.1. and 4.2. will be summarizing most of these studies.

Since the size of literature table fail to comply the format, we divided it in two parts. The first part, Table 4.1. shows "the goal; strategic criteria in general forms; Number of the control criteria; number of alternatives" of the related articles. The numbers between parentheses, which has written next to the criteria, defines the numbers of sub-criteria.

Table 4.1. Literature review on studies that adopt ANP-BOCR method

Authors (Year)	Method	Goal	Strategic Criteria	Control Criteria	Alter-natives
Shang et al. (2004)	ANP-BOCR	Select the best transportation project	None	B: 3(7)(2) O: 2(4) C: 4(8) R: 3(6)	3
Ulutas (2005)	ANP-BOCR	Determine energy policy	None	B: 0 O: 0 C: 0 R: 0	9
Erdoğmuş et al. (2005)	ANP-BOCR	Select the best transaction processing system	Increase member number Increase expenditure Ease of control Increase store number	B: 0 O: 0 C: 0 R: 0	5
Üstün et al. (2005)	ANP-BOCR	Determine optimal policy for an international situation	Regional peace Welfare Disarmament Relations	B:3 O:2 C:3 R:3	4
Farkasovsky & Greda (2006)	ANP-BOCR	Determine how to apply development function	Financial Technology Time-to-market Social	B: 2 O: 2 C: 2 R: 2	3
Emanuel & Cefalu (2006)	ANP-BOCR	Chose drill or do not drill	Public opinion Int. politics Amount	B:3 O:3 C:3 R:3	2
Figueroa & Wood (2006)	ANP-BOCR	Determine the best direction to secure energy future	Energy security Int. competitiveness Environmental quality	B: 7 (21) O: 3 (14) C: 5 (27) R: 4 (27)	4

Checque et al. (2006)	ANP-BOCR	Determine a course of action for the social security program	Stability Adequate Means Fairness	B: 3 O: 3 C: 3 R: 3	5
Kung et al. (2006)	ANP-BOCR	Determine what should do to resolve an international situation	Political Power Economy Power Governments Community	B: 3 O: 3 C: 3 R: 3	4
Freund et al. (2006)	ANP-BOCR	Determine the best action of response to potential nuclear threat	Political (2) Social (2)	B: 3 (7) O: 4 C: 3 (7) R: 4 (8)	7
Bayazit & Karpak (2007)	ANP-BOCR	Determine the readiness of an industry to imply an approach	Cost of implementing Effect on product quality Implementation time	B: 0 O: 0 C: 0 R: 0	2
Köne & Büke (2007)	ANP-BOCR	Determine the best fuel mix in the electricity production	None	B: 0 O: 0 C: 0 R: 0	9
Tan et al. (2007)	ANP-BOCR	Select the best supplier	Competitive advantages Economic benefits Creativity Improvement	B: 0 O: 0 C: 0 R: 0	4
Bies & Zacharia (2007)	ANP-BOCR	Determine the best form of medical tourism	Quality Universality (2) Domestic Condition (2)	B:3 O:2 C:1 R:2	4
Tuzkaya et al. (2008)	ANP-BOCR	Determine facility location	Social perception Environmental National Economy	B: 0 O: 0 C: 0 R: 0	4
Li et al. (2008)	ANP-BOCR	Select the best supplier	None	B: 0 O: 0 C: 0 R: 0	3
Demirtas & Üstün (2008)	Integrated ANP-BOCR and multi-objective mixed integer linear programming	Select the best supplier	The regard of the company Competitive advantage Economic benefit	B: 0 O: 0 C: 0 R: 0	4

Liang & Li (2008)	ANP-BOCR	Select the best enterprise information project	Competitive advantage Brand image Increased market share	B: 0 O: 0 C: 0 R: 0	4
Onüt et al. (2008)	ANP-BOCR	Select the best energy resource manufacturing industry	Economical Competition Accessibility Environmental	B: 0 O: 0 C: 0 R: 0	5
Dağdeviren & Eraslan (2008)	ANP-BOCR	Prioritize strategic energy policies	Strategic level increasing National economy input Native resources evaluation Supply security Market competitiveness	B: 0 O: 0 C: 0 R: 0	5
Turan et al.(2009)	ANP-BOCR	Maximize organizational sustainability	Economic prosperity (9) Environmental quality (8) Social justice (6) Eco-environmental (2) Eco-social (3) Socio-environmental (2) Ecosocio-environmental (4)	B: 3 O: 3 C: 3 R: 3	5
Lee et al. (2009)	ANP-BOCR	Determine the best form of buyer-supplier relationship	Cost reduction Quality improvement Stabilized supply R&D facilitation	B: 3 O: 2 C: 2 R: 2	3
Greda (2009)	ANP-BOCR	Select the best management approach to improve the food quality and effectiveness	Economic-Production (3) Social (3) Political (3) Image (2) Educational (3)	B: 0 O: 0 C: 0 R: 0	3
Saaty (2009)	ANP-BOCR	Decide location for entertainment park expansion	Competition Income Level Infrastructure International Character Political Support	B:2 O:2 C:2 R:2	4
Chen et al. (2010)	ANP-BOCR	Select the best feeder management system project	Performance Business driver Market need	B: 0 O: 0 C: 0 R: 0	5
Botteroa & Lamib (2010)	ANP-BOCR	Prioritize the aspects of different transport scenarios	None	B: 0 O: 0 C: 0 R: 0	4

Tjader et al. (2010)	ANP-BOCR	Selecting the best governing policy for offshore outsourcing	Human well-being (3) Foreign relations (2) Domestic interests (3)	B: 2 (7) O: 2 C: 3 (7) R: 3 (7)	4
Sun et al. (2010)	ANP-BOCR	Select the best 3rd-Party logistics service provider	None	B: 0 O: 0 C: 0 R: 0	3
Lee et al. (2011)	Fuzzy ANP-BOCR with Interpretive structural modeling	Select the most profitable product strategy	Efficiency Quality Customer response Innovation.	B: 0 O: 0 C: 0 R: 0	10
Kang (2011)	Fuzzy ANP-BOCR incorporated with fuzzy Delphi method and constraint programming	Select the most appropriate capacity allocation plan	Finance Customer relationship Manufacturing capability	B: 0 O: 0 C: 0 R: 0	3
Felice et al. (2012)	ANP-BOCR	Evaluate the environmental sustainability of a supply chain	Production-Logistics Costs New Negotiations Environmental Certification Environmental Pressures Local Needs Social Pressures	B:3 O:2 C:3 R:	5
Khadivi & Ghomi (2012)	Integrated Data envelopment analysis with ANP-BOCR	Find the factor weights of facility location	Social perception Environmental National economy	B: 0 O: 0 C: 0 R: 0	4
Chen & Gu (2013)	Fuzzy ANP-BOCR	Select the most suitable grid project	Social-Economic Financial-Marketing Legal-Environmental Technical-Manufacturing	B: 0 O: 0 C: 0 R: 0	6
Wang et al. (2013)	Integrated Fuzzy Delphi-Interpretive structural modeling and ANP-BOCR	Select the most suitable district revitalization and regeneration project	Sustainable development Local activities District assets	B: 0 O: 0 C: 0 R: 0	4

Mohan et al. (2013)	ANP-BOCR	Select the best management approach to preserve food the quality and effectiveness	Economics (2) Political (3) Social (3) Brand image (3) Awareness (3)	B: 0 O: 0 C: 0 R: 0	3
Ergu & Peng (2014)	ANP-BOCR with Virtual team model	Evaluate and select the best customer relationship management software	Financial Technological Reliability	B: 2 O: 2 C: 1 R: 2	3
Kabak & Dağdeviren (2014)	ANP-BOCR	Prioritize renewable energy alternatives	Technology Economy Security Global effects Human well-being	B: 0 O: 0 C: 0 R: 0	5
Jaafar et al. (2015)	ANP-BOCR	Select the best wood extraction method	Ecological (4) Economical (3) Social (3)	B: 0 O: 0 C: 0 R: 0	4
Noorollahi et al. (2018)	Fuzzy ANP-BOCR	Prioritize power generation technologies	Economical Environmental Social Political-Supply security	B: 0 O: 0 C: 0 R: 0	12
Zhu et al. (2018)	Integrated AHP/ANP with BOCR	Decide which product to delete for supply chain sustainability	None	B: 3 (8) O: 3 (8) C: 3 (8) R: 3 (8)	9
Lewis et al. (2018)	DEMATEL Based ANP-BOCR	Prioritize the factors effect Hospital Sustainability	None	B: 0 O: 0 C: 0 R: 0	0

In the second part, Table 4.2., the decision subnets under the Benefit, Opportunity, Cost and Risk merits have been explained. The table consists all of the cluster names in all of decision subnetworks under each merit. The numbers between parentheses which has written next to the cluster names, defines the numbers of nodes in the cluster. Consecutive parentheses indicate that there are same cluster names under the merits' different decision sub networks.

Table 4.2. Decision subnetworks under BOCR merits in the given literature

Authors (Year)	Benefit	Opportunity	Cost	Risk
Shang et al. (2004)	Decision makers (3) Stakeholders (3)	Authors used the same subnetworks named as influence network, which has been described in benefit section	Authors used the same subnetworks named as influence network, which has been described in benefit section	Authors used the same subnetworks named as influence network, which has been described in benefit section
Ulutas (2005)	Technological (1) Educational (1) Participants (2)	Participants (3)	Costs for running (4) Set up costs (2)	Participants (4) Taxes (1) Energy source (4) Environmental (6) Embargo (1)
Erdoğmuş et al. (2005)	Benefits (7) Actors (3)	Opportunities (6) Actors (3)	Costs (4) Actors (3)	Risks (3) Actors (3)
Üstün et al. (2005)	Personal (3) Communal (4) Political (3) Social (3)	Economic (3) Political (3) Social (1)	Economic (3) Political (3)	Economic (2) Political (3) Social (3)
Farkasovsky & Greda (2006)	Financial (3) Operational (5) Technology (2) Resources (2)	Customer base (2) Marketing (2) Business development (2) Financial (2) Employees (4)	Financial (3) Operational (5) Stakeholders (4) Resources (2) Labor (4)	Financial (1) Business processes (3) Security (3) Communication (4) Labor (3) Stakeholders (4)
Emanuel & Cefalu (2006)	Authors used the same cluster name "Reasons" under all control criteria (5) (4) (5)	Authors used the same cluster name "Reasons" under all control criteria (4) (4) (2)	Authors used the same cluster name "Reasons" under all control criteria (5) (4) (5)	Bad luck events (2) Reasons (4)
Figueroa & Wood (2006)	Executive branch (1) Economic (2) Trade blocs (2) Lobbyists (2) Congress (1) Consumers (5)	Authors used the same decision subnetworks, which has been described in benefit section, under all the sub control criteria. they find necessary	Authors used the same decision subnetworks, which has been described in benefit section, under all the sub control criteria. they find necessary	Authors used the same decision subnetworks, which has been described in benefit section, under all the sub control criteria. they find necessary
Checque et al. (2006)	Stakeholders (2) President (3) Legislative (3) Financial (2)	Stakeholders (3) President (4) Legislative (4) Financial (3) Operational (1)	Stakeholders (2) Legislative (1) Operational (3)	Stakeholders (5) President (3) Legislative (4) Financial (1) Operational (2)

Kung et al. (2006)	Int. relations stability (2) Security (2) National systems (2) (2) China (3) Taiwan's Vision (2) Culture Difference (2) Business (5) Individual (2)	Int. Relations (2) Social Issues (4) Taiwan (4) China (2)	Taiwan to Int (2) Taiwan (3) (3) China (2) (2) (2) Taiwanese's (4) International (3)	International (3) (3) Taiwan (3) China (2) Social Risks (5) Domestic (3)
Freund et al. (2006)	Political (2) Public (1) Security forces (1) Foreign countries (2) *Authors used similar decision subnets under benefits sub control criteria	Political (2) (2) Businesses (1) Foreign countries (2) (2) Public (1) Security forces (1)	Political (2) (2) (2) (2) Public (1) (1) (1) (1) Security forces (1) Foreign countries (3) Businesses (1) (1)	Political (2) (2) (2) (2) Public (1) (1) (1) Security forces (1) (1) (1) Foreign countries (2) (2) Businesses (1) (1) (1) (1)
Bayazit & Karpak (2007)	Customer (4) Financial (5) Workforce (3) Operational (2)	Potential Benefits (3)	Inherent to TQM (2) Current structure (6)	Managerial (6) Technical (1)
Köne & Büke (2007)	Environmental Technological Energy security	Environmental Technological Energy security	Total cost	Environmental Energy security Health hazards
Tan et al. (2007)	Outsourcing (3) Transportation (3) Production (7) Inventory (2) Sales (2)	Opportunities (5)	Costs (7)	Risks (6)
Bies & Zacharia (2007)	Quality (3) Condition Seriousness (3) Kind of patient (2) Social class (3) Features of package (4) Psychological (3) Societal (3)	Cost savings (4) Medical System (2) Social class (3) (3) Effectiveness (3) Prosperity (2)	Personal Cost (2) Damage (2)	Unexpected expense (2) Quality (4) US-Indian relations (3)
Tuzkaya et al. (2008)	Economical (2) Technical (4)	Economical (2) Technical (4)	Economical (4) Environmental (3)	Closeness to areas (4) Social–Political (4) Environmental (6) Topography-geology (3)
Li et al. (2008)	Time Costs Service Capacity Quality	Market share Agile manufacturing	Products Maintenance	Technology (4) Time

Demirtas & Üstün (2008)	Quality (2) Service (3)	Opportunities (3)	Costs (2)	Risks (3)
Liang & Li (2008)	Time (2) Costs (3) Service (2) Capacity (2) Quality (1)	Increased market share ROI/payback period Agile manufacturing	Software Implementation Training Maintenance Upgrade	Time delay Budget overrun Technology (4)
Onüt et al. (2008)	Economical (6) Technological (3) Others (4)	Economical (3) Political (2)	General criteria (6)	Environmental (5) Technological (5) Others (5)
Dağdeviren & Eraslan (2008)	Benefits (5) Participants	Opportunities (4) Participants	Costs (5) Participants	Risks (5) Participants
Turan et al.(2009)	Suppliers (4) Employees (4) Customers (2) Media (2) NGO's (4) Regulators (3) Financial partners (4) Community (2) Others (3)	Authors used the same decision subnetworks, which has been described in benefit section, under all control criteria.	Authors used the same decision subnetworks, which has been described in benefit section, under all control criteria.	Authors used the same decision subnetworks, which has been described in benefit section, under all control criteria.
Lee et al. (2009)	Sufficiency Priority Stability Quality Cost control Petitive activities Petitive investment	Relationship Core capabilities Product development Control of competitors Safekeeping technology	Operational Equipment-resources Capital Bearing of loss	Industrial changes Customer loyalty Trust Coordination Compatibility
Greda (2009)	Organizational (5) Production (5) Technological (5) Economic (5)	Organizational (3) Production (4) Technological (4) Economic (4)	Organizational (5) Production (5) Technological (5) Economic (5)	Organizational (5) Production (4) Technological (3) Economic (5)
Saaty (2009)	Market (3) Political Factors (2) Financial (3) Infrastructure (3)	Author used the same decision subnetworks, which has been described in benefit section, under control criteria with identical name	Author used the same decision subnetworks, which has been described in benefit section, under control criteria with identical name	Author used the same decision subnetworks, which has been described in benefit section, under control criteria with identical name
Chen et al. (2010)	Functionality Reliability Usability	Extension- expansion Learning-innovation Flexibility	Bidding Capital Performance	Commercial Technical Cultural

Botteroa & Lamib (2010)	Environmental (3) Economic (2) Running conditions (3) Urban planning (2) Social (3)	Technical-infrastructural (1) Environmental (2) Economic (1) Running conditions (3) Urban planning (3)	Technical-infrastructural (4) Environmental (1) Economic (3)	Environmental (2) Economic (1)
Tjader et al. (2010)	Public policy makers (3) Direct stakeholders (3) Indirect stakeholders (3) Influencers (3)	Authors used the same decision subnetworks, which has been described in benefit section, under all the sub control criteria. they find necessary	Authors used the same decision subnetworks, which has been described in benefit section, under all the sub cont.cr control criteria they find necessary	Authors used the same decision subnetworks, which has been described in benefit section, under all the sub control criteria. they find necessary
Sun et al. (2010)	Benefits (3)	Opportunities (3)	Costs (3)	Risks (3)
Lee et al. (2011)	Relational (3) Technological (3) Strategic (3) Resources (3) Marketing (2)	R&D advantage (2) Market potential (2) Proliferation (1) Speed of R&D (2) Speed of new product (2)	Production (3) Inventory level (3) Product quality (3) Distribution (3) Facility usage (3) Switching opportunity (3)	Legal (3) Technological (3) Financial (2) Customer needs (2)
Kang (2011)	Marginal income Tech. cooperation Tech. innovation	Bottleneck utilization Rate of yield Volume flexibility Leading process	Engineering changes Delay penalty Customer complaint	Foundry service Market share
Felice et al. (2012)	Advantages (3) Sustainable Targets (6) Society (3) Individual (3) Management performance (8) Environmental Condition (6) Operation performance (12)	Process (6) Resources (3) Law (4)	Infrastructure (2) Human Resources (2) Joint Venture (1)	Profitability (2) Social (3) Environmental (3) Life Cycle Assessment (7)
Khadivi & Ghomi (2012)	Economical (2) Technical (4) Actors (4)	Economical (2) Technical (4) Actors (4)	Economical (4) Environmental (3) Actors (4)	Environmental (6) Social & political (4) Topography-geology (3) Critical area closeness (4) Actors (4)
Chen & Gu (2013)	Functionality Reliability Usability	Scaling capabilities Learning-innovation Flexibility	Product R&D Foundation	Concept Conflict Technical Mismatches

Wang et al. (2013)	External utilities Revitalization Living environment	Open space network Government planning Place marketing	Ecology-landscape Conservation Construction Local resource	Policy Residents' Equity Identity Loss
Mohan et al. (2013)	Production (3) Processing (2) Preparation-Consumption (3) Economics (3)	Production (3) Processing (3) Preparation-Consumption (2) Economics (3)	Production (3) Processing (3) Preparation-Consumption (3) Economics (3)	Production (3) Processing (3) Preparation-Consumption (3) Economics (3)
Ergu & Peng (2014)	Financial (5) Operational (4) Safety (2) Implementation (1)	Reliability (2) Implementation (3) Business development (2) Financial (4)	Financial (4) Operational (4)	Financial (3) Operational (3) Implementation (3) Safety (2)
Kabak & Dağdeviren (2014)	Benefits (4)	Opportunities (4)	Costs (5)	Risks (6)
Jaafar et al. (2015)	Benefits (4)	Opportunities (9)	Environmental Production (6) Outlays (7)	Risks (4) Other risks (3)
Noorollahi et al. (2018)	Income Efficiency Reliability Safety	New resources Job creation Industry development Supply security	Investment Transmission-distribution Maintenance Fuel GHG emission	Dependency Immaturity Ecological Acceptability
Zhu et al. (2018)	ANP has been used only in the alternatives clusters, considering they have interrelationships with each other	ANP has been used only in the alternatives clusters, considering they have interrelationships with each other	ANP has been used only in the alternatives clusters, considering they have interrelationships with each other	ANP has been used only in the alternatives clusters, considering they have interrelationships with each other
Lewis et al. (2018)	Org. Behavior (2) Quality of Care (1) Patient Safety (1)	Quality of Care (3)	Cost Reports (1) Quality of Care (2) Patient Safety (3)	Patient Safety (4)

The literature survey shows that there isn't a standard application in the method with respect to the criteria. Therefore, we are going to implement our own approach on the criteria diversity, while developing the model. In the following section, the model development of our case will be explained.

4.2. Model Development

We have perceived the inconsistency on the applications of the ANP-BOCR method in the literature. Different layered models, increased hierarchy with the use of the control criteria and the inability to compare the nodes between each other sufficiently, pushed us to choose the path that would best suit our problem. We will develop a two-layered ANP-BOCR approach in our model. The first layer, i.e. the upper level network, will include the control hierarchy in which the goal node, the strategic criteria and the BOCR merits are presented. The second layer, i.e. the decision networks, will include clusters, similar to the classifications we have previously used in the SWOT analysis, and the alternative strategies.

The problem is expected to be determined and understood in detail, in the first stage of the model development. Everything we have explained up to this point has helped us understand the floricultural industry and the Turkish case in detail. In this direction, we identified the goal node of our decision problem as "Evaluate sustainable development strategies for the Turkish floriculture industry".

Strategic criteria are the main criteria that used to evaluate the BOCR values of all decisions, which basically reflects the objectives of the organization that has to be fulfilled (Saaty, 2004b). In line with our goal, we have created 3 strategic criteria to use in our model's control hierarchy, based on Turkey's sustainable development approach. We have already mentioned in the previous chapters that, in general, sustainability is examined under three main headings which are economic, environmental and socio-political. We used these 3 headings in detail, as the strategic criteria of our model. Due to the lack of a specific sustainability plan for the floriculture industry, we have elaborated these 3 criteria by using the documents mentioned below, which we believe can reflect the sustainable development approach of the Turkish floriculture industry.

The contents of the documents we use to detail the strategic criteria are:

- Targets covering the agricultural policies within 17 sustainable development goals and 169 targets, at the United Nations Development Programme's "The 2030 Agenda for Sustainable Development" which Turkey has committed to follow (United Nations General Assembly, 2015).
- Sustainable agriculture targets included in the strategic plan, covering the years 2018-2022, prepared by the Turkish Ministry of Food, Agriculture and Livestock (GTHB, 2017).
- Sustainability-based measures in the Ornamental Plants Sector National Strategy Report (TÜSSİDE, 2017).

In this context, strategic criteria that we have determined for the Turkish floriculture industry's sustainable development are:

- Ensuring Economic Sustainability in Turkish Floriculture Industry.

To improve scientific and technological capacities in the floriculture industry, to reduce industry losses and to increase production capacity. To ensure the integration of small-scale enterprises in the industry into the markets by developing the trade infrastructure and establishing the security of supply. To become an industry that is self-sufficient and strong in international competition by developing financial policies for the conservation of ecosystems and biodiversity in floricultural products.

- Ensuring Environmental Sustainability in Turkish Floriculture Industry.

To increase the quality and efficiency by using good agricultural practices and environmentally sensitive floricultural product health measures in production. Measure the impact of climate change on the floriculture industry, develop rural infrastructure with environmental sustainability approaches such as land use planning, effective use of existing natural resources, protection of soil and water resources, and become an industry with low impact on environment.

- Ensuring Socio-Political Sustainability in Turkish Floriculture Industry.

Within the framework of development-oriented policies, to register Turkish floriculture in order to become an industry which creates income and employment in the rural areas, reduces informal production and floricultural product smuggling, provides employment to young people, eliminates child labor problem and takes care of women rights. To become an industry that has power in the international arena and takes part in the decision-making processes of international organizations and also minimize emission release together with environmental taxes and legal sanctions.

In order to determine the alternatives for our selection problem, we used the results of the SWOT analysis and TOWS matrix, which we have created in the previous chapters that provides an insight on the current situation of the Turkish floriculture industry. Due to the large scope of our analyses, we reduced the number of strategies which we have obtained, to make our model more applicable. We gathered the strategies under 4 main alternatives by using expert opinions, published documents and our own knowledge. In the first stage, our plan was to have a logistic based strategy separately in our alternatives cluster. However, considering the feedbacks from the experts, we decided that it would be more accurate to evaluate the auction system and logistics strategy together under one alternative. Our alternative strategies are:

- **ST1:** Establish an auction system and an efficient logistics network peculiar to the floriculture industry, in analogy to the Dutch case.
- **ST2:** Make investments to meet world standards in production systems and product diversity.
- **ST3:** Implement internal regulations to increase the competitive power of the industry.
- **ST4:** Restructuring the industry with R & D and educational revolution.

After determining the strategic criteria and alternatives, we proceeded to select the sub-criteria for the decision networks of the Benefit, Opportunity, Cost and Risk merits that we will use to evaluate the selection problem. Same cluster names “production, logistics,

marketing-labor and environmental-political" have been used in all of the decision networks. Since the number of sub-criteria in the clusters are not sufficient for pairwise comparison, the clusters of marketing-labor and environmental-political have been combined.

Benefits Sub-Network

"Benefits of sustainable floriculture approach for Turkey"

We have identified the sub-criteria of the benefits merit according to the strategic criteria that we define. Our approach to the concept of Benefit has been to determine the positive effects that can be achieved by applying the alternative strategies in the short term, and to choose those which are important in terms of sustainability.

Production

- **B1-PRO-1**: Increased modern agricultural practices.
- **B2-PRO-2:** Increased product variety.
- **B3-PRO-3:** Establishment of organized production areas.

Logistics

- **B4-LOG-1:** More efficient use of logistics infrastructure and logistical advantages.
- **B5-LOG-2:** Increased use of modern storage and cold chain applications.

Marketing-Labor

- **B6-MAR/LAB-1:** New job creation and employment.
- **B7-MAR/LAB-2:** Increased industrial recognition and reliability.

Environmental-Political

- **B8-POL/ENV-1:** More efficient use of soil and water resources.
- **B9-POL/ENV-2:** Establishment of public institutions that supervise the industry.

Opportunities Sub-Network

"Opportunities of sustainable floriculture approach for Turkey"

We have identified the sub-criteria of the Opportunities with a similar approach to the Benefits. The concept of opportunity is a relative concept such as benefit. While determining the sub-criteria of the Opportunity merit, our approach has been to determine the positive results that meet the strategic criteria and can be achieved in the long term from applying the alternative strategies.

Production

- **O1-PRO-1:** Increased environment-based good agricultural practices.
- **O2-PRO-2:** Increased use of indigenous seed and endemic flower species.
- **O3-PRO-3**: Increased number of domestic patents (production systems, equipment, and seed).

Logistics

- **O4-LOG-1:** Logistics village installation specific to industry.
- **O5-LOG-2:** Increased green transport and storage applications.

Marketing-Labor

- **O6-MAR/LAB-1:** Growth of enterprises operating in the industry.
- **O7-MAR/LAB-2:** Increase in export rate.

Environmental-Political

- **O8-POL/ENV-1**: Delimitation to greenhouse gas emissions.
- **O9-POL/ENV-2:** To be involved in decision making processes of international organizations.

Costs Sub-Network

"Costs of sustainable floriculture approach for Turkey"

The Costs merit has been regulated by more concrete sub-criteria which can be measured by a certain unit. The criteria we have determined are not only the costs caused by sustainability strategies, they also consider the costs of the developing industry. We have mainly used the cost items which has been determined under the "Finance in Floriculture Industry" section.

Production

- **C1-PRO-1:** Input costs (energy, fuel, land, fertilizer, pesticide, patent ...)
- **C2-PRO-2:** Costs of production technologies
- **C3-PRO-3:** R & D costs

Logistics

- **C4-LOG-1:** Transportation, storage, packaging and deteriorated product costs
- **C5-LOG-2:** Logistics system installation costs
- **C6-LOG-3:** Customs costs

Marketing-Labor

- **C7-MAR/LAB-1**: Training costs
- **C8-MAR/LAB-2:** Marketing costs

Environmental-Political

- **C9-POL/ENV-1:** Insurance costs
- **C10-POL/ENV-2:** Environmental tax

Risks Sub-Network

"Risks of sustainable floriculture approach for Turkey"

The concept of risk is much more hypothetical than other concepts. While the sustainable floriculture approach does not carry high risks by its nature, there are risks that may arise from the implementation of our alternative strategies and risks that may prevent the implementation of these strategies. We have developed the Risks merit's sub-criteria by evaluating these two risk groups.

Production

- **R1-PRO-1**: Import dependence on items such as technology, raw materials and energy.
- **R2-PRO-2:** Lack of sufficient results from R & D activities.
- **R3-PRO-3:** Problems in production finance.

Logistics

- **R4-LOG-1:** Logistics investments failure to comply the industry needs.
- **R5-LOG-2:** Exclusion from the global floriculture distribution network.

Marketing-Labor

- **R6-MAR/LAB-1:** Failure to adapt the change in trend and demand.
- **R7-MAR/LAB-2:** Inadequate market share.

Environmental-Political

- **R8-POL/ENV-1:** Natural disasters, Seasonal differentiation, Global warming.
- **R9-POL/ENV-2:** Financial markets, Political conflicts and International problems.

After determining the criteria and alternatives, the interactions between these elements should be determined. Internal and external dependencies and feedback should be associated. It is useful to mention the software we will use, at this stage of the study. Super Decisions and Decision Lens are basic software that support the ANP method. Since Decision Lens has a commercial purpose we decided to use Super Decisions Software, version 2.6.0, which has been developed for educational purposes by the Creative Decisions Foundation (Ishizaka & Nemery, 2013; Mu & Pereyra-Rojas, 2016). In the software, the basic network components are visualized as nodes, which has been classified under clusters. If there is an interactive relation between any two nodes at different clusters, an uni/bi-directional arrow appears to connect them. Also a loop typed arrow appears over the clusters, to remark the inner-dependency between the nodes under same cluster.

The approach that we are going to follow in the analysis is "influencing", which has also been recommended by Saaty (2004b). So, the same approach will be applied to all components of our whole ANP-BOCR model and therefore, the results will express the effect of the components on others. We created matrices to evaluate the influences between the nodes in each sub-decision network. These matrices are prepared in accordance with the concept of Supermatrix, which will be described later on. The matrix consists of rows and columns. If the node in the row, and therefore the cluster that consist that node, is influencing the one in the column, the matrix is marked with " * ". The influence of a node on itself has not taken into account and these sections are covered with black. Column element becomes the parent node (the one that been influenced) and the row elements becomes child nodes (ones that influence the parent node).

Identifying interactions is a stage that requires intensive knowledge and awareness of the industry and its components. In this sense, in addition to the knowledge we have obtained so far, we have filled this matrix according to the opinions of the experts. In the following pages, there are separate matrices for each decision networks and screenshots of the network structures we have obtained as a result of applying these matrices to Super Decisions software.

Table 4.3. Influences of the components under Benefits Sub-Network

BENEFITS		Production			Logistics		Marketing/ Labor		Politic/ Environmental		Alternatives			
		B1-PRO-1	B2-PRO-2	B3-PRO-3	B4-LOG-1	B5-LOG-2	B6-MAR/LAB-1	B7-MAR/LAB-2	B8-POL/ENV-1	B9-POL/ENV-2	ST1	ST2	ST3	ST4
Production	B1-PRO-1		*	*		*	*	*	*		*			*
	B2-PRO-2	*		*	*			*			*	*		*
	B3-PRO-3	*	*		*	*	*		*	*	*	*		
Logistics	B4-LOG-1			*		*	*		*		*			
	B5-LOG-2			*	*		*	*	*		*	*		
Marketing/ Labor	B6-MAR/LAB-1				*					*		*	*	*
	B7-MAR/LAB-2				*		*		*	*		*	*	*
Politic/ Environ.	B8-POL/ENV-1	*						*			*			
	B9-POL/ENV-2	*					*	*	*				*	
Alter-natives	ST1	*	*	*	*	*	*	*		*				
	ST2	*	*	*	*	*	*	*	*					
	ST3	*	*	*	*	*	*	*	*	*				
	ST4	*	*				*	*	*					

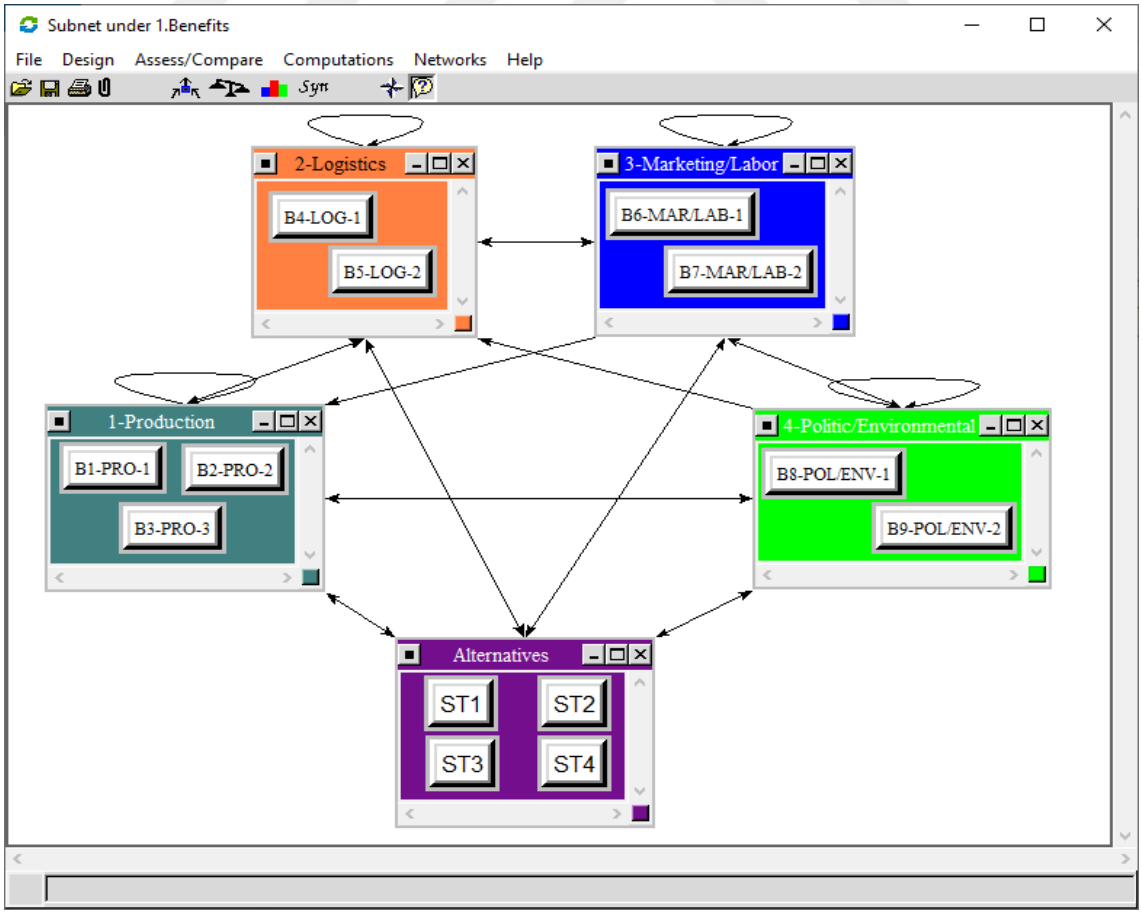


Figure 4.1. Benefits Sub-Network

Table 4.4. Influences of the components under Opportunities Sub-Network

OPPORTUNITIES		Production			Logistics		Marketing/ Labor		Politic/ Environmental		Alternatives			
		O1-PRO-1	O2-PRO-2	O3-PRO-3	O4-LOG-1	O5-LOG-2	O6-MAR/LAB-1	O7-MAR/LAB-2	O8-POL/ENV-1	O9-POL/ENV-2	ST1	ST2	ST3	ST4
Production	O1-PRO-1		*	*		*		*	*	*				*
	O2-PRO-2	*		*			*					*		*
	O3-PRO-3	*	*				*	*		*		*		*
Logistics	O4-LOG-1	*				*	*	*	*		*		*	*
	O5-LOG-2	*			*			*	*	*	*			*
Marketing/ Labor	O6-MAR/LAB-1	*	*	*	*	*		*		*	*	*	*	
	O7-MAR/LAB-2	*	*	*	*	*	*		*	*	*	*	*	
Politic/ Environ.	O8-POL/ENV-1	*			*	*		*		*	*	*	*	*
	O9-POL/ENV-2	*		*	*	*	*	*	*		*	*	*	*
Alter-Natives	ST1	*	*		*	*	*	*	*	*				
	ST2	*	*				*	*	*					
	ST3	*		*		*	*	*	*	*				
	ST4		*	*						*				

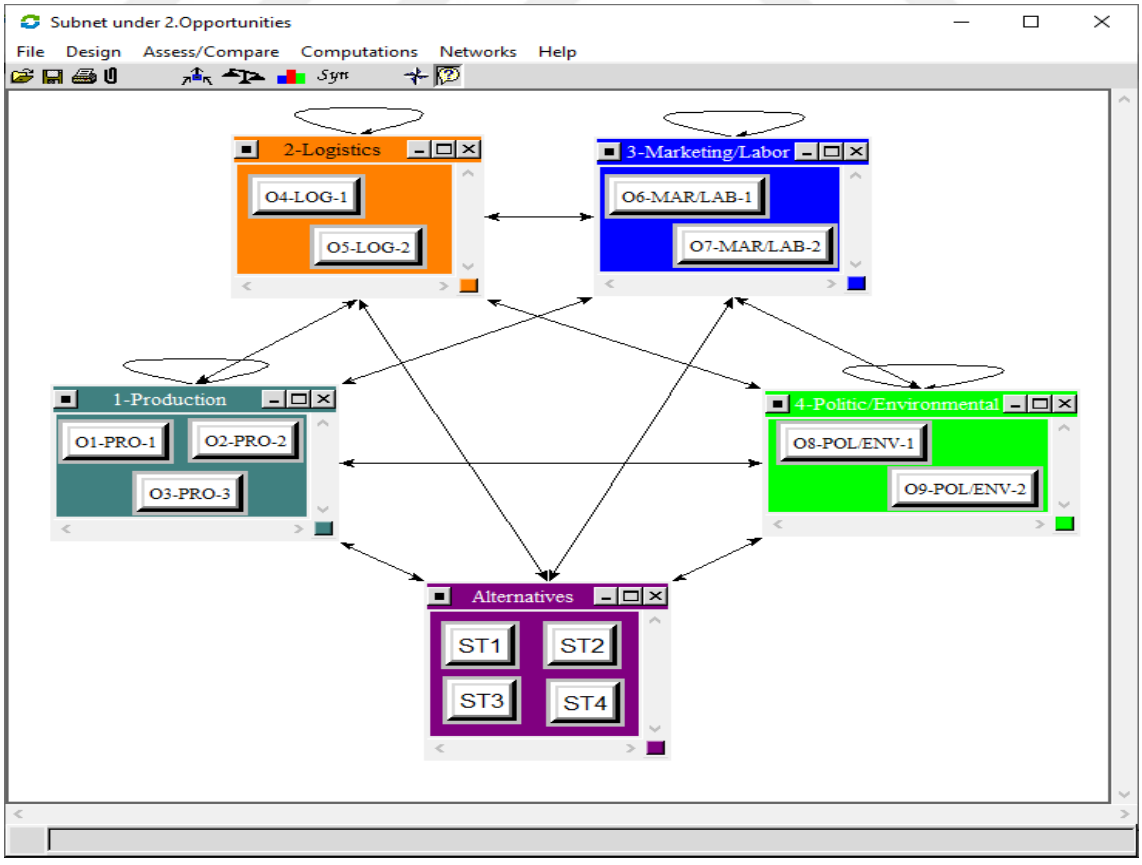


Figure 4.2. Opportunities Sub-Network

Table 4.5. Influences of the components under Costs Sub-Network

COSTS		Production			Logistics			Marketing/ Labor		Politic/ Environ.		Alternatives			
		C1-PRO-1	C2-PRO-2	C3-PRO-3	C4-LOG-1	C5-LOG-2	C6-LOG-3	C7-MAR/LAB-1	C8-MAR/LAB-2	C9-POL/ENV-1	C10-POL/ENV-2	ST1	ST2	ST3	ST4
Production	C1-PRO-1		*	*	*	*			*	*	*	*	*	*	*
	C2-PRO-2	*		*	*			*	*	*	*		*		*
	C3-PRO-3		*					*					*	*	*
Logistics	C4-LOG-1	*				*	*		*	*	*	*			
	C5-LOG-2				*		*		*		*	*			
	C6-LOG-3	*	*		*	*			*	*		*	*	*	
Marketing/ Labor	C7-MAR/LAB-1		*	*									*		*
	C8-MAR/LAB-2	*	*		*							*	*		*
Politic/ Environ.	C9-POL/ENV-1	*	*		*	*			*			*	*	*	
	C10-POL/ENV-2	*	*		*	*			*			*	*	*	
Alter-Natives	ST1	*			*	*	*		*	*	*				
	ST2	*	*	*	*		*	*	*	*	*				
	ST3			*	*				*	*	*				
	ST4		*	*				*							

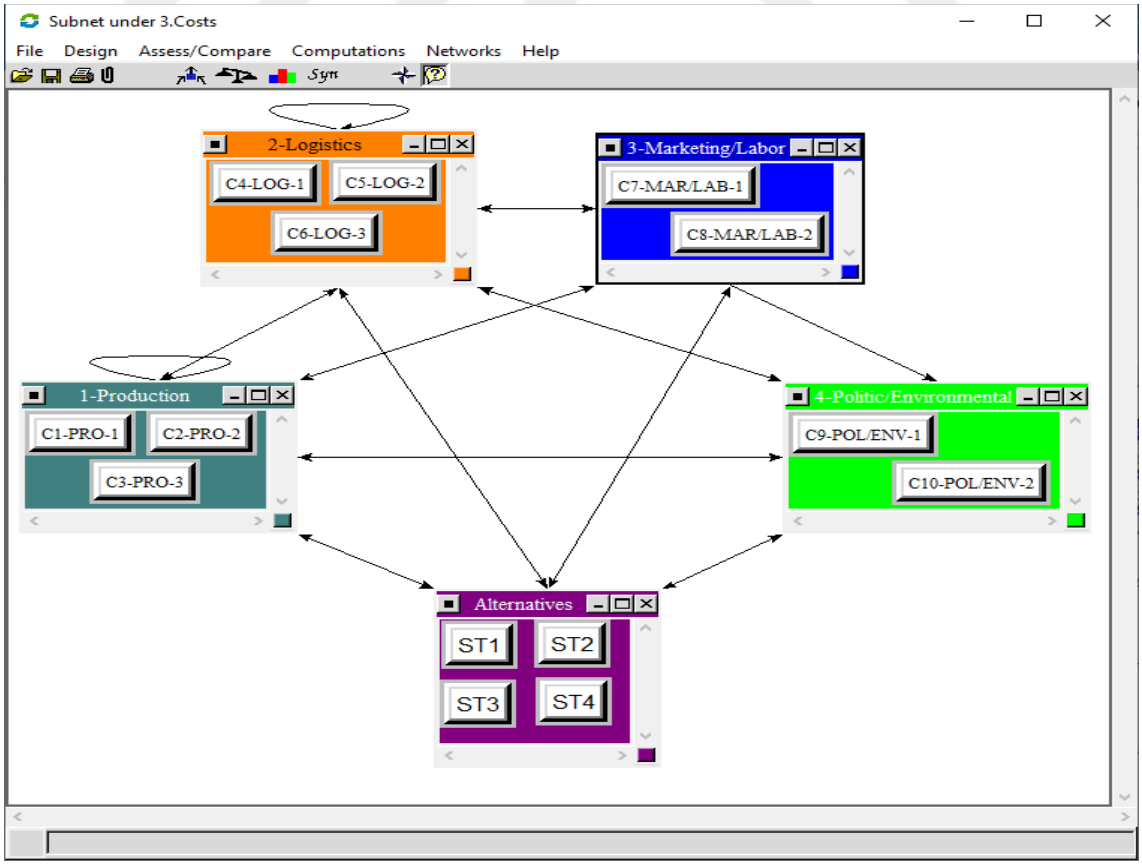


Figure 4.3. Costs Sub-Network

Table 4.6. Influences of the components under Risks Sub-Network

RISKS		Production			Logistics		Marketing/ Labor		Politic/ Environmental		Alternatives			
		R1-PRO-1	R2-PRO-2	R3-PRO-3	R4-LOG-1	R5-LOG-2	R6-MAR/LAB-1	R7-MAR/LAB-2	R8-POL/ENV-1	R9-POL/ENV-2	ST1	ST2	ST3	ST4
Production	R1-PRO-1		*	*	*		*				*	*		*
	R2-PRO-2	*		*			*	*					*	*
	R3-PRO-3		*		*		*	*			*	*	*	*
Logistics	R4-LOG-1			*		*	*	*			*		*	
	R5-LOG-2			*			*	*			*	*		
Marketing/ Labor	R6-MAR/LAB-1		*	*	*	*		*			*	*		*
	R7-MAR/LAB-2		*	*	*	*	*				*	*		*
Politic/ Environ.	R8-POL/ENV-1	*		*		*				*	*	*	*	
	R9-POL/ENV-2	*		*		*	*	*			*	*	*	
Alter-Natives	ST1	*				*								
	ST2	*	*	*	*									
	ST3		*		*	*								
	ST4		*	*				*						

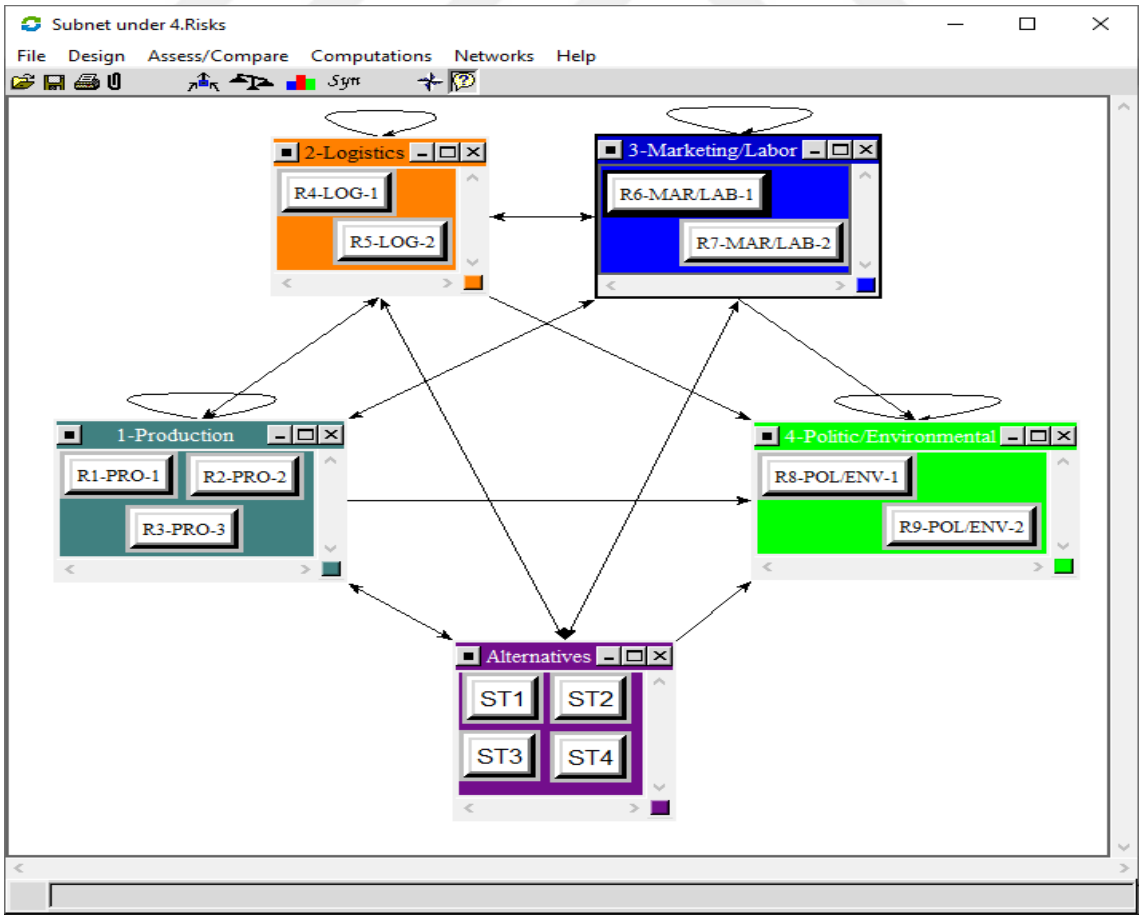


Figure 4.4. Risks Sub-Network

Evaluation of relative importance in means of proportions is one of the most important steps of the method. After determining interactions between the components, an explanation of the paired comparisons structure would be appropriate. As mentioned earlier, ANP, uses the measures of proportions based on pairwise comparisons, likewise AHP, where the individual perceptions represent the relative effect of one of the two nodes/clusters over the other node/cluster on a third node/cluster in the network. "The Fundamental scale of absolute numbers", which also has been referred as the Saaty Scale in the literature, has been acquired from the stimulus response theory, to mirror the intensity of individual perceptions on components, as numerical values (Saaty & Vargas, 2006).

Table 4.7. "The Fundamental Scale of Absolute Numbers" [Saaty (2008)]

Numerical Scale	**Verbal Scale**	**The use of scales through the developed ANP-BOCR Model**
1	Equal Importance	Both child nodes/clusters are equally influential with regard to the parent node/cluster
3	Moderate Importance	One child node/cluster is moderately influential over the other one with regard to the parent node/cluster
5	Strong Importance	One child node/cluster is strongly influential over the other one with regard to the parent node/cluster
7	Very Strong Importance	One child node/cluster is very strongly influential over the other one with regard to the parent node/cluster
9	Absolute Importance	One child node/cluster is absolutely influential (the highest possible validation) over the other one with regard to the parent node/cluster.
2, 4, 6, 8	Intermediate values	

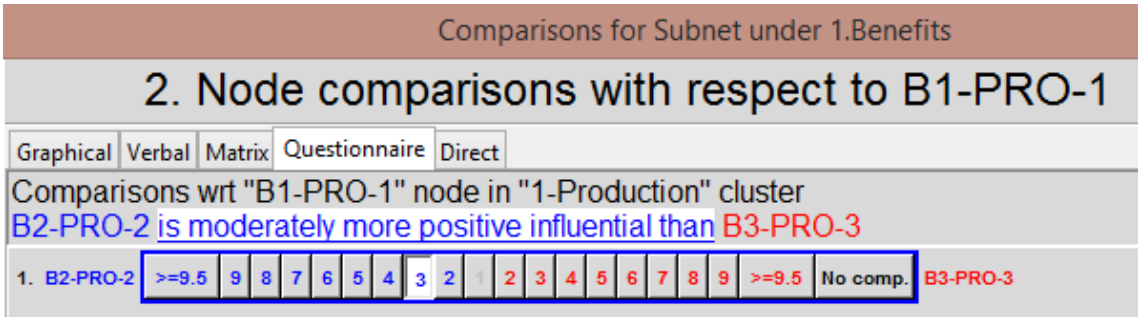


Figure 4.5. Pairwise Comparison Example in Questionnaire mode of Super Decisions

After converting verbal judgments by using the stated Saaty scale (Table 4.7) into numerical data through pairwise comparisons, pairwise comparison matrices, represented with "X", should be organized. This matrix, shows the decision makers' answers on the influential effects, between the row components "i" and column components "j" with respect to the parent nodes/clusters. In the matrix, the numerical influence of component "i" over component "j" is demonstrated with "x_{ij}". The other way round, numerical influence of component "j" over component "i" is demonstrated with "x_{ji}". Note that, "x_{ji}" will be equal to "$1/x_{ij}$".

$$\boldsymbol{X} = \begin{bmatrix} \boldsymbol{x_{11}} & \boldsymbol{x_{12}} & \boldsymbol{x_{13}} & \cdots & \cdots & \boldsymbol{x_{1n}} \\ \boldsymbol{x_{21}} & \boldsymbol{x_{22}} & \boldsymbol{x_{23}} & \cdots & \cdots & \boldsymbol{x_{2n}} \\ \boldsymbol{x_{31}} & \boldsymbol{x_{32}} & \boldsymbol{x_{33}} & \cdots & \cdots & \boldsymbol{x_{3n}} \\ \vdots & \vdots & \vdots & \vdots & \cdots & \vdots \\ \boldsymbol{x_{n1}} & \boldsymbol{x_{n2}} & \boldsymbol{x_{n3}} & \cdots & \cdots & \boldsymbol{x_{nn}} \end{bmatrix} = \begin{bmatrix} \boldsymbol{x_{11}} & \boldsymbol{x_{12}} & \boldsymbol{x_{13}} & \cdots & \cdots & \boldsymbol{x_{1n}} \\ \boldsymbol{1/x_{12}} & \boldsymbol{x_{22}} & \boldsymbol{x_{23}} & \cdots & \cdots & \boldsymbol{x_{2n}} \\ \boldsymbol{1/x_{13}} & \boldsymbol{1/x_{23}} & \boldsymbol{x_{33}} & \cdots & \cdots & \boldsymbol{x_{3n}} \\ \vdots & \vdots & \vdots & \vdots & \cdots & \vdots \\ \boldsymbol{1/x_{1n}} & \boldsymbol{1/x_{2n}} & \boldsymbol{1/x_{3n}} & \cdots & \cdots & \boldsymbol{x_{nn}} \end{bmatrix} \quad \textbf{(4.1)}$$

The resulting matrix is a square matrix [n*n] and all elements are positive numbers. If the X matrix has been evaluated through completely consistent individual judgements and does not contain errors: $\boldsymbol{x_{ij} * x_{jk} = x_{ik}}$ **(4.2)** equality for every positive "i", "j" and "k" occurs. In the same case, all elements of the matrix can be expressed as relative priority ratios denoted with "w_1, w_2, ..., w_n". Therefore, another way to show the consistent X matrix is:

$$\boldsymbol{X} = \begin{bmatrix} \boldsymbol{w_1/w_1} & \boldsymbol{w_1/w_2} & \cdots & \boldsymbol{w_1/w_n} \\ \boldsymbol{w_2/w_1} & \boldsymbol{w_2/w_2} & \cdots & \boldsymbol{w_2/w_n} \\ \vdots & \vdots & \cdots & \vdots \\ \boldsymbol{w_n/w_1} & \boldsymbol{w_n/w_2} & \cdots & \boldsymbol{w_n/w_n} \end{bmatrix} \quad \textbf{(4.3)}$$

As can be seen, the diagonal matrix elements will be calculated as 1. Using the equation (4.3) and the properties of matrix multiplication, we can get the following equality:

$$\begin{bmatrix} \boldsymbol{w_1/w_1} & \boldsymbol{w_1/w_2} & \cdots & \boldsymbol{w_1/w_n} \\ \boldsymbol{w_2/w_1} & \boldsymbol{w_2/w_2} & \cdots & \boldsymbol{w_2/w_n} \\ \vdots & \vdots & \cdots & \vdots \\ \boldsymbol{w_n/w_1} & \boldsymbol{w_n/w_2} & \cdots & \boldsymbol{w_n/w_n} \end{bmatrix} * \begin{bmatrix} \boldsymbol{w_1} \\ \boldsymbol{w_2} \\ \vdots \\ \boldsymbol{w_n} \end{bmatrix} = \begin{bmatrix} \boldsymbol{n * w_1} \\ \boldsymbol{n * w_2} \\ \vdots \\ \boldsymbol{n * w_n} \end{bmatrix} = \boldsymbol{n} * \begin{bmatrix} \boldsymbol{w_1} \\ \boldsymbol{w_2} \\ \vdots \\ \boldsymbol{w_n} \end{bmatrix} \quad \textbf{(4.4)}$$

In his study, Saaty (2003) expounded a theorem where, the following "β" matrix, "θ" vector and "α" constant are positive, the equality: $\boldsymbol{\beta * \theta = \alpha * \theta}$ **(4.5)** only occurs when the "θ" is the eigenvector and "α" is the eigenvalue of the "β" matrix. In this case, considering both equation (4.4) and (4.5), it can be said that "n" is the eigenvalue and $\begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_n \end{bmatrix}$ is the eigenvector of a consistent "X" matrix. However, %100 consistency is not always possible when individual judgments and the different perceptions of verbal expressions are involved. In practice, x_{ij}'s are based on these judgments rather than exact measurements. Therefore, generally x_{ij}'s will deviate from the ideal ratios "w_i/w_j" and so, the equation (4.4) will no longer be valid. To refer the eigenvalues of matrices with inconsistency, $\boldsymbol{\lambda_{max}}$ replaced the constant "α" in the equation (4.5). By using both positive "X" pairwise comparison matrix and "w" relative priority vector the equation transforms to:

$$\boldsymbol{X * w = \lambda_{max} * w} \quad \textbf{(4.6)}$$

In the same study, Saaty (2003) demonstrated that $\boldsymbol{\lambda_{max}}$ is greater than or equal to "n", with an approach based on; small amounts of changes in x_{ij}'s will cause only small amounts of changes in eigenvalues, in a positive reciprocal X matrix. The equality occurs when the matrix is consistent. The eigenvector corresponding to the largest eigenvalue sets priorities in inconsistent matrices. In the literature, there are different methods in order to calculate the eigenvector that corresponds $\boldsymbol{\lambda_{max}}$. In his study, Cabała (2010) demonstrates the most common three methods: "Saaty Method" which uses normalized arithmetic means in high consistency rates; "Power method" which allows the calculation, by the exponentiation of the matrix to its adequate power and performing the column normalization, at any degree of consistency; and "Geometric mean method.

To assess the consistency of the pairwise comparison matrix, Saaty (1990), has adopted the formula for consistency index "CI":

$$\boldsymbol{CI = \frac{\lambda_{max} - n}{n-1}} \quad \textbf{(4.7)}$$

And compared the result from (4.7), with the random inconsistency (RI) values (Table 4.8.), to find the consistency ratio (CR).

Table 4.8. Random Inconsistency Values

Matrix size (*n*)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Average RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1,56	1.57	1,59

The consistency ratio, which can be formulated as: $$\boldsymbol{CR = CI/RI} \quad \textbf{(4.8)}$$ is accepted if the calculated value is less than %10, which means that the judgements are considerably consistent. If the CR value is greater than 0.1, answers to the pairwise comparisons should be reexamined.

We mentioned that ANP is based on a structure called Supermatrix, where the determined priorities from pairwise comparison matrices are gathered under, as sub-matrices. Saaty & Vargas (2006), has given a comprehensive explanation to the concept. The structure basically resembles the matrices which we developed to evaluate the influences. Let's consider a decision sub-network; with "N" clusters and denote the clusters as "Z_k" where "k= 1, 2, ..., N"; and "n_k" nodes under these clusters denoted as "y_{k1}, $y_{k2, \dots}$ y_{knk}". The Supermatrix "W" will be formed as follows:

$$\boldsymbol{W} = \begin{array}{c} \\ \boldsymbol{Z_1} \\ \vdots \\ \boldsymbol{Z_k} \\ \vdots \\ \boldsymbol{Z_N} \end{array} \begin{array}{c} \begin{array}{cc} \boldsymbol{Z_1} & \boldsymbol{Z_k} \\ \boldsymbol{y_{11} - y_{1n_1}} & \boldsymbol{y_{k1} - y_{kn_k}} \end{array} \cdots \boldsymbol{Z_N} \\ \begin{array}{cc} \boldsymbol{y_{11}} & \\ \vdots & \\ \boldsymbol{y_{k1}} & \\ \vdots & \\ \boldsymbol{y_{Nn_N}} & \end{array} \begin{bmatrix} \boldsymbol{W_{11}} & \cdots & \boldsymbol{W_{1k}} & \cdots & \boldsymbol{W_{1N}} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ \boldsymbol{W_{k1}} & \cdots & \boldsymbol{W_{kk}} & \cdots & \boldsymbol{W_{kN}} \\ \vdots & \vdots & \vdots & \vdots & \vdots \\ \boldsymbol{W_{N1}} & \cdots & \boldsymbol{W_{Nk}} & \cdots & \boldsymbol{W_{NN}} \end{bmatrix} \end{array} \quad \textbf{(4.9)}$$

Where the W_{ij} sub-matrix of the Supermatrix is formed as:

$$W_{ij} = \begin{bmatrix} W_{i1}^{j1} & W_{i1}^{j2} & W_{i1}^{j3} & \cdots & \cdots & W_{i1}^{jn_j} \\ W_{i2}^{j1} & W_{i2}^{j2} & W_{i2}^{j3} & \cdots & \cdots & W_{i2}^{jn_j} \\ W_{i3}^{j1} & W_{i3}^{j2} & W_{i3}^{j3} & \cdots & \cdots & W_{i3}^{jn_j} \\ \vdots & \vdots & \vdots & \vdots & \cdots & \vdots \\ W_{in_i}^{j1} & W_{in_i}^{j2} & W_{in_i}^{j3} & \cdots & \cdots & W_{in_i}^{jn_j} \end{bmatrix} \quad \textbf{(4.10)}$$

Here, each column of W_{ij} is an eigenvector that shows the influence of the nodes in the ith cluster on a node in the jth cluster. Zero corresponds to those nodes that doesn't have influence on each other.

Super Decisions software provides 3 supermatrices, related with each network: "Unweighted Supermatrix", "Weighted Supermatrix" and "Limit Supermatrix". The unweighted Supermatrix is the matrix we demonstrated in (4.9), which basically contains the local priorities derived from the pairwise comparisons. The weighted Supermatrix is obtained by multiplying all the nodes in a cluster of the unweighted Supermatrix by the corresponding cluster weight which has been obtained by cluster comparisons. The weighted Supermatrix is also stochastic and with the exponentiation of the matrix by multiplying it times itself the Limit Supermatrix will be formed. $\lim_{k\to\infty} W^k$ **(4.10)**
When the columns come up to same values for each row, the limit matrix will be obtained. These values will be the global priorities.

As we have mentioned, the ANP-BOCR approach consists of 4 separate decision sub-networks. So, for each decision sub-network, limit Supermatrices and the global priorities should be calculated. These priorities, which are calculated separately, enable the evaluation of alternatives under each merit. Best alternatives will be the ones with the highest priority in Benefits and Opportunities merits, while the ones with the lowest priority in Costs and Risks merits. The top network, i.e., control hierarchy, connects all these separate networks under the goal node to find a synthesized result.

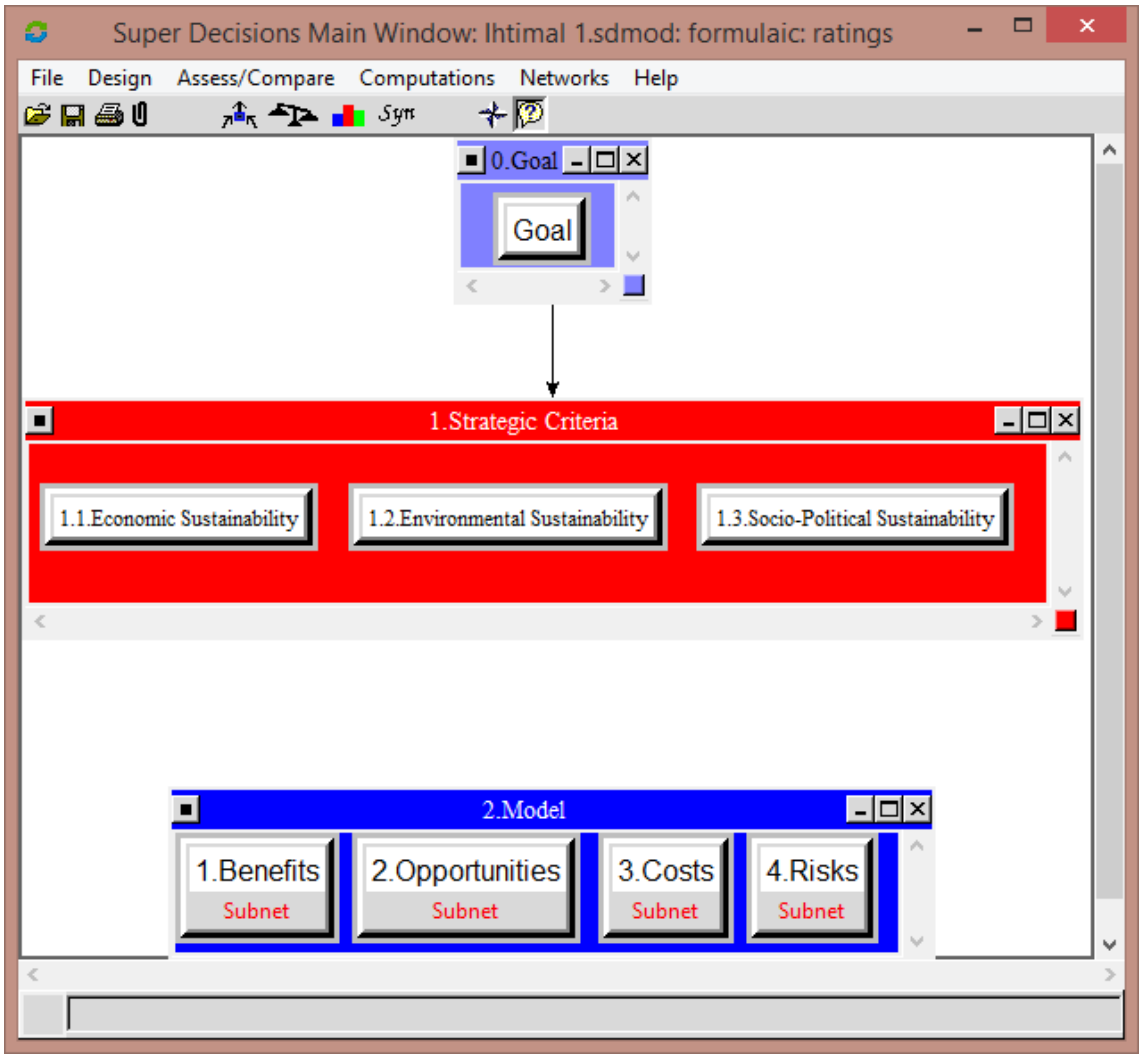


Figure 4.6. The control hierarchy

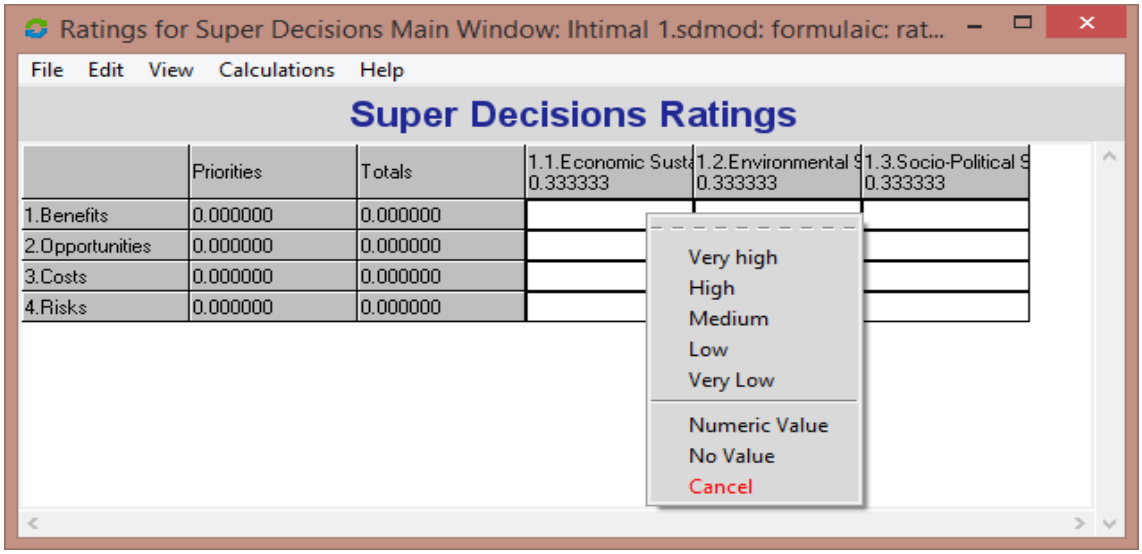


Figure 4.7. Ratings model

In the control hierarchy, the strategic criteria are used to evaluate the merits. As can be seen in figure 5.5. the model doesn't consist a direct connection arrow between the strategic criteria and merits. This connection is provided by the ratings model. Ratings model, shown in figure 5.6. allows us to evaluate the merits with a scale we determine, without pairwise comparisons. For our model, we implemented a very basic quintet scale namely, "Very Low, Low, Medium, High and Very High" and weight this scale with a simple logic where;

$$\partial + 2\partial + 3\partial + 4\partial + 5\partial = 1 \quad <==> \quad \partial = 0.067 \tag{4.12}$$

Therefore, the weights have been determined as; Very Low (∂) = 0.067; Low (2∂) = 0.133; Medium (3∂) = 0.2; High (4∂) = 0.267 and Very High (5∂) = 0.333.

At the final stage of the model, it would be appropriate to mention the formulas used to find the synthesized result. In a multilayered model as ANP-BOCR, cross-layer data transfer is provided by several formulas. In other words, formulas provide an all-inclusive analysis for the alternatives with respect to the goal, by carrying the determined weights in the subnets to the upper network and combining with the weights from the rating model.

Five main formulas used in ANP-BOCR method has been reviewed, by Wijnmalen (2007). We are going to use 3 different formulas which the software automatically provides. First one is multiplicative, the original (BO)/(CR) formula. Where the calculated priorities of the alternatives from Benefits and Opportunities merits are multiplied and divided by the multiplication of alternatives priorities under Costs and Risks merits.

$$\frac{B_i * O_i}{C_i * R_i} \tag{4.13}$$

Where B_i, O_i, C_i and R_i symbolize the results of the alternative "i" under each B, O, C and R merit. As understood from the formula, weights from the strategic criteria are not considered in this formula, and all merits are considered to have equal weight.

Automatic multiplicative formula that the software creates:

$$= \$\boldsymbol{SmartAlt}(\mathbf{1}.\boldsymbol{Benefits}) * \$\boldsymbol{SmartAlt}(\mathbf{2}.\boldsymbol{Opportunities}) * [\boldsymbol{invert}\ \$\boldsymbol{SmartAlt}(\mathbf{3}.\boldsymbol{Costs})] * [\boldsymbol{invert}\ \$\boldsymbol{SmartAlt}(\mathbf{4}.\boldsymbol{Risks})] \quad \textbf{(4.14)}$$

The "SmartAlt" command provides the best alternative values order to use. In our model, the sub-networks are bottom level decision network. So, this command passes up the Ideal values synthesized under the related sub-network.

The second formula is, probabilistic additive, which treats the alternative values of Costs and Risks merits from the subnets like probabilities and utilize these values by subtracting them from 1.

$$\boldsymbol{b} * \boldsymbol{B_i} + \boldsymbol{o} * \boldsymbol{O_i} + \boldsymbol{c} * (\mathbf{1} - \boldsymbol{C_i}) + \boldsymbol{r} * (\mathbf{1} - \boldsymbol{R_i}) \quad \textbf{(4.15)}$$

Where "b, o, c, r" are the normalized weights, which has been determined under the ratings model. Automatic additive (probabilistic) formula that the software creates:

$$= \$\boldsymbol{NormalNet}(\mathbf{1}.\boldsymbol{Benefits}) * \$\boldsymbol{SmartAlt}(\mathbf{1}.\boldsymbol{Benefits}) + \$\boldsymbol{NormalNet}(\mathbf{2}.\boldsymbol{Opportunities}) * \$\boldsymbol{SmartAlt}(\mathbf{2}.\boldsymbol{Opportunities}) + \$\boldsymbol{NormalNet}(\mathbf{3}.\boldsymbol{Costs}) * (\mathbf{1} - \$\boldsymbol{SmartAlt}(\mathbf{3}.\boldsymbol{Costs})) + \$\boldsymbol{NormalNet}(\mathbf{4}.\boldsymbol{Risks}) * (\mathbf{1} - \$\boldsymbol{SmartAlt}(\mathbf{4}.\boldsymbol{Risks})) \quad \textbf{(4.16)}$$

The last formula is subtractive, also known as negative additive, which use alternative values from Cost and Risk merits as calculated. But in order to consider their negative aspects, these values subtracts from the alternative values determined under Benefits and Opportunities.

$$\boldsymbol{b} * \boldsymbol{B_i} + \boldsymbol{o} * \boldsymbol{O_i} - \boldsymbol{c} * \boldsymbol{C_i} - \boldsymbol{r} * \boldsymbol{R_i} \quad \textbf{(4.17)}$$

The final alternative priorities, calculated using this formula may be negative.

Automatic additive (negative) formula that the software creates:

$$= \$\boldsymbol{NormalNet}(\mathbf{1}.\boldsymbol{Benefits}) * \$\boldsymbol{SmartAlt}(\mathbf{1}.\boldsymbol{Benefits}) + \$\boldsymbol{NormalNet}(\mathbf{2}.\boldsymbol{Opportunities}) * \$\boldsymbol{SmartAlt}(\mathbf{2}.\boldsymbol{Opportunities}) + \$\boldsymbol{NormalNet}(\mathbf{3}.\boldsymbol{Costs}) * (-\$\boldsymbol{SmartAlt}(\mathbf{3}.\boldsymbol{Costs})) + \$\boldsymbol{NormalNet}(\mathbf{4}.\boldsymbol{Risks}) * (-\$\boldsymbol{SmartAlt}(\mathbf{4}.\boldsymbol{Risks})) \quad \textbf{(4.18)}$$

Basically, after talking about all the components and setting up the model, a survey was prepared in order to gather expert opinions. The experts are not familiar with the ANP-BOCR methodology and its pairwise comparisons logic, although they have high knowledge and experience on the floriculture industry. For this reason, we have chosen the method which will be more understandable in the survey form, as seen in figure (4.5), as the questionnaire mode. This mode will be converted by us to pairwise comparisons matrices, at the end of the study in order determine the group decision results.

As it can be seen in the Appendix section (the survey prepared in Turkish); the survey consists of total 53 questions with 255 pairwise comparisons and 12 quintets scale questionnaire. 22 of these questions are searching the positive effects (B-O) and 21 of them are searching the negative effects (C-R). 5 questions are for cluster comparisons. B, O, C, R decision subnets requires respectively 61, 52, 56 and 37 pairwise comparisons. For clusters, this number is 46 in total. Last 3 pairwise comparisons evaluate the strategic criteria with respect to the goal.

After the pilot study we applied to the questionnaire, the deficiencies and the details that caused misunderstandings were eliminated. It should be noted here that, a criteria related to the emission trading system was removed from the criterion system due to the lack of adequate response in the experts who solved the survey in the first place. In a special section following the conclusion, this situation will be discussed. The revised and finalized survey was sent to the expert group, which are mostly members of the academic community. The final status of the surveyed questionnaires was received after some inconsistencies were eliminated. In the following “Results and Conclusion” section, we will evaluate the results of the surveys that we have received.

5. RESULTS AND DISCUSSION

It would be appropriate to mention the profile of the experts participating in our survey. Survey evaluations of 12 different experts have been used through the results section. Of these 12 experts, 9 are academicians, while the remaining 3 are non-academic individuals representing firms within the industry. The academic group consist of: 1 associate professor, 1 assistant professor and 3 PhD candidates from the department of horticulture which have specialized on ornamental plants (E_1 – E_5); 1 associate professor and 1 assistant professor from department of agricultural economics, specialized in agricultural business and agricultural policy (E_6, E_7); 1 professor from the department of accounting and finance (E_8); and 1 PhD candidate from the department of public law which has a special interest on environmental tax law and international tax law (E_9). The non-academic individuals consist of: 2 firm owner and 1 agricultural engineer (E_{10} – E_{12}).

5.1. Individual Decision Results

In order to monitor the consistency of the individual surveys and to calculate the individual decision-making results of the experts, we applied the data obtained from the surveys of the 12 experts to the model we developed in the Super Decisions software. Due to the relatively large number of experts and data, only significant results are shown in the tables to be given. Supermatrices, prioritized sub-criteria according to clusters and sensitivity analyses will be elaborated further in the group decision making section. Tables, 5.1. and 5.2., give the global priorities of the alternatives in individual surveys, which has been calculated under each B, O, C, R merits. Since the size of table fail to comply the format, we divided it in two parts. Part 1, gives the limit Supermatrix results of the experts between E_1 and E_6. Part 2, consists of the limit Supermatrix results of experts between E_7 and E_{12}. Values written in bold font, point out the best alternative in the related sub-network (highest priority in B and O, lowest in C and R).

Table 5.1. Individual survey results under B, O, C, R merits – Limiting values (Part 1)

Sub-network	*Alternatives*	E_1	E_2	E_3	E_4	E_5	E_6
Benefits	ST1	**0.041849**	0.052974	**0.091821**	**0.083263**	**0.129511**	**0.104404**
	ST2	0.026571	**0.068258**	0.054375	0.059558	0.107442	0.049165
	ST3	0.008758	0.060963	0.036707	0.032801	0.037205	0.021589
	ST4	0.005297	0.006708	0.051414	0.04857	0.024543	0.024597
Opportunities	ST1	**0.071851**	**0.04831**	**0.087904**	**0.062302**	0.08927	**0.053298**
	ST2	0.018359	0.031804	0.042684	0.039461	**0.089859**	0.012122
	ST3	0.009367	0.042276	0.03489	0.040413	0.024916	0.013315
	ST4	0.010783	0.014125	0.044765	0.032518	0.026774	0.011705
Costs	ST1	0.042442	0.028057	0.068585	0.092797	0.109921	0.043595
	ST2	0.041669	0.052251	0.096777	0.069722	0.118853	0.056905
	ST3	**0.004619**	**0.012219**	0.046173	0.032878	**0.022964**	**0.004379**
	ST4	0.005229	0.072966	**0.017938**	**0.008189**	0.030716	0.024515
Risks	ST1	**0.004585**	**0.011398**	**0.029288**	**0.027967**	**0.006876**	**0.013272**
	ST2	0.034528	0.056615	0.059228	0.051516	0.080353	0.037976
	ST3	0.009801	0.019816	0.035036	0.03822	0.026426	0.019565
	ST4	0.040715	0.033446	0.062592	0.056542	0.089722	0.027225

Table 5.2. Individual survey results under B, O, C, R merits – Limiting values (Part 2)

Sub-network	*Alternatives*	E_7	E_8	E_9	E_{10}	E_{11}	E_{12}
Benefits	ST1	0.011812	**0.167259**	0.135736	0.04223	0.042785	0.04131
	ST2	0.012259	0.028292	**0.145203**	0.063593	**0.095356**	0.045776
	ST3	**0.052732**	0.041108	0.035208	0.056891	0.057075	**0.074087**
	ST4	0.018109	0.014062	0.022643	**0.064151**	0.0621	0.059033
Opportunities	ST1	0.014911	**0.168798**	**0.209028**	**0.049961**	0.026613	**0.062642**
	ST2	0.024716	0.007701	0.033204	0.045163	0.035709	0.038169
	ST3	**0.040886**	0.024539	0.034784	0.046758	0.043801	0.046922
	ST4	0.009504	0.004629	0.032141	0.045964	**0.086915**	0.042449
Costs	ST1	0.030479	0.068631	0.215753	0.073256	0.071674	0.107129
	ST2	0.050662	0.143387	0.082439	0.093466	0.084189	0.072579
	ST3	**0.007584**	0.021945	0.024871	0.021801	**0.024634**	0.041113
	ST4	0.013431	**0.010813**	**0.01445**	**0.01715**	0.061672	**0.040774**
Risks	ST1	0.004562	**0.015868**	**0.022551**	**0.020185**	0.028063	**0.014434**
	ST2	0.024554	0.069898	0.116482	0.051877	0.071215	0.054509
	ST3	**0.003364**	0.041783	0.060239	0.028728	**0.015484**	0.020793
	ST4	0.033219	0.067505	0.107238	0.063215	0.087216	0.056825

When two tables (5.1. and 5.2.) are examined, it is seen that 6 experts consider the best alternative for benefits sub-networks as ST1. Also, 3 experts considered ST2, 2 expert ST3 and 1 expert considered ST4 as the best alternative. When the opportunities subnets are examined, it is seen that 9 experts evaluate ST1 as the best alternative. In addition, ST2, ST3 and ST4 were evaluated as the best alternative, only once. In costs subnets, 6 experts identified the alternative with lowest weight as ST3, while other 6 experts considered ST4 as the best alternative. In the risk subnets, 10 experts considered the lowest weighted alternative as ST1, while the remaining 2 experts identified ST3 as the best alternative.

The synthesized results of the individual decision making process were obtained by using the individual judgements within the control hierarchy and using the three formulas shown in 4.13, 4.15 and 4.17. In the following tables 5.3. and 5.4., the priorities of each B, O, C, R merits, which has been calculated in the ratings model and three pairwise comparisons with respect to the goal node, will be given. Normalized values of synthesized individual survey results, calculated by each formula, will be given in Table 5.5. Again, the values written in bold font, will point out the best alternative, related to the formula.

Table 5.3. Priorities of merits in individual surveys – Normalized values (Part 1)

Merits	E_1	E_2	E_3	E_4	E_5	E_6
Benefits	0.282092	0.287777	0.312828	0.323102	0.269927	0.263963
Opportunities	0.282092	0.215563	0.337959	0.369028	0.214822	0.263963
Costs	0.282092	0.257779	0.174606	0.215324	0.225193	0.269901
Risks	0.153725	0.238881	0.174606	0.092546	0.290057	0.202173

Table 5.4. Priorities of merits in individual surveys – Normalized values (Part 2)

Merits	E_7	E_8	E_9	E_{10}	E_{11}	E_{12}
Benefits	0.142704	0.332932	0.2726	0.307958	0.265844	0.281347
Opportunities	0.357296	0.332931	0.285628	0.307958	0.278368	0.281347
Costs	0.142704	0.256436	0.259375	0.23068	0.227894	0.281347
Risks	0.357296	0.077701	0.182397	0.153403	0.227894	0.155959

Table 5.5. Synthesized individual survey results – Normalized values

Synthesized Results		Alternatives			
Experts	**Formula**	**ST1**	**ST2**	**ST3**	**ST4**
E_1	Subtractive	**0.47328**	-0.27908	0.05023	-0.19741
	Probabilistic Additive	**0.395913**	0.15805	0.262164	0.183873
	Multiplicative	**0.864628**	0.018972	0.101389	0.015011
E_2	Subtractive	0.315554	0.006718	**0.344968**	-0.33276
	Probabilistic Additive	0.343384	0.219037	**0.355228**	0.082351
	Multiplicative	0.412102	0.037789	**0.54811**	0.001999
E_3	Subtractive	**0.661411**	0.01415	0.116073	0.208366
	Probabilistic Additive	**0.383811**	0.17329	0.20644	0.236459
	Multiplicative	**0.553117**	0.055739	0.108977	0.282167
E_4	Subtractive	**0.375748**	0.190692	0.198591	0.234969
	Probabilistic Additive	**0.310645**	0.221397	0.225207	0.242751
	Multiplicative	0.280768	0.09191	0.148174	**0.479148**
E_5	Subtractive	**0.467957**	-0.08552	0.015115	-0.43141
	Probabilistic Additive	**0.376018**	0.229617	0.256237	0.138128
	Multiplicative	**0.84636**	0.055932	0.084516	0.013192
E_6	Subtractive	**0.36639**	-0.42086	-0.00644	-0.20632
	Probabilistic Additive	**0.423647**	0.108078	0.274198	0.194077
	Multiplicative	**0.703037**	0.02016	0.245269	0.031534
E_7	Subtractive	-0.04305	-0.25845	**0.501049**	-0.19746
	Probabilistic Additive	0.231005	0.137103	**0.468199**	0.163693
	Multiplicative	0.014661	0.002819	**0.978055**	0.004465
E_8	Subtractive	**0.590485**	-0.29513	0.050038	-0.06434
	Probabilistic Additive	**0.541772**	0.045065	0.238657	0.174506
	Multiplicative	**0.95537**	0.000801	0.040542	0.003287
E_9	Subtractive	**0.62744**	0.093104	-0.02706	-0.2524
	Probabilistic Additive	**0.354427**	0.246533	0.22227	0.176769
	Multiplicative	**0.76522**	0.065885	0.107264	0.061631
E_{10}	Subtractive	0.209417	0.169303	**0.326391**	0.29489
	Probabilistic Additive	0.231083	0.212385	**0.285607**	0.270924
	Multiplicative	0.158782	0.065914	**0.472641**	0.302662
E_{11}	Subtractive	-0.18185	-0.09772	**0.556438**	0.16399
	Probabilistic Additive	0.198916	0.21363	**0.328047**	0.259406
	Multiplicative	0.065129	0.065343	**0.754076**	0.115453
E_{12}	Subtractive	0.195059	0.008396	**0.544046**	0.252499
	Probabilistic Additive	0.235948	0.188206	**0.325207**	0.250639
	Multiplicative	0.230405	0.060804	**0.559886**	0.148905

When the table with synthesized results is examined, it is seen that the best alternative results are distributed between ST1 and ST3. When the individual results of the academicians are evaluated, it is seen that ST1 stands out. In the surveys of our non - academic experts E_{10}, E_{11} and E_{12}, ST3 was evaluated as the best alternative according to all formulas.

The only anomaly found in the table appears in the expert E_4's synthesized results. According to the multiplicative formula, which does not take into account the merit weights, the best alternative was calculated as ST4. However, when merit weights were taken into account in subtractive and probabilistic additive formula, ST1 was considered as the best alternative. This is due to the fact that the expert weighted the risk too low in the control hierarchy, as can be seen in table 5.3.

5.2. Group Decision Results

To obtain the group decision, as we apply the surveys separately, Saaty (1989) recommends using the geometric mean of individual judgments for each pairwise comparison. This remark, in which mathematically demonstrated in the study of Aczel and Saaty (1983), is a convenient procedure to unify the individual judgments, as it maintains the comparison matrices reciprocal property. In this respect, the geometric mean of the pairwise judgements in individual surveys, which we gave the results in the previous section, was calculated by using Microsoft excel. The geometric mean calculation procedure was performed for each 255 pairwise comparisons and 12 quintets scale questionnaire, as shown in a small application below. Then, the values obtained were entered into the model we developed in the matrix mode as if it were a single survey. Software automatically transforms the values, smaller than one.

Table 5.6. Geometric mean calculation - a small example

Compare the positive influence of following factors **B2-B3** and **B8-B9** on **B1-Pro-1**, in terms of their importance level.														
	E_1			**E_2**			**...**	**E_{12}**			**Calculation**	**Geometric mean**	
B2	1	**1**	1	1	**0.143**	7	...	1	**0.5**	2	(1*0.143*...*0.5)^(1/12)	**0.398305371**	**B3**
B8	5	**5**	1	7	**7**	1	...	2	**2**	1	(5*7*...*2)^(1/12)	**1.787869135**	**B9**

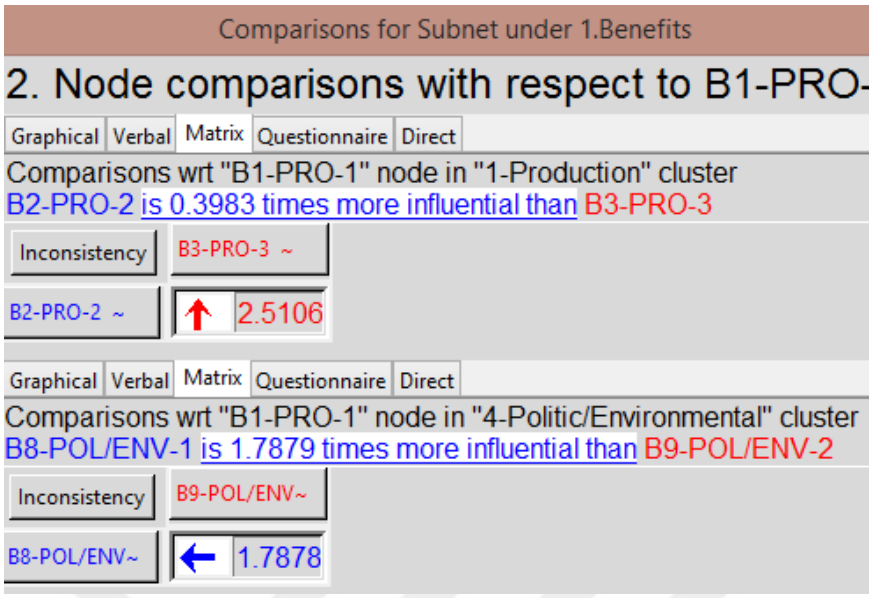


Figure 5.1. Pairwise Comparison Example in Matrix mode of Super Decisions

The data were entered manually in all comparison matrices, as shown in the figure above. The consistency ratio of group-decision data was smaller than 0.1 for each matrix, as in individual surveys. In the following pages, there supermatrices (unweighted, weighted and limit) for the group-decision model will be visualized, which we have not shown before due to the large number of matrices in individual surveys. For each decision-sub-network, a table of these three matrices has been created. In order to adapt the table to the format, the values in the supermatrices were rounded upwards to 3 decimal places. This procedure has been only used on behalf of visualization. Moreover, in order to minimize the effect of the rounding process on the overall result, the data has been entered into the software as complete and the results have been obtained in line with the number of decimal places allowed by the software.

Certain abbreviations are used on the tables. For example, B1 is given instead of B1-PRO-1 code, O4 to refer O4-LOG-1, C7 to C7-MAR/LAB-1 and R9 to R9-POL/ENV-2. In addition, cluster names are also used shortened. For each merit, i.e. for the decision-sub-network, the three supermatrices are shown as a single table. Finally, in order to explain the results obtained from super-matrices more easily, a synthesized table with certain priorities has been prepared which consists all decision sub-networks.

Table 5.7. Combined Supermatrices in Benefits Sub-network – Group decision

Unweighted Supermatrix		1-Pro			2-Log		3-Mar/Lab		4-Pol/Env		Alt			
		B1	B2	B3	B4	B5	B6	B7	B8	B9	ST1	ST2	ST3	ST4
1-Pro	B1	0.000	0.522	0.672	0.000	0.543	0.207	0.736	0.640	0.000	0.227	0.000	0.000	0.415
	B2	0.285	0.000	0.328	0.187	0.000	0.000	0.264	0.000	0.000	0.252	0.251	0.000	0.585
	B3	0.715	0.478	0.000	0.813	0.457	0.793	0.000	0.360	1.000	0.520	0.749	0.000	0.000
2-Log	B4	0.000	0.000	0.524	0.000	1.000	0.514	0.000	0.411	0.000	0.589	0.000	0.000	0.000
	B5	0.000	0.000	0.476	1.000	0.000	0.486	1.000	0.589	0.000	0.411	1.000	0.000	0.000
3-Mar/Lab	B6	0.000	0.000	0.000	0.396	0.000	0.000	0.000	0.000	0.273	0.000	0.324	0.284	0.513
	B7	0.000	0.000	0.000	0.604	0.000	1.000	0.000	1.000	0.727	0.000	0.676	0.716	0.487
4-Pol/Env	B8	0.641	0.000	0.000	0.000	0.000	0.000	0.168	0.000	0.000	1.000	0.000	0.000	0.000
	B9	0.359	0.000	0.000	0.000	0.000	1.000	0.832	1.000	0.000	0.000	0.000	1.000	0.000
Alt	ST1	0.239	0.231	0.377	0.537	0.447	0.342	0.317	0.000	0.544	0.000	0.000	0.000	0.000
	ST2	0.239	0.272	0.417	0.273	0.323	0.296	0.274	0.353	0.000	0.000	0.000	0.000	0.000
	ST3	0.220	0.174	0.205	0.190	0.230	0.163	0.148	0.172	0.456	0.000	0.000	0.000	0.000
	ST4	0.302	0.323	0.000	0.000	0.000	0.199	0.260	0.475	0.000	0.000	0.000	0.000	0.000
Weighted Supermatrix		**1-Pro**			**2-Log**		**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**B9**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	B1	0.000	0.331	0.347	0.000	0.100	0.045	0.219	0.151	0.000	0.120	0.000	0.000	0.227
	B2	0.157	0.000	0.170	0.027	0.000	0.000	0.078	0.000	0.000	0.133	0.110	0.000	0.320
	B3	0.393	0.303	0.000	0.118	0.085	0.172	0.000	0.085	0.397	0.274	0.327	0.000	0.000
2-Log	B4	0.000	0.000	0.097	0.000	0.564	0.096	0.000	0.073	0.000	0.144	0.000	0.000	0.000
	B5	0.000	0.000	0.088	0.444	0.000	0.091	0.256	0.105	0.000	0.100	0.202	0.000	0.000
3-Mar/Lab	B6	0.000	0.000	0.000	0.084	0.000	0.000	0.000	0.000	0.072	0.000	0.117	0.186	0.232
	B7	0.000	0.000	0.000	0.129	0.000	0.271	0.000	0.158	0.193	0.000	0.244	0.468	0.220
4-Pol/Env	B8	0.085	0.000	0.000	0.000	0.000	0.000	0.018	0.000	0.000	0.230	0.000	0.000	0.000
	B9	0.048	0.000	0.000	0.000	0.000	0.078	0.089	0.226	0.000	0.000	0.000	0.346	0.000
Alt	ST1	0.076	0.085	0.112	0.106	0.112	0.085	0.108	0.000	0.184	0.000	0.000	0.000	0.000
	ST2	0.076	0.099	0.124	0.054	0.081	0.073	0.093	0.071	0.000	0.000	0.000	0.000	0.000
	ST3	0.070	0.064	0.061	0.038	0.058	0.040	0.050	0.035	0.154	0.000	0.000	0.000	0.000
	ST4	0.096	0.118	0.000	0.000	0.000	0.049	0.088	0.096	0.000	0.000	0.000	0.000	0.000
Limit Supermatrix		**1-Pro**			**2-Log**		**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		B1	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**B8**	**B9**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	B1	0.139	0.139	0.139	0.139	0.139	0.139	0.139	0.139	0.139	0.139	0.139	0.139	0.139
	B2	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088	0.088
	B3	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168	0.168
2-Log	B4	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091	0.091
	B5	0.103	0.103	0.103	0.103	0.103	0.103	0.103	0.103	0.103	0.103	0.103	0.103	0.103
3-Mar/Lab	B6	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035
	B7	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
4-Pol/Env	B8	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031
	B9	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
Alt	ST1	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077
	ST2	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.066
	ST3	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048	0.048
	ST4	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035	0.035

Table 5.8. Combined Supermatrices in Opportunities Sub-network – Group decision

Unweighted Supermatrix		1-Pro			2-Log		3-Mar/Lab		4-Pol/Env		Alt			
		O1	O2	O3	O4	O5	O6	O7	O8	O9	ST1	ST2	ST3	ST4
1-Pro	O1	0.000	0.239	0.167	0.000	1.000	0.000	0.350	1.000	0.503	0.000	0.000	0.000	0.150
	O2	0.484	0.000	0.833	0.000	0.000	0.230	0.000	0.000	0.000	0.000	0.302	0.000	0.446
	O3	0.516	0.761	0.000	0.000	0.000	0.770	0.650	0.000	0.497	0.000	0.698	0.000	0.404
2-Log	O4	0.220	0.000	0.000	0.000	1.000	1.000	0.486	0.243	0.000	0.513	0.000	1.000	0.660
	O5	0.780	0.000	0.000	1.000	0.000	0.000	0.514	0.757	1.000	0.487	0.000	0.000	0.340
3-Mar/Lab	O6	0.487	0.337	0.552	0.474	0.314	0.000	1.000	0.000	0.345	0.508	0.443	0.350	0.000
	O7	0.513	0.663	0.448	0.526	0.686	1.000	0.000	1.000	0.655	0.492	0.557	0.650	0.000
4-Pol/Env	O8	0.638	0.000	0.000	0.371	0.497	0.000	0.294	0.000	1.000	0.373	0.244	0.181	0.367
	O9	0.362	0.000	1.000	0.629	0.503	1.000	0.706	1.000	0.000	0.627	0.756	0.819	0.633
Alt	ST1	0.346	0.160	0.000	1.000	0.714	0.327	0.367	0.328	0.467	0.000	0.000	0.000	0.000
	ST2	0.450	0.272	0.000	0.000	0.000	0.404	0.347	0.438	0.000	0.000	0.000	0.000	0.000
	ST3	0.203	0.000	0.313	0.000	0.286	0.269	0.286	0.233	0.254	0.000	0.000	0.000	0.000
	ST4	0.000	0.568	0.687	0.000	0.000	0.000	0.000	0.000	0.279	0.000	0.000	0.000	0.000
Weighted Supermatrix		**1-Pro**			**2-Log**		**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		O1	**O2**	**O3**	**O4**	**O5**	**O6**	**O7**	**O8**	**O9**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	O1	0.000	0.116	0.073	0.000	0.144	0.000	0.076	0.237	0.119	0.000	0.000	0.000	0.079
	O2	0.182	0.000	0.364	0.000	0.000	0.050	0.000	0.000	0.000	0.000	0.134	0.000	0.235
	O3	0.194	0.368	0.000	0.000	0.000	0.167	0.141	0.000	0.118	0.000	0.308	0.000	0.213
2-Log	O4	0.031	0.000	0.000	0.000	0.387	0.187	0.091	0.043	0.000	0.138	0.000	0.269	0.161
	O5	0.110	0.000	0.000	0.452	0.000	0.000	0.096	0.135	0.179	0.131	0.000	0.000	0.083
3-Mar/Lab	O6	0.091	0.081	0.120	0.109	0.062	0.000	0.271	0.000	0.054	0.243	0.162	0.168	0.000
	O7	0.096	0.160	0.098	0.121	0.135	0.271	0.000	0.158	0.103	0.235	0.203	0.311	0.000
4-Pol/Env	O8	0.053	0.000	0.000	0.038	0.043	0.000	0.023	0.000	0.226	0.094	0.047	0.046	0.084
	O9	0.030	0.000	0.096	0.064	0.044	0.078	0.055	0.226	0.000	0.159	0.146	0.207	0.145
Alt	ST1	0.074	0.044	0.000	0.216	0.132	0.081	0.091	0.066	0.094	0.000	0.000	0.000	0.000
	ST2	0.096	0.075	0.000	0.000	0.000	0.100	0.086	0.088	0.000	0.000	0.000	0.000	0.000
	ST3	0.043	0.000	0.078	0.000	0.053	0.067	0.071	0.047	0.051	0.000	0.000	0.000	0.000
	ST4	0.000	0.156	0.171	0.000	0.000	0.000	0.000	0.000	0.056	0.000	0.000	0.000	0.000
Limit Supermatrix		**1-Pro**			**2-Log**		**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		O1	**O2**	**O3**	**O4**	**O5**	**O6**	**O7**	**O8**	**O9**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	O1	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063	0.063
	O2	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068	0.068
	O3	0.104	0.104	0.104	0.104	0.104	0.104	0.104	0.104	0.104	0.104	0.104	0.104	0.104
2-Log	O4	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102
	O5	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
3-Mar/Lab	O6	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.114
	O7	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137	0.137
4-Pol/Env	O8	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046	0.046
	O9	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080
Alt	ST1	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
	ST2	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
	ST3	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040	0.040
	ST4	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033	0.033

Table 5.9. Combined Supermatrices in Costs Sub-network – Group decision

Unweighted Supermatrix		1-Pro			2-Log			3-Mar/Lab		4-Pol/Env		Alt			
		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	ST1	ST2	ST3	ST4
1-Pro	C1	0.000	0.637	0.320	0.727	1.000	0.000	0.000	0.654	0.409	0.649	1.000	0.283	0.620	0.267
	C2	1.000	0.000	0.680	0.273	0.000	0.000	0.299	0.346	0.591	0.351	0.000	0.471	0.000	0.288
	C3	0.000	0.363	0.000	0.000	0.000	0.000	0.701	0.000	0.000	0.000	0.000	0.246	0.380	0.445
2-Log	C4	0.824	0.000	0.000	0.000	0.815	0.556	0.000	0.471	0.651	0.607	0.376	0.000	0.000	0.000
	C5	0.000	0.000	0.000	0.664	0.000	0.444	0.000	0.264	0.000	0.393	0.396	0.000	0.000	0.000
	C6	0.176	1.000	0.000	0.336	0.185	0.000	0.000	0.264	0.349	0.000	0.227	1.000	1.000	0.000
3-Mar/Lab	C7	0.000	0.345	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.381	0.000	0.604
	C8	1.000	0.655	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000	0.619	0.000	0.396
4-Pol/Env	C9	0.748	0.713	0.000	0.721	0.721	0.000	0.000	0.684	0.000	0.000	0.697	0.728	0.756	0.000
	C10	0.252	0.287	0.000	0.279	0.279	0.000	0.000	0.316	0.000	0.000	0.303	0.272	0.244	0.000
Alt	ST1	0.391	0.000	0.000	0.422	1.000	0.556	0.000	0.494	0.369	0.442	0.000	0.000	0.000	0.000
	ST2	0.609	0.592	0.450	0.325	0.000	0.444	0.352	0.319	0.335	0.290	0.000	0.000	0.000	0.000
	ST3	0.000	0.000	0.168	0.253	0.000	0.000	0.000	0.187	0.295	0.268	0.000	0.000	0.000	0.000
	ST4	0.000	0.408	0.381	0.000	0.000	0.000	0.648	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Unweighted Supermatrix		**1-Pro**			**2-Log**			**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	C1	0.000	0.239	0.155	0.105	0.180	0.000	0.000	0.196	0.158	0.251	0.367	0.104	0.327	0.146
	C2	0.376	0.000	0.329	0.039	0.000	0.000	0.141	0.104	0.229	0.136	0.000	0.173	0.000	0.158
	C3	0.000	0.136	0.000	0.000	0.000	0.000	0.329	0.000	0.000	0.000	0.000	0.090	0.200	0.244
2-Log	C4	0.116	0.000	0.000	0.000	0.393	0.376	0.000	0.119	0.177	0.166	0.064	0.000	0.000	0.000
	C5	0.000	0.000	0.000	0.257	0.000	0.301	0.000	0.067	0.000	0.107	0.067	0.000	0.000	0.000
	C6	0.025	0.141	0.000	0.130	0.089	0.000	0.000	0.067	0.095	0.000	0.039	0.170	0.244	0.000
3-Mar/Lab	C7	0.000	0.065	0.241	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.115	0.000	0.273
	C8	0.187	0.123	0.000	0.197	0.000	0.000	0.000	0.000	0.000	0.000	0.303	0.187	0.000	0.179
4-Pol/Env	C9	0.062	0.059	0.000	0.063	0.078	0.000	0.000	0.074	0.000	0.000	0.112	0.117	0.174	0.000
	C10	0.021	0.024	0.000	0.024	0.030	0.000	0.000	0.034	0.000	0.000	0.049	0.044	0.056	0.000
Alt	ST1	0.084	0.000	0.000	0.078	0.230	0.180	0.000	0.167	0.126	0.150	0.000	0.000	0.000	0.000
	ST2	0.130	0.127	0.124	0.060	0.000	0.143	0.187	0.108	0.114	0.099	0.000	0.000	0.000	0.000
	ST3	0.000	0.000	0.046	0.047	0.000	0.000	0.000	0.063	0.100	0.091	0.000	0.000	0.000	0.000
	ST4	0.000	0.087	0.105	0.000	0.000	0.000	0.343	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Limit Supermatrix		**1-Pro**			**2-Log**			**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		C1	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	C1	0.144	0.144	0.144	0.144	0.144	0.144	0.144	0.144	0.144	0.144	0.144	0.144	0.144	0.144
	C2	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126	0.126
	C3	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049	0.049
2-Log	C4	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102
	C5	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.064
	C6	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076	0.076
3-Mar/Lab	C7	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038	0.038
	C8	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107	0.107
4-Pol/Env	C9	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058	0.058
	C10	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023	0.023
Alt	ST1	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077	0.077
	ST2	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085	0.085
	ST3	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022	0.022
	ST4	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029	0.029

Table 5.10. Combined Supermatrices in Risks Sub-network – Group decision

Unweighted Supermatrix		1-Pro			2-Log		3-Mar/Lab		4-Pol/Env		Alt			
		R1	R2	R3	R4	R5	R6	R7	R8	R9	ST1	ST2	ST3	ST4
1-Pro	R1	0.000	0.457	0.808	0.557	0.000	0.261	0.000	0.000	0.000	0.458	0.332	0.000	0.229
	R2	1.000	0.000	0.192	0.000	0.000	0.263	0.305	0.000	0.000	0.000	0.000	0.452	0.412
	R3	0.000	0.543	0.000	0.443	0.000	0.476	0.695	0.000	0.000	0.542	0.668	0.548	0.358
2-Log	R4	0.000	0.000	0.673	0.000	1.000	0.457	0.291	0.000	0.000	0.507	0.000	1.000	0.000
	R5	0.000	0.000	0.327	0.000	0.000	0.543	0.709	0.000	0.000	0.493	1.000	0.000	0.000
3-Mar/Lab	R6	0.000	0.526	0.386	0.298	0.368	0.000	1.000	0.000	0.000	0.419	0.400	0.000	0.383
	R7	0.000	0.474	0.614	0.702	0.632	1.000	0.000	0.000	0.000	0.581	0.600	0.000	0.617
4-Pol/Env	R8	0.159	0.000	0.207	0.000	0.202	0.000	0.000	0.000	1.000	0.212	0.174	0.187	0.000
	R9	0.841	0.000	0.793	0.000	0.798	1.000	1.000	0.000	0.000	0.788	0.826	0.813	0.000
Alt	ST1	0.306	0.000	0.000	0.000	0.399	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	ST2	0.694	0.301	0.498	0.570	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	ST3	0.000	0.246	0.000	0.430	0.601	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	ST4	0.000	0.453	0.502	0.000	0.000	0.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000
Weighted Supermatrix		**1-Pro**			**2-Log**		**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		R1	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	R1	0.000	0.221	0.303	0.153	0.000	0.075	0.000	0.000	0.000	0.168	0.122	0.000	0.126
	R2	0.559	0.000	0.072	0.000	0.000	0.076	0.066	0.000	0.000	0.000	0.000	0.238	0.226
	R3	0.000	0.263	0.000	0.122	0.000	0.137	0.151	0.000	0.000	0.199	0.245	0.289	0.196
2-Log	R4	0.000	0.000	0.095	0.000	0.452	0.113	0.054	0.000	0.000	0.086	0.000	0.244	0.000
	R5	0.000	0.000	0.046	0.000	0.000	0.135	0.133	0.000	0.000	0.084	0.170	0.000	0.000
3-Mar/Lab	R6	0.000	0.127	0.072	0.111	0.085	0.000	0.271	0.000	0.000	0.127	0.121	0.000	0.173
	R7	0.000	0.114	0.115	0.263	0.145	0.360	0.000	0.000	0.000	0.176	0.182	0.000	0.279
4-Pol/Env	R8	0.020	0.000	0.017	0.000	0.021	0.000	0.000	0.000	1.000	0.034	0.028	0.043	0.000
	R9	0.104	0.000	0.066	0.000	0.081	0.104	0.078	0.000	0.000	0.126	0.132	0.187	0.000
Alt	ST1	0.097	0.000	0.000	0.000	0.086	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	ST2	0.221	0.083	0.107	0.200	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	ST3	0.000	0.068	0.000	0.151	0.130	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	ST4	0.000	0.125	0.107	0.000	0.000	0.000	0.247	0.000	0.000	0.000	0.000	0.000	0.000
Limit Supermatrix		**1-Pro**			**2-Log**		**3-Mar/Lab**		**4-Pol/Env**		**Alt**			
		R1	**R2**	**R3**	**R4**	**R5**	**R6**	**R7**	**R8**	**R9**	**ST1**	**ST2**	**ST3**	**ST4**
1-Pro	R1	0.106	0.106	0.106	0.106	0.106	0.106	0.106	0.000	0.000	0.106	0.106	0.106	0.106
	R2	0.114	0.114	0.114	0.114	0.114	0.114	0.114	0.000	0.000	0.114	0.114	0.114	0.114
	R3	0.120	0.120	0.120	0.120	0.120	0.120	0.120	0.000	0.000	0.120	0.120	0.120	0.120
2-Log	R4	0.066	0.066	0.066	0.066	0.066	0.066	0.066	0.000	0.000	0.066	0.066	0.066	0.066
	R5	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.000	0.000	0.052	0.052	0.052	0.052
3-Mar/Lab	R6	0.099	0.099	0.099	0.099	0.099	0.099	0.099	0.000	0.000	0.099	0.099	0.099	0.099
	R7	0.130	0.130	0.130	0.130	0.130	0.130	0.130	0.000	0.000	0.130	0.130	0.130	0.130
4-Pol/Env	R8	0.079	0.079	0.079	0.079	0.079	0.079	0.079	0.000	0.000	0.079	0.079	0.079	0.079
	R9	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.000	0.000	0.064	0.064	0.064	0.064
Alt	ST1	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.000	0.000	0.016	0.016	0.016	0.016
	ST2	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.000	0.000	0.064	0.064	0.064	0.064
	ST3	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.000	0.000	0.027	0.027	0.027	0.027
	ST4	0.064	0.064	0.064	0.064	0.064	0.064	0.064	0.000	0.000	0.064	0.064	0.064	0.064

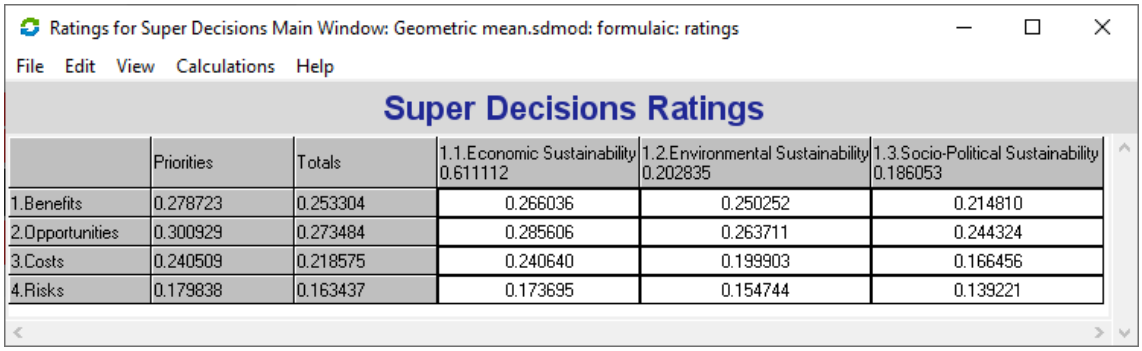
Table 5.11. Consolidated group decision results under B, O, C, R subnets – Limiting and Normalized by cluster values

Cluster	Node	Normalized By Cluster	Limiting	Node	Normalized By Cluster	Limiting
1-Pro	**B1**	0.351810	0.138639	**O1**	0.269400	0.063238
	B2	0.222540	0.087695	**O2**	0.288750	0.067782
	B3	**0.425650**	**0.167737**	**O3**	**0.441850**	0.103719
2-Log	**B4**	0.469120	0.091149	**O4**	**0.507120**	0.102498
	B5	**0.530880**	0.103147	**O5**	0.492880	0.099621
3-Mar/Lab	**B6**	0.306330	0.035285	**O6**	0.453330	0.113650
	B7	**0.693670**	0.079902	**O7**	**0.546670**	**0.137047**
4-Pol/Env	**B8**	0.436660	0.030984	**O8**	0.365640	0.046230
	B9	**0.563340**	0.039973	**O9**	**0.634360**	0.080206
Alt	**ST1**	**0.341390**	0.076980	**ST1**	**0.404230**	0.075191
	ST2	0.290720	0.065555	**ST2**	0.206330	0.038379
	ST3	0.210930	0.047562	**ST3**	0.213000	0.039619
	ST4	0.156960	0.035392	**ST4**	0.176440	0.032820
Cluster	**Node**	**Normalized By Cluster**	**Limiting**	**Node**	**Normalized By Cluster**	**Limiting**
1-Pro	**C1**	**0.451690**	**0.144345**	**R1**	0.312190	0.105852
	C2	0.395570	0.126408	**R2**	0.335170	0.113646
	C3	0.152740	0.048810	**R3**	**0.352640**	0.119567
2-Log	**C4**	**0.422310**	0.102102	**R4**	**0.559120**	0.066412
	C5	0.264070	0.063843	**R5**	0.440880	0.052368
	C6	0.313620	0.075824			
3-Mar/Lab	**C7**	0.260380	0.037716	**R6**	0.431860	0.098713
	C8	**0.739620**	0.107132	**R7**	**0.568140**	**0.129862**
4-Pol/Env	**C9**	**0.718450**	0.058000	**R8**	**0.552100**	0.078861
	C10	0.281550	0.022728	**R9**	0.447900	0.063978
Alt	**ST1**	0.361300	0.076991	**ST1**	**0.094140**	0.016074
	ST2	0.400310	0.085302	**ST2**	0.374160	0.063884
	ST3	**0.101840**	0.021702	**ST3**	0.155840	0.026609
	ST4	0.136550	0.029097	**ST4**	0.375860	0.064174

In the table above, important values are shown in bold font. Although the highest weighted values are marked in the related sub-parts, only alternatives with low weight are marked in order to show the best alternative in the alternative clusters of costs and risks subnets.

When the combined results in Table 5.11. are examined, according to group-decision data, ST1 have been considered the best alternative in the Benefits-Opportunities-Risks sub-networks, while ST3 have been considered as the best alternative in the Costs sub-network. In other words, between alternatives, the ST1 strategy has been evaluated as the one with most positive influence in terms of benefit and opportunity, while it has been weighted as the one with the least negative influence in terms of risk. Also, ST3 strategy have been evaluated as the alternative with the least negative influence in terms of cost.

When cluster-based evaluations are performed, B3-PRO-3 and O3-PRO-3 are the sub-criteria with most positive influence in the production cluster, whereas C1-PRO-1 and R3-PRO-3 are the sub-criteria with the most negative influence. Similarly, when other clusters are examined, B5-LOG-2 and O4-LOG-1 are the sub-criteria with most positive influence in the logistics cluster, whereas C4-LOG-1 and R4-LOG-1 are the sub-criteria with the most negative influence; B7-MAR/LAB-2 and O7-MAR/LAB-2 are the sub-criteria with most positive influence in the marketing/labor cluster, whereas C8-MAR/LAB-2 and R7-MAR/LAB-2 are the sub-criteria with the most negative influence; B9-POL/ENV-2 and O9-POL/ENV-2 are the sub-criteria with most positive influence in the politic/environmental cluster, whereas C9-POL/ENV-1 and R8-POL/ENV-1 are the sub-criteria with the most negative influence. When the columns with limiting values are examined, it can be observed that B3-PRO-3 sub-criteria in the benefits sub-net and O7-MAR/LAB-2 sub-criteria in opportunities sub-net has the most positive influence in overall, while in cost sub-net C1-PRO-1 and risk sub-net R7-MAR/LAB-2 has the most negative influence. In the conclusion section, stated criteria will be discussed using their explanations.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Super Decisions Ratings

	Priorities	Totals	1.1.Economic Sustainability 0.611112	1.2.Environmental Sustainability 0.202835	1.3.Socio-Political Sustainability 0.186053
1.Benefits	0.278723	0.253304	0.266036	0.250252	0.214810
2.Opportunities	0.300929	0.273484	0.285606	0.263711	0.244324
3.Costs	0.240509	0.218575	0.240640	0.199903	0.166456
4.Risks	0.179838	0.163437	0.173695	0.154744	0.139221

Figure 5.2. Priorities in the ratings model – Group decision

Table 5.12. Synthesized group decision results – Normalized, Raw and Ideal values

Synthesized	Subtractive			Probabilistic Additive			Multiplicative		
Alternative	Ideal	Normal	Raw	Ideal	Normal	Raw	Ideal	Normal	Raw
ST1	**1.0000**	**0.5842**	**0.3175**	**1.0000**	**0.3411**	**0.7379**	**1.0000**	**0.5183**	**4.4234**
ST2	-0.0900	-0.0526	-0.0286	0.5309	0.1811	0.3918	0.0987	0.0512	0.4366
ST3	0.6142	0.3588	0.1950	0.8340	0.2845	0.6154	0.6977	0.3616	3.0861
ST4	-0.0075	-0.0044	-0.0024	0.5664	0.1932	0.4180	0.1330	0.0689	0.5883

According to group-decision data, 1.1.Economic Sustainability strategic criteria has been evaluated as more influential than 1.2.Socio-political Sustainability and 1.3.Environmental Sustainability, on the sustainable development of the Turkish floriculture industry. According to the ratings table in Figure 5.2., the weights of merits have been calculated as; Benefit 0.278723, Opportunity 0.300929, Costs 0.240509, Risks 0.179838. According to the synthesized results in which 3 formulas were applied separately, the ST1 strategy has been finally calculated as the best alternative.

5.3. Sensitivity Analysis

Super Decisions allows a "what-if" type sensitivity analysis, by setting nodes as independent variables. In this direction, we interpreted graphs by separately assigning each B, O, C, R merits as independent variables, in our group decision model. Since the multiplicative formula accepts all weights of merits are equal, it wouldn't fit the sensitivity analysis. We decided to use the probabilistic additive formula in order to work with positive values

In the graphs given, the influence of the criterion selected as independent variable on the alternative weights is visualized. The x-axis of the graph gives the priorities of the selected independent variable according to the determined number of steps. We plotted the sensitivity graphs for each independent variable in 10 steps with a range between 0.0001 and 0.9999. The y-axis of the graph gives the priorities of each four alternatives, which has been plotted in separate colors where ST1 is red, ST2 is blue, ST3 is black and ST4 is green.

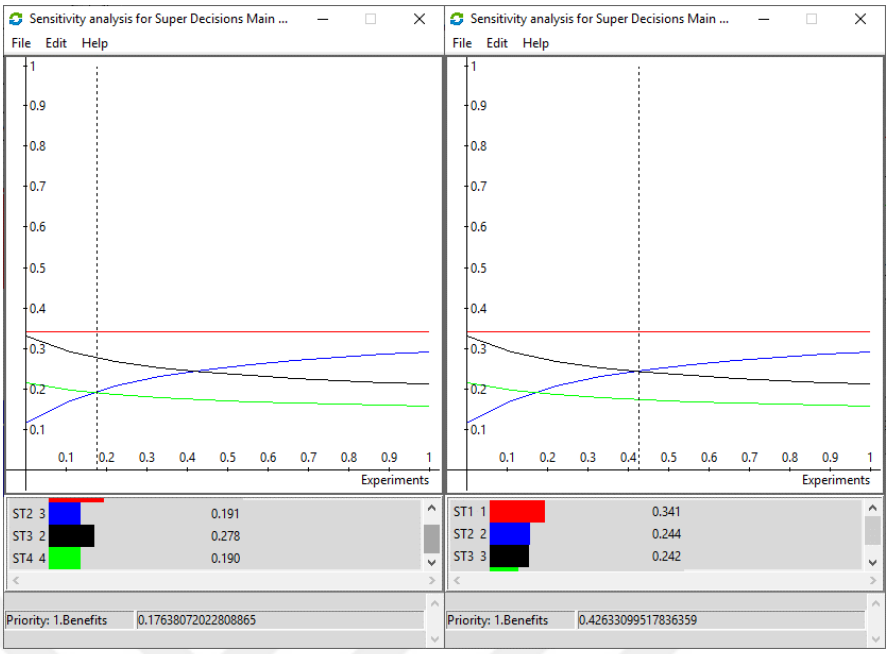

Figure 5.3. Group decision sensitivity analysis - Independent variable: Benefits

No matter how the weight of the Benefits independent variable changes, ST1 remains as the best alternative. However, when the weight reaches around 0.1764, ST4 becomes the alternative with lowest priority. If the weight reaches the value approximately 0.426 and above, ST2 becomes the second best alternative by passing ST3.

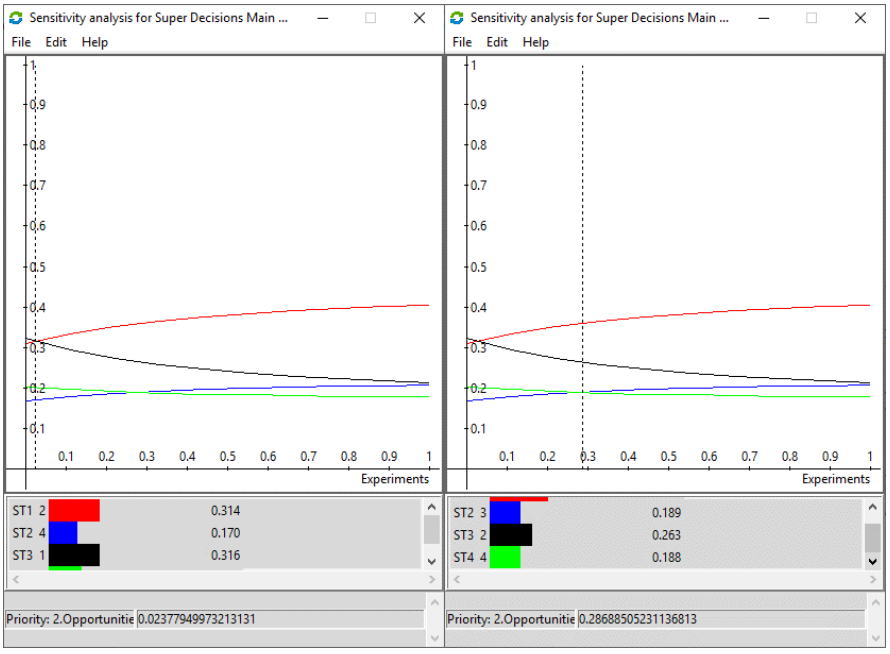

Figure 5.4. Group decision sensitivity analysis - Independent variable: Opportunities

Although ST3 is the alternative with the highest priority in a very small range such as 0.0001 and 0.02378, ST1 alternative is the alternative with the highest priority in almost all weights when opportunities merit is selected as the independent variable. In addition, if the weight reaches the value approximately 0.287 and above, ST4 becomes the worst alternative.

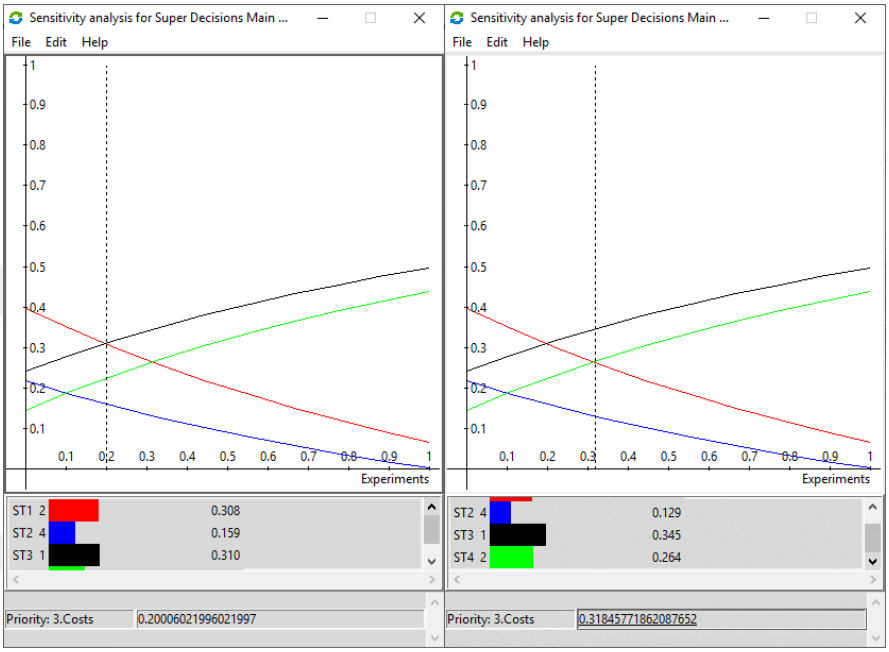

Figure 5.5. Group decision sensitivity analysis - Independent variable: Costs

When we set the costs merit as the independent variable, it can be observed that ST1 is the best alternative until the weight reaches 0.2001 and ST3 is a better alternative for larger values. In addition, ST4 at the values approximately 0.3185 and above will be prioritized as a better alternative than ST1. For the most part of the sensitivity analysis that considers costs as the independent variable, ST2 is the alternative with the lowest priority.

Finally, when we assigned the risk merit as an independent variable, it did not cause a change in the order of alternatives. It was not deemed necessary to share the graph because there was no situation to be explained.

6. CONCLUSION

We evaluated the current status of floriculture industry on a global and local scale, under the basic concepts such as production, logistics, marketing, labor and finance. Contributing to the floriculture industry, which has been previously studied under different branches of the academy, with an industrial engineering perspective was one of the main source of motivation for our study. With the basis on sustainable development of the Turkish floriculture industry, we believe that this study and the criterion system that we have identified, draws an applicable road map to similar countries and similar industries. It has clearly been evaluated, by the experts who participated in our study that, between the three main components of the sustainability concept; economic, environmental and socio-political; economic sustainability has the highest significance level. Such a low evaluation on environmental and socio-political sustainability concepts in terms of significance level, partially reveals the sustainability perspective of developing countries such as Turkey, in industrial sense.

Considering the collective data of all experts contributed to our study under group-decision making results; for sustainable production in floriculture, "Establishment of organized production areas" and "Increased number of domestic patents (production systems, equipment, and seed)." have been evaluated as the factors with most positive influence, while "Input costs (energy, fuel, land, fertilizer, pesticide, patent...)" and "Problems in production finance." have been evaluated as the factors with most negative influence. Agricultural and thereby floricultural production in Turkey has mostly been conducted in fragmented small lands. With the adoption of a sustainable floriculture approach, establishing organized production areas can be seen as a move that will eliminate inefficiencies and high rental costs in this sense. It is clear that an action plan should be formed in order to reduce the foreign-dependency in important industrial inputs such as energy, fuel, fertilizer, pesticide. Moreover, the government should take cost-

cutting measures to support floriculture. In this context, it has also been evaluated by experts that increasing the number of domestic patents will contribute significantly to sustainable development by enhancing the competitive capacity and reducing costs in the long term. These results support the point of having a certain level of production, which is one of the strengths in SWOT analysis. Rather than making radical changes, it is seen that making certain, well planned improvements will give promising results to ensure sustainable development in Turkish floriculture production.

The problems to be experienced in production finance were expected to be at the forefront under the risk merit. In the literature, agricultural finance has been accepted as a difficult process to manage. Already, agricultural finance requires a specialty of its own. Financing the floriculture, which is a specialized sub-branch of agriculture, should have higher expertise. The problems in production finance, were the main problem conveyed by the industry representatives, which we have interviewed. Expecting a system to finance the floriculture industry will not be rational in the short term. However, improving industry's data infrastructure and data flow, increasing cooperation with financial institutions, raising the awareness of producers on cost management, optimizing credit analysis systems and risk management can be considered as actions to be taken into consideration, in order to overcome the problems in floricultural production finance. Sustainability should not only be considered from the producer point of view, but also the sustainability of financial institutions and government support systems should be taken into account.

From the logistical perspective, “Increased use of modern storage and cold chain applications.” and “Logistics village installation specific to industry.” have been evaluated as the factors with most positive influence, while “Transportation, storage, packaging and deteriorated product costs.” and “Logistics investments failure to comply the industry needs.” have been evaluated as the factors with most negative influence. In logistical sense, despite having an appropriate geopolitical position, in global competition Turkey has failed to turn this into advantage. When the situation is evaluated together with the results obtained, it is understood that the competitive advantage arising from Turkey’s position hasn’t been supported with right investments and couldn’t establish a

structure to meet the needs of today. Along with the sustainable floriculture approach, it can be considered that the benefits of the investments on cold chain applications and the logistic villages in the following stages will not only bring opportunities to floriculture but also can meet the needs of other industries related to agriculture. In Turkey, the logistics of agricultural products, mainly proceeds through commission merchants. Fundamentally, as in the logic of 3rd party logistics providers, logistics services supporting manufacturers are required, but the situation is progressing slightly different in Turkey. The lack of opportunities for producers in terms of logistics and marketing at a later stage, strengthens the hands of commission merchants. This system, eventually evolved into a situation where only commissioners are able to earn high profits and producers can only bear their costs. When manufacturers began to realize they cannot receive a recompense for their work, they fall back upon closing down their businesses or transferring them to the commissioners. Establishing individual logistics systems is not seen as a possible structure for small and medium sized enterprises in the short term. However, it is clear that the industry needs to be supported in a logistic sense with a broader perspective. The impact of transportation, storage, packaging and deteriorated product costs on the industry and the negative impact of the risk of logistics investments failing to meet the industrial needs, support this situation.

When we consider the marketing and labor perspectives together, it can be seen that most influential factors evaluated were related to marketing. In this sense, "Increased industrial recognition and reliability." and "Increase in export rate." have been evaluated as the factors with most positive influence, while “Marketing costs.” and “Inadequate market share.” have been evaluated as the factors with most negative influence. Naturally, marketing will have a significant impact on industry and business, but the lack of adequate awareness on socio-political issues can be seen as an important reason for achieving these overall results. When influential factors are examined, it is understood that the priority should be to take steps towards the foreign market. The increase in export rates will have an important role in sustainable approach. Low local currency, usually increases exports, however, due to its dependence on imports in many industrial inputs, floriculture cannot use the positive impacts that will arise out of this situation. Already, the industry does not have an efficient marketing network in the domestic market. Therefore,

representatives generally use contracted production when the foreign market is targeted. It is clear that sustainability approach will play a role in increasing the country's industrial recognition and reliability. While, inadequate market share and marketing costs stands outs as major concerns of the industry's marketing and labor approach, it is clear that improvements in marketing channels will play an important role for the sustainability of Turkish floriculture.

When the expert evaluations made in the political and environmental perspective are examined, “Establishment of public institutions that supervise the industry.” and “To be involved in decision making processes of international organizations.” have been evaluated as the factors with most positive influence, while “Insurance costs” and “Natural disasters, Seasonal differentiation, Global warming.” have been evaluated as the factors with most negative influence. It is clear that the industry needs political support. Industry’s non-autonomous structure is probably the key fact in the lack of adequate political support. The decision-makers need to take action in order to ensure the political sustainability of Turkish floriculture, together with the currently discussed seed law. To have a voice in the international arena, national results must be accomplished primarily. In agricultural insurance, state support is a positive element. However, as floriculture has more specific characteristics on the basis of products, performing certain studies within the scope of insurance will contribute to sustainability. At many points in the study, we have shown the dependence of floriculture on environmental conditions, in many ways. The "Natural disasters, Seasonal differentiation, Global warming." factor, which our experts consider as having a higher negative influence than "Financial markets, Political conflicts and International problems.” points to the importance of the situation among such a financially focused assessment.

Considering all the results, the best strategy for the sustainable development of Turkish floriculture have been evaluated as "Establishing an auction system and an efficient logistics network peculiar to the floriculture industry, in analogy to the Dutch case". Underlying principles of this strategy is: Developing a sustainable, export-oriented logistics system in conformity with Turkey's advantageous geographic location where effective intermodal transport networks are used, cold chain applications that catch the

world standards are adopted and the deterioration rate of floriculture products is minimized; without any break in the chain. With the right location selection, supported with such studies on infrastructure, storage, packaging, product standardization and quality standards, it is an investment which will improve the Turkish floriculture industry's position in the global arena and ensure its sustainable development.

Our original aim in the thesis study was to evaluate the sustainable financing mechanisms independently from the industries. At this point, we would like to note that we have carried out a considerable research on the carbon market, which is one of the mechanisms accepted worldwide. As a party to many international agreements, such as the Kyoto protocol, Paris agreement, and so on, Turkey has entered into a process that accepts to limit the emission of harmful gas at some point. While global warming and its effects on environment is so prominent in global agenda, our aim was to make a local based study by examining the status of an important instrument in the financing part of the business that used to control the environmental impact. Although it is a subject that is studied in the academy, we had to postpone our goal to the next stages due to the volunteer basis of the system in Turkey and lack of sufficient actual data. However, making use of the knowledge we gained in this subject over the Turkish floriculture industry, seemed as an executable target at the following stages of the research. It has been determined through the study that floriculture is an industry which is affected by environmental conditions and also affects the environment with components such as greenhouses, cold chain components, plastic by-products and etc. Taking advantage of working with verbal data, we asked to see how this effect was evaluated within the industry by introducing a criterion such as carbon-footprint, in the costs merit of our ANP-BOCR model. However, it was observed that this concept did not have an adequate response through the industry representatives both during our interviews and during the implementation of the pilot study. This situation, which is encountered in an environment-oriented industry such as floriculture, should be considered as a proof that Turkey needs to take remarkable steps in this regard. Especially, if Turkey wants to be involved in the decision-making processes of international organizations and to increase the share in foreign markets, we believe that awareness of these and similar concepts should be increased. It is not possible to talk about sustainability without considering its environmental dimension.

REFERENCES

Aczél, J., & Saaty, T. L. (1983). Procedures for synthesizing ratio judgements. Journal of mathematical Psychology, 27(1), 93-102.

Adam, M. T., Eidels, A., Lux, E., & Teubner, T. (2017). Bidding behavior in Dutch auctions: Insights from a structured literature review. International Journal of Electronic Commerce, 21(3), 363-397.

Adeola, O., Meru, A. K., & Kinoti, M. W. (2018). Kenya's Blooming Flower Industry: Enhancing Global Competitiveness. In Africa's Competitiveness in the Global Economy (pp. 331-349). Palgrave Macmillan, Cham.

Ahmed, J. U., Linda, I. J., & Majid, M. A. (2018). Royal floraholland: Strategic supply chain of cut flowers business. SAGE Publications: SAGE Business Cases Originals.

Aksu, M., Kuşak, B., Kuşak, L. (2016) "Marmara Bölgesinde Süs Bitkileri Üzerine Faaliyet Gösteren İşletmelerin Türkiye Ekonomisindeki Yeri, In Proceedings of National Ornamental Plant Congress VI, Antalya, Turkey, 105-110.

Bac, C. W., van Henten, E. J., Hemming, J., & Edan, Y. (2014). Harvesting robots for high-value crops: State-of-the-art review and challenges ahead. Journal of Field Robotics, 31(6), 888-911.

Baourakis, G., Gerasopoulos, D., Kalofolias, N., Kalogeras, N., & Zoumis, A. (2000). Marketing research-the case of floral products. Acta Horticulturae, (541), 227-232.

Baris, M. E., & Uslu, A. (2009). Cut flower production and marketing in Turkey. African Journal of Agricultural Research, 4(9), 765-771.

Barry, P. J., & Robison, L. J. (2001). Agricultural finance: Credit, credit constraints, and consequences. Handbook of agricultural economics, 1, 513-571.

Baudoin, W. O., Bester, C., Chemonidou, D., Laws, N., Mohktari, M., & Ozzambak, E. (2007). Floriculture for food security. Acta Horticulturae, 743, 25.

Bayazit, O., & Karpak, B. (2007). An analytical network process-based framework for successful total quality management (TQM): An assessment of Turkish manufacturing industry readiness. International Journal of Production Economics, 105(1), 79-96.

Behe, B. K., & Wolnick, D. J. (1993). Floral marketing and consumer research. HortScience, 28, 11-11.

Belwal, R., & Chala, M. (2008). Catalysts and barriers to cut flower export: A case study of Ethiopian floriculture industry. International Journal of Emerging Markets, 3(2), 216-235.

Benschop, M., Kamenetsky, R., Le Nard, M., Okubo, H., & De Hertogh, A. (2010). 1 The Global Flower Bulb Industry: Production, Utilization, Research. Horticultural Reviews, 36(1), 1-115.

Bies, W., & Zacharia, L. (2007). Medical tourism: Outsourcing surgery. Mathematical and Computer Modelling, 46(7-8), 1144-1159.

Bottero, M., & Lami, I. M. (2010). Analytic network process and sustainable mobility: an application for the assessment of different scenarios. Journal of Urbanism, 3(3), 275-293.

Burnett, S., Mattson, N., Krug, B., & Lopez, R. (2011). Floriculture Sustainability Research Coalition: Bringing the Latest Sustainability Research to the Industry. Horttechnology, 21(6), 692-693.

Cabała, P. (2010). Using the analytic hierarchy process in evaluating decision alternatives. Operations research and decisions, 20(1), 5-23.

Catron, J., Stainback, G. A., Dwivedi, P., & Lhotka, J. M. (2013). Bioenergy development in Kentucky: A SWOT-ANP analysis. Forest Policy and Economics, 28, 38-43.

Checque, V., Nolph, L. E., & Patt, B. R. (2006). Stabilizing Social Security for the Long-Term. In Decision Making with the Analytic Network Process [Edited by: Thomas L. Saaty and Luis G. Vargas] (pp. 173-192). Springer, Boston, MA.

Chen, H. H., Lee, A. H., & Kang, H. Y. (2010). A model for strategic selection of feeder management systems: a case study. International Journal of Electrical Power & Energy Systems, 32(5), 421-427.

Chen, H. H., & Gu, H. (2013). A fuzzy ANP model integrated with benefits, opportunities, costs, and risks to prioritize intelligent power grid systems. Mathematical Problems in Engineering, 2013.

Christopher, M. (2011). Logistics & supply chain management. Pearson UK. (Fourth edition)

Dağdeviren, M., & Eraslan, E. (2008). Priority determination in strategic energy policies in Turkey using analytic network process (ANP) with group decision making. International Journal of Energy Research, 32(11), 1047-1057.

de Felice, F., Petrillo, A., & Cooper, O. (2012). Multicriteria analysis to evaluate influence of green practices on supply chain performance. Science Journal of Business Management, 2012(2), 1-12.

de Groot, N. S. P. (1998). Floriculture worldwide trade and consumption patterns. In WCHR-World Conference on Horticultural Research 495 (pp. 101-122).

de Keizer, M., van der Vorst, J. G. A. J., Bloemhof, J. M., & Haijema, R. (2015). Floricultural supply chain network design and control: industry needs and modelling challenges. Journal on Chain and network science, 15(1), 61-81.

de Keizer, M., Akkerman, R., Grunow, M., Bloemhof, J. M., Haijema, R., & van der Vorst, J. G. (2017). Logistics network design for perishable products with heterogeneous quality decay. European Journal of Operational Research, 262(2), 535-549.

Demirtas, E. A., & Üstün, Ö. (2008). An integrated multiobjective decision making process for supplier selection and order allocation. Omega, 36(1), 76-90.

Dennis, J. H., Lopez, R. G., Behe, B. K., Hall, C. R., Yue, C., & Campbell, B. L. (2010). Sustainable production practices adopted by greenhouse and nursery plant growers. HortScience, 45(8), 1232-1237.

Donohoe, M. (2008). Flowers, diamonds, and gold: the destructive public health, human rights, and environmental consequences of symbols of love. Hum. Rts. Q., 30, 164.

Dubey, A., & Lal, R. (2009). Carbon footprint and sustainability of agricultural production systems in Punjab, India, and Ohio, USA. Journal of Crop Improvement, 23(4), 332-350.

Dyson, R. G. (2004). Strategic development and SWOT analysis at the University of Warwick. European journal of operational research, 152(3), 631-640.

Elkington, J. (1994) Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development. California Management Review, 36, 90-100.

Emanuel, J., & Cefalu, P. (2006). ANWR-Arctic National Wildlife Refuge: an ANP Validation Example. In Decision Making with the Analytic Network Process [Edited by: Thomas L. Saaty and Luis G. Vargas] (pp. 89-100). Springer, Boston, MA.

Erdoğmuş, Ş., Kapanoglu, M., & Koc, E. (2005). Evaluating high-tech alternatives by using analytic network process with BOCR and multiactors. Evaluation and Program Planning, 28(4), 391-399.

Ergu, D., & Peng, Y. (2014). A framework for SaaS software packages evaluation and selection with virtual team and BOCR of analytic network process. The Journal of Supercomputing, 67(1), 219-238.

Farkasovsky, M. D., & Greda, A. (2006). Outsourcing a Firm's Application Development Group. In Decision Making with the Analytic Network Process [Edited by: Thomas L. Saaty and Luis G. Vargas] (pp. 63-87). Springer, Boston, MA.

Figueroa, J. D., & Wood, D. R. (2006). US Energy Security. In Decision Making with the Analytic Network Process [Edited by: Thomas L. Saaty and Luis G. Vargas] (pp. 145-171). Springer, Boston, MA.

French, D. (2006). The Dutch monetary environment during tulipmania. The quarterly journal of Austrian economics, 9(1), 3-14.

Freund, J., Kang, H. J., & Lee, S. S. (2006). US Response to North Korean Nuclear Threat. In Decision Making With The Analytic Network Process [Edited by: Thomas L. Saaty and Luis G. Vargas] (pp. 225-250). Springer, Boston, MA.

Galli, A., Wiedmann, T., Ercin, E., Knoblauch, D., Ewing, B., & Giljum, S. (2012). Integrating ecological, carbon and water footprint into a "footprint family" of indicators: definition and role in tracking human pressure on the planet. Ecological indicators, 16, 100-112.

Ganguly, A., Misra, D., & Ghosh, S. (2010). Modeling and analysis of solar photovoltaic-electrolyzer-fuel cell hybrid power system integrated with a floriculture greenhouse. Energy and buildings, 42(11), 2036-2043.

Garber, P. M. (1990). Famous first bubbles. Journal of Economic perspectives, 4(2), 35-54.

Gebreeyesus, M., & Sonobe, T. (2009). Governance of global value chain and firms' capability in African floriculture. United Nations University Maastricht Economic and

Social Research and Training Centre on Innovation and Technology (UNU-MERIT) and National Graduate Institute for Policy Studies (GRIPS), Japan.

Gebreeyesus, M., & Sonobe, T. (2012). Global value chains and market formation process in emerging export activity: Evidence from Ethiopian flower industry. Journal of Development Studies, 48(3), 335-348.

Gebreeyesus, M. (2015). Firm adoption of international standards: evidence from the Ethiopian floriculture sector. Agricultural economics, 46(S1), 139-155.

Getu, M. (2009). Ethiopian floriculture and its impact on the environment. Mizan law review, 3(2), 240-270. Available online: URL: https://opendocs.ids.ac.uk/opendocs/handle/123456789/8712

Gitman, L. J., Juchau, R., & Flanagan, J. (2015). Principles of managerial finance. Pearson Higher Education AU.

Gómez-Arroyo, S., Díaz-Sánchez, Y., Meneses-Pérez, M. A., Villalobos-Pietrini, R., & De León-Rodríguez, J. (2000). Cytogenetic biomonitoring in a Mexican floriculture worker group exposed to pesticides. Mutation Research/Genetic Toxicology and Environmental Mutagenesis, 466(1), 117-124.

Görener, A., Toker, K., & Ulucay, K. (2012). Application of combined SWOT and AHP: a case study for a manufacturing firm. Procedia-social and behavioral sciences, 58, 1525-1534.

Greda, A. (2009). Application of the AHP/ANP in food quality management. Proceedings of ISAHP.

GTHB (2017). Türkiye Cumhuriyeti Gıda, Tarım ve Hayvancılık Bakanlığı 2018-2022 Stratejik Plan. [Republic of Turkey, Ministry of Food, Agriculture and Livestock Strategic Plan 2018-2022] Available online: https://www.tarimorman.gov.tr/SGB/Belgeler/2013-2017/GTHB%202018-2022%20STRATEJI%CC%87K%20PLAN.PDF (accessed on 08. December 2018).

Gülgün, B. (2016). TR83 İllerinde Süs Bitkileri Sektörünün Mevcut Durumu ve Geliştirilmesi Üzerine Bir Araştırma. Selçuk Tarım Bilimleri Dergisi, 3(1), 18-24.

Hall, T. J., Dennis, J. H., Lopez, R. G., & Marshall, M. I. (2009). Factors affecting growers' willingness to adopt sustainable floriculture practices. HortScience, 44(5), 1346-1351.

Hall, T. J., Lopez, R. G., Marshall, M. I., & Dennis, J. H. (2010a). Barriers to adopting sustainable floriculture certification. HortScience, 45(5), 778-783.

Hall, C. R., Campbell, B. L., Behe, B. K., Yue, C., Lopez, R. G., & Dennis, J. H. (2010b). The appeal of biodegradable packaging to floral consumers. HortScience, 45(4), 583-591.

Harker, P. T. (1987). Incomplete pairwise comparisons in the analytic hierarchy process. Mathematical Modelling, 9(11), 837-848.

Hughes, A. (2000). Retailers, knowledges and changing commodity networks: the case of the cut flower trade. Geoforum, 31(2), 175-190.

International Trade Centre Statistics, Trade Map (2018). Available online: https://www.trademap.org/Country_SelProduct_TS.aspx?nvpm / (accessed on 07 December 2018).

Ishizaka, A., & Nemery, P. (2013). Multi-criteria decision analysis: methods and software. John Wiley & Sons.

Jaafari, A., Najafi, A., & Melón, M. G. (2015). Decision-making for the selection of a best wood extraction method: An analytic network process approach. Forest Policy and Economics, 50, 200-209.

Joshi, R., Banwet, D. K., & Shankar, R. (2011). A Delphi-AHP-TOPSIS based benchmarking framework for performance improvement of a cold chain. Expert Systems with Applications, 38(8), 10170-10182.

Kabak, M., & Dağdeviren, M. (2014). Prioritization of renewable energy sources for Turkey by using a hybrid MCDM methodology. Energy Conversion and Management, 79, 25-33.

Kahraman, C., Demirel, N. C., & Demirel, T. (2007). Prioritization of e-Government strategies using a SWOT-AHP analysis: the case of Turkey. European Journal of Information Systems, 16(3), 284-298.

Kajanus, M., Leskinen, P., Kurttila, M., & Kangas, J. (2012). Making use of MCDS methods in SWOT analysis—Lessons learnt in strategic natural resources management. Forest Policy and Economics, 20, 1-9.

Kaliski, B. S. (2009). Encyclopedia of Business and Finance-Two-volume set. MacMillan Reference Books.

Kambil, A., & Van Heck, E. (1995). Information technology, competition and market transformations: re-engineering the Dutch flower auctions.

Kang, H. Y. (2011). A multi-criteria decision-making approach for capacity allocation problem in semiconductor fabrication. International Journal of Production Research, 49(19), 5893-5916.

Kangogo, J., Wario, G., Bowen, M., & Ragui, M. (2013). Supply Chain Disruption in the Kenya Floriculture Industry: A Case study of Equator Flowers. European Journal of Business and Management, 2222-1905.

Karababa, E. (2015). Marketing and consuming flowers in the Ottoman Empire. Journal of Historical Research in Marketing, 7(2), 280-292.

Kargbo, A., Mao, J., & Wang, C. Y. (2010). The progress and issues in the Dutch, Chinese and Kenyan floriculture industries. African Journal of Biotechnology, 9(44), 7401-7408.

Karsak, E. E., Sozer, S., & Alptekin, S. E. (2003). Product planning in quality function deployment using a combined analytic network process and goal programming approach. Computers & industrial engineering, 44(1), 171-190.

Katsoulas, N., Kittas, C., Dimokas, G., & Lykas, C. (2006). Effect of irrigation frequency on rose flower production and quality. Biosystems engineering, 93(2), 237-244.

Kazaz, S. (2016). Dünya Süs Bitkileri Sektöründe Ürün Deseni, Sosyo-Ekonomik ve Teknoloji Alanında Yaşanan Gelişmeler ile Türkiye'nin Gelecek Vizyonu, In Proceedings of National Ornamental Plant Congress VI, Antalya, Turkey, 3-12.

Kazimierczuk, A. H., Kamau, P., Kinuthia, B. K., & Mukoko, C. (2018). Never a rose without a prick: (Dutch) multinational companies and productive employment in the Kenyan flower sector. ASC Working Paper Series.

Khadivi, M. R., & Ghomi, S. F. (2012). Solid waste facilities location using of analytical network process and data envelopment analysis approaches. Waste management, 32(6), 1258-1265.

Kitinoja, L. (2013). Use of cold chains for reducing food losses in developing countries. Population, 6(1.23), 5-60.

Köne, A. Ç., & Büke, T. (2007). An Analytical Network Process (ANP) evaluation of alternative fuels for electricity generation in Turkey. Energy policy, 35(10), 5220-5228.

Kung, W. L., Lu, M. H., & Liu, H. C. (2006). The Conflict between China and Taiwan. In Decision Making with the Analytic Network Process [Edited by: Thomas L. Saaty and Luis G. Vargas] (pp. 209-224). Springer, Boston, MA.

Kurttila, M., Pesonen, M., Kangas, J., & Kajanus, M. (2000). Utilizing the analytic hierarchy process (AHP) in SWOT analysis—a hybrid method and its application to a forest-certification case. Forest policy and economics, 1(1), 41-52.

Labuschagne, C., Brent, A. C., & Van Erck, R. P. (2005). Assessing the sustainability performances of industries. Journal of cleaner production, 13(4), 373-385.

Larson, R. A. (2013). Introduction to floriculture (3th Ed.). Academic press.

Lazzerini, G., Lucchetti, S., & Nicese, F. P. (2016). Green House Gases (GHG) emissions from the ornamental plant nursery industry: a Life Cycle Assessment (LCA) approach in a nursery district in central Italy. Journal of Cleaner Production, 112, 4022-4030.

Lee, A. H., Chang, H. J., & Lin, C. Y. (2009). An evaluation model of buyer–supplier relationships in high-tech industry—The case of an electronic components manufacturer in Taiwan. Computers & Industrial Engineering, 57(4), 1417-1430.

Lee, A. H., Chen, H. H., & Kang, H. Y. (2011). A model to analyze strategic products for photovoltaic silicon thin-film solar cell power industry. Renewable and Sustainable Energy Reviews, 15(2), 1271-1283.

Lewis, J., Hsiao, B., Lin, W., & Lewis, R. (2018). Integration of DEMATEL-Based ANP with BOCR Merits for Hospital Sustainability: Evidence from Hospitals in Panama. Integration, 6, 26-2018.

Li, C. H., Sun, Y. H., & Du, Y. W. (2008). An ANP with benefits, opportunities, costs and risks for selecting suppliers. In Wireless Communications, Networking and Mobile Computing, 2008. WiCOM'08. 4th International Conference on (pp. 1-4). IEEE.

Liang, C., & Li, Q. (2008). Enterprise information system project selection with regard to BOCR. International Journal of Project Management, 26(8), 810-820.

Mano, Y., Yamano, T., Suzuki, A., & Matsumoto, T. (2011). Local and personal networks in employment and the development of labor markets: Evidence from the cut flower industry in Ethiopia. World Development, 39(10), 1760-1770.

Marble, S. C., Prior, S. A., Runion, G. B., Torbert, H. A., Gilliam, C. H., & Fain, G. B. (2011). The importance of determining carbon sequestration and greenhouse gas mitigation potential in ornamental horticulture. HortScience, 46(2), 240-244.

McDonald, M. B., & Kwong, F. Y. (2005). Flower seeds: biology and technology. CABI publishing.

Miller, C., & Jones, L. (2010). Agricultural value chain finance: Tools and lessons. Food and Agriculture Organization of the United Nations and Practical Action Publishing.

Moe, R., Grimstad, S. O., & Gislerod, H. R. (2005, June). The use of artificial light in year round production of greenhouse crops in Norway. In V International Symposium on Artificial Lighting in Horticulture 711 (pp. 35-42).

Mohan, K. K., Reformat, M. Z., & Pedrycz, W. (2013). Interval-based analysis of BOCR (benefits, opportunities, costs and risks) models evaluated by multiple experts. In 2013 Joint IFSA World Congress and NAFIPS Annual Meeting (IFSA/NAFIPS) (pp. 244-250). IEEE.

Mol, J. N., Holton, T. A., & Koes, R. E. (1995). Floriculture: genetic engineering of commercial traits. Trends in Biotechnology, 13(9), 350-355.

Mou, N. H. (2012). Profitability of flower production and marketing system of Bangladesh. Bangladesh Journal of Agricultural Research, 37(1), 77-95.

Mu, E., & Pereyra-Rojas, M. (2016). Practical Decision Making: An Introduction to the Analytic Hierarchy Process (AHP) Using Super Decisions (Vol. 2). Springer.

Muhammad-Lawal, A., Adenuga, A. H., Olatinwo, K. B., & Saadu, T. A. (2012). Economic analysis of floricultural plants production in Kwara State, North Central Nigeria. Asian Journal of Agriculture and Rural Development, 2(393-2016-23830), 373.

Munier, N. (2005). Introduction to sustainability. The Netherlands: Springer.

Noorollahi, E., Fadai, D., & Ghodsipour, S. H. (2018). A hybrid multi-criteria assessment framework to prioritise power generation technologies in Iran. International Journal of Information and Decision Sciences, 10(2), 116-146.

Önüt, S., Tuzkaya, U. R., & Saadet, N. (2008). Multiple criteria evaluation of current energy resources for Turkish manufacturing industry. Energy Conversion and Management, 49(6), 1480-1492.

Ostrega, A., de Felice, F., & Petrillo, A. (2011). ANP-SWOT approach to minimize environmental impacts due mining activities. In Proceedings of ISAHP 2011 Symposium, Italy.

Palma, M. A., Hall, C. R., & Collart, A. J. (2011). Repeat buying behavior for ornamental plants: A consumer profile. Journal of Food Distribution Research, 42(856-2016-57988), 67.

Porter, M. E. (1998). Clusters and the new economics of competition (Vol. 76, No. 6, pp. 77-90). Boston, MA: Harvard Business School Press.

Porter, M. E. (2008). On competition (Updated and expanded edition). Harvard Business School Press.

Qin, K., Jiang, X., & Yang, B. (2010). How to develop Chinese flower auction markets: Results from a comparative analysis. iBusiness, 2(04), 38

Raina, V., Nain, M. S., Hansra, B. S., & Singh, D. (2011). Marketing Behaviour and Information Sources Utilization Pattern of Flower Growers. Journal of Community Mobilization and Sustainable Development, 6(2), 180-184.

Rath, T., & Kawollek, M. (2009). Robotic harvesting of Gerbera Jamesonii based on detection and three-dimensional modeling of cut flower pedicels. Computers and Electronics in Agriculture, 66(1), 85-92.

Raynolds, L. T. (2012). Fair trade flowers: Global certification, environmental sustainability, and labor standards. Rural Sociology, 77(4), 493-519.

Riisgaard, L. (2009). Global value chains, labor organization and private social standards: Lessons from East African cut flower industries. World Development, 37(2), 326-340.

Rikken, M. (2011). The global competitiveness of the Kenyan flower industry. In Fifth Video Conference on the Global Competitiveness of the Flower Industry in Eastern Africa.

Rudnicki, R. M., Nowak, J., & Goszczynska, D. M. (1991). Cold storage and transportation conditions for cut flowers cuttings and potted plants. In Hortifroid, Vth International Symposium on Postharvest Physiology of Ornamental Plants; Importance of Cold in Ornamental 298 (pp. 225-236).

Runkle, E. (2006). Temperature effects on floriculture crops and energy consumption. Ohio Florists Association Bulletin, 894, 1.

Russo, G., Mugnozza, S. G., & De Lucia Zeller, B. (2007). Environmental improvements of greenhouse flower cultivation by means of LCA methodology. In International Symposium on High Technology for Greenhouse System Management: Greensys2007 801 (pp. 301-308).

Saaty, T. L. (1989). Group decision making and the AHP. In The analytic hierarchy process (pp. 59-67). Springer, Berlin, Heidelberg

Saaty, T. L. (1990). How to make a decision: the analytic hierarchy process. European journal of operational research, 48(1), 9-26.

Saaty, T. L. (2003). Decision-making with the AHP: Why is the principal eigenvector necessary. European journal of operational research, 145(1), 85-91.

Saaty, T. L. (2004a). Fundamentals of the analytic network process—Dependence and feedback in decision-making with a single network. Journal of Systems science and Systems engineering, 13(2), 129-157.

Saaty, T. L. (2004b). Fundamentals of the analytic network process—multiple networks with benefits, costs, opportunities and risks. Journal of systems science and systems engineering, 13(3), 348-379.

Saaty, T. L., & Vargas, L. G. (2006). Decision making with the analytic network process (Vol. 282). Springer Science+ Business Media, LLC.

Saaty, T. L. (2008). Decision making with the analytic hierarchy process. International journal of services sciences, 1(1), 83-98.

Saaty, T. L. (2009). Applications of Analytic Network Process in Entertainment. Iranian Journal of Operations Research, 1(2), 41-55.

Scoones, I. (2007). Sustainability. Development in Practice, 17(4-5), 589-596.

Shahabi, R. S., Basiri, M. H., Kahag, M. R., & Zonouzi, S. A. (2014). An ANP–SWOT approach for interdependency analysis and prioritizing the Iran′ s steel scrap industry strategies. Resources Policy, 42, 18-26.

Shang, J. S., Tjader, Y., & Ding, Y. (2004). A unified framework for multicriteria evaluation of transportation projects. IEEE transactions on engineering management, 51(3), 300-313.

Sheela, V. L. (2008). Flowers for trade (Vol. 10). New India Publishing.

Shrestha, R. K., Alavalapati, J. R., & Kalmbacher, R. S. (2004). Exploring the potential for silvopasture adoption in south-central Florida: an application of SWOT–AHP method. Agricultural Systems, 81(3), 185-199.

Šimelytė, A., Peleckis, K., & Korsakienė, R. (2014). Analytical network process based on BOCR analysis as an approach for designing a foreign direct investment policy. Journal of

Singh, K. P., Kumar, R., & Verma, P. K. (2017). Opportunities in floriculture for livelihood security. Advances in Floriculture and Landscape Gardening, 66.

Singh, R. D., & Tiwari, G. N. (2000). Thermal heating of controlled environment greenhouse: a transient analysis. Energy conversion and management, 41(5), 505-522.

Solecki, R. S. (1975). Shanidar IV, a Neanderthal flower burial in northern Iraq. Science, 190, 880-881.

Souret, F. F., & Weathers, P. J. (2000). The growth of saffron (Crocus sativus L.) in aeroponics and hydroponics. Journal of herbs, spices & medicinal plants, 7(3), 25-35.

Staby, G., & Reid, M. (2005). Improving the cold chain for cut flowers and potted plants. California Cut Flower Commission, December.

Stacey, R. D. (2007). Strategic management and organizational dynamics: The challenge of complexity to ways of thinking about organizations. Pearson Education.

Steen, M. (2010). A world of flowers: Dutch flower auctions and the market for cut flowers. Journal of Applied Horticulture, 12(2), 113-121.

Steen, M. (2014). Measuring price–quantity relationships in the Dutch flower market. Journal of Agricultural and applied Economics, 46(2), 299-308.

Sun, C., Pan, Y., & Bi, R. (2010). Study on third-party logistics service provider selection evaluation indices system based on analytic network process with BOCR. In 2010 International Conference on Logistics Systems and Intelligent Management (ICLSIM) (Vol. 2, pp. 1013-1017). IEEE.

Tan, X., Ma, K., Guo, W., & Huang, T. (2007). An application of ANP with benefits, opportunities, costs and risks in supplier selection: a case study in a diesel engine manufacturing firm. In Automation and Logistics, 2007 IEEE International Conference on (pp. 1446-1451). IEEE.

Tanaka, Y., Katsumoto, Y., Brugliera, F., & Mason, J. (2005). Genetic engineering in floriculture. Plant cell, tissue and organ culture, 80(1), 1-24.

Tapkı, N., Kızıltuğ, T., & Çelik, A. D. (2018). Türkiye'de Kesme Çiçek Üretim ve Ticaretinde Mevcut Durum, Sorunlar ve Çözüm Önerileri. Turkish Journal of Agriculture: Food Science and Technology, 6(3), 313-321.

Thompson, E. A. (2007). The tulipmania: Fact or artifact? Public Choice, 130(1-2), 99-114.

Tilman, D., Cassman, K. G., Matson, P. A., Naylor, R., & Polasky, S. (2002). Agricultural sustainability and intensive production practices. Nature, 418(6898), 671

Tjader, Y. C., Shang, J. S., & Vargas, L. G. (2010). Offshore outsourcing decision making: A policy-maker's perspective. European Journal of Operational Research, 207(1), 434-444.

Turan, F. K., Scala, N. M., Besterfield-Sacre, M., & Needy, K. L. (2009). An Analytic Network Process (ANP) Approach to the Project Portfolio Management for Organizational Sustainability. In Proceedings of the Industrial Engineering Research Conference. Institute of Industrial Engineers, Available online: URL: http://d-scholarship.pitt.edu/22703/1/Turan_et_al_2009.pdf"

Turkish statistical institute (2018), Plant Production Statistics. Available online: http://www.tuik.gov.tr/PreTablo.do?alt_id=1001 / (accessed on 16 December 2018).

TÜSSİDE (2017). Tohumculuk Sektörü Ulusal Strateji Geliştirme Projesi: Süs Bitkileri Üreticileri Alt Birliği, Süs Bitkileri Sektörü Ulusal Strateji Raporu. Berikan Publishing, Ankara. [Seed Sector National Strategy Development Project: The Ornamental Plants Growers Union, Ornamental Plants Sector National Strategy Report]. Available online: http://www.susbir.org.tr/images/duyurular/ulusal-strateji-raporu.pdf / (accessed on 07 December 2018)

Tuzkaya, G., Önüt, S., Tuzkaya, U. R., & Gülsün, B. (2008). An analytic network process approach for locating undesirable facilities: an example from Istanbul, Turkey. Journal of Environmental management, 88(4), 970-983.

Ulutaş, B. H. (2005). Determination of the appropriate energy policy for Turkey. Energy, 30(7), 1146-1161.

United Nations General Assembly (1987). "Report of the World Commission on Environment and Development: Our Common Future". A/42/427. Available online: https://undocs.org/A/42/427 (accessed on 28 December 2018).

United Nations General Assembly (2015). “Transforming Our World: The 2030 Agenda for Sustainable Development”. A/70/L.1 Available online: https://undocs.org/A/70/L.1 (accessed on 02 March 2019).

Üstün, Ö., Özdemir, M. S., & Demirtaş, E. A. (2005). Kıbrıs Sorunu Çözüm Önerilerini Değerlendirmede Analitik Serim Süreci Yaklaşımı. Endüstri Mühendisliği Dergisi, 16(4), 2-13.

van der Vorst, J. G., Bloemhof, J. M., & de Keizer, M. (2012). Innovative logistics concepts in the floriculture sector (No. 1020-2016-81766, p. 241).

van der Vorst, J. G., Ossevoort, R., de Keizer, M., Van Woensel, T., Verdouw, C. N., Wenink, E. & Van Willegen, R. (2016). DAVINC 3 I: towards collaborative responsive logistics networks in floriculture. In Logistics and Supply Chain Innovation (pp. 37-53). Springer, Cham.

van Heck, E., & Ribbers, P. M. (1997). Experiences with electronic auctions in the Dutch flower industry. Electronic Markets, 7(4), 29-34.

van Huylenbroeck, J. (2010). Status of floriculture in Europe. In Protocols for in vitro propagation of ornamental plants (pp. 365-376). Humana Press.

van Liemt, G. (1999). The world cut flower industry: Trends and prospects. Geneva, Switzerland: International Labour Office.

van Tuyl, J. M., Arens, P., Miller, W. B., & Anderson, N. O. (2014). The role of ornamentals in human life. In Horticulture: Plants for People and Places, Volume 1 (pp. 407-433). Springer, Dordrecht.

Verdouw, C. N., Beulens, A. J., Trienekens, J. H., & Verwaart, T. (2010). Mastering demand and supply uncertainty with combined product and process configuration. International Journal of Computer Integrated Manufacturing, 23(6), 515-528.

Verdouw, C. N., Beulens, A. J. M., & van der Vorst, J. G. A. J. (2013). Virtualisation of floricultural supply chains: A review from an Internet of Things perspective. Computers and electronics in agriculture, 99, 160-175.

Verdouw, C. N., Beulens, A. J., Reijers, H. A., & van der Vorst, J. G. (2015). A control model for object virtualization in supply chain management. Computers in industry, 68, 116-131.

Wandl, M. T., & Haberl, H. (2017). Greenhouse gas emissions of small scale ornamental plant production in Austria-A case study. Journal of cleaner production, 141, 1123-1133.

Wang, S., Tao, F., & Shi, Y. (2018). Optimization of location–routing problem for cold chain logistics considering carbon footprint. International journal of environmental research and public health, 15(1), 86.

Wang, W. M., Lee, A. H., Peng, L. P., & Wu, Z. L. (2013). An integrated decision making model for district revitalization and regeneration project selection. Decision Support Systems, 54(2), 1092-1103.

Wani, M. A., Nazki, I. T., Din, A., Iqbal, S., Wani, S. A., & Khan, F. U. (2018). Floriculture Sustainability Initiative: The Dawn of New Era. In Sustainable Agriculture Reviews 27 (pp. 91-127). Springer, Cham.

Weihrich, H. (1982). The TOWS matrix—A tool for situational analysis. Long range planning, 15(2), 54-66.

Whitaker, M., & Kolavalli, S. (2006). Floriculture in Kenya. Technology, Adaptation, And Exports, 335.

Wickramasinghe, V., & Takano, S. E. (2010). Application of Combined SWOT and Analytic Hierarchy Process (AHP) for Tourism Revival Strategic Marketing Planning. Journal of the Eastern Asia Society for Transportation Studies, 8, 954-969.

Wijnands, J. H. (2005). Sustainable International Networks in the Flower Industry: bridging emperical findings and theoretical approaches (No. 2). International Society for Horticultural Science.

Wijnmalen, D. J. (2007). Analysis of benefits, opportunities, costs, and risks (BOCR) with the AHP–ANP: A critical validation. Mathematical and computer modelling, 46(7-8), 892-905.

Wollaeger, H. M., Getter, K. L., & Behe, B. K. (2015). Consumer preferences for traditional, neonicotinoid-free, bee-friendly, or biological control pest management practices on floriculture crops. HortScience, 50(5), 721-732.

Xia, Y., Deng, X., Zhou, P., Shima, K., & Teixeira da Silva, J. A. (2006). The World floriculture industry: dynamics of production and markets. Floriculture, Ornamental and Plant Biotechnology, Adv. Trop Issues, 4, 336-347.

Yan, B., & Lee, D. (2009). Application of RFID in cold chain temperature monitoring system. In 2009 ISECS International Colloquium on Computing, Communication, Control, and Management (Vol. 2, pp. 258-261). IEEE.

Yeler, O., Hocagil, M.M., Aydin, A., Subaşı, O.S., Aslantaş, P. (2016b). Dış Mekân Süs Bitkileri Üretim Biçimleri ve Örgütlenme Modellerinin İncelenmesi: İtalya Örneği, In Proceedings of National Ornamental Plant Congress VI, Antalya, Turkey, 93-98.

Yüksel, İ., & Dagdeviren, M. (2007). Using the analytic network process (ANP) in a SWOT analysis–A case study for a textile firm. Information Sciences, 177(16), 3364-3382.

Zencirkiran, M., & Gürbüz, İ. B. (2009). Turkish ornamental plants sector in the European Union screening process. Journal of Fruit and Ornamental Plant Research, 17(2), 235-250.

Zhao, S. Y., Yang, S., Liang, C., & Gu, D. (2016). Where is the way for rare earth industry of China: An analysis via ANP-SWOT approach. Resources Policy, 49, 349-357.

Zhu, Q., Shah, P., & Sarkis, J. (2018). Addition by subtraction: Integrating product deletion with lean and sustainable supply chain management. International Journal of Production Economics, 205, 201-214.

APPENDIX: Expert opinion survey prepared in Turkish

UZMAN GÖRÜŞ FORMU

Değerli katılımcılar, bu uzman görüş formu Galatasaray Üniversitesi Fen Bilimleri Enstitüsü bünyesinde gerçekleştirdiğimiz "***Türkiye çiçekçilik endüstrisinin sürdürülebilir gelişme stratejilerini ve sürdürülebilir finansman mekanizmalarını değerlendirme***" adlı tez çalışmamıza veri sağlamak amacı ile hazırlanmıştır.

Hazırladığımız soru formunda Türkiye'de sürdürülebilir çiçekçilik yaklaşımının getireceği faydalar, yaratacağı fırsatlar, ortaya çıkaracağı maliyetler ve barındırdığı riskler; literatür taraması ve uzman görüşleri ile derlenmiş olup yine Türkiye'de çiçekçilik adına uygulanabilecek stratejileri değerlendirmede kullanılacak unsurlar haline getirilmiştir. Soru formunda bulunan unsurlar genel olarak çiçekçilikte "üretim, lojistik, pazarlama ve işgücü, politik ve çevresel" başlıkları altında değerlendirilmiş ve siz değerli uzmanlarımıza sunulmuştur. Sürdürülebilir çiçekçilik adına belirlediğimiz ve siz değerli uzmanlarımızın görüşleri doğrultusunda değerlendireceğimiz dört strateji aşağıda tanımları ile birlikte verilmiştir.

Strateji 1: "Çiçekçilik endüstrisine özgü, Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak."
Türkiye'nin avantajlı coğrafi konumu ile bütünleşik, etkin taşımacılık ağlarının kullanıldığı, soğuk zincir uygulamalarında dünya standartlarının yakalandığı ve zincirin aşamalarında kırılma yaşanmadan çiçekçilik ürünlerinin bozulma oranının en aza indirildiği, ihracat odaklı dünya standartlarında sürdürülebilir bir lojistik sistemi geliştirmek. Depolama, paketleme gibi uygulamalarda dünya standartlarının yakalandığı, kalite standartları ve ürün standardizasyonu çalışmalarıyla desteklenecek, doğru yer seçimi ve sağlam alt yapı çalışmaları ile Hollanda'nın yarattığı tekele alternatif oluşturabilecek, ihracat odaklı bir mezat sistemi oluşturmak.

Strateji 2: "Çiçek üretim sistemlerinde ve ürün çeşitliliğinde dünya standartlarını yakalayacak yatırımlar yapmak."
Elde bulunan ve belirli bir kaliteyi yakalamış üretim sistemlerini dünya standartlarına uyacak biçimde modernize etmek, dünya geneli talebin fazla olduğu çiçeklere odaklanarak ürün yelpazesini genişletmek, çevresel etkiler göz önünde bulundurularak iyi tarım uygulamaları geliştirmek ve gerekli altyapı sistemlerini kullanarak Türkiye'yi çiçekçilik sektöründe rekabetçi bir konuma getirmek.

Strateji 3: "Çiçekçilik sektörünün rekabetçi gücünü arttıracak iç düzenlemeleri hayata geçirmek."
Sektör tabanlı teşvikleri artırmak, kayıt dışı üretim ve yüksek aracı komisyonlarını azaltan, yüksek vakit ve zaman alan gümrük işlemlerini kolaylaştıran adımlar atmak, çiçekçilik sektörünü kayıt altına almak ve çevresel sürdürülebilirliği de ön planda tutarak mevcut çiçekçilik mevzuatlarını Avrupa Birliği mevzuatlarıyla uyumlaştırmak.

Strateji 4: "Çiçekçilik sektörünün AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmesi."
Endemik türler ve yerli tohumlar üzerinde Ar-Ge faaliyetlerini artırmak, üniversite-sanayi işbirlikleri ile çiçekçilik özelinde özgün üretim teknikleri, donanımlar ve sistemler geliştirmek, genç nüfusun çiçekçilik eğitimine katılımını sağlamak, yerel girişimleri destelemek, kendine yeten, sürdürülebilir bir sektör yaratmak.

Çalışmamızın analizinde kullandığımız "Analitik Ağ Süreci" yöntemi, sözel verileri, uzmanların kişisel görüşlerine göre ikili karşılaştırması yoluyla, sayısal veriler halinde değerlendirilmeye olanak sağlamaktadır. Bu doğrultuda formumuzda bulunan soruları cevaplandırmanız çalışmamıza çok değerli katkılar sunacaktır.

Doldurduğunuz form sonucu elde edilecek veriler sadece akademik ve bilimsel çalışmalar adına kullanılacaktır. Çalışmaya gösterdiğiniz ilgi, ayırdığınız zaman ve değerli katkılarınız için şimdiden çok teşekkür ederiz.

Doç. Dr. S. Emre ALPTEKİN
Ar. Gör. A. Ürem ÇÜRÜK

İkili Karşılaştırmalarda Kullanılacak Önem Aralıkları:

1: Eşit derecede önemli	3: Biraz daha fazla derecede önemli	5: Fazla derecede önemli	7: Çok fazla derecede önemli	9: Aşırı fazla derecede önemli	2,4,6,8: Ara Değerler

İkili Karşılaştırma Örnekleri:

Not: 01-22 arası sorular, unsurların OLUMLU (fayda-fırsat arttıran) etkilerine odaklanacaktır.

- Aşağıdaki unsurların "***Türkiye çiçekçilik sektöründe, yerli patent sayısının artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

* Çevre odaklı iyi tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7 X	8	9	* Yerli tohum ve endemik çiçek türlerinin kullanımının artması
**Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1 X	2	3	4	5	6	7	8	9	** İhracat oranında artış

* Türkiye çiçekçilik sektöründe, "**Yerli patent sayısının artmasına**"; "*yerli tohum ve endemik çiçek türlerinin kullanımının artması*" unsurunun "*Çevre odaklı iyi tarım uygulamalarının artması*" unsuruna göre **Çok fazla derecede olumlu** etki göstereceği düşünülmektedir.

** "Türkiye çiçekçilik sektöründe, "**Yerli patent sayısının artmasına**"; "*Sektörde faaliyet gösteren firmaların büyümesi*" unsuru ile "*İhracat oranında artış*" unsurunun **Eşit derecede olumlu** etki göstereceği düşünülmektedir.

Not: (23-43) arası sorular, unsurların OLUMSUZ (maliyet-risk arttırıcı) etkilerine odaklanacaktır.

- Aşağıdaki unsurların "***Türkiye çiçekçilik sektöründe; taşıma, depolama, paketleme ve bozulan ürün maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

*** Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6 X	5	4	3	2	1	2	3	4	5	6	7	8	9	*** Üretim teknolojilerinin maliyetleri
**** Lojistik sistem kurulum maliyetleri	9	8	7	6	5	4	3	2	1	2	3 X	4	5	6	7	8	9	**** Gümrük maliyetleri

*** Türkiye çiçekçilik sektöründe, "***taşıma, depolama, paketleme ve bozulan ürün maliyetleri***" üzerinde; "*Girdi maliyetleri"* unsurunun "*Üretim teknolojilerinin maliyetleri*" unsuruna göre **Çok fazla ile Fazla arasında bir derecede olumsuz** etki göstereceği düşünülmektedir.

**** Türkiye çiçekçilik sektöründe, "***taşıma, depolama, paketleme ve bozulan ürün maliyetleri***" üzerinde; "*Gümrük maliyetleri"* unsurunun "*Lojistik sistem kurulum maliyetleri"* unsuruna göre **Biraz daha fazla derecede olumsuz** etki göstereceği düşünülmektedir.

Soruların sonlarında bulunan parantezler içinde, soruda verilmiş unsurun hangi grupta değerlendirildiği belirtilmiştir (örneğin: Üretim veya Lojistik). Çalışmanın ilerleyen bölümünde, grupların aralarında kıyaslanabilmesi adına bu bilgiler kullanılacaktır.

DEĞERLENDİRME SORULARI:

Takip eden sorular (01-22) unsurların olumlu (fayda-fırsat arttıran) etkilerine odaklanacaktır.

1) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, modern tarım uygulamalarının artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Ürün çeşitliliğinin artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Toprak ve su kaynaklarının daha verimli kullanılması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sektörü denetleyen kamu kurumlarının oluşması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

2) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, ürün çeşitliliğinin artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

3) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, organize üretim alanlarının kurulması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ürün çeşitliliğinin artması
Lojistik altyapı ve avantajların daha etkin kullanılması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Modern depolama ve soğuk zincir uygulamalarının kullanımının artması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

4) Aşağıda bulunan unsurların "***Çiçekçilik sektörünün, Türkiye'nin Lojistik altyapı ve avantajlarını daha etkin kullanması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Ürün çeşitliliğinin artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Yeni iş alanları ve istihdam oluşması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sektörel güvenilirliğin ve tanınırlığın artması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

5) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, Modern depolama ve soğuk zincir uygulamalarının kullanımının artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.

Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

6) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, yeni iş alanları ve istihdam oluşması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (İşgücü)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Lojistik altyapı ve avantajların daha etkin kullanılması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Modern depolama ve soğuk zincir uygulamalarının kullanımının artması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

7) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün, tanınırlığının ve güvenilirliğinin artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Pazarlama)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ürün çeşitliliğinin artması
Toprak ve su kaynaklarının daha verimli kullanılması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sektörü denetleyen kamu kurumlarının oluşması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

8) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, toprak ve su kaynaklarının daha verimli kullanımı***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Çevresel)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Lojistik altyapı ve avantajların daha etkin kullanılması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Modern depolama ve soğuk zincir uygulamalarının kullanımının artması

Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

9) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, denetleyici kamu kurumlarının oluşması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Politik)

Yeni iş alanları ve istihdam oluşması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sektörel güvenilirliğin ve tanınırlığın artması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

10) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, çevre odaklı iyi tarım uygulamalarının artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Yerli tohum ve endemik çiçek türlerinin kullanımının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Sektöre özel lojistik köy kurulumu	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yeşil (çevreci) taşımacılık ve depolama uygulamaların artması
Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

11) Aşağıdaki unsurların "***Türkiye çiçekçilik sektöründe, yerli tohum ve endemik çiçek türlerinin kullanımının artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Çevre odaklı iyi tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

12) Aşağıdaki unsurların "***Türkiye çiçekçilik sektöründe, yerli patent sayısının (üretim sistemleri, ekipman, tohum) artması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Çevre odaklı iyi tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli tohum ve endemik çiçek türlerinin kullanımının artması
Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış

Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

13) Aşağıda bulunan unsurların "***Türkiye çiçekçiliğinde, sektöre özel lojistik köy kurulması***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak

14) Aşağıdaki unsurların "***Türkiye'de çiçekçilik sektöründe, yeşil (çevreci) taşımacılık ve depolama uygulamalarının artması"*** üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

15) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, faaliyet gösteren firmaların büyümesi***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (İşgücü)

Yerli tohum ve endemik çiçek türlerinin kullanımının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

16) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, ihracat oranında artış***" üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Pazarlama)

Çevre odaklı iyi tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Sektöre özel lojistik köy kurulumu	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yeşil (çevreci) taşımacılık ve depolama uygulamaların artması
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

17) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, zararlı emisyon salınımına bir sınır getirilmesi*** " üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Çevresel)

Sektöre özel lojistik köy kurulumu	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yeşil (çevreci) taşımacılık ve depolama uygulamaların artması
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.

Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

18) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektör temsilcilerinin, uluslararası örgütlerin karar süreçlerine dâhil olması"*** üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Politik)

Çevre odaklı iyi tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

19) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe kullanılan, üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak***" stratejisi üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji)

Ürün çeşitliliğinin artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Yeni iş alanları ve istihdam oluşması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sektörel güvenilirliğin ve tanınırlığın artması
Yerli tohum ve endemik çiçek türlerinin kullanımının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak

20) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün, rekabetçi gücünü arttıracak iç düzenlemeleri hayata geçirmek.***" stratejisi üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji)

Yeni iş alanları ve istihdam oluşması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sektörel güvenilirliğin ve tanınırlığın artması
Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak

21) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörü için, Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.***" stratejisi üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ürün çeşitliliğinin artması
Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Ürün çeşitliliğinin artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Organize üretim alanlarının kurulması
Lojistik altyapı ve avantajların daha etkin kullanılması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Modern depolama ve soğuk zincir uygulamalarının kullanımının artması
Sektöre özel lojistik köy kurulumu	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yeşil (çevreci) taşımacılık ve depolama uygulamaların artması

Sektörde faaliyet gösteren firmaların büyümesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	İhracat oranında artış
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak

22) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.***" stratejisi üzerindeki olumlu etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji)

Modern tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ürün çeşitliliğinin artması
Yeni iş alanları ve istihdam oluşması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sektörel güvenilirliğin ve tanınırlığın artması
Çevre odaklı iyi tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli tohum ve endemik çiçek türlerinin kullanımının artması
Çevre odaklı iyi tarım uygulamalarının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Yerli tohum ve endemik çiçek türlerinin kullanımının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yerli patent sayısının artması (üretim sistemleri, ekipman, tohum)
Sektöre özel lojistik köy kurulumu	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Yeşil (çevreci) taşımacılık ve depolama uygulamaların artması
Zararlı emisyon salınımına bir sınır getirilmesi	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Uluslararası örgütlerin karar süreçlerine dâhil olmak

Takip eden sorular (23-43) unsurların olumsuz (maliyet-risk arttırıcı) etkilerine odaklanacaktır.

23) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.

24) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, üretim teknolojilerinin maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge maliyetleri
Eğitim maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

25) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, Araştırma-Geliştirme maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim teknolojilerinin maliyetleri
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

26) Aşağıdaki unsurların "***Türkiye çiçekçilik sektöründe; taşıma, depolama, paketleme ve bozulan ürün maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim teknolojilerinin maliyetleri
Lojistik sistem kurulum maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

27) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, lojistik sistem kurulum maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi

28) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün gümrük maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik sistem kurulum maliyetleri
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.

29) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, eğitim maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (İşgücü)

Üretim teknolojilerinin maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge maliyetleri
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

30) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün pazarlama maliyetleri***" üzerindeki üzerindeki olumsuz(maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız.(Pazarlama)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim teknolojilerinin maliyetleri
Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik sistem kurulum maliyetleri
Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Lojistik sistem kurulum maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

31) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, sigorta maliyetleri***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Çevresel)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim teknolojilerinin maliyetleri
Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

32) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörüne uygulanan çevre vergisi***" üzerindeki olumsuz (maliyet arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Politik)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim teknolojilerinin maliyetleri
Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik sistem kurulum maliyetleri
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

33) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün; teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığının artması riski***" üzerindeki olumsuz (risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Doğal afetler, Mevsim değişiklikleri ve Küresel ısınma	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Finansal piyasalar, Siyasi problemler ve Uluslararası sorunlar
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.

34) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, Araştırma-Geliştirme faaliyetlerinden yeterli sonuç alınamaması riski***" üzerindeki olumsuz (risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Trend ve talepteki değişime uyum sağlayamamak	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazardan yeterli payı alamamak
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.
Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

35) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün üretim finansmanında yaşanan problemlerin artması riski***" üzerindeki olumsuz (risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Üretim)

Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge faaliyetlerinden yeterli sonuç alınamaması
Lojistik yatırımların sektör ihtiyacını karşılamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Dünya çiçek dağıtım ağının dışında kalmak
Trend ve talepteki değişime uyum sağlayamamak	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazardan yeterli payı alamamak
Doğal afetler, Mevsim değişiklikleri ve Küresel ısınma	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Finansal piyasalar, Siyasi problemler ve Uluslararası sorunlar
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek.

36) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, lojistik temelli yatırımların sektör ihtiyacını karşılayamaması riski***" üzerindeki olumsuz (risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Trend ve talepteki değişime uyum sağlayamamak	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazardan yeterli payı alamamak
Üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

37) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün, dünya çiçek dağıtım ağının dışında kalması riski***" üzerindeki olumsuz (risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Lojistik)

Trend ve talepteki değişime uyum sağlayamamak	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazardan yeterli payı alamamak
Doğal afetler, Mevsim değişiklikleri ve Küresel ısınma	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Finansal piyasalar, Siyasi problemler ve Uluslararası sorunlar
Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak.	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Rekabetçi gücü arttıracak iç düzenlemeleri hayata geçirmek.

38) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün, çiçekçilik dünyasında gerçekleşen trend ve talep değişimine uyum sağlayaması riski***" üzerindeki olumsuz (risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Pazarlama-İşgücü)

Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge faaliyetlerinden yeterli sonuç alınamaması
Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Ar-Ge faaliyetlerinden yeterli sonuç alınamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Lojistik yatırımların sektör ihtiyacını karşılamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Dünya çiçek dağıtım ağının dışında kalmak

39) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün, dünya çiçekçilik pazarından beklenen payı alamaması riski***" üzerindeki olumsuz (risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Pazarlama-İşgücü)

Ar-Ge faaliyetlerinden yeterli sonuç alınamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Lojistik yatırımların sektör ihtiyacını karşılamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Dünya çiçek dağıtım ağının dışında kalmak

40) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörü için, Hollanda benzeri bir mezat sistemi ve etkin bir lojistik ağı oluşturmak***" üzerindeki olumsuz (maliyet/risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji)

Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik sistem kurulum maliyetleri
Taşıma, depolama, paketleme ve bozulan ürün maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Lojistik sistem kurulum maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Gümrük maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi
Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığının artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Lojistik yatırımların sektör ihtiyacını karşılamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Dünya çiçek dağıtım ağının dışında kalmak
Trend ve talepteki değişime uyum sağlayamamak	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazardan yeterli payı alamamak
Doğal afetler, Mevsim değişiklikleri ve Küresel ısınma	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Finansal piyasalar, Siyasi problemler ve Uluslararası sorunlar

41) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe kullanılan, üretim sistemlerinde dünya standartlarını yakalayacak yatırımlar yapmak***" üzerindeki olumsuz (maliyet/risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim teknolojilerinin maliyetleri
Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge maliyetleri
Üretim teknolojilerinin maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge maliyetleri
Eğitim maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi
Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığın artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Trend ve talepteki değişime uyum sağlayamamak	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazardan yeterli payı alamamak
Doğal afetler, Mevsim değişiklikleri ve Küresel ısınma	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Finansal piyasalar, Siyasi problemler ve Uluslararası sorunlar

42) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektörünün, rekabetçi gücünü arttıracak iç düzenlemeleri hayata geçirmek.***" üzerindeki olumsuz (maliyet/risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji)

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge maliyetleri
Sigorta maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Çevre vergisi
Ar-Ge faaliyetlerinden yeterli sonuç alınamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Doğal afetler, Mevsim değişiklikleri ve Küresel ısınma	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Finansal piyasalar, Siyasi problemler ve Uluslararası sorunlar

43) Aşağıda bulunan unsurların "***Türkiye çiçekçilik sektöründe, AR-GE ve eğitim atılımlarıyla yeniden yapılanmaya gitmek***" üzerindeki olumsuz (maliyet/risk arttırıcı) etkilerini önem derecesine göre ikili olarak kıyaslayınız. (Strateji).

Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim teknolojilerinin maliyetleri
Girdi maliyetleri (enerji, yakıt, arazi, gübre, ilaç, patent...)	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge maliyetleri
Üretim teknolojilerinin maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge maliyetleri
Eğitim maliyetleri	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama maliyetleri

Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığın artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Ar-Ge faaliyetlerinden yeterli sonuç alınamaması
Teknoloji, hammadde ve enerji gibi kalemlerde dışa bağımlılığın artması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Ar-Ge faaliyetlerinden yeterli sonuç alınamaması	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Üretim finansmanında yaşanan problemlerin artması
Trend ve talepteki değişime uyum sağlayamamak	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazardan yeterli payı alamamak

Bu bölüme kadar cevapladığınız sorularda bahsi geçen unsurlar/faktörler temel olarak Türkiye çiçekçilik sektöründe "Sürdürülebilirlik Stratejileri - Üretim - Lojistik - Pazarlama ve İşgücü - Politik ve Çevresel" başlıkları altında gruplanarak belirlenmiştir. Soruların son bölümünde bulunan parantezler içinde, faktörlerin hangi gruba ait olduğu belirtilmiştir. Takip eden 5 soru için (44-48) sizlerden bu unsurları grupları altında topluca değerlendirerek, grupların birbirleri üzerindeki etkilerini yine önem derecesine göre ikili olarak karşılaştırmanızı rica ediyoruz.

44) Aşağıda bulunan faktör gruplarının "***Türkiye çiçekçilik sektöründe, sürdürülebilirlik stratejileri***" üzerindeki etkilerini (olumlu/olumsuz) önem derecesine göre ikili olarak kıyaslayınız.

Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler

45) Aşağıda bulunan faktör gruplarının "***Türkiye çiçekçilik sektöründe, üretimde sürdürülebilirlik***" üzerindeki etkilerini (olumlu/olumsuz) önem derecesine göre ikili olarak kıyaslayınız.

Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Politik ve Çevre odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri

46) Aşağıda bulunan faktör gruplarının "***Türkiye çiçekçilik sektöründe, sürdürülebilir lojistik***" üzerindeki etkilerini (olumlu/olumsuz) önem derecesine göre ikili olarak kıyaslayınız.

Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler

Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Politik ve Çevre odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri

47) Aşağıda bulunan faktör gruplarının "***Türkiye çiçekçilik sektöründe, sürdürülebilir iş gücü ve sürdürülebilir pazarlama***" üzerindeki etkilerini (olumlu/olumsuz) önem derecesine göre ikili olarak kıyaslayınız.

Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Politik ve Çevre odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri

48) Aşağıda bulunan faktör gruplarının "***Türkiye çiçekçilik sektöründe politik ve çevre odaklı faktörler***" üzerindeki etkilerini (olumlu/olumsuz) önem derecesine göre ikili olarak kıyaslayınız.

Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Lojistik odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Üretim odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Pazarlama ve İşgücü odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Lojistik odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Politik ve Çevre odaklı faktörler
Pazarlama ve İşgücü odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri
Politik ve Çevre odaklı faktörler	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Sürdürülebilir çiçekçilik stratejileri

Uzman görüş formunda son olarak, sizlerden sürdürülebilirlik çerçevesinde Türkiye'nin çiçekçilik sektörüne yönelik vizyonunu yansıtan, aşağıda tanımları verilmiş olan hedefleri, öncelikle kendi içinde (49. soru) değerlendirmenizi rica ediyoruz. Devam eden sorularda (50-53) sürdürülebilir çiçekçilik stratejilerinin getirilerini fayda, fırsat, maliyet ve risk bakış açısı ile değerlendirmenizi talep ediyoruz.

Türkiye Çiçekçilik Sektöründe Ekonomik Sürdürülebilirliği Sağlamak:
"Çiçekçilik sektöründe bilimsel ve teknolojik kapasiteleri geliştirerek, sektör kayıplarının azaltılması ve üretim kapasitesinin arttırılmasını sağlamak. Ticaret altyapısını geliştirerek ve arz güvencesini oluşturarak, sektörde bulunan küçük ölçekli işletmelerin piyasalarla bütünleşmesini sağlamak. Bunlarla birlikte çiçeklerde biyolojik çeşitlilik ile ekosistemlerin korunmasına yönelik mali politikalar geliştirerek kendi kendine yetebilen ve uluslararası rekabette güçlü konumda olan bir sektör haline gelmek."
Türkiye Çiçekçilik Sektöründe Çevresel Sürdürülebilirliği Sağlamak:
"Üretimde iyi tarım uygulamaları ve çevreye duyarlı çiçek sağlığı tedbirleri kullanarak kalite ve verimi arttırmak. İklim değişikliğinin çiçekçilik sektörü üzerine olan etkilerini ölçmek, arazi kullanım planlamaları, eldeki doğal kaynakların etkin kullanımı, toprak ve su kaynaklarının korunması gibi çevresel sürdürülebilirlik yaklaşımlarıyla kırsal altyapıyı geliştirmek ve çevre üzerindeki kötü etkisi azaltılmış bir sektör haline gelmek."
Türkiye Çiçekçilik Sektöründe Sosyo-Politik Sürdürülebilirliği Sağlamak:
"Kalkınma odaklı politikalar çerçevesinde, kırsalda gelir ve istihdam yaratan, kayıt dışı üretim ve çiçek kaçakçılığının azaltıldığı, gençlerin iş imkânı bulduğu, çocuk işçiliği sorununun ortadan kalktığı, kadın haklarını gözeten bir sektör oluşturmak adına Türkiye çiçekçiliğini kayıt altına almak. Çevre vergileri ve emisyon salınımlarını en aza indirecek kanuni yaptırımlar ile birlikte uluslararası arenada daha etkin biçimde yer alan ve uluslararası örgütlerin karar süreçlerinde bulunan bir sektör haline gelmek."

49) "***Türkiye çiçekçilik sektöründe sürdürülebilirlik***" adına yukarıda tanımlanmış olan Türkiye'nin sürdürülebilirlik hedeflerinin etkilerini görüşünüz doğrultusunda, önem derecesine göre ikili olarak kıyaslayınız.

Türkiye Çiçekçilik Sektöründe Ekonomik Sürdürülebilirlik	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Türkiye Çiçekçilik Sektöründe Çevresel Sürdürülebilirlik
Türkiye Çiçekçilik Sektöründe Ekonomik Sürdürülebilirlik	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Türkiye Çiçekçilik Sektöründe Sosyo-Politik Sürdürülebilirlik
Türkiye Çiçekçilik Sektöründe Çevresel Sürdürülebilirlik	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Türkiye Çiçekçilik Sektöründe Sosyo-Politik Sürdürülebilirlik

Son 4 soru (50-53) ikili karşılaştırma gerektirmeden sadece stratejilerin hedeflere katkı düzeyine göre aşağıdaki ölçek kullanılarak değerlendirilecektir.

Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük

50) Uzman görüş formu genelinde değerlendirdiğiniz çiçekçilikte sürdürülebilirlik stratejilerinin, Türkiye'nin sürdürülebilir çiçekçilik hedeflerine sağlayacağı "***FAYDA***" miktarını/derecesini, ekonomik, çevresel ve sosyo-politik çerçevede değerlendiriniz.

Ekonomik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Çevresel	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Sosyo-Politik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük

51) Uzman görüş formu genelinde değerlendirdiğiniz çiçekçilikte sürdürülebilirlik stratejilerinin, Türkiye'nin sürdürülebilir çiçekçilik hedeflerine sağlayacağı "***FIRSAT***" miktarını/derecesini, ekonomik, çevresel ve sosyo-politik çerçevede değerlendiriniz.

Ekonomik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Çevresel	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Sosyo-Politik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük

52) Uzman görüş formu genelinde değerlendirdiğiniz çiçekçilikte sürdürülebilirlik stratejilerinin, Türkiye'nin sürdürülebilir çiçekçilik hedeflerine sağlayacağı "***MALİYET***" miktarını/derecesini, ekonomik, çevresel ve sosyo-politik çerçevede değerlendiriniz.

Ekonomik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Çevresel	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Sosyo-Politik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük

53) Uzman görüş formu genelinde değerlendirdiğiniz çiçekçilikte sürdürülebilirlik stratejilerinin, Türkiye'nin sürdürülebilir çiçekçilik hedeflerine sağlayacağı "***RİSK***" miktarını/derecesini, ekonomik, çevresel ve sosyo-politik çerçevede değerlendiriniz.

Ekonomik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Çevresel	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük
Sosyo-Politik	Çok Yüksek	Yüksek	Orta	Düşük	Çok Düşük

Sorulara verdiğiniz yanıtlardan dolayı çok teşekkür ederiz.

BIOGRAPHICAL SKETCH

Avni Ürem Çürük was born in 1992 in Exeter/England. Having completed his high school Education in Adana Seyhan ÇEAŞ Anatolian High School in 2010, he enroled to Yıldız Technical University, Mechanical Engineering Department and completed his B.Sc. on Mechanical Engineering in 2015. He also graduated from the Anadolu University, Faculty of Business Administration, and Department of Business Administration in 2016. He was accepted to Galatasaray University, Graduate School of Science and Engineering to carry out his master study at Logistics and Financial Management programme in 2016. At present, he works as a research assistant at Adana Alparslan Türkeş Science and Technology University, Department of International Trade and Finance, in Adana.