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ANALYSIS OF MARKETING STRUCTURE AND PROBLEMS IN GARLIC PRODUCTION: THE CASE OF KASTAMONU PROVINCE

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Abstract

In this study, the existing marketing system of garlic, which is an important product in terms of Kastamonu, was analysed. The problems of the farmer, the intermediaries and the handler were examined. In this frame, the data were obtained from the garlic farmers, intermediaries (agent, traders) and handler by questionnaire. The most important marketing channel for farmers in the region were traders. The price of garlic was usually determined by traders. The activities/number of members of the garlic producer association established in 2010 were not at the desired level. After the garlic produced by the farmers in the research area was classified according to their size and quality, they were offered for sale. Farmers were firstly tried to sell 3rd class small size and 2nd class medium-size garlic. First-grade garlic which can easily find buyers was kept in storage for more income. Problems in garlic farming; lack of technical knowledge of farmers, high garlic loss, the farmers tend to plant the Chinese garlic because of higher yield, lack of marketing opportunities, fluctuations in the price of garlic. With the development of storage facilities in the region, more income can be generated from the product. The development of organizational awareness at the level of producers in the region will increase the likelihood of the producer having a say in the market. Work should be done to protect the Taşköprü garlic. It is necessary to increase the awareness of this species, both within the country and abroad. Cooperative establishments for farmers to market in garlic will be a step towards ensuring price stability.

Key words**:** *consumption, organic products, Romania*

INTRODUCTION

There are 300 kinds of garlic in the world. It grows in all the climates and lands of the world. However, most plants prefer the abundant and sandy soil of selenium in temperate climates. From this point of view, Kastamonu is suitable for garlic agriculture by its land structure [10] [11].

Taşköprü Garlic is a product with "Geographical Recruitment" in the region [9]. Garlic is produced in almost all regions except the Northeast region of Turkey. Aegean region, Balıkesir, Aydın, Manisa, Mediterranean Region; Gaziantep, Antalya, Kahramanmaraş, Central Anatolia Region; Nevşehir, Kayseri, Karaman, Kastamonu, Samsun and Sinop in the Black Sea Region are among the important garlic production places. Turkey according to 2016 data dehydrated garlic planting area has 11,916 hectares (Fig. 1). The production amounted to 109,161 tons (Fig. 2).

Kastamonu province as of 2016 in terms of production and acreage of garlic is in first place in Turkey. The Kastamonu's garlic cultivated area share is 20.06% and production share is 22% of Turkey. Gaziantep is the second important garlic producers with 12.9% share of Turkey, Istanbul is third with 11.6%, Aksaray is fourth with 7.5%, Balikesir ranks is fifth with 6.1%.

Kastamonu is Turkey's highest dry garlic producer. Kastamonu province in 1991, a total of 13,298 tons of garlic was produced by making 1,514 hectares of garlic in the field. The cultivation area continued to increase year by year. In 2011, the total dry garlic production reached 19,937 tons. In 2013-2014 it decreased by 2,055 hectares. There was a decrease due to drought in 2012, planting area and yield decreased in 2013. From 2014, the cultivated area of garlic has risen to over 2055 hectares, and thus production has increased to 24024 tonnes in 2016. As of 1991-2016 years of dry garlic production share's 13.9% to

32.7% in Turkey was carried out by Kastamonu (Fig. 3).

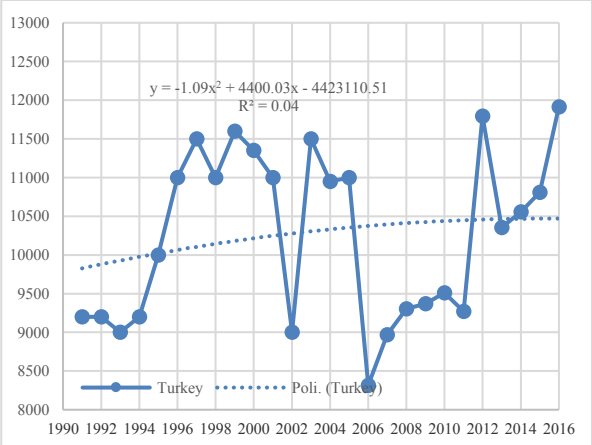

Fig. 1. Garlic cultivation areas (hectare) in Turkey
Source: TUİK [13].

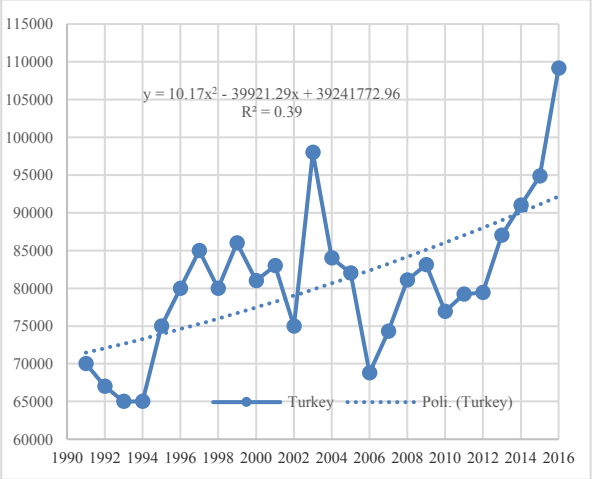

Fig. 2. Garlic production (tons) in Turkey
Source: TUİK [13].

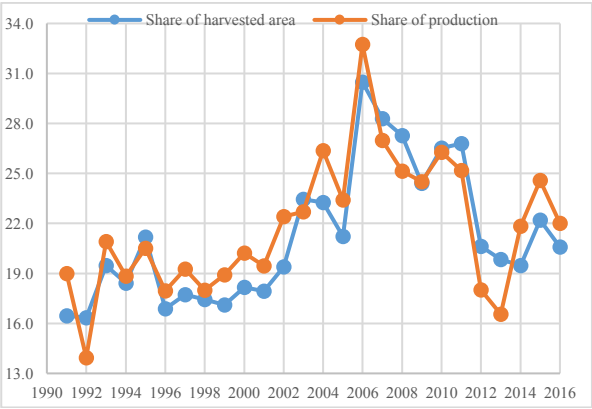

Fig. 3. Kastamonu's garlic production and harvested area share in Turkey
Source: TUİK [13].

Dry garlic production area in Kastamonu province is got stronger in Taşköprü, Merkez and Hanönü districts.

Taşköprü district was selected as a research area. The reason for this, Taşköprü is constituted of 87.6% of the Kastamonu's garlic harvested area and 90.6% of the production.

Studies on marketing about garlic are very few (Some of them Erkal et al. [4]; and Güneş et al. [6]). For this reason, in this study, it was aimed to determine the marketing conditions in the stakeholders' level of garlic cultivation and to identify the problems and to improve the production.

MATERIALS AND METHODS

The main material of the study was the data obtained by the face-to-face survey with farmers, intermediaries and processing companies in the villages of Kastamonu and Taşköprü. The data belong to the 2014 production period.

Method used to determine stakeholders numbers

In the study, data were obtained by face-to-face survey from farmers, intermediaries and processors dealing with garlic in the region. Taşköprü districts and villagers were identified as the study area. The questionnaires were prepared for stakeholders both for production and for marketing purposes. Questionnaires prepared according to the purpose of the research were filled by interviewing the stakeholders.

When the sample farmer's volume was determined, farmers' garlic harvested areas in the region were divided into three groups according to the width of the garlic field. Using layered sampling method [14], it was calculated that 105 of the number of farmers who grew garlic to be interviewed at a margin of error of 5% and a confidence interval of 99%. This sample volume was distributed to layers by the Neyman method [3]. First strata were identified farmers with 0.10-0.7499 hectare garlic cultivation area as I. group. Farmers with 0.750-1.50 hectare garlic cultivation area were II. group and farmers with 1.51 hectares and over garlic cultivation area were III. group (Table 1).

Table 1. The sample volume of garlic producers

Farm groups	Garlic harvested area (ha)	Population number (N)	Standard deviation	Variance	Average garlic harvested area	Sample number (n)
I	0.1-0.749	1,215	0.91	0.83	0.518	34
II	0.75-1.50	794	2.27	5.17	1.058	55
III	1.510+	111	4.60	21.15	1.886	16
Total		2,120	4.09	16.73	0.792	105

Source: Own calculation.

Twenty of the merchant-intermediaries who were active in the region were interviewed. There are 8 handlers as garlic processor in the region. Three of these companies were interviewed. The data were obtained by the face-to-face survey method. At this point, the marketing activities for each channel were included in the survey.

RESULTS AND DISCUSSIONS

Farmers' level

The 90.48% of the farmers was their parents where they learn about garlic farming channelled, while 7.62% of them from neighbouring farmers, and 1.90% of them from both neighbouring farmers and their own efforts.

At the beginning of the reasons why farmers prefer to cultivate garlic, the income was high (20.95%). The 13.33% of response prefer to cultivate garlic as a source of livelihood for themselves, 13.33% was because of high yields. 11.43% of the farms said that they preferred because of the easy and low cost of garlic cultivation.

About 64.76% of the farmers' garlic sale channel were merchants in the surveyed area. 28.57% of them were the district market, 4.76% of them were the company and 1.90% was the commission. Therefore, merchants are very influential in the garlic sale channel.

When the criteria for harvesting garlic in the area studied were examined that 8.57% of the farmers were colour of garlic; 75.24% of them were the maturity of garlic; 2.86% of them declared that they decided on the harvest date based on their hardness. 3.81% of the farmers interviewed were determined to consider market conditions in the garlic harvest.

The 2.86% of the farmers classified of garlic in the farmland, 7.62% of them in the farmhouses, 40.95% in the storage. According to this, it was determined that the farmers interviewed did not have enough storage.

The classification of the products is an important marketing activity. Classification is divided the different products with their similar ones in terms of height, size, shape, colour, etc. Classification enables the consumers to select the products according to their tastes and income levels. It makes purchase and sale of the products easier. It prevents the purchase of undesired products. It facilitates assigning prices to the products [5].

There are three classes of garlic according to Turkish Standard Institute 1,131 and farms took this classification into consideration. These are extra, first class, second class. The minimum diameter for garlic entering the extra class should be 45 mm. Garlic entering Class I and Class II should have a diameter of 30 mm - 45 mm (excluded) [1].

The garlic was sold according to the market conditions. As the producer obtains more money, he attempts to produce the extra class product. Considering the average of the farms, the 1st class had the highest ratio of 51.82%. 2nd class products follow with 30.71% and the extra class products with 17.46% (Table 2).

Table 2. Categorization of the garlic production in the farms

Groups	Extra-Class	I. Class	II. Class	Total
	The average of farms (kg)			
I	819.12	1,941.18	1,230.88	3,991.18
II	1,554.55	4,401.82	2,716.36	8,672.73
III	3,531.25	12,250.00	6,718.75	22,500.00
Average	1,617.62	4,800.95	2,845.24	9,263.81
	The share in the total production (%)			
I	20.52	48.64	30.84	100.00
II	17.92	50.75	31.32	100.00
III	15.69	54.44	29.86	100.00
Average	17.46	51.82	30.71	100.00

Source: Own calculation.

The majority (98.10%) of the farmers interviewed had lost crops. The garlic loss rates in the farmers were 5% at 17.14%; 2% in 16.19%; and 3% loss rate in 15.24% of farms.

About 85.71% of the farmers are not members of any agricultural cooperatives. Therefore, the organization of farmers in the region as producer association-cooperative is low.

Distribution of Gross Production Value (GPV)

Farms' Gross Production Value (GVP) was calculated as the sum of the revenues generated by the agricultural activities (such as crop production, supports, animal husbandry) for 2014 production season.

The mean GPV for farms was 101,713.53 TRY. In terms of farm size groups, the highest amount of GVP was in the third group farms at 171,488.73 TRY, followed by the second group with 100,459.40 TRY and first group with 70,919.22 TRY.

In the garlic size groups, the garlic production value was ranged from 17,061.76 TRY to 94,890.63 TRY, while the other crop production value was varied between 29,252.59 TRY and 35,554.34 TRY, and animal husbandry 24,604.87 TRY to 44,436.60 TRY (Table 3).

Garlic production values were the most important activities and the highest income in farms average and third groups. Indeed, garlic production value amounted to be 37.83% in average farms and ranged 24.06% to 55.33% of the total GPV in farm groups in the region. In the first group, other crop production value was the first with 41.25% of total GPV. This activity's share was changed 18.75% to 41.25% in the groups. Animal husbandry production value's share was 25.91% to 34.69% in the groups. In other words, farms derived more than one in four ratios of their annual GPV from animal husbandry production activities. Therefore, garlic production appears to be an important economic activity for the farms examined in the study (Table 3).

About 16.79% of the farmers interviewed had problems with garlic cultivation, 84.77% had disease and harmful problems, 16.19% had fertilizer and fertilization problem, 19.05% had irrigation problem, 8.57% had problems with machine use, 7.62% 11.43% of the problem was in the input structure, 3.81% in the equipment problem, 40.00% in the input prices, 19.04% in the control of the input vendors and 35.23% in the product prices. Of the 105 farmers interviewed, 56.19% said the market was inadequate for chickpeas and that in some periods the buyers' numbers were inadequate for the product.

59.05% of the farmers interviewed from the research findings stated that there is a lack of producers' organising in garlic production.

Table 3. Distribution of GPV in the farms

Production branches	I	II	III	Average
	Value (TRY/farms)			
Garlic production activities	17,061.76	35,314.55	94,890.63	38,482.38
Other crop production activities	29,252.59	35,554.34	32,161.50	32,996.77
Animal husbandry	24,604.87	29,590.52	44,436.60	30,238.38
Total	70,919.22	100,459.40	171,488.73	101,717.53
	Rate (%)			
Garlic production activities	24.06	35.15	55.33	37.83
Other crop production activities	41.25	35.39	18.75	32.44
Animal husbandry	34.69	29.46	25.91	29.73
Total	100.00	100.00	100.00	100.00

Source: Own calculation.

Stakeholders' level

It was discussed with 20 traders and 3 processors in the marketing channel.

85% of the traders purchased garlic on their behalf, 10% of them purchased garlic on firm behalf, and 5% of them purchased garlic on behalf of another merchant.

The period of purchasing garlic from farmers in the region was the most (50%) in July.

The traders declared that decisive of the garlic purchase price was garlic quality (30%), market supply and demand (20%), bargaining (20%), garlic classification (10%) and garlic size.

The majority of merchants (80%) did not have a garlic processing facility. 20% were in the garlic processing plant. A large majority (85%) of merchants had storage. 80% of them did market research.

A significant portion of merchants sold the product (80%) in advance while 5% sold futures.

Merchants reported that the development of market opportunities in the region, improvement of garlic yield, dissemination of conscious production, compliance with crop rotation, regulation of price uncertainty, control of Chinese garlic and improvement of garlic production in the region could be achieved.

All of the processing companies were Limited Liability Corporation.

Firm A has been in garlic purchase activity about 15 years, B 10 years and C about 1 year. The level of education of the workers employed by firms in their organizations was generally at primary and secondary level.

The managers' education level was generally university degree (66.67%). It was determined that the companies interviewed did not have an infrastructure for exporting. All of the companies sell garlic in the national market.

The marketing channels that companies use in purchasing garlic were usually "producer-commissioners" and "producer-collector-commissioners". Firms usually sold garlic to big chain stores in the national market. All of the companies interviewed conduct market research with their own team. Firms used domestic packaging material. Firms were using string bags and reported that their sizes varied between 100-250 g and 3 kg.

Standardization procedure for garlic was applied (classification of garlic to head diameter). They divided garlic into large, medium and small.

It was determined that 67.57% of the cost of 1 kg of garlic was raw material cost, 15.06% was processing cost, 9.65% was transportation cost and 7.22% was packaging cost.

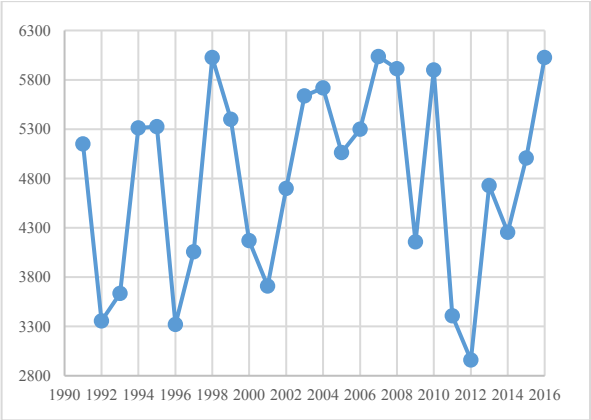

Fig. 4. Real prices of garlic (TRY/tons) in Turkey
Source: TUİK [13].

Over the years, the real prices of the garlic producers have fluctuated based on supply-demand balance (Figure 4). This result corroborates with Özkan and Aydın's [12] findings. Therefore, the effect of this had been felt more in garlic producers. It had been a reflection of net profit fluctuations of the farmers. Reducing the production costs to the minimum level or increasing the yield potential in this situation are the ways of the farmer. However, this is hardly achieved due to the nature of agricultural products.

Yurdakul [16] defined marketing channels that they are routes through which agricultural products move from producers to consumers. These channels' length varies from commodity to commodity.

Yurdakul [16] declared the marketing channels of the fruit and vegetable in Turkey below:

Producer – Agriculture Cooperative – Retailer - Consumer

Producer – Wholesaler – Commissioner – Retailer – Consumer

Producer – Commissioner – Wholesaler – Retailer – Consumer

Producer – Middleman – Commissioner (at the production place) – Wholesaler – Commissioner (at the consumption place) – Retailer – Consumer

In investigated areas, there were local wholesale, merchants, commissioners, processing firms. Farmers can directly sell their garlic to the local wholesalers or processing firms. Some of the common marketing channels for garlic are farmers, local wholesalers, merchant, retailers, and consumers. The wholesale markets play an important role in the entire marketing channel for garlic.

SWOT Analysis of Garlic Sector

In this study, the SWOT analysis [2] [7] [8] [15] [17] for garlic production was based on the opinions of stakeholders related to garlic. Within this framework, the strengths, weaknesses, opportunities and threats of garlic production are presented in the framework of information obtained from producers, intermediaries and processors.

The strong aspects of garlic in the region are appropriate to the ecological conditions; product quality; Turkey is the center of the garlic production; the substances in the soil structure are effective in the production of high-quality garlic; taste and smell are different according to other garlic; the storage life varies from approximately 12-14 months; high yield; little use of inputs; income is high.

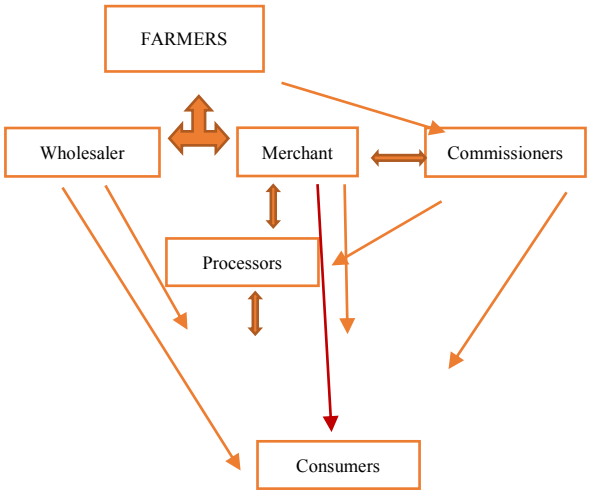

Figure 5. Marketing channels of garlic
Source: Own calculation.

The weaknesses of the sector in the field of research are the failure of producers to carry out soil analyses and the inadequacy of organization in production and marketing of the region in which the research is conducted. As a matter of fact, some producers in the region were found to have fewer organizations. The price of garlic is not established by certain committees and organizations. According to the number of merchants coming to the bazaar according to supply-demand in the local market, the price formation takes place. It can be said that with the increase of the organizations, the producers will have an advantage in terms of input and sales price. Inadequate/unconscious input by farmers in the region surveyed may lead to lower productivity and quality in production. The development of the garlic industry is also due to the inadequate processing, sorting and packaging facilities.
Opportunities in the region's garlic sector are that the use of technology is increased, the harvest season of the garlic grown in the region is different from other regions, the usage areas are widespread, and the regional varieties are preferred by consumers.
The threats in the garlic sector of the region covered in the survey are: climate change, increased disease and pests, which in turn affects the quality and price of the garlic; the difficulty of finding workers in the region; lack of production planning; price instabilities; some farmers turn to Chinese garlic cultivation due to the high yield.

CONCLUSIONS

In this study, the marketing structure and problems of the garlic sector in Kastamonu province were examined. It was tried to bring solutions for the sector.
Kastamonu province for 21.8% of garlic production to meet in Turkey, was selected as the research area. The most important district of Kastamonu where garlic production is concentrated is Taşköprü. Garlic farm made in Taşköprü district constitutes one of the important income resources of the families.
An important part of the garlic produced in Taşköprü is evaluated in internal markets. The main fields used in the internal market are meat products (especially sausage and bacon) industry, pickle industry, head and fresh spices. Industries that will use garlic in the region by processing canned, puree, dried tablets, etc., have begun to develop.
Farmers in the region sell garlic usually in neighbourhood markets. Merchants are the most buyer of garlic in the neighbourhood markets. The price of the garlic is formed by the supply-demand and the number of merchants coming from the bazaar. According to this situation, farmers can turn marketing margins into their own interests by setting up cooperatives for garlic marketing. With the activities of the garlic producer association established in 2010, the number of members is not at the desired level. It could not be worked effectively. It needs to be supported and developed.
After the garlic produced by the farmers in the research area are classified according to their size and quality, they are offered for sale. The farmers were selling predominantly middle-class third-class small-sized and second-class medium-sized garlic on the market, which is more difficult to sell. First class garlic, which always finds recipient easily, is kept in storage to get more income and is driven to the market according to its price.
Garlic hiding warehouse was usually a simple warehouse. Long-term storage in Kastamonu is made by merchants other than a few farmers. Merchants are able to sell their garlic for a certain period of time, drive into the market during winter, and sell high prices.

With the development of storage facilities in the region, more income can be generated from the product. Contractual production for farmers in the region may also be an alternative.

The problems experienced in garlic farming in the region were the fluctuations in the price of the garlic, the problems of the marketing opportunities, the farmers' tendency to plant Chinese garlic because the higher yield, inadequate technical knowledge of farms and losses in harvesting.

For the development of the sector with the movement from the obtained findings:

-At the farmer level, agricultural extension activities should be increased and this should be aimed at solving the right problem.

-Knowledge of organisation at the level of farmers in the region should be improved, which will increase the likelihood of farmers being active in the market.

-In particular, the so-called Taşköprü garlic is one of Turkey's most important species in terms of quality, flavour and durability. Therefore, studies should be done to protect their characteristics.

-It is necessary to increase awareness of Taşköprü garlic in domestic and international markets.

-There is no organised structure in production and marketing of the region in which the research is conducted. In the years when production is low, while the product price is rising, the product price can decrease considerably due to the production excess due to high price expectation next year. This can lead to significant price instability over the years.

Therefore, it can be stated that farmers may have taken a step towards price stability by establishing cooperatives to market in garlic.

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