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ANALYSIS OF PRODUCTION AND TRADE OF CHICKPEA IN TURKEY AND THE WORLD

Aybike ERTÜRK, Mevlüt GÜL

University of Süleyman Demirel, Agriculture Faculty, Department of Agricultural Economics, 32260 Isparta, Turkey, Phone: +902462118588, Fax:+902462118696, Emails: Aybikeerturk43@gmail.com, mevlutgul@sdu.edu.tr

Corresponding author: Aybikeerturk43@gmail.com

Abstract

In this study, the changes in world's and Turkish chickpea market were discussed. The data used in this study were obtained from FAO (Food and Agricultural Organisation) and TÜİK (Turkish Statistical Service) for the 1980-2016 periods. According to the data collected, worlds production of chickpea has increased due to an expansion of sown area and yield have also experienced a massive increment of 1.90 times over the period. In the world, Turkey is ranked 5th out of the world's total production of chickpea. Turkey is placed seventh and 52nd in sown area and yield in the world. The trade of chickpea has seen significant development in the world. Thus, over the above mentioned period, export of chickpea quantity increased by 6.88 times, value by 10.34 times. Over the period, the chickpea production of Turkey has increased due to the expansion of the planting area. The chickpea production is being carried out intensively in the following provinces of Turkey, Antalya, Uşak, Konya, Karaman, Mersin, Kırşehir, Kütahya, Yozgat, Ankara, and Isparta provinces are also well known in the production of the chickpea. Turkey's production share and export have decreased. Recently, Turkey is not self-sufficient in the chickpea production. In this respect, especially the increased production of the chickpea sector, this is an essential point of policy regarding the development and improvements.

Key words**:** *chickpea, market, trade, price, Turkey*

INTRODUCTION

Chickpea (Cicer arietinum L) is a plant rich in nutrients and consumed almost everywhere in the world. Chickpea is an essential cultural plant of the Fabaceae family. It contains protein content (16.4-31.12%) and regarding carbohydrate values in Turkey and is an essential crop regarding meeting the needs of protein in the diet against the growing population in the world [14]. In addition to being consumed as food, it is an agricultural industry product that can be used both as roasted chickpea and as an animal food [1] [2] [12] [8]. Chickpea is also used as an ingredient of sweet type natural yeast for making traditional bread [6]. Chickpea is generally used in gluten-free food formulations such as for production of gluten free-bread [5].

In the world, chickpea has an essential place in total legume production. India is in the first place regarding chickpea harvested area and production. The fact that histidine amino acid, which is essential in the digestion of protein in chickpeas and the feeding of children, is higher in the chickpea protein than in the mother's milk leads to the separate importance of this food. It is also rich in mineral substances such as calcium, iron, and phosphorus. A, B and C group vitamins, as well as a rich appetiser with roasted chickpeas and edible grain consumption in Turkey, is quite common [3].

This study aimed to analyse the situation of chickpeas in Turkey and the world. These objectives were the development and compared of chickpea harvested areas, production, yield, consumption, and the export-import situation in the world and Turkey. Moreover, also provinces in Turkey were evaluated on the basis of developments in chickpeas production.

MATERIALS AND METHODS

The primary material of the study was FAO, TURKSTAT statistical data. In this context,

the 1980-2016 year, chickpea harvested area, yields, production, import and export data in some countries with the data in some provinces of Turkey were evaluated.
Five-year averages of data were obtained since 1980. This data calculated index was analysed using ratios.
The current prices of chickpea were converted to real values in 2016 using the Producer Price Index (UFE; 2016 = 100) calculated by TURKSTAT. Thus, over the years, the changes in prices, their developments, and the causes were tried to be revealed.
Gujarati [10] and Greene [9] defined regression analysis as the estimation of the linear relationship between a dependent variable and one or more independent variables or covariates. The primary goal of regression analysis is to model the various factors which cause variations of the dependent variable [9] [10].
We used the multiple regression analysis to identify the factors that affect chickpea harvested area of Turkey. The regression model in its implicit form was given as:

$$Y = F(X_1, X_2, U) \text{ [9] [10]} \quad (1)$$

where Y = Harvested area of chickpea (ha)
X_1 = Chickpea yield a year ago (kg)
X_2 = the farmer's real price of chickpea two years ago (TRY)
U = Error term.
Logarithmic function was used to calculate the model. Logarithmic regression model was:

$$LnY = \beta_0 + \beta_1 LnX_1 + \beta_2 LnX_2 + U \quad (2)$$

RESULTS AND DISCUSSIONS

Firstly, the developments in the total world pulses production 2014-2016 averages, and their shares were examined. World total pulses production was estimated to have increased by 75 percent (Fig. 1) from the 45 million tonnes in 1980/84 to 79 million tonnes in 2014/16. The highest share in total pulses production was 34.3% of dry beans. This share was followed by peas dry with 16.0% and chickpeas with 15.4%.
Turkey total pulses production was estimated to have decreased by 1.3 percent (Fig. 1) from the 112.2 thousand tonnes in 1980/84 to 110.8 thousand tonnes in 2014/16. The decline in Turkey production could be attributed to the erratic rainfall and severe harmattan related weather conditions which prevailed mostly during the period. The highest share in Turkey's total pulses production was 41.1% of chickpeas. Lentil followed this share with 32.2% and dry beans with 20.6%.

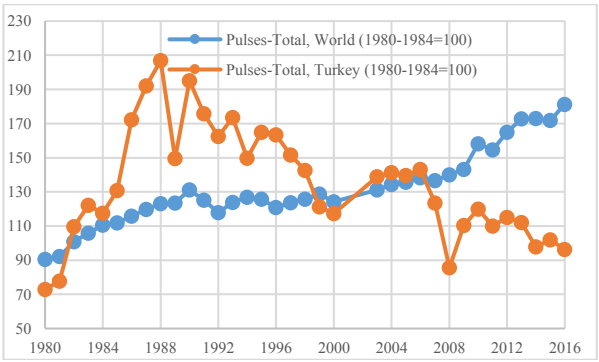

Fig. 1. Development of total pulses production
Source: FAOSTAT [4].

Chickpea is grown in 59 countries around the world. When world chickpea production is examined between 1980 and 2016; the production of chickpeas, which was 6.1 million tons in the 1980-1984 period, increased 1.90 times compared to the base period in 2015-2016. Moreover, world chickpea production reached approximately 11.5 million tonnes (Table 1). The most important producer of chickpea in the world is India (with a significant share of 65.5%). Important other countries in the production of chickpeas were Australia, Myanmar, Ethiopia, Turkey, Pakistan, Russia, Iran, Mexico, USA, and Canada. In the investigated periods in which chickpea production was considered, Australia was the country that increased the most (376 times) followed by Russian Federation (268 times more) (Table 1).
India's share in world chickpea production has declined by 7.9% over the years covered, while Australia's share has increased by 6.2%. Turkey accounts for 4% of the world chickpea production. In the considered period, Turkey has increased production of chickpeas, but it appears to other countries and because of the

increase chickpea production in world production rate less than the rate of decrease of share in the world.

In the study direction, chickpea cultivation areas in the world were also examined. World chickpea harvested area in 1980 - 1984 was about 9.8 million hectares, increased about 1.26 times in the period of 2015-16 and increased to 12.3 million hectares (Table 2).

Table 1. Chickpea production

Country	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004	2005-2009	2010-2014	2015-2016
				Production (tonnes)				
India	4,473,260	4,727,140	4,618,440	5,982,660	4,880,160	6,037,420	8,352,500	7,574,492
Australia	1,900	69,678	169,893	238,394	185,105	279,837	623,291	714,997
Myanmar	118,991	139,796	89,012	83,780	195,200	353,980	515,000	565,445
Pakistan	391,380	486,080	472,740	659,500	521,980	680,180	498,411	448,150
Turkey	283,000	643,100	775,000	673,400	590,600	547,540	498,422	457,500
Ethiopia	121,352	88,804	92,456	132,192	165,190	250,571	400,239	482,556
Russian Federation	-	-	-	800	10,500	25,600	78,062	214,954
Iran (Islamic Republic of)	112,410	125,557	259,119	277,051	278,017	239,973	191,747	185,299
Mexico	158,468	154,682	162,057	197,160	208,462	148,584	171,508	129,688
United States of America	-	-	8,337	23,269	43,699	60,573	125,555	110,991
Canada	-	-	1,684	51,520	221,160	126,880	133,540	95,200
Others	431,201	436,065	441,149	473,420	490,375	386,523	550,878	585,318
World	**6,091,964**	**6,870,904**	**7,089,887**	**8,793,146**	**7,790,447**	**9,137,661**	**12,139,153**	**11,564,589**
				Index (1980-1984=100)				
India	100	106	103	134	109	135	187	169
Australia	100	3,667	8,942	12,547	9,742	14,728	32,805	37,631
Myanmar	100	117	75	70	164	297	433	475
Pakistan	100	124	121	169	133	174	127	115
Turkey	100	227	274	238	209	193	176	162
Ethiopia	100	73	76	109	136	206	330	398
Russian Federation	-	-	-	100	1,313	3,200	9,758	26,869
Iran (Islamic Republic of)	100	112	231	246	247	213	171	165
Mexico	100	98	102	124	132	94	108	82
United States of America	-	-	100	279	524	727	1,506	1,331
Canada	-	-	100	3,060	13,136	7,536	7,932	5,655
Others	100	101	102	110	114	90	128	136
World	**100**	**113**	**116**	**144**	**128**	**150**	**199**	**190**
				Share (%)				
India	73.4	68.8	65.1	68.0	62.6	66.1	68.8	65.5
Australia	0.0	1.0	2.4	2.7	2.4	3.1	5.1	6.2
Myanmar	2.0	2.0	1.3	1.0	2.5	3.9	4.2	4.9
Pakistan	6.4	7.1	6.7	7.5	6.7	7.4	4.1	3.9
Turkey	4.6	9.4	10.9	7.7	7.6	6.0	4.1	4.0
Ethiopia	2.0	1.3	1.3	1.5	2.1	2.7	3.3	4.2
Russian Federation	-	-	-	0.0	0.1	0.3	0.6	1.9
Iran (Islamic Republic of)	1.8	1.8	3.7	3.2	3.6	2.6	1.6	1.6
Mexico	2.6	2.3	2.3	2.2	2.7	1.6	1.4	1.1
United States of America	-	-	0.1	0.3	0.6	0.7	1.0	1.0
Canada	-	-	0.0	0.6	2.8	1.4	1.1	0.8
Others	7.1	6.3	6.2	5.4	6.3	4.2	4.5	5.1
World	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: FAOSTAT [4].

According to 1980-1984 period in the period of 2015-2016, Australia (about 290 times) chickpea area was the country that is expanding the cultivation area the most. Also, there was a 48% drop in the area of chickpea in Mexico (Table 2).

World chickpea cultivation seems to have occurred in India as well as in production. India accounts for 67.5% of world chickpea cultivated areas. Pakistan follows this share with 7.9% and Australia with 4.5% share. 2.9% of the world chickpea acreage constitutes Turkey (Table 2).

World chickpea yields increased by 1,640 hg per ha in the period 1980-1984 to 1,540 hg per ha in the period 2015-2016 (Table 3).

Ethiopia is the highest yield country in 2015-2016 with 19,921 hg per ha (Table 3). Canada follows Ethiopia with 17,917 hg per ha, Mexico with 17,738 hg per ha, Myanmar with 15,362 hg per ha, and the USA with 14,549 hg per ha (Table 3). Canada and Australia have a production advantage especially yield per hectare. These countries also become leaders on chickpea export.

When countries compare chickpea yield with world average in selected periods, Ethiopia has 2.1 times more yield than average world chickpea yield. In the 2015-2016 period, Turkey's average yield is 37% higher than the world average yield of chickpea.

Table 2. Chickpea harvested area

Country	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-16
	Harvested area (ha)							
India	7,199,420	6,853,760	6,476,860	7,507,600	6,140,460	7,307,680	8,825,800	8,291,326
Pakistan	937,100	985,820	1,035,280	1,092,560	951,200	1,072,360	1,013,922	973,677
Australia	1,900	61,918	186,717	251483	234,103	240,387	523,919	551,122
Iran (Islamic Republic of)	197,961	281,467	560,205	695432	664,736	538,820	446,906	448,072
Myanmar	150,611	159,891	134,451	126343	192,469	279,719	357,662	368,091
Russian Federation	-	-	-	1000	11,300	26,200	79,097	228,973
Turkey	272,594	631,311	823,265	703311	629,375	504,161	412,468	354,455
Ethiopia	150,756	134,600	119,722	159142	185,408	210,507	229,735	242,047
United States of America	-	-	6,486	17327	31,776	41,804	74,106	76,535
Mexico	141,161	133,129	110,975	126422	133,008	94,007	98,548	73,351
Canada	-	-	1,216	36834	198,680	91,400	68,340	53,150
Others	701,522	671,918	680,993	746686	706,882	506,664	623,165	628,134
World	**9,753,026**	**9,913,815**	**10,136,170**	**11464139**	**10,079,398**	**10,913,710**	**12,753,668**	**12,288,931**
	Index (1980-1984=100)							
India	100	95	90	104	85	102	123	115
Pakistan	100	105	110	117	102	114	108	104
Australia	100	3,259	9,827	13,236	12,321	12,652	27,575	29,006
Iran (Islamic Republic of)	100	142	283	351	336	272	226	226
Myanmar	100	106	89	84	128	186	237	244
Russian Federation	-	-	-	100	1,130	2,620	7910	22,897
Turkey	100	232	302	258	231	185	151	130
Ethiopia	100	89	79	106	123	140	152	161
United States of America	-	-	100	267	490	644	1,142	1,180
Mexico	100	94	79	90	94	67	70	52
Canada	-	-	100	3,030	16,344	7,519	5,622	4,372
Others	100	96	97	106	101	72	89	90
World	**100**	**102**	**104**	**118**	**103**	**112**	**131**	**126**
	Share (%)							
India	73.8	69.1	63.9	65.5	60.9	67.0	69.2	67.5
Pakistan	9.6	9.9	10.2	9.5	9.4	9.8	8.0	7.9
Australia	0.0	0.6	1.8	2.2	2.3	2.2	4.1	4.5
Iran (Islamic Republic of)	2.0	2.8	5.5	6.1	6.6	4.9	3.5	3.6
Myanmar	1.5	1.6	1.3	1.1	1.9	2.6	2.8	3.0
Russian Federation	-	-	-	0.0	0.1	0.2	0.6	1.9
Turkey	2.8	6.4	8.1	6.1	6.2	4.6	3.2	2.9
Ethiopia	1.5	1.4	1.2	1.4	1.8	1.9	1.8	2.0
United States of America	-	-	0.1	0.2	0.3	0.4	0.6	0.6
Mexico	1.4	1.3	1.1	1.1	1.3	0.9	0.8	0.6
Canada	-	-	0.0	0.3	2.0	0.8	0.5	0.4
Others	7.2	6.8	6.7	6.5	7.0	4.6	4.9	5.1
World	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: FAOSTAT [4].

Table 3. Chickpea yield

Country	1980-84	1985-89	1990-94	1995-99	2000-04	2005-09	2010-14	2015-16
	Yield (hg per hectares)							
Ethiopia	8,042	6,733	7,730	8,454	8,917	11,884	17,374	19,921
Canada	-	-	8,410	13,465	11,541	14,906	19,466	17,917
Mexico	11,264	11,538	14,612	15,423	15,335	15,937	16,892	17,738
Myanmar	7,550	8,647	6,576	6,715	10,028	12,581	14,374	15,362
Australia	4,166	11,473	9,537	9,824	7,972	11,582	12,111	12,992
USA	-	-	10,225	13,397	13,580	14,652	16,925	14,549
Turkey	10,612	10,308	9,392	9,560	9,388	10,891	12,083	12,908
Russian Federation	-	-	-	3,333	9,280	10,366	9,818	9,969
India	6,212	6,866	7,140	7,959	7,915	8,250	9,464	9,133
Iran (Islamic Republic of)	5,921	4,449	4,657	3,951	4,220	4,326	4,253	4,135
Pakistan	4,241	4,916	4,563	6,033	5,461	6,341	4,913	4,585
World	**6,244**	**6,913**	**6,995**	**7,669**	**7,715**	**8,363**	**9,516**	**9,407**
	Index (1980-1984=100)							
Ethiopia	100	84	96	105	111	148	216	248
Canada	-	-	100	160	137	177	231	213
Mexico	100	102	130	137	136	141	150	157
Myanmar	100	115	87	89	133	167	190	203
Australia	100	275	229	236	191	278	291	312
USA	-	-	100	131	133	143	166	142
Turkey	100	97	88	90	88	103	114	122
Russian Federation	-	-	-	100	278	311	295	299
India	100	111	115	128	127	133	152	147
Iran	100	75	79	67	71	73	72	70
Pakistan	100	116	108	142	129	150	116	108
World	**100**	**111**	**112**	**123**	**124**	**134**	**152**	**151**

Source: FAOSTAT [4].

In the period 1980-1984 world chickpea exports 237 thousand tons and by the year 2013 world chickpea exports increased 6.88 times to 1.63 million tons.

When the developments in countries exporting chickpeas were examined, the most massive increase in 2013 (from 1980 to 1984) took place in Ethiopia with about 46,879

times. Russia followed Ethiopia with an increase of 5,697 times and Canada with an increase of 640 times.

Turkey's chickpea exports in 2013 (compared to the period 1980-1984) was down 87%.

The 33.8% of world chickpea exports were in Australia, 24.6% in India and 11.0% in Russia. Turkey exported a rate of less than 1.2% of world exports chickpeas.

World exports of chickpeas rose to $ 111 million in the 1980-84 period, $ 204 million in the 1990-94 period, $ 595 million in the 2005-09 period and $ 1.15 billion in the year 2013.

Countries with high chickpea export values continue to be India, Australia, Mexico, and Russia. In 2013, India increased by about 1,032 times to 348 million dollars. In 2013, the most significant increase in the value of chickpeas exported over the 1980-84 period was in Ethiopia. Turkey's export value showed a 67% decline in 2013.

The amount of world chickpea import increased from 149 thousand tons in the 1980-1984 period to 10.61 million tons in 2013. When the developments in the country's imports of chickpeas were examined, in 2013 (according to the 1980 to 1984 period) Turkey’s import was the most massive increase with 7,109 times. Bangladesh’s chickpeas import was a 423-fold increase, followed by a 136-fold increase in India. Turkey 1980-1984 period, while imports do not do chickpeas, were imported 56,875 tons in 2013.

India was imported 33.4% of the world's chickpea, 12.7% in Bangladesh and 6.8% in Algeria.

When the world imports of chickpeas were evaluated as worth, the import value of about 95 million dollars in the 1980-84 period rose to 225 million dollars in the 1990-94 period, 623 million dollars in the 2005-09 period and 1.28 billion dollars in the year 2013. Countries with high imports of world chickpeas continue to be India, Algeria, Bangladesh, and Spain.

The value of imports of chickpeas, which was $ 1 million in the 1980-84 period of India, rose to $ 43 million in the 1995-99 period and rose to 323 million dollars in 2013. In 2013, the most significant increase compared to the 1980-84 period had been worth chickpea imports about 39,115 fold in Turkey.

Turkey and the world export quantity of chickpeas share in the production were given in Fig. 2. According to this, 12.3% of the chickpeas produced in the world in 2013 is subject to export. In the world between 1980 and 2013, this rate varied between 3.4% and 16.5%, with an average of 8.1%. This ratio is continuing to increase in the world. Turkey's chickpea exports amount share in the production was 3.8% by 2013. In Turkey, this ratio ranged from 3.8% to 73.2% in the years 1980-2013, the average was realised as 29.2%. This rate was the highest value for Turkey in 1981 (73.2%) had received. From this year onwards, it has tended to decrease (Fig. 2).

Australia and Russian Federation important export countries and they exported nearly all their produced chickpeas. Mexico, Canada and USA also become important export countries, and they exported above/nearly half of their chickpeas production. The domestic consumption of chickpea is low in these countries. Their markets are generally Asia and the Middle East.

Turkey's imports of chickpea began in 1989. The share of world imports of chickpeas has also increased over the years examined. Turkey chickpeas in the world regarding import value rose to ninth place. Chickpea major exporter of Turkey in recent years has lost its situation. Turkey's export volume of chickpea showed an upward trend until the period 1980-1989 (average 225 thousand tons), the average realised export 206 thousand tons in 1990-1999 periods, and it has a tendency to decrease after 1994. The share of world chickpeas export amount has been declining. Turkey's export amount of chickpeas 2000-2013 period, the average has dropped to 88 thousand tons. After 2010, it exported less than 30 thousand tonnes. Especially after 2009 and chickpeas Turkey's share in world export volume dropped below 8% after the year 2012 also declined below 2%.

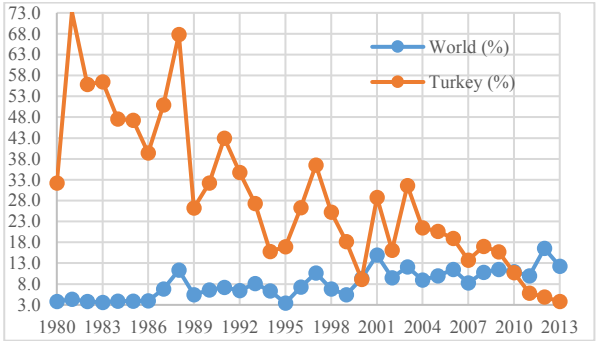

Fig. 2. World and Turkey's chickpea export volume share in production (%)
Source: FAOSTAT [4].

According to the 1980-1984 period, the amount of world chickpea imports increased by about 14 times and import value increased by about 15 times. In this, it can be said that besides world trade volume, higher prices of chickpeas are effective. The same is right for world chickpea export quantity and value. According to the baseline period, world chickpea export quantity increased 8.73 times in 2013 and chickpea export value increased by 10.7 times. Therefore, it can be said that the world chickpea export quantity is increased in volume, and the increase in chickpeas export prices is more effective in this. As the year's chickpeas, export value increased in the world, while Turkey has fluctuated in the 2000s. Indeed, Turkey's share declined to 10th.

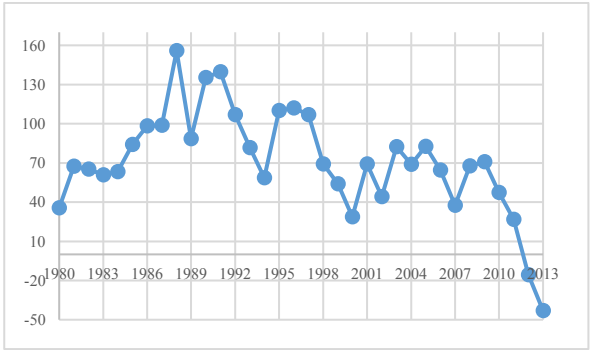

Fig. 3. Turkey trade balance (million $)
Source: FAOSTAT[4].

Turkey's chickpea export-import amount and Turkey's chickpea export-import values difference was given in Fig. 3 and Fig. 4, in this case, it was more clearly understandable. Turkey's difference in the amount of export-import chickpeas was around 225 thousand tons in the 1980-1989 and decreased to 77 thousand tons in 2000's, implements the -38 thousand tons in 2013. Turkey's difference chickpeas export-import value was 82 million $ in 1980-1989, while 45 million $ in the 2000s, then declined to 43 million $ in 2013.

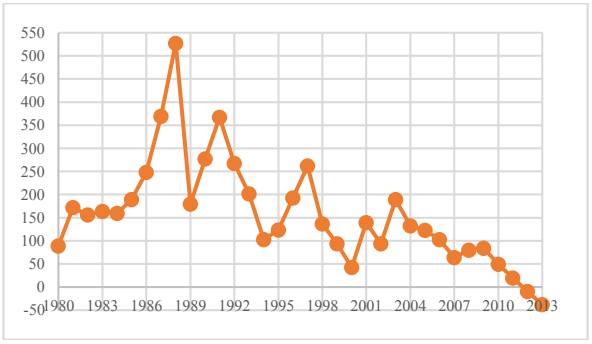

Fig. 4. Turkey trade balance (thousand tonnes)
Source: FAOSTAT [4].

The producers' real prices of chickpea have fluctuated based on the supply-demand balance in 1982-2016 in Turkey (Fig. 5).

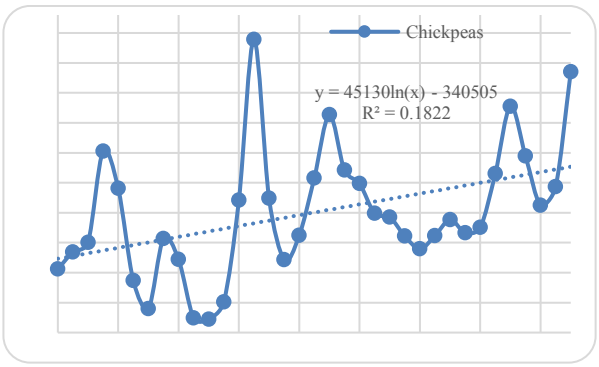

Fig. 5. Real Prices of Chickpeas (1982-2016, TRY/tons) in Turkey
Source: Own design.

It could be said that these had been felt more in chickpeas producers and decreased or fluctuated on farmers' net profit. 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.
In Fig. 6, the change of some pulses real prices were given as % (according to the average of 1982-1984 years). Not only in chickpea but also in lentils and dry beans prices fluctuated between 1982-2016. However, the coefficient of variation was higher in chickpeas, followed by lentils.

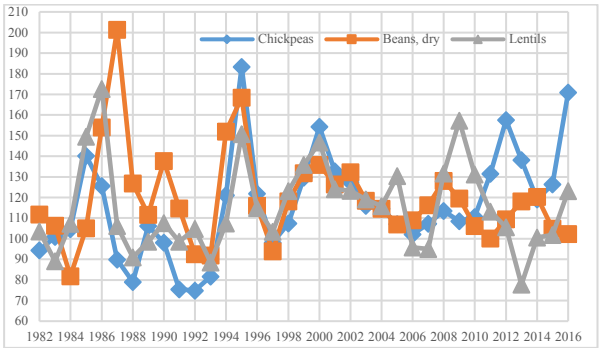

Fig. 6. Change of real prices of some pulses (1982-2016, TRY/tons) in Turkey
Source: TUİK [13]

We used regression analysis to determine the factors that affect the harvested area of chickpea production in Turkey. The dependent variable was the quantity of chickpea harvested area Y (ha) in the model specified. The independent variables were chickpea yield a year ago (X_1) and farmers' real price of chickpea two years ago (X_2) in a function. The summary of the model result was given in Table 4 below.
The calculated logarithmic model can be expressed as:

$$LnY = 18.627 - 0.869LnX_1 + 0.342LnX_2$$

The value of the coefficient of determination R^2 was amounted to be 0.518 (51.8%), and this parameter was indicated that the independent variables in the model could explain about 52 percent of the variation in chickpea harvested areas. The F-test was statistically significant at the 1% level ($F_{calculated}>F_{table}$, 20.368>3.32). These parameters indicate that the calculated model can be used for the prediction purpose. Chickpea yield and farmer's chickpea real price identify as the significant factors affecting the harvested area of chickpea production in Turkey. The yield a year ago (X_1) had a negative coefficient. The decrease in this parameter will result in a decrease of 0.869 units in the area of chickpea cultivation. However, the real price two years ago (X_2) had a positive coefficient. The value of the coefficient was calculated to be 0.342. This score shows that a unit increase in real price will lead to an increase of 0.342 units in the area of chickpea cultivation (Table 4).

Table 4. Regression analysis result

	Constant	X_1	X_2	F test	R^2
Coefficient	18.627	-0.869	0.342		
Standard error	3.039	0.315	0.066		
t-values	6.129	-2.756	5.205	20.368	0.518

Source: own calculation.

Turkey ranks fifth in chickpea production, ranked seventh in chickpea acreage, while in chickpea yield ranks fifty-second in the world. Ten provinces; Antalya, Istanbul, Konya, Karaman, Mersin, Kirsehir, Kutahya, Istanbul, Ankara, and Isparta, were the most chickpeas producers in Turkey. Antalya is produced 34,918 tonnes of chickpea in Turkey with 7.6% shares. Usak follows Antalya with 30,937 tons and 6.7% shares, Konya with 29,747 tons and 6.5% shares, Karaman with 29,358 tons and 6.4% shares and Mersin with 27,131 tons and 5.9% shares, respectively. Kırşehir has increased its production by 4.67 times in comparison with 1991-95 period. Uşak, Konya, Yozgat, and Isparta chickpea productions decreased by 20% to 59% compared to the 1991-95 period. The decline in sowing area was effective in this downfall.
There are many diseases, pests, and weeds in places where leguminous farming is carried out. Among them, anthracnose (*Ascochyta rabiei*) stands out as the most critical disease, while *Liriomyza cicerina* also stands out as a critical harmful agent [11].
Chickpeas consumption ranged from 4.5 kg to 6.0 kg per capita in Turkey. Turkey is not self-sufficient in the chickpeas in recent years. Gül and Işık [7] examined the developments total pulses production and trade in the world and Turkey as compared to the period 1961-2000.
Gül and Işık [7] reported that beans, peas and chickpeas production in total pulses have an essential share in the world, lentil and chickpeas production have almost all of total pulses production in Turkey. Turkey, an important pulses exporter in the period of review, lost this feature with the decline in pulses cultivation areas in recent years and had become the importer country.
Some projects started in some provinces and regions in Turkey in the 1970s; pulses production has been increasing with the

policies applied [7]. These products have lost their significance in recent years, while they have peaked in exports. In this case, the policies implemented related pulses sector indicates that it should be revised. To sustain the pulses production, taking long-term measures must be established and forward-looking projections.

CONCLUSIONS

In this study, changes in world market chickpeas and Turkey were discussed. Chickpea production increased 2.34 times in the world. This increase was due to the increase in crop area (1.5 times) and the increase in yield (1.5 times). Turkey is in fifth place in the world chickpea production. The share in the world decreased by the beginning of the period, but its production increased by 62%. In Turkey, this increase in production in more acreage (30%) increase was effective. Yield increased by 22%.

Turkey ranks fifth in world production of chickpeas, chickpea acreage in the seventh is located fifty-second in chickpea yield.

The countries that exports most chickpeas are Australia, India, Russia, Canada and the United States. The countries that import most chickpeas are Pakistan, India, Bangladesh, United Arab Emirates and Algeria.

As a result, Turkey in recent years regarding the production of chickpeas is not self-sufficient. It shows fluctuations in the price of chickpeas in Turkey. Worldwide, the price of chickpea has also fluctuated, but it tends to increase. This situation affects farmers' production decision. Usually, the farmer takes into account the prices of the previous year. By such factors as the low yields in Turkey, disease and pest population density, and the natural conditions of production affect the net income of farmers directly. Therefore, the agricultural policies of the product must take these criteria into account.

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REFERENCES

[1]Akçin, A., 1988, Yemeklik Dane Baklagiller (in Turkish). Selçuk Üniversitesi Yayınları:43, Konya.

[2]Devos, P., 1988, Nitrogen value of lentils and chickpeas and changes during processing. Lentils for everyone symposium, 29-30th September, Marmaris, Turkey.

[3]Ercan, A.S., 1986, Chickpea external market research (in Turkish). T.C. Basbakanlık Hazine ve Dış Ticaret Müsteşarlığı İhracatı Geliştirme Etüt Merkezi, İGEME Yayınları, No:110, Ankara, 80p.

[4]FAOSTAT, 2017, Food and Agriculture Organization of the United Nations Statistical Data. (Internet address: http://www.fao.org/faostat/en/#home, accessed on (02.11.2017).

[5]Gül, H., Hayıt, F., 2017, Optimization of gluten-free bread formulation by using response surface methodology. Abstract Proceeding Book of International Conference on Agriculture, Forest, Food Sciences and Technologies Conference, May 15-17, Cappadocia, Turkey, 148p.

[6]Gül, H., Hayıt, F., Açar, C., Kurt, N., 2016, Effects of chickpea yeast on physical, textural and sensory properties of breads. 8th International Conference on Chemical, Agricultural, Biological and Environmental Sciences, Dec 30-31, Dubai, 67p.

[7]Gül, M., Işık, H., 2002, Developments in pulses production and trade in the World and Turkey (in Turkish). Mustafa Kemal University Ziraat Fakültesi Dergisi, Vol.7(1-2):59-72.

[8]Gül, M.K., Egesel, C.Ö., Kahrıman, F., Tayyar, Ş., 2006, Winter production possibilities of chickpea in Çanakkale province (in Turkish). Uludağ Üniversitesi Ziraat Fakültesi Dergisi, Vol.20(1):57-66.

[9]Greene, W.H., 2008, Econometric Analysis. Department of Economics at the Stern School of Business, New York University.

[10]Gujarati, D.N., 2006, Essentials of Econometrics. Basic Econometrics. Aravaca, Madrid: Mac Graw- Hill interamericana, Spain.

[11]Özdem, M.A., 2012, Dry beans in the world and Turkey (Dünya ve Türkiye'de kuru baklagiller). Tarımsal Ekonomi ve Politika Geliştirme Enstitüsü, 9p, Ankara.

[12]Şehirali, S., 1998, Yemeklik Dane Baklagiller (in Turkish). Ankara Üniversitesi Ziraat Fakültesi Yayınları, No: 1089, Ankara, 314p.

[13]TUİK, 2017, TUİK (Turkish Statistical Institute) Statistical Data. (web page: http://www.tuık.org.tr, Accessed on 20.12.2017.

[14]Uzun, A., Özçelik, H., Yılmaz, S., 2012, Evaluation of some selected chickpea (Cicer arietinum L.) lines in respect to agronomic and quality traits (in Turkish). Akademik Ziraat Dergisi, Vol.1(1):29-36.