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Evaluation of Agro-Industries According To Management Functions: Case of Konya Province

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ABSTRACT

The study is to investigate the current situation in agricultural industry enterprises according to business functions. The data used in the research were made voluntarily through face-to-face interviews. The sample volume of the study was determined as 199 according to the quota (stratified purposive sampling) sampling method in the agro-industries of Konya, using TOBB data. According to the research results, it has been determined that the management functions in agro-industries are mostly carried out by business owners, business managers are generally male individuals, and their education level is generally at the undergraduate level. In agro-industries, raw materials are mostly (43.22%) brought from the province of Istanbul. It has been determined that the majority of agro-industries operate in national and international (71 enterprises) markets. The majority of the exports (15.08%) in the analyzed agro-industries are allocated to Iraq. It is stated that the average annual turnover of agro-industries is approximately 61 million TL. In agro-industries, income is one of the important factors used in determining the level of enterprises. When we look at the sector, it can be said that the existing industry consists of workshop-type family businesses rather than institutionalized companies and they have just started to institutionalize.

1. Introduction

While some of the products obtained as a result of agricultural production reach the consumer without being involved in any process, the other part can be consumed only after processing. Agro-industries are examined in two groups, agro-based, and agro-linked industries. In order to increase the efficiency in agricultural production, fertilization, and agricultural struggle, agricultural mechanization technologies are carried out by agro-linked industries. Agro-industrial enterprises consist of both the industry branch that provides input to agriculture and the sector that transforms agricultural raw materials into processed and semi-finished products. In order to increase efficiency in agricultural production, fertilization, agricultural struggle, and agricultural mechanization technologies are carried out by agro-linked industries. The branch of industry that uses agricultural products as raw materials, processes agricultural products, and makes them usable and transportable over long distances is agro-based industries.

In agro-industries, businesses engage in many activities to survive and achieve their goals. There is a systematic path to be followed for all activities that need to be achieved. Institutions and organizations consisting of certain elements and operating in line with specific goals have a functional system within themselves (Genç, 2017). Business activities that are grouped according to their similarities are called “business functions” (Yüksel, 2008). This study aims to examine the structures of agro-industrial enterprises according to their business functions.

2. Materials and Methods

The main material of the study consists of primary data obtained from agro-industry business managers operating in Konya. Agro-industries were examined according to the "International Standard Industrial Classification (ISIC)" classification method established by the UN. According to this classification, agro-industries:

A: Agro-based industries 1) Food industry 2) Beverage industry 3) Tobacco and products Industry 4) Textile and clothing industry 5) Leather and products industry 6) Forest products industry 7) Paper industry

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B: Agro-linked industries 1) Agricultural equipment and machinery industry 2) Fertilizer industry 3) Agro-pharmaceutical industry 4) Seed industry

Within the scope of the study, the agro-industry enterprises located in the province of Konya in the union of chambers and commodity exchanges of Turkey (TOBB) records constitute the total population. The current situation of the agricultural industry enterprises in the research area is given in Table 1 and it is a total of 899 enterprises. Since the criterion of capacity as a criterion in determining samples from the total population is not homogeneous based on enterprises, quota sampling was made by considering the number of personnel of the enterprises. Quota sampling (stratified purposive sampling) is the grouping of the researcher from the population according to certain characteristics and sampling until a certain number of them is reached (Moser & Stuart, 1953; Yağar & Dökme, 2018). Accordingly, the number of enterprises in the sample was determined not less than 20% of the enterprises operating in the same field (Table 1). TOBB has classified enterprises as 1-9, 10-49, and 50-249, enterprises with 250 or more employees (Mecek, 2020). To analyze the data obtained because of the study in a homogeneous way, the number of personnel of the enterprises was divided into strata, considering the classification of TOBB.

Table 1
Distribution of agro-industrial enterprises in Konya according to sub-sectors and determination of sample enterprises

Agro-industry sectors		1-9 *	Eg. **	10-49 *	Eg. **	50-249 *	Eg. **	250-+ *	Eg. **	Sum Pop. ***	Sum Eg. ****	Eg. **
Agro-based industries	Food industry	175	35	185	37	64	16	10	2	434	90	20,74
	Beverage industry	2	1	7	3	2	1	-	-	11	5	45,45
	Tobacco and products Industry	-	-	-	-	-	-	-	-	-	-	-,--
	Textile and clothing industry	23	5	25	5	16	4	5	1	69	15	21,74
	Leather and products industry	33	7	25	5	4	1	-	-	62	13	20,97
	Forest products industry	23	4	15	4	4	1	-	-	42	9	21,43
	Paper industry	14	4	11	5	6	2	-	-	31	11	35,48
Agro-based industries		270	56	268	59	96	25	15	3	649	143	22,50
Agro-linked industries	Fertilizer industry	20	4	10	3	2	1	-	-	32	8	25,00
	Agri. equipment and machinery industry	114	23	70	15	19	4	-	-	203	42	20,69
	Agro-pharmaceutical industry	8	3	3	2	4	1	-	-	15	6	40,00
	Seed industry	-	-	-	-	-	-	-	-	-	-	-,--
Agro-linked industries		142	30	83	20	25	6	-	-	250	56	22,40
Agro-industries		412	84	351	79	121	33	15	3	899	199	22,14

Note: *Total population according to the number of personnel, **Number of businesses to be interviewed, ***Total population in industry sub-branches, ****Number of sample businesses to be drawn from the total population, ***** What percentage of the total population will be interviewed according to sampling

Data related to businesses in agro-industries are classified based on business functions. Although there are various classifications for business functions, the generally accepted classification is developed by Fayol (1916) in his book "General and Industrial Management".

a. General administration (Management) function

b. Production management function

c. Marketing management function

d. Finance and accounting management function

e. Human resource management function

f. R&D management function

The research data is presented in a table by analyzing frequency and percentage calculations.

The attitudes, behaviors, and perceptions of the business managers in the agro-industries in Konya were analyzed using a 5-point Likert-type scale. A Likert-type scale is the most practical method for measuring attitudes. Therefore, this method is used similar data (Powers & Xie, 2008; Ünlüer & Güneş, 2013; Christoforou et all. 2018;)

3. Findings and Discussion

In terms of business functions of the agro-industries examined within the scope of the study, general administration function (agricultural industry sub-sectors, legal structure, establishment date, etc.), production function (input supply method, where they obtain input from, etc.), marketing function (market network, export status, etc.), R&D management function (R&D status, number of patents, status of following innovations, etc.), finance and accounting function (annual turnover), and human resources function (number of personnel, personnel qualifications, etc.) were examined.

3.1. Management structures according to business functions in agro-industries

The management statuses according to the management functions in the examined agro-industries are shown in Table 2. In the general administrative management of agro-industries in Konya, 67.34% were managed by the business owners, 22.61% by the family of the business, and 10.05% by a professional manager. While the professional manager is 11.89% in agro-based industries, this rate is 5.36% in agro-linked industries. In the study conducted by Mazgal&Bozoglu (2006) in Samsun province, it was determined that only 1.70% of the agriculture-based industrial enterprises were managed by professional managers. General administrative management in agro-industrial enterprises is usually carried out by business owners. The current management and business entrepreneurship qualities of the business owner or business family are the important factors that make up the success of businesses. This situation can bring various advantages to the company, as well as lead to negative consequences. Being flexible and fast in the decision-making process creates a positive effect on the business in businesses managed by the owner or his family. Despite this, the decisions made by the owner of the business due to the lack of management, knowledge,

and experience can lead to negative consequences for the business.

In the production management of agro-industries, 56.78% were managed by the business owners and 20.60% are managed by the business family. In agro-industries, professional managers were found in general administration management with a ratio of 10.05%, while in production management with a share of 22.61%. While business owners hold the general administration into their own hands, they can also prefer professional managers in the field of production. While the professional manager was 22.38% in agro-based industries, this rate was 23.21% in agro-linked industries.

In the marketing function of the enterprises, 48.74% were managed by the business owners and 17.59% by the business family. The fact that there are more professional managers in the marketing department compared to other business departments shows that companies give more importance to marketing. While the professional manager was 30.77% in agriculture-based industries, this rate was 41.07% in agriculture-related industries.

In agro-industrial enterprises, 22.11% of the R&D management was managed by the business owners and 10.05% by the business family. Enterprises that do not have an R&D department in agro-industries and that do not have a business manager had a large share of 40.70%. This shows that R&D was not given enough importance in agro-industries. While the professional manager was 25.87% in agriculture-based industries, this rate was 30.36% in agro-linked industries.

Table 2
Management structures of the agro-industries studied

Agro-industry sectors		Business owner		Business family		Professional Manager		Do not have Department		Total	
		Count	%	Count	%	Count	%	Count	%	Count	%
General administration	Agro-based	99	69,23	27	18,88	17	11,89	-	-	143	100,00
	Agro-linked	35	62,50	18	32,14	3	5,36	-	-	56	100,00
	Agro-industries	134	67,34	45	22,61	20	10,05	-	-	199	100,00
Production	Agro-based	83	58,04	28	19,58	32	22,38	-	-	143	100,00
	Agro-linked	30	53,57	13	23,21	13	23,21	-	-	56	100,00
	Agro-industries	113	56,78	41	20,60	45	22,61	-	-	199	100,00
Marketing	Agro-based	74	51,75	25	17,48	44	30,77	-	-	143	100,00
	Agro-linked	23	41,07	10	17,86	23	41,07	-	-	56	100,00
	Agro-industries	97	48,74	35	17,59	67	33,67	-	-	199	100,00
Finance and accounting	Agro-based	39	27,27	22	15,38	82	57,34	-	-	143	100,00
	Agro-linked	19	33,93	8	14,29	29	51,79	-	-	56	100,00
	Agro-industries	58	29,15	30	15,08	111	55,78	-	-	199	100,00
R&D	Agro-based	30	20,98	12	8,39	37	25,87	64	44,76	143	100,00
	Agro-linked	14	25,00	8	14,29	17	30,36	17	30,36	56	100,00
	Agro-industries	44	22,11	20	10,05	54	27,14	81	40,70	199	100,00
Human resource	Agro-based	51	35,66	16	11,19	28	19,58	48	33,57	143	100,00
	Agro-linked	18	32,14	8	14,29	15	26,79	15	26,79	56	100,00
	Agro-industries	69	34,67	24	12,06	43	21,61	63	31,66	199	100,00

3.2. Structure of the general administration (Management) function in agro-industries

The gender and education status of business owners and professional managers in the examined agro-industries is shown in Table 3. It was determined that 95.67% of the business owners were male and 4.33% are female founders or partners. In the study conducted by Keskin (2014) on the situation of women entrepreneurs in Turkey, it was stated that the rate of employers and self-employed women was 12.10% in 2012 and 14.90% of total entrepreneurs were women entrepreneurs. It was determined that 82.10% of the agro-industries consisted of male professional managers. There is a similar situation in the study by Üçler and Karaçor (2015). In the study on the industry in Konya, it was stated that male business managers managed 76.40% of them. In addition, in a study by Ulas and Çakır (2004) in the agro-based industry in Van determined that 97.70% of business managers were men.

While only 4.28% of agro-industry business owners were women, the rate of professional managers they employ was 17.90%. While the rate of female professional managers in agro-based industrial enterprises was 16.03%, this rate was determined as 23.08% in agro-linked industries.

It was determined that the majority of the business owners of agricultural industrial enterprises (62.50%) were primary or high school graduates. Insufficient education of business owners or partners is one of the major causes of business failure. Due to the lack of education, the developments in the growth process of the enterprise may not be properly controlled and problems related to business management may occur. However, especially considering the country's scale, it is seen that there are many entrepreneurs who set an example of success despite their low education levels. The common features of these examples are; Despite their low level of education, it is shown that they have the opportunity to work with people who have experience or expertise in the master-apprentice relationship.

Table 3
General administrative management gender and education status in the analyzed Agro-industries

Agro-industry sectors			Business owner			Pro. Manager		
			Agro-based	Agro-linked	Agro-industries	Agro-based	Agro-linked	Agro-industries
Education	Primary edu.	Count	0,62	0,43	0,56	0,08	0,09	0,08
		%	28,12	23,30	26,92	4,23	5,88	4,64
	High school	Count	0,85	0,48	0,74	0,21	0,32	0,24
		%	38,66	26,21	35,58	11,54	21,18	13,91
	Associate Deg.	Count	0,04	0,11	0,06	0,25	0,20	0,24
		%	1,92	5,83	2,88	13,85	12,94	13,62
	Bachelor	Count	0,62	0,77	0,66	1,25	0,88	1,15
		%	28,43	41,75	31,73	68,85	57,65	66,09
	Master Deg.	Count	0,06	0,05	0,06	0,03	0,04	0,03
		%	2,88	2,91	2,88	1,54	2,35	1,74
	Total	Count	2,19	1,84	2,09	1,82	1,52	1,73
		%	100,00	100,00	100,00	100,00	100,00	100,00
Gender	Female	Count	0,10	0,05	0,09	0,22	0,30	0,25
		%	4,79	2,91	4,33	12,31	20,00	14,20
	Male	Count	2,08	1,79	2,00	1,59	1,21	1,49
		%	95,21	97,09	95,67	87,69	80,00	85,80
	Total	Count	2,19	1,84	2,09	1,82	1,52	1,73
		%	100,00	100,00	100,00	100,00	100,00	100,00

The legal statuses of the examined agro-industries are shown in Table 4. 72.86% of agro-industries were limited liability companies, 16.58% were joint stock companies and 10.55% were individual property. While there were 70.63% limited liability companies in agro-based industries, this rate was 78.57% in agro-linked industries. In the study of Herdem (2014) on software and R&D companies in Konya, it was determined that most enterprises (63.60%) were limited liability companies. Ulaş & Çakır (2006); In the research conducted in the agro-industries in Van, it was determined that 38.88% of the companies were joint stock companies. Contrary to this, in the study by Çelikkaya (2010) on SMEs in Gebze determined that the joint stock company rate was 86.70% and the limited company rate was 13.30%. The legal structure of businesses depends on the cities they are in, the structure of the business, the situation of the entrepreneurs, the sector, etc. appears to vary accordingly.

Table 4
Legal status of examined agro-industries

Agro-industry sectors	Joint stock		Individual property		Limited liability		Total	
	Count	%	Count	%	Count	%	Count	%
Agro-based industries	24	16,78	18	12,59	101	70,63	143	100
Agro-linked industries	9	16,07	3	5,36	44	78,57	56	100
Agro-industries	33	16,58	21	10,55	145	72,86	199	100

3.3. Structure of the product management function in agro-industries

Production: It is expressed as increasing the use of goods or services used to meet human needs. The production unit is defined as the provision of raw materials or inputs and the realization of production to carry out the production activities of the enterprise (Kobu, 2017).

The establishment dates of the examined agro-industries are given in Table 5. The establishment dates of enterprises in agro-industries vary. It is seen that 42.71% of agro-industries were established between 1991 and 2010 and continued their activities. Businesses that have been continuing since 2011 have a rate of 27.64%. In a study conducted by Üçler & Karaçor (2015) on industrial enterprises in the province of Konya, it was stated that 31.00% of the establishment dates of the enterprises were between 2001-2009 and 32.50% between 1990-2000. In addition, in the study conducted by Mazgal & Bozoğlu (2006) on agriculture-based industrial enterprises in Samsun, it was stated that the majority of the establishment dates were started after 1991.

In the study by Doğan (2013) on the industrialization process of Turkey, it was reported that since 1950, decisions have been taken to accelerate development in Turkey and the world and to support private investors. With the Second Five-Year Development Plan, it was stated that policies were followed in order to make and support investments in the field of industry in other provinces apart from metropolitan cities. In the sixth five-year development plan implemented between 1990 and 1994, it was stated that the importance of industry increased, and industrialization was the main source of development. This information confirms the establishment dates of the agricultural industries established in the research area.

Table 5
Distribution of the examined agro-industries by date of establishment

Agro-industry sectors	1950-1970		1971-1990		1991-2010		2011-+		Toplam	
	Count	%	Count	%	Count	%	Count	%	Count	%
Agro-based industries	12	8,39	30	20,98	63	44,06	38	26,57	143	100

Agro-linked industries	5	8,93	12	21,43	22	39,29	17	30,36	56	100
Agro-industries	17	8,54	42	21,11	85	42,71	55	27,64	199	100

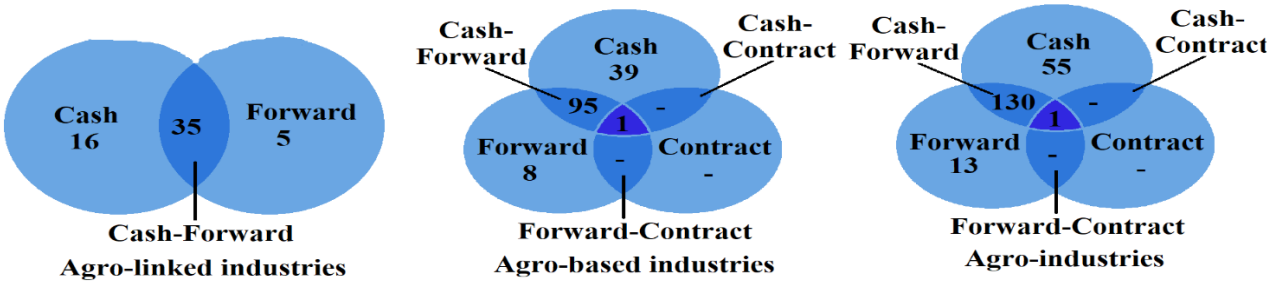
The raw material supply method in the examined agro-industries is shown in Table 6. 61.00% of the agro-industries purchased the input in cash. The rate of agro-industry enterprises that purchase input on a forward basis was 38.75%. While the agro-based industries purchased the raw material in cash at 61.61%, the agro-linked industries remained at the rate of 59.46%. In the study conducted by Yalcin & Esengün (2008) on food industry enterprises in the province of Tokat, it was determined that the enterprises did not engage in contracted farming, and received the inputs on a forward basis or in cash.

Table 6
The raw material supply method in the examined agro-industries

Agro-industry sectors	Cash Purchase	Forward Purchase	Contract farming	Total
Agro-based industries	61,61	38,05	0,34	100
Agro-linked industries	59,46	40,54	-	100
Agro-industries	61,00	38,75	0,25	100

The raw material supply limits of the examined agro-industries are shown in Figure 1. It has been determined that the majority of agro-industrial enterprises (130 enterprises) use both cash and forward basis purchases. While the number of businesses that purchase raw materials only in cash is 55, the number of those that purchase only in time is 13. It has been determined that the majority of the agro-based industries (95 enterprises) examined use both cash and forward basis purchases. While the number of businesses that purchase raw materials only in cash is 39, the number of those that purchase only in time is 8. It was observed that only 1 enterprise used the contract farming method. It has been determined that the majority of the agro-linked industries (35 enterprises) examined use both cash and forward basis purchases. While the number of businesses that purchase raw materials only in cash is 16, the number of only time deposits is determined as 5. The contracted (agricultural) production model is a form of production and marketing because the companies receive the product to be obtained under certain conditions, even though the product at the planting-planting time or the farmer assumes the responsibility of realizing a certain cultivation area and production (Hekimoğlu & Altındeger, 2012). Since there are enterprises that provide input to agriculture in agro-linked industries, contract farming cannot be done in these enterprises.

Figure 1
The cluster of raw material purchase methods (number of enterprises) in the agro-industries studied



The distribution of raw materials used in the examined agro-industries is given in Table 8. It has been determined that 44.82% of the agro-industries allocate the input from within the province. The ratio of enterprises allocating input from other provinces was determined as 42.83%. It has been determined that while the industries based on agriculture allocate the raw materials mostly (46.91%) from other provinces, the industries related to agriculture mostly (50.45%) from within the province.

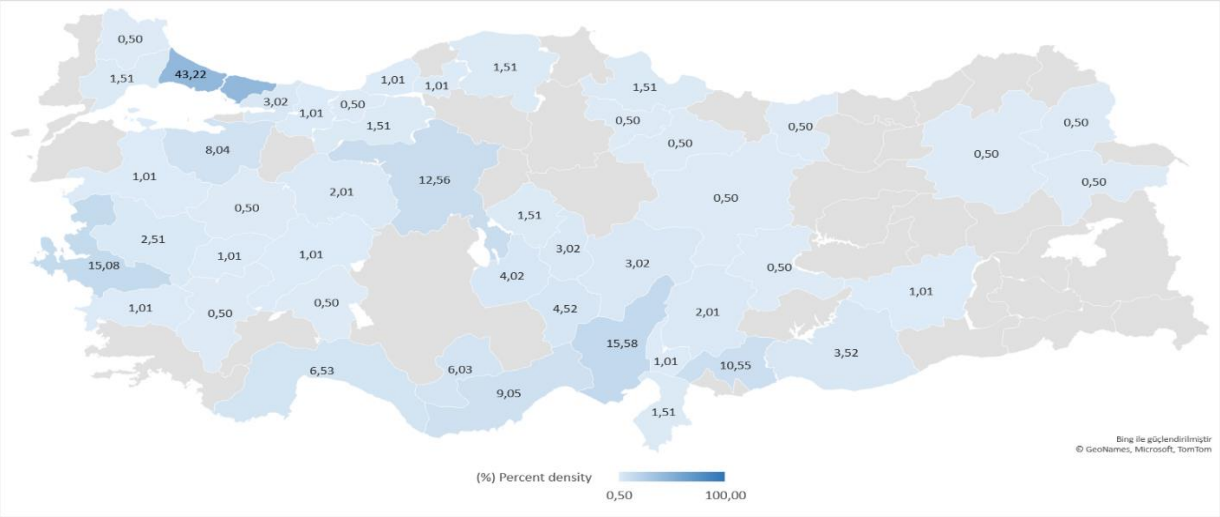
Table 7
Distribution of raw material supply locations used in the examined agro-industries (%)

Agro-industry sectors	Within the province	Other provinces	Own production	From abroad	Toplam
Agro-based industries	42,62	46,91	3,39	7,08	100
Agro-linked industries	50,45	32,41	4,29	12,86	100
Agro-industries	44,82	42,83	3,64	8,70	100

Figure 2 shows where the raw materials used in the examined agro-industries were obtained from outside the province of Konya. While creating the raw material supply map, the places where the enterprises are supplied with raw materials are determined by frequency and percentage calculations. It has been determined that agro-industries supply raw materials mostly (43.22% of enterprises) from Istanbul on the basis of provinces. Istanbul was followed by Adana (15.58%), Izmir (15.08%), Ankara (12.56%), Gaziantep (10.50%), Mersin (9.05%), Bursa (8.04%) respectively, Antalya (6.53%), Karaman (6.03%), and Aksaray (4.02%). Except for these provinces, raw material supply remained

at the rate of 2.38% and Şanlıurfa, Kocaeli, Kayseri, Manisa, etc. provinces have been identified. It has been observed that the examined agro-based industries mostly supply inputs from the province of Istanbul (24.62%). It is stated that Adana is in second place in the supply of inputs with 10,77% and Gaziantep in third place (7.69%). It is seen that the input supply in the industries related to agriculture was mostly met in the province of Istanbul (29.73%). However, it was determined that while the input supply in agro-linked industries is in second place in İzmir (17.57%), it was in fifth place in agro-based industries. Agro-linked industries; It was determined that while obtaining input supply from provinces such as Aksaray, Manisa, Nevşehir, Şanlıurfa, and Karabük, agro-industries did not bring raw materials from these provinces. It was determined that while agro-based industries use provinces such as Gaziantep, Antalya, Karaman, and Niğde, agro-linked industries didn't establish a relationship with these provinces in terms of input supply.

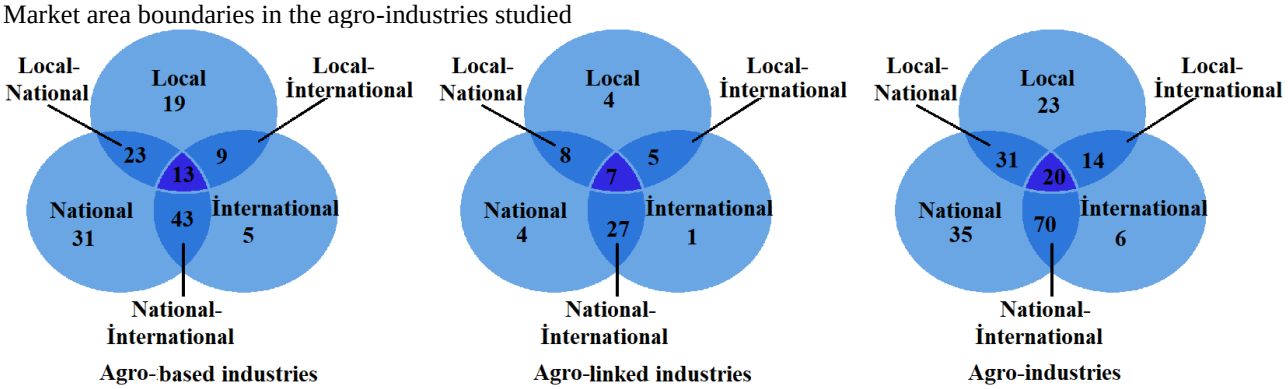
Figure 2
Provinces from which the examined agro-industries supply raw materials (%)



3.4. Structure of the marketing management function in agro-industries

In agro-industries, it is of great importance for enterprises to operate on an international and national scale and for the development of national and international trade. The scope of activity of the examined agro-industries is given in Figure 3 based on enterprises. It was determined that the majority of agro-industries operated in national and international (70 enterprises) markets. However, there were 35 enterprises operating only in the national market, while 31 enterprises operated in both regional and national areas. In a study conducted by Dinçer (2010) on SMEs in Eskişehir, it was stated that 38.60% of the enterprises operate regionally, 52.90% nationally, and 39.80% internationally. It was determined that the majority of the examined agriculture-based industries consist of companies that use the national-international (43 enterprises) field of activity. While the number of enterprises with a market network in the national area was 111, 31 of these enterprises only created a market network in the national area and did not form a regional or international market network. In the study Bakkaloglu (2018) on Turkish food industry enterprises, it was determined that while the majority of the enterprises constituted the national-international field of activity, only the enterprises with a regional market network drew attention when their small enterprises were taken into account. A result similar to the situation in the agro-based industries occurs in the examined agro-linked industries.

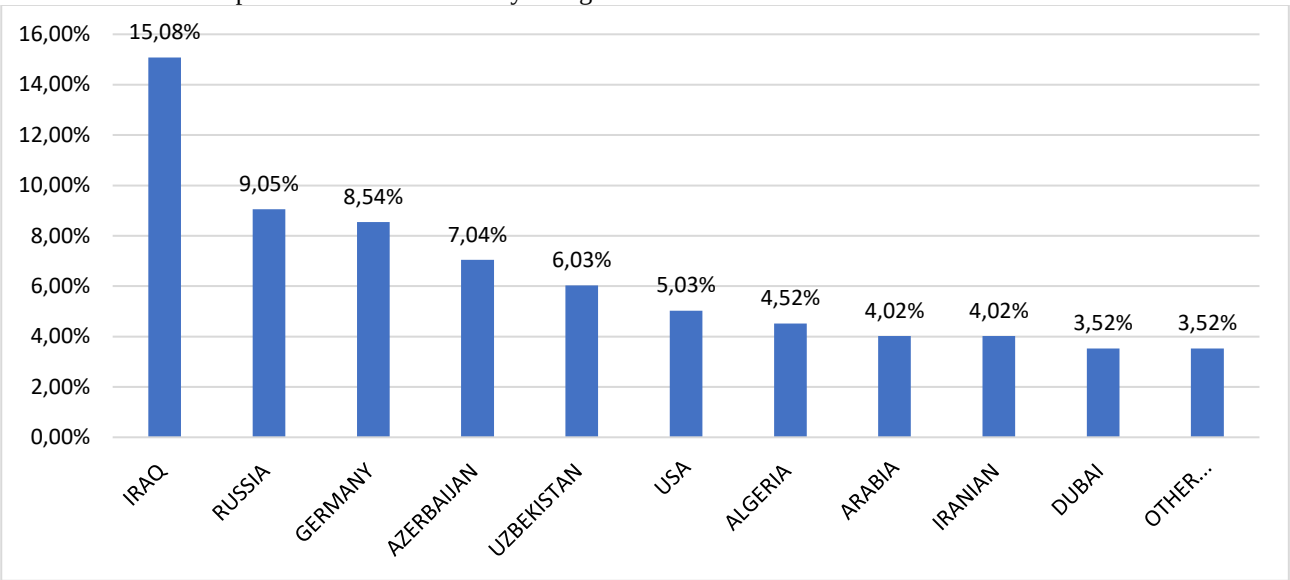
Figure 3
Market area boundaries in the agro-industries studied



The exported countries in the examined agro-industries are shown in Figure 4. The majority of exports (15.08%) in agro-industries were allocated to Iraq. Iraq is followed by Russia (9.05%), Germany (8.54%), Azerbaijan (7.04%), Uzbekistan (6.03%), etc., respectively. countries followed. Apart from these top ten countries, agro-industries include Palestine, France, Qatar, England, Italy, Libya, Egypt, Romania, Jordan, Belgium, etc. countries were also exported. In the study conducted by KSO (2022) on Konya's economic data, it was stated that the export of Konya province in 2021 was in the eleventh rank in Turkey. In addition, most of the exports are from Iraq, USA, Germany, Russia, etc. countries have been identified.

When the non-exporters in agro-industry enterprises are investigated, insufficient infrastructure, insufficient production, insufficient financing power, excessive raw material prices, inability to deliver the product to the customer in the country, insufficient operating capacity, small company, lack of personnel, insufficient technology, product exportability, unsuitable, etc. causes have been identified.

Figure 4
Countries to which exports are made in the analyzed agro-industries



3.5. Structure of the finance and accounting management function in agro-industries

Annual sales turnovers of the examined agro-industries are shown in Table 8. It was determined that 46.73% of agro-industrial enterprises had an income between 0 and 550 thousand $. It was stated that the average annual turnover of agro-industries was approximately 3.352 thousand $. While 23.08% of the agro-based industries earn more than 2.201 thousand $, this rate was seen as 14.29% in the agro-linked industries. While the average annual turnover in agro-based industries was 1.594 thousand $, it was 3.132 thousand $ in agro-linked industries. In the study conducted by Bakkaloglu (2018) on the Turkish food industries, the majority of the enterprises had an income of more than 190 thousand $, in the study conducted by Dinçer (2010) on SMEs in Eskişehir, only 5.00% of the companies were 660 thousand $ reported having more income. The country's economic conditions also change the enterprises' income over the years.

Table 8
Annual sales turnover in the examined agro-industries (thousand $)

Agro-industry sectors	0-550		551-1.100		1.101-1.650		1.651-2.200		2201-+		Total	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Agro-based industries	68	47,55	22	15,38	13	9,09	7	4,90	33	23,08	143	100,00
Agro-linked industries	25	44,64	14	25,00	5	8,93	4	7,14	8	14,29	56	100,00
Agro-industries	93	46,73	36	18,09	18	9,05	11	5,53	41	20,60	199	100,00

Note: (1$=18,20 TL in 2020), (1$=5,29 in 2018), (1$=1,53 TL in 2010)

3.6. Structure of the R&D management function in agro-industries

The concept of research and development is generally understood as the research and development methods used in producing and developing new products. However, developing methods that will increase the company's profitability in marketing, finance, accounting, and human resources management also has an important function in achieving company goals (Kahveci $ Baş, 2015).

The status of R&D activities in the examined agro-industries is given in Table 9. It was determined that

43.72% of the agro-industries enterprices actively carried out R&D studies, 33.67% did not carry out R&D studies, and 22.61% did R&D studies, even if they were not laboratories, even partially. While the enterprises that did not perform R&D in agro-based industries constituted 28.67%, this rate was 46.43% in agro-linked industries. Tan et al. (2017) stated that 75.16% of the enterprises in the province of Çanakkale on agro-based industries, and in the study conducted by Mazgal and Bozoğlu (2006) in the province of Samsun, 80.70% of the enterprises did not carry out R&D activities.

Table 9
The status of doing R&D activities in the examined agro-industries

Agro-industry sectors	Enterprises doing R&D		Enterprises partially engaged in R&D		Enterprises that do not do R&D		Total	
	Count	%	Count	%	Count	%	Count	%
Agro-based industries	63	44,06	39	27,27	41	28,67	143	100,00
Agro-linked industries	24	42,86	6	10,71	26	46,43	56	100,00
Agro-industries	87	43,72	45	22,61	67	33,67	199	100,00

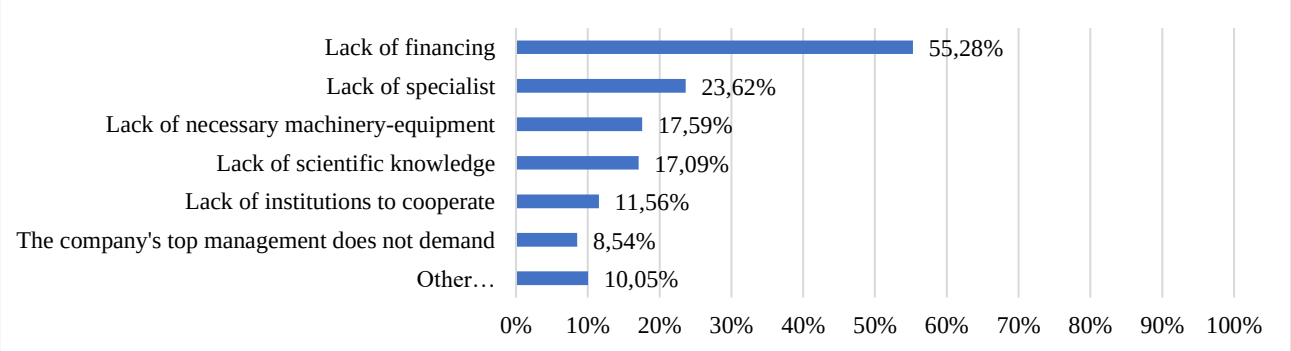
In the examined agro-industries, the number of patents applied by the enterprises during the period and received since the establishment date is given in Table 10. It was determined that agro-industrial enterprises had an average of 5,93 patents. It was stated that 16.44% of these patent numbers were applied during this period and 83.56% were previously obtained. According to TÜRKPATENT (2022) data, the patent applications of agro-industry enterprises in 2020 were determined as 2.251. While the number of patent applications and patented products was 5,72 in agro-based industries, this rate was 6,46 in agro-linked industries.

Table 10
Number of patents applied or received in the agro-industries examined (Average)

Agro-industry sectors	Applied to		Received		Total	
	Count	%	Count	%	Count	%
Agro-based industries	0,76	13,33	4,96	86,67	5,72	100,00
Agro-linked industries	1,52	23,48	4,95	76,52	6,46	100,00
Agro-industries	0,97	16,44	4,95	83,56	5,93	100,00

The difficulties encountered while developing technology in the agro-industries studied are given in Figure 5. Problems faced by agro-industrial enterprises while developing technology; It was determined that 55.28% of them had insufficient financing, 23.62% of them could not find enough experts in the market, 17.59% of them could not reach the necessary machinery and equipment, and 17.09% of them had a lack of scientific knowledge. In addition, 10.05% of the official procedures (Bureaucracy), the inadequacy of state support, lack of qualified personnel, the location of the establishment, etc., it was stated that they had difficulties in developing technology due to situations.

Figure 5
Challenges encountered while developing technology in the agro-industries examined



It is shown in Table 11 whether the enterprises in the examined agro-industries cooperate with universities. It was determined that 76.88% of enterprises in agro-industries did not cooperate with universities. Even in the study conducted by Gül (2012) in the technology region of İzmir, it was determined that 40.50% of the companies were not in cooperation with any university, and 59.50% were in cooperation with universities. The study of Yardımcı and Müftüoğlu (2015) on industrial enterprises determined that 76.69% of the enterprises do not cooperate with the university-industry.

Table 11
Collaboration status with universities in the examined agro-industries

Agro-industry sectors	Yes		No		Total	
	Count	%	Count	%	Count	%
Agro-based industries	21	14,69	122	85,31	143	100,00
Agro-linked industries	25	44,64	31	55,36	56	100,00
Agro-industries	46	23,12	153	76,88	199	100,00

4. Results and Discussion

According to the results of the research, mostly general administration (89.95%), production (77.39%), and marketing (66.33%) management within the business departments were carried out by business owners or family members. In addition, it was observed that there was no manager in R&D (32.16%) and human resources (46.73%) management. It is known that one of the solutions to the problems of family businesses in Turkey is possible with the institutionalization of businesses. Global competition conditions require institutionalization and professional management team in enterprises. However, if family companies have started to hire professional or assistant managers, adaptation and transition processes will be easier. A "management system" should be established by the general operating rules in enterprises and care should be taken to employ professional managers.

It was determined that the education level of business owners in agro-industries was generally high school (35.58%) and bachelor's (31.73%), but business owners who had completed their graduate education (2.09%) were not sufficient. While the undergraduate level provides general competence in a particular field, it provides specialization in a postgraduate field. Considering the ratio of enterprises that did not cooperate with universities (76,88%), it is seen that the ties between agro-industries and universities were weak. In agro-industrial enterprises, especially business owners and managers should focus on undergraduate and graduate education and get to know universities more closely.

It was determined that the legal structure of the agro-industries examined, 72.86% of them were limited liability companies, and the establishment dates were concentrated between 1991 and 2010 (42.71%). This situation was the result of the policies created for the industry in the sixth Five-year development plan.

The vast majority of agro-industrial enterprises provided raw materials in cash (61.00) and from within the province (44.82%). In addition, raw materials were procured (42.83%) from outside the province of Konya for the examined agro-industries. Except for Konya province, raw materials were mostly (25.60%) procured from Istanbul. While Adana (10.77%) and Gaziantep (7.69) stand out in agriculture-based industries, İzmir (17.57%) and Ankara (8.11%) were in agro-linked industries. Also, Germany, China, Italy, Russia, etc. Raw materials are also imported from other countries. Procuring raw materials from other provinces (especially distant provinces) or abroad increases the input costs (transportation fees, etc.) of the enterprises. While allocating the necessary raw materials for production in the enterprises, they should be procured at an affordable price. The department responsible for raw material supply should work efficiently to carry out its activities and functions rationally and economically.

It was determined that most of the enterprises in the examined agro-industries operate in the national and international (71 enterprises) areas. In addition, 35 enterprises operating only in the national area drew attention. Only 6 enterprises were exporting. The development of exports is an important issue for businesses as well as for countries. Especially the integration and liberalization brought about by increasing competition and globalization increase the importance of exports. It seems possible with the development and export of high technology machinery equipment with high added value in the industry sector.

It was determined that 49.75% of the enterprises have 1-3 quality certificates in the quality certificates of agro-industrial enterprises. It was stated that 40.59% of the enterprises received OHSAS (Occupational health and safety) and 31.19% of them ISO 9001 (quality management) certificate. Although each country has its quality standards, quality certificates such as ISO, which is the reason why it is preferred by businesses, will help companies make a good start on the environment. Especially international enterprises should understand the standards of each country and produce accordingly.

In agro-industries, income is one of the important factors used in determining the status of enterprises. The employment structures of enterprises are also one of the factors that can be used to determine the characteristics of enterprises. One of the most important problems in Turkey is the high unemployment rate. In addition, the need for qualified labor in agro-industries is extremely important. For this reason, unemployment rates can be reduced by providing training activities and training qualified personnel. To meet the qualified labordemand of agro-industrial companies in the study area, more effective cooperation should be established between industrial organizations and technical high schools in the region. In addition, the necessary training should be given to the technical personnel present in the enterprise through the said institutions. In this context, industry, universities, government institutions, etc. cooperation between stakeholders is needed.

It was determined that 43.72% of the enterprises in agro-industries carried out R&D activities, and 33.67% did not carry out any R&D activities. It was stated that they generally used domestic fairs (71.86%) and internet-media tools to follow innovations. It was shown that the difficulties faced by enterprises while developing technology were due to the lack of finance 55.28% and the lack of specialists or qualified personnel 23.62%. Industrial enterprises need to initiate systematic plans to improve their R&D activities and employ qualified personnel. Due to the financial problems of the enterprises, it is necessary to provide sufficient resources from the institutions and organizations that support R&D and to benefit more from universities. Successful R&D studies should be carried out to raise financial performance to a positive level. Especially small or medium-sized industrial companies KOSGEB, TUBITAK, etc. institutions should be supported.

It was determined that 76.88% of the agro-industries didn't cooperate with universities. University-industry cooperation can benefit the industry, universities, and the welfare of society separately. The most important problem between industrialists and universities is the lack of communication and it needs to be solved urgently. The information obtained from the university should be transferred to the industry as soon as possible, and the technology in the sector to the university. University curricula should be oriented toward the educational needs of the sector, and university students should spend certain days of the week in the industry, transferring what they learned from education to the business, and the knowledge they gained from the business to education.

5. References

Bakkaloglu Z (2018). Research and Development (R&D) Status of Food Industry in Turkey and Suggestions for Improvement. Academic Food Journal, 16, 183-191.

Christoforou A, Dachner N, Mendelson R, Tarasuk V (2018). Front of Package Nutrition References are Positively Associated with Food Processing. Public health nutrition, 21(1), 58-67.

Çelikkaya S (2010). Kobi'lerde Ar-Ge ve İhracat Desteği Gebze Organize Sanayi Bölgesi Üzerine Bir Araştirma. Department of Economics. Suleyman Demirel University. Isparta-Turkey

Dincer A (2010). İşletmelerin İnovasyon Gücünün Ölçümlenmesi ve Eskişehir İlinde Faaliyette Bulunan Kobilerde Bir Uygulama. In Department of Business Administration. Dumlupinar University Institute of Social Sciences. Kütahya-Turkey

Doğan M (2013). Türkiye Sanayileşme Sürecine Genel Bir Bakış. Marmara Geographical Review, 28, 211-231. 2013.

Genç N (2017). Yönetim ve Organizasyon. 5th Edition Seçkin yayıncılık. Ankara 1-424.

Gül TG (2012). İzmir Teknoloji Geliştirme Bölgesinde, Teknoloji Geliştirme Faaliyetlerinin Firma Performansi Üzerine Etkilerinin Ölçülmesi. Social Sciences Institute. Ege University. İzmir-Turkey.

Hekimoğlu B, Altındeğer B (2012). Tarımda Sözleşmeli Üretim Modeli ve Samsun İli Yaklaşımı. TC Samsun Governorship Provincial Directorate of Food, Agriculture and Livestock. Samsun.

Herdem P (2014). Rekabet Avantajı Sağlamada Bir Araç Olarak Kümelenme: Konya Yazılım ve Ar-Ge Firmaları Üzerine Bir Alan Araştırması. In Industrial Engineering Department. Selcuk University. Konya -Turkey

Kahveci M (2015). Baş F. Üretim işletmelerinde ürün mamul geliştirmenin Ar-Ge departmanında teknik aşamaları ve bilgi teknolojilerinin kullanımı. Accounting and Auditing Review, 15: 75-88.

Keskin S (2014). Türkiye'de kadın girişimcilerin durumu. Journal of Entrepreneurship and Developmen, 9: 71-94.

Kobu B (2017). Üretim Yönetimi. Beta basım yayım. İstanbul.

KSO (2022). Konya Ekonomik Verileri. Konya: Konya Sanayi Odası (KSO).

Mazgal B, Bozoğlu B (2006). Samsun ilinde tarıma dayalı sanayinin geliştirilebilmesi üzerine bir araştırma. Department of Agricultural Economics. Ondokuz Mayiz University. Samsun 1-114.

Mecek G (2020). Küçük ve Orta Büyüklükteki İşletmelerin (KOBİ) Uluslararası Tanımlama Ölçütleri ve Kavramlaştırılması, Ekonomi İşletme Siyaset ve Uluslararası İlişkiler Dergisi, 6 (1), 29-55.

Moser CA, Stuart A (1953). An experimental study of quota sampling. Journal of the Royal Statistical Society. Series A (General), 116(4), 349-405.

Powers D, Xie Y (2008). Statistical methods for categorical data analysis (Vol. 2). Bingley: Emerald Group Publishing.

Tan S, Tepeli C, Everest B (2017). Investigation of R&D Potential of the Agricultural Industry Firms: Çanakkale Province Case. In International Conference On Eurasian Economies. Beykent University. İstanbul 379-385.

TÜRKPATENT (2022). Patent ve Faydalı Model Başvurularının NACE Sınıflandırmasına Göre Sektörel Dağılımı. https://www.turkpatent.gov.tr/patent-ve-faydali-model. web (Türk Patent ve Marka Kurumu).

Ulas F, Çakır C (2004). The Fields of Occupation, Socio-Economic Structures and Capacity Use of Agribusiness Firms in Van Province. Graduate school of natural sciences. Yuzuncu Yıl University. Van.

Unluer M, Günes E (2013). An Analysis of Factors Affecting Repayment of Agricultural Credits. Journal of Agricultural Faculty of Gaziosmanpasa University, 30(2), 86-93.

Üçler YT, Karaçor Z (2015). Bölgesel Kalkınmada Üniversite-Sanayi İşbirliği Yöntemleri: Konya Üniversitelerinde ve Sanayisinde Bir Araştırma. Journal of Selcuk University Vocational School of Social Sciences. 18. 89-116.

Yağar F, Dökme S (2018). Niteliksel Araştırmaların Planlanması: Araştırma Soruları, Örneklem Seçimi, Geçerlik ve Güvenirlik. Gazi Journal of health sciences. 3, 1-9.

Yalcin H, Esengün K (2008). Food Regulation in EU-Turkey and Food Industry Farms Structure in Tokat. Journal of the Agricultural Faculty of Gaziosmanpaşa University, 25, 37-49.

Yardımcı A, Müftüoğlu EB (2015). Üniversite Sanayi İşbirliğine Sanayi kesiminin Bakışı. Ankara University SBF Journal, 70, 815-838.

Yüksel O (2008). Uluslararası finansal raporlama standardı III kapsamında işletme birleşmeleri ve muhasebeleştirilmesi. Phd. Marmara University. İstanbul-Turkey.