Herbal Production in the Turkish Agricultural Sector

Asst. Prof. Dr. Özlem Durgun (Istanbul University, Turkey)

Abstract

Agricultural production depends on natural conditions. All the countries try to stabilize and increase the food supply for communities. For this reason, the agriculture sector, support policies analyzed and conducted well. In agricultural support policies, there are different objectives like raising farm incomes, production and productivity. In Turkey, agriculture is very important. Because certain part of the population of Turkey live in rural areas. There are agricultural activities. They support those living in urban areas, especially in times of crisis. People living in rural areas, as well as food and labor force ready for those living in urban areas. In 2001 is an important milestone in Turkish agricultural policies. Before 2001, agricultural support policies consisted of mainly market price support, credit support and input subsidies. New policies started to be implemented after 2001. The purpose of this study was to determine the level of success in the new agricultural support policies in the context of the agreement with the European Union. We tried to find the best way to deal with the current main problems of Turkish Agricultural Sector in last year's.

JEL code: Q18

1 Introduction

Agriculture sector will never lose its forefront significant position so long as the humanity is bound to nutrition for the survival of the countries and the societies. Thus, countries tend to guarantee the product supply as much as possible, in order to sustain the self sufficiency. However, the agricultural production, naturally, is receptive to various effects. Climate and environmental conditions, epidemic diseases affect the production. So, developed countries, try to keep the agricultural production and supply stable, applying scientific ways.

Since the foundation of the European Union, the first common policy area is determined as Common Agricultural Policy. By the aid of this policy, the product insufficiency policy in the foundation years was overcome and afterwards, the famine in Europe was eradicated. But, in this process, subsidies within the frame of Common Agricultural Policy, in time, brought EU out an oversupply of production which is above the consumption. This excess of production was exported with undercost prices. Several mechanisms were developed to curb cheap product imports out of the Union. The excess product sold undercost to world market and the import preventions were severely protested by Non European Countries and blocks and caused the European Union strand in organizations like WTO. Besides, the Agricultural subsidies laid a significant burden on the budget and taxpayers felt indisposed. In that period, liberalization had been significant in the World economic policy and thus affected the European Union Policies. Subsidies appeared as a result of the reforms in the Common European Policy and gradually most of the subsidies given was made independent from the production in years. In the Subsidy policies, the role of the production was replaced by subjects like the improvement of welfare in the rural areas, environmental prevention, livestock welfare, food safety and quality. Despite the process mentioned above, European Union never totally left the agricultural sector to free market conditions and always controlled it by detailed policies. Now, Common Agricultural Policy constitute 43% of European Union budget

Turkey followed a planned and production favored agricultural policy in the foundation years and after the foundation and tried to control the agricultural production with the intervention tools and Subsidy systems as much as possible. But instable political structures and long term governments curbed the conduction of long term policies. Governments decided to use the agricultural policies as a tool for their self political situations and this situation led to the deterioration of the tools which are constituted in good will and eventually they became useless.

Agriculture has a key role in the economy of Turkey in social and economical means. Since the industrial sector and services sector remained undeveloped for long years, agriculture became the power of the economy.

Today, half of the lands of Turkey is used as agricultural field which is slightly high from the average of EU-27. Turkey's membership shall add approximately 41 million decares. Roughly, 24 % of workforce is in agriculture in 2009 and the share of the agricultural income in GNP is 8,2' (T.R. Ministry of Agriculture and Rural Areas, 2012). Although the share of agricultural sector in GNP diminishes, it still has a significant importance in the workforce. Fertility in the developed countries could not been achieved. Still, 1 in 4 person is employed in agriculture. This number could not be decreased as much as the share of the agriculture in total income. The continuing increase in this difference, leads to an increase in the poverty in rural areas. As the labor is the most frequent input, it encourages crowded families in the agricultural sector and causes the land to be rapidly divided and lessened. The scarcity in the capital and accumulation of knowledge decreases the fruitful production.

2 Development of Income in Agricultural Sector

Agriculture witnesses a rapid growth when the current prices are taken into account. That is why this situation brings us to a deceptive increase in income. However, it is observed that the share of agriculture in GNP rapidly falls relatively, this difference indicates that the share of the agricultural side in the income decreases and the rural poverty increases. Initially, as the agricultural employment increased, the agricultural income rose up because of the growth of agricultural sector. So, crowded families and high population was increased. However, with the fall in the increase in the agricultural employment depending upon the machinery, the importance of fertility increased. Afterwards, every increase in the agricultural increase meant a hidden unemployed. The decrease in the income in agriculture led to a disengagement in open and hidden unemployment. As a result of IMF policies, who abolished the incentive and subsidies in agricultural sector, the share of agriculture in GDP rapidly fell (T.R. Ministry of Agriculture and Rural Areas, 2012).

The economical difference between OECD members and Turkey has not changed since 1970 on the basis of national income, only slightly increased. As can be seen in Table 1 above, the numbers of Turkey are lowest among OECD countries and the situation does not change when compared to EU countries.

Indicator	Unit	2006	2000-2006	EU Average
Population	1000	72.974	70.216	486.957
National Income Per Person	EUR	4.398	3.331	21.971
Workforce between 15-64 years.	%	45,9	46,8	62,9
Unemployment in Active Population or productivity in Agriculture.	% n.a.*	9,9 n.a.	9,5 n.a.	8,6 -
Gross Fixed Overhead Capital in Agriculture	Million TL	5.185 TL	n.a.	27 Million EUR
Development of workforce in industrial Sector	1000 person	6.088	7.209	1.502,60*
Economical Development In Agricultural Sector	%	2,9	1,3	2,1*
Economical Development in Food Industry	%	6,1	3,2	2,2*
Workforce in Secondary and Tertiary Sectors (unemployed 1000 people)	1.000	16,242	n.a.	-

Note: * EU25 (2002)

Table 1. Main Economical Indicators *Source: T.R. Ministry of Agriculture and Rural Areas*

	Unemployment Rate	Share of Agricultural Sector	Share of Industrial Sector	Share of Services Sector	Male employment in Agricultural Sector	Female employment in Agricultural Sector
1998	6,9	40,5	23,6	35,9	30,5	67,0
1999	7,7	41,4	22,8	35,8	30,9	67,6
2000	6,5	36,0	24,0	40,0	27,0	60,5
2001	8,4	37,6	22,7	39,7	27,7	63,3
2002	10,3	34,9	23,0	42,1	24,8	60,0
2003	10,5	33,9	22,8	43,4	24,4	58,5
2004	10,8	29,1	24,9	46,0	21,6	50,8
2005	10,6	25,7	26,3	48,0	18,6	46,3
2006	10,2	24,0	26,8	49,2	17,2	43,6
2007	10,3	23,5	26,7	49,8	16,8	42,7
2008	11,0	23,7	26,8	49,5	17,1	42,1
2009	14,0	24,6	25,3	50,1	18,1	41,6
2010	11,9	25,2	26,2	48,2	18,3	42,4
2011	9,8	25,5	26,5	48,1	18,7	42,2

Table 2. The share of Employment in Agricultural Sector in Years *Source: TSI Employment and Unemployment due to the Economical Activity Branches*

3 Employment in Agricultural Sector

Besides the fact that the share of industrial sector in the national income follows a diminishing trend, it still has a significant importance. Its share in the employment follows a parallel course. Agricultural employment materializes more than the industrial employment. The share of agricultural employment in the workforce can be considered as an indicator of economical development. As the economical development level rises, though the share of agricultural sector in the general economy does not fall, a decrease in the employment is expected due to reasons such as technological development, machinery. As the level of economic development increases, the development in the non- agricultural sector rises up. The diminishing employment is expected to shift into these

sectors. In Turkey the expected occurred as well. But it could not reach to the average of the developed countries and EU.

Agricultural employment tending to decrease since 2001, followed a different course in 2008. In 2008, agricultural employment increased in contrary to general tendency. As a result of the process, the share of agriculture in employment which was 37.6% in 2001 and recessed to 26.4 % in 2007, stopped decreasing in 2008. In 2009, while the number of the workers in non-agricultural sector diminished 184 thousand persons in January, the agricultural employment increased 259 thousand persons when compared to the same month of the previous year. In this month when the unemployment rose to 15.5 % the share of agriculture in employment increased 1.2 points rising from 20.6% to 21.8 % (TSI, 2012). When the October 2009 period is examined, the distribution of the employment is: 25,3% agriculture, 19,4 % industry 6,3% construction, 49 % services sector. When compared to the same period of the previous year, while the share of agricultural sector in the total employment increased 0.8 points, the share of industrial sector decreased 1.3 points. In 2011, while the share of the agriculture increased to 25.5 points, industrial sector continued to decrease. However, in April 2012 agricultural employment recessed to 24,4 % with a fall of 0.8 pts. This increase is related to the last crisis. A return to agriculture occurred because of the contraction in industry (TSI, 2009). This situation is thought to be rooted due to the fact that people regard the agriculture as a more reliable sector because of the increase in unemployment. A part of workforce who are unemployed without income in cities, shelter to the agriculture and their families in agriculture though their economic condition is also poor.

Within the context of mechanization of agriculture which is one of the reasons of employment lose in agriculture, one of the important indicators is the number of tractors. While this number increased 78.8 percent at the end of the period, the number of tractor owner companies increased 61.0 percent. However, 1 in every three company does not own a tractor. As from 2006, the number of tractors is 1.037 (T.R. Ministry of Agriculture and Rural Areas a, 2012).

The number of machinery and equipment used in the agricultural product increases in years. Despite the increasing trend of mechanization in Turkey, the fact that there is no mention worthy decrease in industrial population, moreover an increase in recent years may be resulting from the failing of non agricultural sectors in providing employment and thus the return of the employment seekers to agriculture.

Female employment is higher in agricultural sector when compared to other activity branches. This can be explained by the combined effect of the two structural characteristics of labor market: General characteristics of agricultural population and the unqualified female labor. The labor force using the family labor working in the semi-subsistence agricultural farms and getting no wages affects the statistics of workforce.

4 Improvement Of Workforce In Terms Of Production

The farm structures of Turkey has similarities with some of the new candidate countries. According to the counting in 2001, there are approximately 3 million agricultural enterprises most of which are family enterprises using family labor. This number is about 15 million in EU-27. Agricultural enterprises possessing 6 decare average of land, are smaller than the 13 decare average of EU Subsistence and semi subsistence farming is a characteristics of Turkish farming..

Indicators	Turkey	EU 27
Agricultural Area (000 ha)	40.459	182.129
Ratio of Total Area	%51.6	%42.3
Ratio of Plough Land	%56.8	%59.3
Ratio of Continued Lawn	%36.1	%30.9

Table 3. Turkey EU Agricultural Area Comparison *Source: European Commission*

Irrigated and modern farming is done in only 18% of agricultural lands (4,9 million decare) Semi-developed farming is done in only 2.9% of agricultural lands (762.273 decare) together with insufficient irrigation. In the remaining lands, which account for %78,5 (approximately 20,9 million decare) dry agriculture (rain addicted) is done.

In the yearly agricultural structure calculation of TURKSTAT, it is found out that the agricultural land diminished 3.0% in 1984-2004 period. Since 1995 this trend has slowed down and since that date between 1995-2004 the diminishing land has been 0,9% . Besides, cultivable lands increased 3.75% between 1984-2004. Fallow lands lessened 3,4%, vineyards lessened by 16,8. Vegetable gardens increased 28,2%, fruit trees increased 16,3% and olive trees increased 15,8%.

The sizes of agricultural enterprises in Turkey are not sufficient. The amount of land cultivated by farmer based enterprises is limited and distinct from each other . Because the land is highly split into many parts, regular enterprises cannot be established on them and thus desired increase in production cannot be achieved. According

to the results of 2001 Agricultural Counting, there are total 3.021.207 agricultural enterprises in Turkey . 81% of the enterprises run their own land.

Use of Land	Area (decares)	%
Agricultural Area	26.590.000	34,13
Unused but potentially fruitful land	1.944.340	2,5
Forages	21.505.168	27,61
Lawn	646.691	0,83
Meadows and continued fells	20.858.477	26,78
Forest/Bush	23.227.975	29,82
Forest	15.184.879	19,49
Bushes	8.043.096	10,33
Water Area	1.158.109	1,48
Other Land	3.474.108	4,46
Total	77.899.700	100

Table 4. Land Use in Turkey *Source: T.R. Ministry of Agriculture and Rural Lands*

“The number of agricultural enterprises in Turkey, being 2.2 millions in 1950 increased to 3.5 million in 1980, 3.9 million in 1990, 3 million in 2001. “ Average Enterprise Size being 10 hectares in 1950 fell down to 6 hectares in 1990, and finally calculated as 6.1 hectares in 2001. When the split condition of Agricultural Enterprises are examined, due to the 2001 agricultural counting data, it may be seen that of the current 3.022.127 enterprises 4.8% is 1-3 parts, 44.2% are 4-5 parts , 28%’are 6-9 parts, 23%’ are 10 or more parts The average number of parcels in the enterprises is 4.1 , average parcel size is 1,5 hectares. The splitting in the lands owned by the agricultural enterprises continue because the increasing population cannot be attracted into non-agricultural sectors and other factors; and the sizes fall down behind the economical enterprises sizes.”(T.R. Ministry of Agriculture and Rural Areas a,2012)

Year	Agricultural Added Value	Farming and Animal Husbandry (%)	Forestry (%)	Fishing (%)
1998	15.952	93,33	4,44	2,22
1999	15.064	93,43	4,38	2,19
2000	15.641	93,28	4,48	2,24
2001	14.710	93,48	4,35	2,17
2002	15.808	92,75	5,07	2,17
2003	15.422	92,91	4,72	2,36
2004	15.733	92,37	5,08	2,54
2005	16.625	93,04	4,35	2,61
2006	17.109	92,86	4,46	2,68

Table 5. The Distribution of Agricultural Added Value into Activity Branches *Source: TSI GNP in Economical Activity Branches*

The share of animal husbandry is mostly more than that of herbal production in agricultural added value in developed countries. In Turkey herbal production activity is higher . In Table 5 above, the shares of four components of agricultural production, herbal production, animal husbandry, forestry, and aquaculture can be seen. As can be seen in the table above, shares of forestry and fishing in agricultural added value are very low. In parallel to the development in recent years, the share of fishing, increases, though with a slow pace.

5 Herbal Production

The share of herbal products in Agricultural productive value is 77,4% and this rate is high when compared to EU-15 . Recently, there have been increases in the share of herbal products in the agricultural productive value in EU and reached to 55%. This is partly because of the quota system applied to animal products. . Agricultural production value in Turkey is higher than the total production value of 10 new members and about 10% of EU-15 agricultural value. The herbal production value constitutes 14.5% of EU-15. Within the herbal production value of Turkey, fruit and vegetable gets the highest share (42,5%) followed by cereal (17,2%) . Cereal gets the highest share in herbal production value in EU-15 (Abay, 2005).

Fruit and vegetable production lands constitute 12.4% of total agricultural land. Approximately 27% of the figs produced in the World, 17% of apricots 12% of melons, 11% of watermelons 14% of green beans 9% of eggplants and tomatoes , 13% of citrus are produced in Turkey. According to the 1991 agricultural counting data 2.6% of total enterprises do only fruit vegetable production. Turkey also has a significant share in EU fresh fruit and vegetable foreign trade. Turkey materializes about ¾ of fruit export and about ¼ of vegetable export to EU countries. On the other hand, Turkey’s 80-90% of fruit import and 10-30% of vegetable import from EU.

Among the most important types of fruit and vegetables exported from Turkey to EU are citrus in fruit group and green pepper in vegetable group (Usman, 2011).

When Table 6 is grounded on, it can be observed that the production, amount and added value of basic herbal products followed an instable pattern between 1998-2011. In this long period, serious disproportions in production amounts can be observed even in subsequent years. Important differences can be observed between Turkey and EU in productivity. For example, productivity in wheat per hectare in Turkey is 2.1 ton, in EU it is 6.7 tons (DİE 2002, Eurostat, 2002). This productivity is in turn 2.0 and 3.1 tons in cotton Bektaşoğlu vd.,2011). When examine on the basis of product groups, a flashing point is that, while the cereal product increases, there is a great decrease in industrial production. The highest lessening is observed in tobacco in sugar beet, cotton and tobacco group followed by cotton and sugar beet. A disconnection between agriculture industry relation occurred and disconnection increasingly continues.

YEARS	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Cereal														
Wheat	21.000	18.000	21.000	19.000	19.500	19.000	21.000	21.500	20.010	17.234	17.782	20.600	19.700	21.800
Barley	9.000	7.700	8.000	7.500	8.300	8.100	9.000	9.500	9.551	7.306	5.923	7.300	7250	7600
Maize	2.300	2.397	2.300	2.200	2.100	2.800	3.000	4.200	3.811	3.535	4.274	4.250	4.310	4.200
Pulse														
Lentil	540	380	353	500	565	540	540	570	623	535	125	302	447	406
Chickpea	625	560	548	535	650	600	620	600	552	505	518	562	530	487
Bean	236	237	230	225	250	250	250	210	196	154	155	181	212	200
Industrial Plant														
Pulse	22.283	17.102	18.821	12.633	16.523	12.623	13.517	15.181	14.452	12.415	15.488	17.274	17.942	16.126
Cotton	7.565	7.192	6.541	6.846	7.210	6.373	6.400	5.468	5.907	5.302	4.950	4.200	4.806	5420
Tobacco	251	243	200	145	153	112	134	135	118	75	93	82	53	55
Oil Seeds														
Cotton Seed	2.305	2.026	2.261	2.358	2.542	920	936	864	977	868	673			
Sunflower	860	950	800	650	850	800	900	975	1.118	854	992	1.057	1.320	1.335
Peanut	90	95	78	72	90	85	80	85	78	86	85	90	97	90
Tuber Crops														
Potatoes	5.250	6.000	5.370	5.000	5.200	5.300	4.800	4.090	4.397	4.227	4.197	4.397	4.513	4.613
Onion	2.270	2.500	2.200	2.150	2.050	1.750	2.040	2.070	1.765	1.859	2.007	1.847	1.900	2.141
Fruit Edible Vegetable														
Watermelon	5.815	5.725	5.805	5.795	6.395	5.950	5.575	5.795	5.570	5.458	5.752	5.418	5.295	5.512
Tomatoes	8.290	8.956	8.890	8.425	9.450	9.820	9.440	10.050	9.854	9.945	10.985	10.785	10.051	11.003
Fruit														
Grapes	3.600	3.400	3.600	3.250	3.500	3.600	3.500	3.850	4.000	3.612	3.918	4.264	4.255	4.296
Citrus	1.943	2.263	2.222	2.478	2.493	2.487	2.707	2.913	3.220	3.064	3.000	3.513	3.572	3.328
Nut	580	530	470	625	600	480	350	530	661	530	801	500	600	430
Apple	2.450	2.500	2.400	2.450	2.200	2.600	2.100	2.570	2.002	2.458	2.504	2.782	2.600	2.682
Olive	1.650	600	1.800	600	1.800	850	1.600	1.200	1.767	1.076	1.464	1.290	1.415	1.750
Tea	979	1.096	758	825	792	869	1.105	1.192	1.121	1.145	1.100	1.103	1.305	1.231
Agriculture Added Value														
Million TL in 1998 Prices	8.520	8.030	8.626	7.926	8.663	8.745	8.701	9.274	9.393	8.736	9.141	9.477	9.703	10.210

Table 6. Production of Basic Herbal Products in Turkey. (Thousand tons) 2012 *Source: TSI Herbal Production Statistics*

As an indicator of the competitiveness of Turkish agriculture in EU, current prices can be compared. In Turkey, Some products are expensive the other countries.

Product	TR Price (EURO)	EU-25 Price (EURO)
Wheat	19,05	12,28
Rye	15,02	11,04
Barley	16,17	11,45
Oat	17,05	12,51
Maize	19,36	12,77
Potatoes	20,01	20,22
Sugar Beet	59,23	44,49

Table 7. Comparative Product Prices In 2004 Between EU-25 and Turkey (EURO/for 100 Kgs) *Source: T.R.Ministry of Agriculture and Rural lands*

As can be seen above in Table 7 prices of Turkish products are high except potatoes. Moreover, the potatoes' difference in price is low. Cereals have already been protected by a number of export preventions. With the membership to EU, prices are expected to fall down. . Wheat, which is one of the most important products of farming and Turkey's highest volume product, has a price of 19,1 EURO in Turkey 13,8 EURO in EU 25 . With so high prices, it does not seem possible to export wheat to EU. Competition is not possible without incentives. On the contrary, Turkey has to import from EU. From the table, It is obvious that an increase in productivity should be enhanced.

6 Productivity

Oversplit land and relatively small enterprise sizes are one of the most important reasons of unproductiveness in agriculture sector (especially in herbal production). When Turkey and EU countries are compared, it can be said that average enterprises sizes are 3 times bigger in EU than Turkey To Illustrate, average size of enterprises in Turkey is. 6 hectares, in 15 EU countries, the same average is 19 hectares. On one hand, 83% of the enterprises in Turkey are small and has a split structure. On the other hand, agricultural and animal production are done together in Turkey (TSI, 2006).

As can be seen in Table 8, the productivity levels of all products but cotton are lower than EU. This fact indicates that in a possible liberalization in foreign trade, when there is a competition, the producers of these products shall go under a very different situation and perhaps they will have to completely stop their producing activities. In the EU-15, Turkish value-added per worker is only 1/8 respectively. Therefore Turkey is a burden for EU. (Dinç, 2012).

	Turkey	EU-15	EU-25	Turkey/EU-15
Wheat	20,4	64,2	56,6	31,8
Cotton (unpinned)	35,5	30,5		116,4
Barley	22,4	44,9	41,8	49,9
Maize	43,6	85,8	73,8	50,8
Sunflower	12,1	16,3	16,7	74,2
Sugar Beet ton/ha	4	8,7		45,8
Potatoes	259,2	353,9	264,6	73,2

Table 8. Productivity of Some Products in Turkey and EU 2001/2003 avr. (100 kg/ha) **Source:** Canan Abay,

7 Conclusion

Agriculture is not an only economic subject. It is a part of the survival and security of the country. Problems in food supply directly affect the status-quo of the country. So, it is not an issue to be risked. .

Despite the high share of employment in total in agriculture in our country and recent diminishing in industry, the increase in agriculture employment is a protest against the result of inability of non-agriculture sector to create employment. Continuously repeated target, making the agriculture sector effective by making it smaller in Turkey, cannot be met under these conditions. Attempts to lessen the population, encouraging the people to leave the rural areas and to move to cities shall increase the problems in the long run. Shifting the population in the rural areas to cities by creating non agriculture employment opportunities is a policy that cannot be realized in the short run because of the global and in country constraints. This indicates the reality that one third of the population shall live in cities for long years. .

A long term strategy including precautions against the problems of global warming, a strategy that will realize and continue sustainable development, that will not detriment ecological support, provide balanced use of natural sources is needed.

Turkey needs more agricultural production and employment Agriculture sector should be developed and made effective and should be improved to a level in which it can compete with their worldwide rivals in every area. Two indispensable of agriculture is water and soil. A comprehensive land inventory must be done and effective policies must be determined for the correct use of it. An irrigation management strategy must be formed. Despite the reality that we are at the edge of cultivable agriculture lands, erosion and out of purpose use of agricultural areas, causes our lands to lessen every year. On the other hand, in order to meet the food consumption increase because of the increasing population and welfare, requires the increase of productivity per unit area and productivity per unit. In this scope, in order to provide the structural transformation of agricultural structure and make the agriculture sector a resource creator, subsidy policies should have a structure that can integrate with other policies.

Small enterprise structure which is one of the significant reasons of unproductive agriculture structure should be examined and solutions with different methods should be sought for the problems created by it. Turkey is relatively underdeveloped in EU.

References

- Abay, Canan (2005), Herbal Product Policies in EU Turkey's Evaluation in terms of Adaptation, Aegean University , Faculty of Agriculture, Agriculture Economy Department, No:134 Ankara
- Bektaşoğlu Beyhan, BEFUS Tanja, BROCKMEIER Martina (2012), "Moving towards EU or MENA? Comparing Alternative Turkish Foreign Policies Utilizing the GTAP Framework" University of Hohenheim, (Online), <https://www.gtap.agecon.purdue.edu/resources/download/5985.pdf>, 17 June 201
- Dinç Cengiz, (2012), " European Union's Fifth Enlargement Process: Economic and Political Dimensions", Aegean Academic Review,12(1), 79-96
- European Commission, Turkey-Agriculture and Enlargement, (Online), http://ec.europa.eu/agriculture/enlargement/countries/turkey/profile_en.pdf, 25 December 2011
- T.R. Ministry of Agriculture and Rural Areas a, Rural Development Instrument for Pre-Accession (IPARD) Program (2007-2013), (Online), http://www.tkd.gov.tr/files/IPARD_Program_son1.doc , 06 June 2012
- T.R. Ministry of Agriculture and Rural Areas, Strategic Plan 2010-2014, (Online), http://www.agriculture.gov.tr/images/Files/SGB/SGB/2010_2014Stratejik_Plan.pdf, 06 June 2012
- TSİ, Turkish Statistical Institute, (2012), Employment and Unemployment due to the Economical Activity Branches, (Online), <http://www.tuikapp.gov.tr/ulusalgostergeler/degiskenleUzerindenSorgula.do#07Temmuz2012>
- TSİ, Turkish Statistical Institute, (2009), Household Workforce Survey October Period Results (September, October November 2009), News Bulletin, Number 10, 15 January 2010, p.2, (Online) <http://www.tuik.gov.tr/PreHEUerBultenleri.do?id=10860>, 07 Temmuz 2012
- TSİ, Turkish Statistical Institute, (2012), GNP in Economical Activity Branches, (Online), http://www.tuik.gov.tr/VeriBilgi.do?alt_id=55, 09 June 2012
- TSİ, Turkish Statistical Institute, (2012), Herbal Production Statistics, (Online), http://www.tuik.gov.tr/VeriBilgi.do?alt_id=45, 10 June 2012
- TSİ, Turkish Statistical Institute, (2012), the structure of agricultural enterprise 2006 (Online), <http://www.tuik.gov.tr/PreHEUerBultenleri.do?id=3977>, 9 June 2012
- Tuğay Mehmet Emin,(2012), "Türk Tarımında Bitkisel Üretimi Artırma Yolları" Tarım Bilimleri Araştırma Dergisi 5 (1): 01-08, 2012
- Usman Ilyass, (2011), Assessing the Water Footprint of Tofu Produced from Organically Cultivated Crops, Degree Thesis for a Bachelor of Natural Resources Degree Programme in Integrated Coastal Zone Management, Raseborg, Finland (Online), <http://publications.theseus.fi/handle/10024/37796>, 24 June 2012