Sustainable Agriculture and New Food Marketing Management System

Salih GÖKKÜR*, Esra SINAV
Aegean Agricultural Research Institute, Menemen, İzmir/Turkey
*Corresponding author: salihgkr@gmail.com
ORCID: 0000-0002-0217-0420

Abstract

Food security is a global problem. Unforeseen problems such as infrastructure problems in agricultural areas, income uncertainty in these areas, climate change, population growth and change in eating habits and reduction of agricultural land threaten food security. Sustainable agriculture is the whole of the production activities that human beings carry out to access the food they need in order to survive. In order to achieve this, a new food marketing management system is needed. The food marketing management system is part of the value chain. Value chain includes all pre-harvest and post-harvest activities in agricultural products. For success in the food marketing management system, all activities in the value chain must be evaluated together. In this study, the components that a new food marketing management system to be prepared in agriculture should contain.

Keywords: Agriculture, climate change, eating habits, food security, harvest, value chain

Review article
INTRODUCTION

Regardless of their level of development of the countries, the agricultural sector has an important place in every country's economy. A significant portion of the foodstuffs and raw materials they use for people to survive is provided by the agricultural sector and therefore an alternative to this sector cannot be considered. Agriculture is an important and indispensable tool that every country should consider in policy making, due to its positive contributions to the supply of raw materials to industry, labor transfer, foreign currency income and national income (Tunçer and Günay, 2017).

The food industry is of vital and strategic importance for the future of countries. Preventing increases in food prices and developing policies to reduce the negative effects of these increases are of great importance to ensure long-term and permanent price stability in our world. In this context, there is a need for policies that will ensure agricultural transformation, reduce migration from the countryside, increase rural welfare, support production planning, productivity increase, production and increase in the number of producers. In this way, increases in agriculture and food prices can be controlled and inflation expectation targets can be achieved (Eştürk and Albayrak, 2018). The rise in prices of agricultural products will push a part of society into poverty. Inflation is the increase in the general level of prices. Due to climate change and rapid population growth, an increase in food prices in general will adversely affect the inflation rates of countries.

In the division of labor in the world countries in agriculture, developed countries become agricultural raw material exporters, while developing or underdeveloped countries become dependent on agricultural food imports. In order to increase the export of agricultural products, it is increasingly required to import raw materials. This, on the one hand, leads to low added value and at the same time, the positive contribution to total foreign trade is gradually disappearing (Aydin and Aydin, 2018).

Agricultural production contains more risks in its structure than its other sectors in terms of its commitment to nature. Risks faced by agricultural enterprises are production, finance, technology, human origin, marketing, official and social risks. When agriculture is taken into account depending on nature, producers face many natural risks such as drought, flood, frost, hail and storm. Realization of such risks will not only affect the income of the producers negatively, but will also affect the country's economy negatively. It would be wrong to limit the risks faced by agricultural enterprises to only natural risks. In addition to natural risks, risks such as changes in product and input prices, government policies, sickness or death of the farmer, and failure to keep up with new technological developments also affect agricultural enterprises negatively. As a result, sustainability of agriculture is negatively affected. When the risks faced by growers are clearly identified, it will be easier to take precautions against risk. A wide variety of risk management strategies have been developed for this. Risk management strategies should be developed based on the degree of risk faced by the manufacturer and the possibilities for occurrence. Risk strategies will not produce healthy results unless the level of risk and probability of occurrence are clearly revealed (Erdoğan and Bayramoğlu, 2017).
Spring freeze is the most important risk sources in some fruits production. A lot of fruit producers are not aware of the advantages of agricultural insurance. Designing the farmers’ education program may increase the information related to agricultural insurance. Monitoring the fruit market and sharing the market information with fruit farmers may decrease the market risk faced with fruit producers. Spread of the cooperation among the fruit farmers has the positive contribution to the fruit producers for designing optimum risk management strategy (Gunduz et al., 2016).

Good Agricultural Practices (GAP): It is the production model that ensures traceability, sustainability and food safety in agriculture by agricultural production in a way that does not harm the environment, human and animal health, and the products produced as a result of production are certified. On the important effects of good agricultural practice on soil quality; known that pollution in soil was prevented and soil fertility increased as a result of the decrease in fertilizer use and balanced use of fertilizer. Similarly, it is known that there is no drug residue in the soil or that it decreases very much since there is no excessive use of drug (Aydın et al., 2016).

The goal of organic agriculture to protect biodiversity and soil fertility ensures that the "possibilities of future generations to meet their own needs" stated in the definition of sustainable development are ensured. Chemicals, hormones and drugs used in the production of food products have reached a worrying level for many consumers. In the case of organic food products, it will be effective to bring better product performance to the forefront in terms of taste as well as the important competitive advantage related to food health and safety (Eti, 2014).

Some countries have sufficient potential in terms of the production of many agricultural products due to their soil and ecological conditions. However, production merely is not enough to be among the important exporters in the world. Export value should be high as well as production. Therefore, it is very important to increase the export of agricultural products. In order for these countries to increase their competitiveness in the agricultural products market, importance should be given to productivity, quality and technology in production (Bashimov and Çiçek, 2017).

Besides agricultural production, agriculture-based industries and marketing channels should be developed and competitiveness should be increased in national and international markets. In the processing and marketing of agricultural products, a structure that complies with the standards should be established (Bayraç and Yenilmez, 2005).

Since there are too many middlemans in the value chain in our country's agriculture sector, it affects the traceability negatively. However, new technologies and techniques are increasingly making traceability a cost-effective expense, and in the following years the system pays off, making the business competitive (Yılmaz and Yılmaz, 2017). The developments in today's technology and the increased level of consciousness in humans provide an opportunity for the situations that may be negative for the future to become more positive. Today is an important opportunity for the future, and it is important for the future of the food to be managed in the best way. Traceability covers all stages from production to consumption, including production and distribution phases and export. It is aimed to ensure food safety by monitoring the traceability and sustainability of natural resources in the agriculture and food sector (Gökirmakli and Bayram, 2018). The use of agricultural lands for other purposes should be prevented.
Some Suggestions for Sustainable Agriculture

Since the food sector is a highly dynamic sector, it undergoes major transformations over time and these transformations closely affect the decisions and consumption habits that all stakeholders of the sector should take. The trends in the food industry are influenced by many factors. Due to the healthy lifestyle trends, it is thought that foods with high mineral and vitamin content but low in fat and sugar content will continue to be important in the future, and the demand for these products will continue to increase especially in developed and developing countries. Health, convenience, pleasure, sustainability, authenticity trends reveal as the five main trends that have an important place in food and beverage consumption and may affect the industry in many areas such as production, consumption, investment and market orientations in the future (Keskin and Güneş, 2019).

The effects of global climate change in all areas of life, especially in recent years, show themselves on agricultural production and trade in the form of yield and price fluctuations. These fluctuations in prices and yield levels make it difficult for companies whose main inputs are agricultural products to continue their activities in a stable manner. The deterioration in the financial structures of companies that do not manage the risks caused by fluctuations well can be priced by investors, which can have a lowering effect on the market values of companies. On the other hand, it is possible to say that the picture will be positive for companies that can manage these risks well. Changes in air temperatures affect agricultural production and prices of agricultural products in our country as well as in the world, affecting the activities of companies operating in the field of food and beverage production (Durmuşkaya, 2016).

The main reason for the lack of potential competitive advantage in the trade of agricultural raw materials is the export of processed products. Importing agricultural raw materials to support the export of processed products reduces competitiveness in this sub-sector. Therefore, priority should be given to domestic production rather than agricultural raw material imports (Mangır & Fidan, 2017). The change in exchange rates affects the prices of agricultural products determined by the producers due to the import of raw materials and intermediate goods of the food industry (Tay Bayramoğlu and Koç Yurtkur, 2015). Applications such as the use of effective technology that will increase productivity and competitiveness in agriculture and improving the infrastructure of agricultural enterprises should be focus on (Bayraç and Yenilmez, 2005).

Although investments in the agricultural sector have a significant contribution to production, employment and rural development, foreign direct investments are shifted to areas with high profitability in the short term. Investing in the production, processing and marketing of products for which we have a comparative advantage by region will be very useful in terms of rural development and employment (Koçtürk et al., 2013).

Taking measures for the diversification of rural income and shifting from product-based supports to producer-based supports will increase the efficiency of the support and reduce the burden on public finance. The agricultural sector should be transformed from a labor-intensive sector into a technology-intensive sector, but social policy practices should also be taken into account while doing this (Erçakar, 2010).

Products, which are cultivated in a region with its geographical, ecological and human factors, are known as the name of the regions that they produced. Those products are featured and prestigious agricultural products and they can be sold for a higher price than similar products in other regions and countries.
As a result of customer awareness in the world, quality and confidence became the most important attributes that they want in products. In order to protect regional agricultural and food products, geographical indication, origin and related laws and practices gained more importance in EU in last decade. There are plenty of prestigious agricultural products that are marketed by the agricultural sales cooperatives for many years. Marketing the prestigious and famous agricultural products under their own names with geographical indications will provide significant added value to both cooperatives and the manufacturers. The market shares of prestigious local agricultural products have been increasing in the last decade. This situation is very desirable for producers who grow specialty agricultural products. Increasing the market share of local products is extremely important for farmers and rural development (Ertan, 2010). Geographical indications of natural food products specific to the city should be taken. The acquisition of geographical indications will not only ensure that the products are produced and protected to a good quality standard, but also prevented the different city local ownership of these local products. In addition, products with geographical indication registration will have a great contribution to finding customers in domestic and foreign markets at a good price. Efforts should be made to brand specific geographic products by prioritizing them according to their potential to produce added value and their marketing. It is important to develop strategies to develop, market and support processed derivatives without harming the naturalness of these products (Arslan, 2018).

The fact that the consumers are not conscious enough about organic products and the prices of organic products are higher than conventional products are the main factors that prevent the increase of domestic consumption of organic products. To this end, there is a need to raise awareness of consumers to increase the consumption of organic products. Local organic markets where producers and consumers meet by reducing the number of intermediaries are important in increasing the demand for organic products in the country. Thanks to these markets, consumption of organic products will increase, and cultural interaction between producers and consumers will be ensured and organic products will be recognized by wider environments. In addition, since the use of input will be more effective with improvements in production technology, the production cost will decrease in organic products (Eryılmaz and Kılıç, 2019). Growing the production of organic agricultural products will contribute to the increase in exports.

Although the production cost of medicinal and aromatic plants varieties is low, high prices due to insufficient production affect consumption negatively. In particular, it is becoming a rapidly increasing sector. In order to improve the production of medicinal and aromatic plants, unconscious collection, which is the main problem of collecting from nature, should be prevented and culture of medicinal and aromatic plants should be ensured due to the increase in both domestic and foreign market needs (Mert and Dağistan, 2016).
Pesticides can cause a number of problems due to unconscious use and improper application. In the solution of the problem, it is thought that it is important to be sensitive in the use of pesticides and to give more weight to the practices and methods in which possible damages are minimized. It is considered important to raise the awareness of producers by making educational extension activities widespread and effective in the unconscious use of pesticides and inadequate implementation of the relevant measures. Countries with an increasing trend of pesticide use continue to import pesticides. More imports mean more foreign currency losses. Providing the need for consumption through domestic facilities can be effective in reducing import expenses. In addition, the use of drugs that will minimize risks in terms of environment, natural balance and human health is also important. In this context, it would be appropriate to support research and development studies for drug production with low risk. At the same time, giving priority to the development of alternative practices to pesticides is important in terms of reducing the risks of medicines (Arslan and Çiçekgil, 2018).

Soon, we will have the opportunity to monitor the whole farm with cloud-connected and unmanned aerial vehicles, such as controlling natural elements such as humidity and temperature, preventing unnecessary use of natural resources. In addition, it will be possible to evaluate the production and analyze all the products and resources in the farm. The internet of things in agriculture will increase in productivity with the spread of technology. What needs to be done is to make smart agriculture easy to use, economical and more accessible to all users (Aytekin et al., 2019).

The agricultural mechanization is the use of machinery and new technologies in planting or planting, watering, fertilizing, protecting plants from diseases and pests, harvesting and many other agricultural activities, which makes plant and animal production less affected by natural disasters. Traditional production methods should be adapted to today's technologies. The increase in welfare that may occur in the world countries can increase the potential of countries to import. In order to be prepared for this situation, we must increase the number of producers in agriculture.

**What Processes Should A Standard Field Crops, Fruit and Vegetable Products Global Value Chain Include?**

Population growth in the world necessitates an increase in agricultural production. However, since this increase rate is not the same rate, since the number of consumers without production increases, the importance of living in harmony with nature is not understood and human being is faced with nutrition problems. The value chain in agricultural products is a collection of activities that include all processes before and after harvest, that is, the sustainability of agriculture. When we think about contracted agriculture and similar production patterns, we can understand that the first stage contains much earlier than production. Market research, research and development work, product supply contracts with consumer and producer commitments, inputs and supports to farmers are available prior to the start of the production phase in this chain. In the Global Value chain, post-harvest operations include processing, packaging, storage, sale, marketing activities such as advertising to strengthen the brand value, digital marketing and many more. Increasing the value in the value chain should be ensured by highlighting product differences, not by reducing labor. Reduction of costs can be provided increase of production area with high yield, long-lasting varieties with increasing of shelf life, increasing fertilization, irrigation, labor cost reduction, using modern irrigation methods, increasing the state support given to products, reducing costs with the continuity of support given to farmers (Gökkür and Çelik, 2016).
While global competition is increasing, the competition understanding also changes. Production processes, which were previously carried out under a single roof, can now be carried out in more than one place and specialization areas are created in production. Thus, the different stages of the value chain can be deployed in different geographies (Erol, 2015; Gökkür and Çelik, 2016).

The Global Value chain can help businesses to stand out with their product diversity by increasing their competitiveness. The world's population is growing rapidly, and each business can find customers with good planning. World agriculture is interdependent. Considering the changes in yields due to climate changes, and the changes in the harvest dates, there is the potential to be transformed into a competitive system in food. The impossibility of farmers to access the market through production contracts is an issue to be considered. Research The development phase should be one of the first stages of the value chain. Product diversity is customer satisfaction and should be included in the Research Development phase in the value chain. Research and development services will reach the farmers quickly by increasing the communication of research institutes and farmers and demonstrations (Gökkür and Çelik, 2016).

The first condition to enter international markets is to ensure food security. Quality standards put an additional burden on manufacturers. These loads cannot be easily met by small businesses. In addition, standards should be developed not only for the foreign market but also for the domestic market (Alemdar, 2008; Gökkür and Çelik, 2016).

Post-harvest studies are important in storage efficiency. In our country, importance should be given to increase the number of cold stores and to expand the licensed warehousing. By expanding packaging technology throughout the country, the brand value of the products should be strengthened. In the Global Value Chain, all activities are important, and therefore, distinguishing between primary and supportive activities can provide for some important processes to be ignored (Gökkür and Çelik, 2016). Measures should be taken to minimize the losses in agricultural products during and post-harvest storage.

**In a standard Field Crops, Fruit and Vegetable Products Global Value Chain should include the following processes (Porter, 1985; Gökkür and Çelik, 2016):**

- Research & Development Studies (Early or Late Harvest Date, High Efficiency, High Quality, Shelf Life Long, Different Product Development Stages, Farmer Trainings)
- The Process to Decide on the Farmer's Area to Be Investigated
- Consumers' and Producers' Procurement of Products (Procurement Activities-Entering Logistic Operations)
- Commitment of the Business Owner, Love of Interest
- Financial Status Inputs to be Provided to the Farmer etc. Advances
- Supply
- Raw Material (Seed, Sapling, Fertilizer, Water) Production Costs
- Packaging Costs
- Production
- Product Type, Quality Characteristics
- Production Quantity
Conclusions

In many parts of the world, climate change threatens food access and food security. National Food Safety Strategy should be determined. Dependency on food should be reduced to other countries. It is necessary to plan the consumption and food supply of the country together. The yields of the varieties vary according to the regions where they are grown. Production areas in agriculture should be planned taking into account the regions where the yields are high. Planning should be done on the basis of self-sufficiency in agriculture. Production of some products can be increased according to the need. Consumption should be provided as much as possible from domestic production. If the domestic demand cannot be met and there are regions with suitable conditions in terms of cultivation of the imported products, the cultivation of the imported products in the country should be increased with the incentives to be given. Consumers access to food should be facilitated. This will help restrain the price increase in food in the medium term. In places where few agricultural products are grown, alternative products with high profitability can be grown. Our export potential can be increased by growing agricultural products needed by neighboring countries in regions close to the borders of countries. By reducing intermediaries in agriculture, affordable high quality products should be offered to the consumer.

Making arrangements to increase animal supply and meat supply will have positive contributions to increase country welfare.

Since agriculture provides raw materials to the industry sector, the development of the agriculture sector will also improve the industry sector. Sustainable growth occurs with the growth of the industry sector along with agriculture. Instead of growing directly in the industry sector, the growth of the industry sector together with the agriculture sector will have a positive effect on ensuring balance in income distribution. In order to reduce the dependence on imports in agricultural products, plans can be made according to the needs of sectors that provide raw materials from agriculture. By growing the agricultural products necessary for raw materials in areas close to industrial areas, the increase in the speed of conversion of agricultural areas into industrial areas can be slowed down.
A controlled structure is required in the use of herbicides and pesticides. Herbicide and pesticide users should be obliged to provide the seller with the information for which product and for how much area. The seller must also process this information into the herbicide and pesticide control program to be created on the computer. Traceability of agricultural products will positively contribute to achieving price stability in agricultural products.

All the rings of the value chain in agricultural products are responsible for access to food. The traceability of the value chain will have positive effects on the prevention of informality in agriculture. Agricultural products, agricultural lands and agricultural infrastructure should be considered as holistic in every project to be prepared for food traceability.

Yield, quality, harvest time price in agricultural products and the prices it takes in every activity after harvest are the parameters that play a role in shaping the international competitiveness. Every study to be made in order to be the country that invests in other countries in agriculture and evaluates the production potential together with its land assets will serve the welfare of our country. In order to increase the traceability of the food market, "every product grown is a brand" approach should be adopted by the agricultural sector.

The countries of the world should prepare a new production planning in order to ensure food security, taking into account the increase or decrease in the production of climate change and world agricultural products, or the products that will remain at the same level.

Countries should develop varieties with low production costs, high quality and different characteristics. Compulsory agricultural insurance should be made to farmers and the cost of this insurance should be covered by the supports given to agricultural products. A new agricultural management system should be prepared in which the size of agricultural holdings is increased by decreasing the number of parcels.

All things considered the source of digital technologies is information. With the use of digital technologies in agriculture, a successful food marketing management system can be established. In the near future, all activities in agriculture will be managed and monitored. What should be considered here is not to stay away from individual field observations while benefiting from technology. Because agricultural products consist of different varieties, the phenology of all of them is different. Care should be taken to ensure that the information storage capacity of the digital technologies to be used is high. The food marketing management system depends on the modernization of agriculture and the global value chain. The new value chain studies to be created will have positive contributions to the sustainability of agriculture.

REFERENCES


Erçakar M. 2010. Küresel Kriz Öncesi ve Sonrasında Tarım Kesimine Bakış (An Overview to Agriculture Sector Before and After Global Crisis). Journal of Management and Economics Research (The journal was firstly published under the name of 'Akademik Fener'), 8 (14), pp. 93-104.


