Possibilities of Improving Organic Farming in Turkey

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Abstract: Although there is no universally accepted definition of organic farming, most of the scientists focus on an economic, social, and environmentally sustainable agricultural production system that prohibits chemicals, livestock feed additives, and growth regulators. Organic farming in a region must provide a sustainable livelihood for farmers, a clean environment for all living organisms, and healthy food items at reasonable prices for consumers. The overall purpose of this study is to examine the current state and potential developments of organic agriculture in Turkey. The paper first reviews the principles of organic agriculture, then gives information about the legislative process and developments of organic agriculture in Turkey. Specific objectives are to examine the legal structure, organic production, marketing of organic products, and strategies to develop organic agriculture in Turkey. Qualitative research methods were applied to accomplish the objectives of this study. For this reason, journal articles, books, websites, state statistics, and official reports were used for data collection. The basic outline of the paper organized considering the overall purpose and specific objectives of the study.

Keywords: Organic farming, Organic agriculture, Conventional agriculture, Organic products

1. Introduction

Organic farming is a procedure of growing agricultural products without using any chemicals that are harmful to health and nature; instead, substances that are approved for compliance with organic regulations, green fertilization, alternation, and biological control methods are applied. All production and sales stages of organic products are controlled and certified by accredited inspection and certification bodies. Producers are given proper training and extension services from input provision to final marketing stages. In this way, organic products with high nutritional value and reliability are made available to customers. All stages of organic products should be inspected and documented. No uncertified products can be produced and sold under the name of organic. Control and certification are essential for organic farming and ensures that the commodities are grown organically, and pass all the process until to reach the final consumers according to standards specified in organic laws and regulations.

One of the most commonly used definitions of organic agriculture was made by the International Federation of Organic Agriculture Movement (IFOAM) in 1985, which states that "Organic Agriculture is a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity, and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved." (IFOAM, 2019). Organic agriculture is based on four basic principles which were also defined by IFOAM as follows:

Principle of Health: Practicing organic agriculture in a region should protect and improve the health of the plants, soil, humans, animals, and the entire planet as a unified whole. According

to this principle, the health of persons and communities cannot be isolated from the health of ecosystems. Healthy products are grown in healthy soils, and people and animals consuming these products live a healthier life.

Principle of Ecology: Organic agriculture is based on living ecological systems and cycles. This principle links the origin of organic agriculture to existing ecological systems. Accordingly, production should be based on ecological processes and recycling. Nutrition and prosperity are provided by the ecology of a particular production environment. This ecology is the living environment for vegetative production, the ecosystem for animals, and the aquatic environment for fish and other marine organisms.

Principle of Fairness: According to this principle, people who engaged with organic farming should establish good relationships, and ensure justice to all stakeholders such as organic producers, processors, farm employees, distributors, marketing companies, and final consumers. There should be fair relations among all these stakeholders while dealing with organic farming, shared environment, and emerging opportunities. Justice is characterized by equality, respect, and fairness in the management of the shared world both in interpersonal relations and in the relationships of people with other living things.

Principle of Care: In order to protect the health and well-being of present and future generations and the environment, organic farming should be managed carefully and responsibly. Organic agriculture is a vibrant and dynamic system that responds to domestic and international demands and conditions. Organic farming practitioners can increase efficiency in production, but not increase the risk of compromising health and well-being. As a result, it is necessary to evaluate new technologies for organic farming and to review existing methods. Care should be taken when considering the incomplete ecosystem and agricultural understanding.

Aim of the Study

The primary objective of this study is to examine organic agriculture regarding production and marketing and to develop strategies to improve organic farming by utilizing agricultural resources in Turkey. It is aimed by this study to provide useful information for farmers, farmers organizations, agriculturists, extension practitioners, and scientists.

2. Research Methodology

The primary material used for this study was obtained from secondary sources such as state statistics, official reports, and earlier published work. The study gives information about organic agriculture and its principles in the introduction section. It continues by an examination of organic agriculture in Turkey, providing updated information on organic agriculture such as the number of organic farms, the area under organic production, the number of commodities produced organically, total organic output, and exports of organic products. A set of strategies to strengthen organic farming is discussed in the finding section. The study concludes with some recommendations to utilize agricultural resources and improve organic agriculture in Turkey.

3. Results and Interpretation

3.1. Legislation Process of Organic Agriculture

Organic agriculture in Turkey has been organized by different legislation, which can be divided into two main periods as before and after the organic law of 2004.

Before the Organic Law of 2004: There were no national legal regulations in this period. Organic agriculture activities in this period started with the demand of Western European companies and carried out following the legislation of the importer countries. The European

Council issued the Council Regulation (No. 2092/91) in 1991 and brought obligation to the countries exporting organic products to the European Community (EC) to publish their national legislation. The first official organic agricultural movement in Turkey started in 1992, with the establishment of the Association of Ecological Agriculture (ETO). The regulation entitled "Production of Plant and Animal Agricultural Products by Ecological Methods" (No. 22145) was issued on December 18, 1994 (OG, 1994). With this regulation, organic agricultural activities in Turkey started to be carried out, for the first time, under control and established rules of the Ministry of Agriculture and Rural Affairs (MARA). To adjust the changes in the EU legislation, amendments to this regulation were required, and a new regulation entitled "Principles and Implementation of Organic Agriculture (No. 24812) was issued on July 11, 2002 (OG, 2002). The rules and regulations of organic animal production and cultural fisheries were also included in this regulation (Boz et al., 2011; Durak Kılıçaslan, 2015).

After the Organic Law of 2004: The most effective legislation on organic agriculture in Turkey was made by passing the Law of Organic Agriculture (No. 5262) issued on December 3, 2004 (OG, 2004). The law sets the rules for the production, consumption, and inspection of organic products. It strengthened the legal amendments made in the previous organic agriculture regulations. Besides, the duties and responsibilities of the parties involved in organic processes and penalties for not obeying the law and regulations were determined. Based on the organic law, the regulation entitled "Principles and Implementation of Organic Agriculture" (No.25841) was entered into force on June 10, 2005 (OG, 2005). This regulation was issued to take part in the list of countries who export organic commodities to EU countries and was prepared considering the Council Regulation (No. 2092/91). The export and marketing of organic agricultural products in the desired varieties and quantities in foreign markets was made possible by this regulation. To ensure that internal amendments to the EU legislation are made, the Regulation on the Principles and Implementation of Organic Agriculture (No.26322) was issued on October 10, 2006 (OG, 2006).

In order to comply with new EU legislation, the regulation entitled "Principles and Implementation of Organic Agriculture (No. 27676) was issued on August 18, 2010 (OG, 2010). Amendments were made in this regulation on October 6, 2011 (No. 28076), August 14, 2012 (No. 28384), May 24, 2013 (No. 28656), February 15, 2014 (No. 28914), July 22, 2015 (No. 29422), and January 10, 2018 (No. 30297).

3.2. Organic Agriculture in Turkey

In terms of climate, soil, water resources, labor, and product diversity Turkey has favorable conditions for organic agriculture. In every region of the country, some products can be grown organically within the present agricultural systems. The most produced organic commodities in Turkey include pistachios, pears, sunflowers, almonds, green peppers, wheat, walnuts, tea, rice, strawberry, tomatoes, apples, hazelnuts, carrots, figs, watermelon, melon, apricots, chestnuts, cherry, lemon, mandarin, lentil, maize, pomegranate, chickpea, cottonseeds, potatoes, orange, onion, soybean, grape, sour cherry, oat, and olives.

Figures related to the number of farms producing organic commodities, the number of organic products, organically certified area, and total organic production is presented in Table 1. It can be followed by the table that organic agriculture has an increasing trend regarding all these four aspects. For example, the number of organic farms was 14401 in 2005 and increased to 75067 in 2017. Similar growing trends can be observed in organically certified areas and total organic production. However, the diversity of organic products did not have the same increasing trend in the same period, which was 205 products in 2005 and reached to only 214 products in 2017.

Table 1: Organic Farming Figures in Turkey

Year	Number of organic farms	Number of products	Organically certified area /Hectare	Total Production /tons
2005	14401	205	203811	421934
2008	14926	247	166883	530224
2011	42460	225	614618	1659543
2014	71472	208	842216	1642235
2015	69967	197	515268	1829291
2016	67867	238	523777	2473600
2017	75067	214	543033	2407600

Source: <http://tarimsalistatistik.com/tr-TR/Sayfa/alan-ve-uretim-miktari-area-and-amount-of-production>

Table 2: The Most Exported Organic Commodities in 2017

Product	Amount (Ton)	Value (\$)	%(Ton)	%(\$)
Maize	14.902,5	56.108.024,5	24,2	26,1
Figs and fig products	7.098,7	43.581.055,1	11,5	20,2
Fruits and fruit products	12.742,9	32.340.145,1	20,7	15,0
Hazelnuts and hazelnut products	3.857,6	31.941.924,4	6,3	14,8
Grapes and grape products	9.595,6	22.965.367,5	15,6	10,7
Apricots and apricot products	3.078,4	14.571.024,7	5,0	6,8
Vegetables and vegetable products	7.939,0	4.953.971,1	12,9	2,3
Spices	253,7	4.769.184,1	0,4	2,2
Lentils and lentil products	562,2	1.208.576,6	0,9	0,6
Forestry products	63,8	857.712,5	0,1	0,4
Pistachios	33,4	829.797,8	0,1	0,4
Wheat and wheat products	1.193,1	438.088,0	1,9	0,2
Milk and dairy products	150,0	124.412,4	0,2	0,1
Total	61.473,8	214.689.284,7	99,7	99,7
GENERAL TOTAL (Including other crops in the list)	61.689,3	215.288.185,8	100,0	100,0

Source: <https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler>

Table 3: The Most Exported Countries in 2017

Country	Amount (Tons)	Value (\$)	%Tons	%\$
England	22.593,44	62.915.945,67	36,62	29,22
USA	7.271,73	31.369.690,33	11,79	14,57
Germany	7.976,45	28.259.705,55	12,93	13,13
The Netherlands	6.872,48	25.073.960,26	11,14	11,65
France	5.773,81	21.809.399,52	9,36	10,13
Switzerland	2.811,95	11.356.171,02	4,56	5,27
Italy	2.397,83	11.051.690,62	3,89	5,13
Canada	1.019,24	3.516.049,60	1,65	1,63
Sweden	958,02	3.238.918,82	1,55	1,50
Austria	664,04	3.087.092,11	1,08	1,43
Sri Lanka	7,24	2.102.058,41	0,01	0,98
Australia	423,27	1.717.205,80	0,69	0,80
Japan	383,66	1.465.627,46	0,62	0,68
Belgium	381,22	1.424.310,10	0,62	0,66
Total	59.543,38	208.387.843,3	96,51	96,79
Others	2.154,92	6.900.351,5	3,49	3,21
GENERAL TOTAL	61.689,3	215.288.185,8	100,0	100,0

Source: <https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler>

Expanding export potential is a crucial factor influencing the production of organic products. Exports provide a continuously increasing demand at higher prices and stimulate domestic farmers to convert their conventional production to organic. Since organic agriculture in Turkey started as exports oriented, different companies from Europe sign contracts with farmers in Turkey and provide a constant demand, which also positively affect the income and wellbeing of farmers. Table 2 shows the most exported commodities in 2017. Organic maize takes the first place in tons and dollars as it makes almost one-fourth of the total export value. This was followed by figs, fruits, hazelnuts, and grapes. As of 2017, the amount of organic product exports reached to 61.6 thousand tons and the value of exports to \$215 million.

Organic products are exported to many different countries around the world. According to Table 3, England takes the first place of importing organic commodities from Turkey, and it is followed by the USA, Germany, the Netherlands, France, and Switzerland, respectively. Although most of the exports are made to European countries, the United States, Canada, and Japan also have remarkable potential for importing organic commodities from Turkey.

3.3. Strategies for Improving Organic Farming

Eliminating the Belief that Organic Farming Reduces Yield

Almost in every segment of the society, including intellectuals and scientists, there is a common belief that organic farming reduces yield and cannot provide an adequate amount of return to sustain the increasing world population. Scientific studies conducted on this issue revealed exciting results. De Ponti et al. (2012) analyzed 362 data sets (conventional and organic) collected from 43 countries and compared the yields of 67 commodities produced, both organic and conventional. It was found that the yield in organic production was 80% of the conventional output. The yield range in organic products was also quite high. The relative yields were higher than 80% in soybeans, some other pulses, corn, and rice; however, lower than 80% in barley, wheat, and potatoes. The relative yields of organic production of most countries were quite close to the overall average of 80%. However, Asian and Central European countries relatively showed higher yield than the average while the Northern European countries had lower yields than the mean value of 80%. In countries such as Denmark and the Netherlands, where inputs are intensively used in conventional agriculture, the difference between organic agriculture and conventional agriculture is more. A significant result from the study is that as yield level in conventional agriculture increases, the difference in yield with organic agriculture is also going up.

Another meta-data analysis (Ponisio et al., 2015) gave comparative results between conventional and organic yields (115 studies containing more than 1000 observations). It found that organic yields are only 19.2% lower than conventional yields. Crop types and management practices played a vital role in covering the yield differences between organic and conventional production. The study found no significant differences in yields for leguminous versus non-leguminous crops, perennials versus annuals, or developed versus developing countries. The significant result of the research was that two agricultural diversification practices, multi-cropping, and crop rotations, substantially reduce the yield gap when these methods are applied in organic systems.

Studies conducted in Turkey also gave impressive results. For example, Bayramoğlu and Gündoğmuş (2008) compared conventional and organic raisin farmers regarding their cost and technical efficiencies. The efficiency coefficients were calculated as 0.712 and 0.862 for organic producers, and 0.844 and 0.903 for conventional producers. These coefficients indicated that conventional producers were more efficient than organic producers. Considering the long-term benefits of organic agriculture, it can be noted that the efficiency gaps are small and can be eliminated by proper managerial practices and price policies.

There are some studies in Turkey favoring organic agriculture. For example, Engindeniz (2006) found that organic lettuce production is an economically reasonable alternative production system for farmers, although the average total costs in this system are higher than that of conventional farms. In the long run, the costs of organic agriculture are expected to go down as total production and sales increase, and organic production systems become more productive. The results of another favoring study (Demiryürek and Ceyhan 2008) showed that the production costs of organic hazelnut producers are lower while their income is higher than conventional hazelnut producers. For this reason, Eryılmaz and Kılıç (2019) recommended governmental support and strengthening extension services to promote organic hazelnut farming in the same region.

In general, scientific studies conducted worldwide show some yield gaps between organic and conventional production. However, these gaps are not too large and can be closed by crop diversification and proper management practices. In order to increase efficiency in organic farms, factors influencing production costs and selling prices should be regulated by the government.

Developing Long Term Value Chain for Organic Products

A long-term value chain makes the organic production process operate properly. It includes all stakeholders who take part in the cultivating, processing, and marketing of a specific product (Figure 1). It is called a value chain because it is only as strong as the weakest link; once this link is broken, the entire chain becomes ineffective and loses its total value. The generic value chain presented in Figure 1 can be adapted to organic farming. Since productions begin with input provision, organic seeds, seedlings, fertilizers, irrigation equipment, and pests control methods are needed for cultivating farm products organically. Organic fields should be secured from chemical fertilizers and pesticide passages from neighboring conventional agricultural areas. All the cultural practices required for the healthy growth of organic products must be fulfilled in a timely and complete manner.

Growing healthy organic products is not sufficient for a perfectly functioning value chain. The post-harvest operations, including collecting, grading, storage, packaging, and transportation, are also critical. All these activities should be maintained with the same care to minimize product losses, and not to deteriorate the organic feature of the products. For example, organic containers should be used in harvest; workers should wear gloves, and harvesters must be cleaned from all residues. Plastic and metal containers cannot be used for the packaging of organic products. Instead, paper, cardboard, basket, and cloth bag should be used as packaging material according to the principles of organic agriculture. Storage facilities should be separate from conventional products. Adequate measures should be taken to prevent product mix when the storage facilities are limited. No chemical materials can be used during storage.

Organic products cannot be processed in the same place and at the same time with conventional products. Chemical additives and irradiation cannot be used during processing. Only permitted additives may be used. The product cannot be genetically modified during processing. The provisions of the Turkish Food Codex Regulation are applied during the processing. Accelerating the germination and development process of organic products by using chemical substances, and cleaning with unauthorized chemicals is prohibited.

The control body determines the warehouse structure and transport conditions of organic products. According to the rules, organic products cannot be kept on the motorways. Double protected containers to prevent products from being affected by fuel waste during transport must be used, and the container must be labeled. Transporters of organic products must have a certificate of internal circulation. In the marketing process, organic products must be sold separately from other products. They must be sold strictly packaged. Products to be sent abroad or to be brought from other countries must be under the control of the inspection body.

All these processes add value to organic products and make contributions to each stakeholder involved in every stage of this process. The final consumers can consume organic commodities if

they are correctly processed and distributed along the marketing chain. The smoother the consumers have access to products, the more they buy and consume. Thus, proper marketing channels are essential to reach all consumers residing in different neighborhoods. The value of the organic commodities increases through these processes and each stakeholder involved in the process benefits the situation (Aksoy et al., 2018). Facilitating institutions are needed for a well-operating value chain, particularly to develop and implement organic farming policies and enforce commercial laws and regulations. Institutions should be appropriately involved in finance, marketing information, adequate standards, niche markets, proper technology, food security and food safety, innovation, and property rights. Meanwhile, facilitating activities such as transportation, storage, processing, packaging, importing, and exporting is required. Also, giving subsidies to individuals who add value to organic commodities in different stages may have a strengthening effect on the value chain (Aksoy et al., 2018).

This value chain can be applied in organic agriculture in Turkey. However, to use this chain, first of all, organic agriculture should be focused on favorable farm commodities of each of the seven regions of Turkey. For example, the Eastern Black Sea Region is convenient for tea and hazelnuts, while the Western Black Sea Region for hemp. The central and eastern Anatolian regions are famous for cereals, particularly wheat, barley, oat, and rye. Apricots have a remarkable advantage in Malatya and neighboring provinces. The southeastern Anatolian Region has suitable climate and soil conditions for growing cotton, pistachios, lentil, and watermelon while the Mediterranean Region has favorable conditions for growing bananas, maize, peanuts, soybeans, citruses, rose, and all kinds of greenhouse vegetables. The Aegean Region produces very famous olives, grapes, poppy, tobacco, and figs, and finally, the Marmara Region produces linen, olives, rice, and sunflower. Organic agriculture should be first focused on these products. Initially, certain production areas and farmers should be identified. The Ministry of Agriculture and Forestry must bring together all stakeholders, including farmers' organizations, control and certification bodies, universities, consumers' associations, and the media. Once farmers start to produce the most crucial commodity organically and earn an adequate income, they may increase the diversity with other products. Mainly, the Eastern and the Central Anatolian regions can be focused on organic grains, fodders, and livestock. This may provide a completely organic agricultural farming system in the predetermined areas.

Figure 1: A Generic Value Chain.
Source: United Nations Industrial Development Organization (2009)

Increasing Organic Product Sales in Mainstream Retailers.

Organic agriculture should be considered as a socio-economic system in which family farms, workers, and rural people are involved. In order to make a sustainable living in a rural area these people should earn enough income from the sales of their organic products. As the yield is expected to decrease by around 20% (results of earlier studies), this gap should be compensated by additional price raise for organic commodities or governmental subsidies. Once farmers face constant demand for their organic products at reasonable prices, they will be able to earn enough income, part of which they can use for future farm investments and developments. Individually small organic farmers face many difficulties in accessing markets and reaching the final consumers. Mainstream retailers may play an essential role in making organic food available to consumers. They have stores in every neighborhood, want to grow even further, try to share collective responsibility, and want to increase their profit in every market by selling valuable goods.

On the other hand, the global trends regarding food and nutrition force consumers to be more educated, concern about lifelong health, and pay attention to sustainability. For these reasons, consumers prefer more delicious food like fresh fruits and vegetables, organic bread and cereals, and organic beverages; and healthier food containing fewer calories, less meat, less processed, and no chemicals. Also, consumers concern about environmental ethics, including animal welfare, fair trade, less CO₂ production, and local food.

Although every income segment of the society is precious and deserve to consume organic food, some higher-income consumers are willing to pay higher prices for organic products but cannot reach these products because of unavailability. Mainstream retailers may play an essential role in reaching organic products to customers in every neighborhood. They can contribute to creating a constant demand for organic products, which will strengthen the other links of the value chain, such as producers, processors, and distributors.

Increasing the Sales of Organic Products through Local Organic Bazaars

Local organic bazaars are one of the most effective ways of selling organic products. They are constructed in urban and suburban areas where consumers are available on certain days of the week, and producers can have easy access to the market, bringing their organic products and selling to consumers. Since there are no mediators in this kind of marketing, the gaps between production costs and selling prices get smaller, and the larger part of rates paid by customers to go directly to producers. This also gives producers to take the initiative for discounts in the case of demand shortages. The benefits of local organic bazaars include the following (Ekolojikpazar.org, 2017; Ayan et al., 2017; Boz and Rasulov, 2018; Eryılmaz ve ark., 2019):

- Consumers receive reliable information, directly or most shortly, about the products, not just the products but other related attributes as well.
- It opens the road for fair trade.
- Assures without any documents and certificates.
- Allows cultural exchange, protects local culture and makes regional differences worldwide.
- Makes it possible for consumers to buy the products according to their regions and religious belief.
- Protects biodiversity and ensures that local species, varieties, and tastes get an opportunity in the local markets.
- Adds social, cultural, and ecological values to the commercial values (such as taste and durability) of agricultural products.
- Disseminates information between producers and consumers.
- Makes it possible for producers to arrange their production considering the demand of consumers.
- Makes it possible for consumers to shop by touching, selecting, and even tasting the products.
- Allows consumers to access fresh products.
- Provides opportunities to small producers who are unable to meet the large demand to enter the market.

Organic bazaars have remarkable potential in Turkey. The first one was established with the cooperation of the Buğday Association and Şişli Municipality in 2006. As of 2018, the number of organic bazaars in Turkey reached 18. By the law on the regulation of trade of vegetables and fruits, and other goods with sufficient supply and demand (2010), and the regulation of marketplaces (2012), municipalities could open markets where only organic products were sold. Because many issues differentiate organic markets from other local markets, separate legislation for organic markets is required (Ekolojikpazar.org., 2018).

Starting with 25 producers and 45 stands in 2006, the Şişli Organic Bazaar reached to 80 producers with 340 stands in 2018. Sales of fresh vegetables and fruits in the same period changed from 3-5 tons to 15 tons per week. Except for providing organic products to its retail customers, the bazaar offers a product supply channel to more than 30 shops, e-commerce sites, and other organic markets. To date, thanks to 100% Ecological Markets and other organic markets, nearly 600 organic fresh vegetables and fruit producers have met the customers (Ekolojikpazar.org., 2018).

As of 2019 there are 18 organic markets, six of which are 100% ecological market and two of them are seasonal. These are İzmit, Kayseri Kocasinan (seasonal), Şişli, Kartal, Bakırköy, and Beylikdüzü 100% Ecological Markets, Bursa Nilüfer, İzmir Bostanlı and Balçova, Eskişehir Tepebaşı, Burhaniye (seasonal), Ankara Ayrancı and Çayyolu, Adana Çukurova, Konya Meram, Eyüp, K.Çekmece, and Kadıköy organic bazaars. It is also possible to reach organic herbal products from the organic bazaar established in Sürmeli Village Samsun

4. Conclusion and Recommendations

In order to improve organic agriculture in Turkey, multidimensional goals should be set, and long-term policies implemented accordingly. Production, processing, marketing, consumption, exports, and legislation work should be carried out simultaneously. Instead of the supply-driven output, demand-driven production should be preferred due to ensuring the sales of organically produced commodities at reasonable prices.

Although the total area under organic production, the number of organic farmers and commodities, and the amount of the organic output have increasing trends in Turkey, considering the agricultural potential of the whole country, the present figures aren't satisfactory. Therefore, agricultural extension programs are needed to raise awareness among farmers in every region, particularly for favorable crops. Farmers should be convinced with an environmentally friendly, socially acceptable, and economically viable production system. Cooperating with farmers' organizations, the Ministry of Agriculture and Forestry must take the initiative to identify priority regions, priority crops, and farmers who agree to produce organic crops. Subsidies should be provided to compensate income losses, particularly in the earlier years of the converting process.

Although there are certification and control bodies, and the government provides subsidies for organic agriculture, because of small and separated farms, it is challenging to organize farmers and apply joint certification campaigns. This situation also lowers farmers' power on influencing input and output prices, increasing the dependence on market forces. For this reason, organic agriculture programs should be implemented through farmers' organizations.

Consumer research should be given priority. The population of Turkey has reached 82 million in 2019, but still, the improvements in organic agriculture are highly depended on exports. Domestic consumption should not be ignored. There are millions of people who are willing to pay higher prices for organic products, but they don't consume them because of unavailability. Mainstream retailers and local organic bazaars may play an important role in filling this gap. Besides, the internet should also be used to market organic products. In order to use this

method, sellers and consumers should have access to the internet, and proper capabilities to utilize this method.

New storage and processing facilities should be established to increase the value of organic products. The facilities where organic products are stored and processed must have adequate qualifications. The storage facilities should be safe from chemical ingredients and materials. Licensed storage facilities should be encouraged. Once these facilities receive enough organic products to store, storage cost per unit of the product may go down.

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References

- Aksoy, U., Boz, İ., Eynalov, H., Gulliev Y. (2018). Organic Agriculture. in Azerbaijan, Current status and potentials for future development. Food and Agriculture Organization of the United Nations Baku 2018.
- Ayan AK, Boz I, Kaynakci C, and Aytac S (2017): Consumers' perception of organic food items: A case study of Sisli And Kartal organic bazaars of Istanbul. International Journal of Agriculture and Environmental Research. 3(5); 3635-3643. [Crossref](#)
- Ayan AK, Boz I, Kaynakci C, and Aytac S (2017): Suppliers of organic food: evidence from Sisli and Kartal Ecological Bazaars of Istanbul. International Journal of Scientific Research and Management (IJSRM) 5, 5553-5559. [Crossref](#)
- Ekolojikpazar.org (2017): 100% ekolojik pazar. Retrieved (May 12, 2017) from: <http://ekolojikpazar.org/hakkinda/neden/>
- Bayramoglu, Z., Gundogmus, E. (2008). Cost efficiency on organic farming: a comparison between organic and conventional raisin-producing households in Turkey. Spanish Journal of Agricultural Research, (1), 3-11. [Crossref](#)
- Boz, I, Aksoy, U., Özçatalbaş, O. (2011). Enhancing Organic Farming in Turkey (UTF/TUR/052), Workshops and Training Programs. Food and Agriculture Organization of the United Nations and the Ministry of Food Agriculture and Livestock. Ankara.
- Boz, I., Rasulov, A. (2018). The effects of local bazaars on marketing of organic products: the cases of Turkey and Uzbekistan. Development of Organic Agriculture in Central Asia. Proceedings of the International Conference held during 22-24 August 2017 in Tashkent & Samarkand, Uzbekistan, p.245-155.
- Demiryurek, K., & Ceyhan, V. (2008). Economics of organic and conventional hazelnut production in the Terme district of Samsun, Turkey. Renewable Agriculture and Food Systems, 23(3), 217-227. [Crossref](#)
- De Ponti, T., Rijk, B., & Van Ittersum, M. K. (2012). The crop yield gap between organic and conventional agriculture. Agricultural systems, 108, 1-9. [Crossref](#)
- Durak Kılıçaslan, N. S. (2015). Türkiye ve AB’de Organik Tarım Mevzuatı, Uygulamaları Ve Değerlendirilmesi. AB Uzmanlık Tezi. T.C. Gıda Tarım ve Hayvancılık Bakanlığı, Ankara.
- Engindeniz, S., & Tuzel, Y. (2006). Economic analysis of organic greenhouse lettuce production in Turkey. Scientia Agricola, 63(3), 285-290. [Crossref](#)
- Eryılmaz, G. A., & Kılıç, O. (2019). Türkiye’nin Organik Fındık Üretimi ve İhracatındaki Gelişmeler. Fırat Üniversitesi İİBF Uluslararası İktisadi ve İdari Bilimler Dergisi, 3(1): 41-54.
- Eryılmaz, G. A., Kılıç, K., & Boz, I. (2019). Türkiye’de Organik Tarım ve İyi Tarım Uygulamalarının Ekonomik, Sosyal ve Çevresel Sürdürülebilirlik Açısından Değerlendirilmesi. Yüzüncü Yıl Üniversitesi Tarım Bilimleri Dergisi, 29 (2), 352-361.
- European Council. (1991). Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs.

- IFOAM. (2019). Principles of Organic Agriculture. Retrieved (September 3, 2019) from: <https://www.ifoam.bio/en/organic-landmarks/principles-organic-agriculture>.
- Ministry of Agriculture and Forestry (MAF), 2019. Organik Tarım İstatistikleri. <https://www.tarimorman.gov.tr/Konular/Bitkisel-Uretim/Organik-Tarim/Istatistikler>.
- Official Gazette (1994). Bitkisel ve Hayvansal Ürünlerin Ekolojik Metotlarla Üretilmesine İlişkin Yönetmelik. T.C. Resmi Gazete, Tarih: 18.12.1994, Sayı: 22145, Ankara.
- Official Gazette (2002). Organik Tarımın Esasları ve Uygulanmasına İlişkin Yönetmelik. T.C. Resmi Gazete, Tarih: 11.07.2002, Sayı: 24812, Ankara.
- Official Gazette (2004). Organik Tarım Kanunu. T.C. Resmi Gazete, Tarih: 03.12.2004, Sayı: 25659, Ankara.
- Official Gazette (2005). Organik Tarımın Esasları ve Uygulamasına İlişkin Yönetmelik. T.C. Resmi Gazete, Tarih: 10.06.2005, Sayı: 25841, Ankara.
- Official Gazette (2006). Organik Tarımın Esasları ve Uygulamasına İlişkin Yönetmelikte Değişiklik Yapılmasına Dair Yönetmelik. T.C. Resmi Gazete, Tarih: 17.10.2006, Sayı: 26322, Ankara.
- Official Gazette (2010). Organik Tarımın Esasları ve Uygulamasına İlişkin Yönetmelik. T.C. Resmi Gazete, Tarih: 18.08.2010, Sayı: 27676, Ankara
- Ponisio, L. C., M'Gonigle, L. K., Mace, K. C., Palomino, J., de Valpine, P., Kremen, C. (2015). Diversification practices reduce organic to conventional yield gap. Proceedings of the Royal Society B: Biological Sciences, 282 (1799), 20141396. [Crossref](#)
- United Nations Industrial Development Organization (2009). Agro-value Chain Analysis and Development. The UNIDO Approach A Staff Working Paper