Course of current status and development of cotton in Turkey

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ABSTRACT

In this study, the current situation in Turkey was examined and change values of cotton production, consumption, cultivation, yield, exports, imports over the years were determined. The time-series analysis was used to determine the direction of changes.

Additionally, in order to determine the current status of the cotton sector in Turkey the index values were calculated in terms of several criteria. For enhancing the competitiveness and the development of the sector, SWOT analysis (SWOT) Strengths-Weaknesses-Opportunities-Threats analysis is used to determine aspects of current and potential of the sector.

In the study, according to the projection following findings has been reached, in 2015 cotton production amount cannot afford the consumption amount, imports will increase and becoming dependent on foreign economy completely. According to these results, the new regulations shall be determined in supporting policies to increase cotton production.

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INTRODUCTION

Despite a long history going back until the year 330 BC, Cotton began to develop in 11th century by Seljuk Turks and the 14th century by Ottoman Turks in Turkey. After the proclamation of the Republic, great importance was given to the cotton cultivation[23].

In general cotton cultivation in Turkey is made at Aegean, Antalya, Çukurova and Southeastern Anatolia Region. Sowing areas of cotton began to increase rapidly in the Southeast Anatolian region because Southeastern Anatolia Project irrigation facilities entered into service in the 1990s[13]. Approximately 55% of cotton fiber production is carried out at Southeastern Anatolia, 18% at Aegean region, 27% at Çukurova and 1% at Antalya regions[17].

China, India, USA, Brazil, Pakistan, Uzbekistan, Australia and Turkey are 8 countries leading the production of cotton respectively. These countries were realized 89% of the cotton production in the world in 2010/11 season.

Cotton, includes both the fiber and oil plants among the industrial plants. It is used as raw material such as fiber in textile industry, as oil derived from its kernel at vegetable oil industry and as pulp in feed industry. In addition, the oil obtained from the core used in biodiesel production show its importance in terms of energy.

Cotton, takes an important place in the field of textile and confection employment. Factors that accelerate the increase in demand for textile and confection products, such as income growth, population growth, urbanization, demographic structure and the rate of
change showed a rapid change in Turkey\cite{13}. Extraordinary increases in factors of cost of production of textile, garment and apparel industries affect export performance in 2008. Thus, by dissolving the profitability of the industry, the production and export has been brought to a halt\cite{3}.

In this study, taking into account the importance of the cultivation of cotton, the trend analysis was performed by examining sowing, yield, production, consumption, import, export values of cotton in Turkey and objected to find out the status of the industry’s future. In addition, the industry SWOT analysis (Strengths-Weaknesses-Opportunities-Threats analysis) was used to determine aspects of current and potential aspects of the sector.

MATERIAL AND METHOD

As the study material, web pages, reports of TURKSTAT and other statistical agencies, research and publications previously published on the subject, with books, magazines, statistics and reports of various institutions were used.

In order to determine the direction of changes occurring in cotton in Turkey the trend analysis was conducted during 1993-2010. Trend indicates a long period of economic events within the structural trend\cite{10}. Cotton industry in Turkey, sowing, yield, production, consumption, import, export values, linear, exponential, logarithmic trend of the method were tried with trend analysis done. It was resulted that linear method was more suitable than other methods, and projections were performed. At the time of detection of trends, the formula which represents the best trend and has the highest determination coefficient (R 2) has been taken chosen carefully. Therefore, linear and exponential trend equation is used with the highest regression coefficients that the trend suits\cite{11}. Proportional changes of values over time were defined and interpreted with a simple calculation of the index.

RESEARCH AND RESULTS

Current status of cotton sector in Turkey

Turkey, in 1993, the planting area of 568 thousand ha decreased from 481 thousand ha which is decreased by 13% in 2010/2011. Yield is increased 1060 kg / ha from 1700 kg / ha with is a rate of 28%\cite{5}.

Figure 1 shows trend analysis of Turkey cotton planting area.

At cotton planting trend analysis values were applied as, \( Y_t = 724.675 - 9.38824 \times t \). the Slope of the trend of the equation of cotton planting area is negative. In 2015, 508 thousand ha of cotton planting area are estimated.

Figure 2 Trend analysis in the area of cotton yield in Turkey is given.

In Figure 2, cotton yield trend is applied to the analysis of values as following, \( Y_t = 973.575 + 38.5941 \times t \). Slope of the trend of equation of cotton yield, is positive. In 2015 Cotton yield is estimated to be 1 861 ha.

Turkey’s place in world cotton production is given in TABLE 1.

As shown in TABLE 1, in 2010/11 world cotton production season, cotton production of 24.9 million has been made 33.3 million hectares, the average yield is 746 kg / ha. Among the world, with cotton production of 6.4 million tons China takes the first place with, India ranked second with 5.5 million tons, and U.S.A is third with the 3.9 million tones. In 2010/11 period, in Turkey approximately 450 thousand tons of cotton fiber was obtained among 817 thousand hectares of cotton cultivation. According to the world cotton cultivation in the field Turkey is at 8th place all over the world, 8th in terms of production quantity, 5th in terms of lint.
yield.

Values $Y_t = 731.582 + 52.3926 \times t$ respectively are applied to cotton consumption trend analysis. The amount of cotton consumption is estimated to increase to 1.94 million tons in 2015. The slope of the trend is positive.

Trend analysis of cotton imports in Turkey is given in Figure 5.

From Figure 5, linear method is used in the trend analysis of cotton imports. The values are applied as $Y_t = 50.4 + 47.4456 \times t$ respectively in trend analysis of cotton imports. The slope of the trend equation is positive.

According to the projection, the amounts of cotton imports are estimated to increase to 1.14 million tons in 2015.

Koç expressed in his study that if the premium payments are not paid to cotton producers Turkey’s dependence on imports of cotton will increase.

**TABLE 1** Turkey’s place in world cotton production (2010/2011)

<table>
<thead>
<tr>
<th>Ülkelar</th>
<th>Cultivation</th>
<th>Yield</th>
<th>Production</th>
<th>Consumption</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(000 ha)</td>
<td>(kg/ha)</td>
<td>(000 ton)</td>
<td>(000 ton)</td>
<td>(000 ton)</td>
</tr>
<tr>
<td>India</td>
<td>11.142</td>
<td>496</td>
<td>5.525</td>
<td>4.483</td>
<td>87</td>
</tr>
<tr>
<td>USA</td>
<td>4.330</td>
<td>910</td>
<td>3.942</td>
<td>849</td>
<td>2</td>
</tr>
<tr>
<td>China</td>
<td>5.220</td>
<td>1.226</td>
<td>6.400</td>
<td>9.594</td>
<td>2.609</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2.800</td>
<td>681</td>
<td>1.907</td>
<td>2.200</td>
<td>314</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>1.330</td>
<td>684</td>
<td>910</td>
<td>273</td>
<td>1</td>
</tr>
<tr>
<td>Brazil</td>
<td>1.400</td>
<td>1.400</td>
<td>1.960</td>
<td>990</td>
<td>153</td>
</tr>
<tr>
<td>Turkey</td>
<td>481</td>
<td>1.700</td>
<td>817</td>
<td>1.540</td>
<td>750</td>
</tr>
<tr>
<td>Greece</td>
<td>250</td>
<td>720</td>
<td>180</td>
<td>35</td>
<td>3</td>
</tr>
<tr>
<td>Australia</td>
<td>590</td>
<td>1.522</td>
<td>898</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Syria</td>
<td>150</td>
<td>1.071</td>
<td>161</td>
<td>185</td>
<td>-</td>
</tr>
<tr>
<td>Indonesia</td>
<td>9</td>
<td>707</td>
<td>6</td>
<td>431</td>
<td>420</td>
</tr>
<tr>
<td>Mexico</td>
<td>116</td>
<td>1.357</td>
<td>157</td>
<td>390</td>
<td>261</td>
</tr>
<tr>
<td>World</td>
<td>33.337</td>
<td>746</td>
<td>24.872</td>
<td>24.459</td>
<td>7.600</td>
</tr>
</tbody>
</table>

Source: Anonymous, 2012a

Trend analysis of cotton production in Turkey is given Figure 3.

From Figure 3, at the trend analysis applied to cotton production values; $Y_t = 740.325 + 11.4103 \times t$, respectively. The slope of the trend cotton production equation is positive. The amount of cotton production is estimated to rise to 1 million tons in 2015.

**Figure 3** : Trend analysis of cotton production in Turkey

Trend analysis of cotton consumption in Turkey is given in Figure 4.

**Figure 4** : Trend analysis of cotton consumption in Turkey

Trend Analysis of Cotton Export in Turkey is given in Figure 6.

**Figure 6** : Trend analysis of Turkey exports of cotton

From Figure 6, Turkey cotton export values applied to the analysis of trends were calculated as $Y_t = 53.65-0.436765 \times t$. The slope of the trend of the equation is. According negative to the projection, the amount of export of cotton is estimated to be 44 thousand tons in 2015.

Since 1991, a traditional exporter of cotton, Turkey has been an importer of cotton as a result of increase at internal and external demand at textile and
As a result of successful investments especially at spinning, weaving and garment industry, Turkey began to take place among the world firsts with the share of world production and foreign trade in recent years.

**Turkey and the world cotton prices**

In the study of Anderson and Valenzuela[1], considering 2001, given according to calculations made by GTAP (Global Trade Analysis Forecasting Project Model), as a result of the removal of cotton production and export subsidies and tariff barriers on products; an annual increase of 283 million U.S. dollars in global economic prosperity and an average increase of 12.9% has been estimated to at cotton prices at international markets.

World cotton prices are given in TABLE 2.

In 2010/2011 period, cotton price was meeting %20 of production cost amount.

**COTTON SUPPORTS IN TURKEY**

In 2005, diesel fuel (4.5 TL/da) support and chemical fertilizer (3 TL/da) support are given to cotton-producing farmers[16]. In 2011, 6 TL/da of chemical fertilizer support payments were made. In 2011, 6TL/da diesel-support payments were made for 1 da.

“Watershed-Based Production and Support Model” will be applied in agriculture after 2010. In this model Turkey is divided into 30 basin by taking into account climate, topography and soil data[18]. Agricultural production will take place according to this basin model. The product-based supports up to now will be given on the basis of the basin. Products which are supported for each basin individually indicated in the

**TABLE 2 : World cotton prices**

<table>
<thead>
<tr>
<th>Year</th>
<th>Turkey ($/ton)</th>
<th>USA ($/ton)</th>
<th>World ($/ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002/03</td>
<td>1.318</td>
<td>1.202</td>
<td>1.229</td>
</tr>
<tr>
<td>2003/04</td>
<td>1.618</td>
<td>1.569</td>
<td>1.526</td>
</tr>
<tr>
<td>2004/05</td>
<td>1.352</td>
<td>1.219</td>
<td>1.181</td>
</tr>
<tr>
<td>2005/06</td>
<td>1.381</td>
<td>1.225</td>
<td>1.258</td>
</tr>
<tr>
<td>2006/07</td>
<td>1.413</td>
<td>1.293</td>
<td>1.332</td>
</tr>
<tr>
<td>2007/08</td>
<td>1.728</td>
<td>1.639</td>
<td>1.635</td>
</tr>
<tr>
<td>2008/09</td>
<td>1.385</td>
<td>1.365</td>
<td>1.342</td>
</tr>
<tr>
<td>2009/10</td>
<td>1.880</td>
<td>1.803</td>
<td>1.735</td>
</tr>
<tr>
<td>2010/11</td>
<td>3.537</td>
<td>3.650</td>
<td>3.601</td>
</tr>
</tbody>
</table>

Source: Anonymous, 2012b

**TABLE 3 : Quantities of cotton support in Turkey**

<table>
<thead>
<tr>
<th>Years</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel (TL/da)</td>
<td></td>
<td></td>
<td></td>
<td>-</td>
<td>4.5</td>
<td>5.4</td>
<td>5.4</td>
<td>5.5</td>
<td>5.5</td>
<td>6</td>
</tr>
<tr>
<td>Fertilizer (TL/da)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>3</td>
<td>5.5</td>
<td>5.5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>DGD (TL/da)</td>
<td>10</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>10</td>
<td>7</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Premium (without certificate TL/da)</td>
<td>30.77</td>
<td>32.04</td>
<td>71.25</td>
<td>108</td>
<td>126</td>
<td>129</td>
<td>124</td>
<td>143.85</td>
<td>156.8</td>
<td>156.8</td>
</tr>
<tr>
<td>Premium (with certificate TL/da)</td>
<td>33.847</td>
<td>35.244</td>
<td>85.5</td>
<td>128</td>
<td>152</td>
<td>156</td>
<td>147</td>
<td>172.62</td>
<td>188.16</td>
<td>188.16</td>
</tr>
<tr>
<td>Total Support for Certificated production (TL/da)</td>
<td>43.847</td>
<td>49.244</td>
<td>103.45</td>
<td>151.5</td>
<td>162</td>
<td>174.4</td>
<td>162.4</td>
<td>183.62</td>
<td>199.16</td>
<td>200.16</td>
</tr>
<tr>
<td>Total Support for Certificated production (TL/Kg)</td>
<td>0.121</td>
<td>0.138</td>
<td>0.276</td>
<td>0.379</td>
<td>0.373</td>
<td>0.391</td>
<td>0.355</td>
<td>0.447</td>
<td>0.445</td>
<td>0.447</td>
</tr>
<tr>
<td>Total Support Un-certificated production (TL/da)</td>
<td>40.77</td>
<td>46.04</td>
<td>89.2</td>
<td>131.5</td>
<td>136</td>
<td>147.4</td>
<td>139.4</td>
<td>154.85</td>
<td>167.8</td>
<td>168.8</td>
</tr>
<tr>
<td>Total Support Un-certificated production (TL/Kg)</td>
<td>0.113</td>
<td>0.129</td>
<td>0.238</td>
<td>0.328</td>
<td>0.313</td>
<td>0.33</td>
<td>0.304</td>
<td>0.377</td>
<td>0.375</td>
<td>0.377</td>
</tr>
</tbody>
</table>

Source: Anonymous, 2011 b.
2001/02 with a rate of 10% increase[19].

As of 2002/03 period, it was seen that 63% of the world cotton subsidies were given to their own producers in the U.S; during the same period, despite cotton production in Greece and Spain referred only 2.5% the global cotton production, EU took the 18.5% of world cotton subsidies[18].

Turkey Cotton Sector SWOT Analysis are given in TABLE 4.

RESULT

Cotton acreage between 2004/2010 in Turkey, while cotton production between 2010/2011 decreased due to contraction in the area of cultivation. Because cotton prices are low, labor and input costs is getting higher, cotton planting areas and consequently cotton production has been decreasing in recent years. Cotton subsidies should be given by the Provincial Directorate of Agriculture Oil Seeds Agricultural Sales Cooperative Union for the high quality, inexpensive, faster, non-labor costs production and the benefits of the use of machine should be explained to the producers. In addition, projects should be made about cotton machine and producers should be informed about usage. The ratio of cotton production meeting the demand of consumption is low Turkey. To increase cotton yield by increasing the use of certified seed must be provided. To do this, support for the use of certified seed should be increased and should be given in advance to producers. According to trend analysis of cotton planting area, planting area of cotton in 2015 is estimated about 508 thousand ha. Cotton yield is estimated to be 1 861 ha. The amount of cotton production is expected to increase 1 million tons and the amount of cotton consumption is expected to rise to 1.94 million tons.

The biggest problem in terms of quality and cotton use is the problem of foreign matter in cotton. This issue of moving the current stage of solving the problem of cotton collection, storage requires the awareness of all producers up to the stage of ginning. Another problem to be solved about using the raw cotton, even though the legislation came into force in Turkey, is due to a single bale implementation system. A strict control of single bale implementation system and promote the implementation of activity needs to be conducted across the country for Industrial use of the products produced for the elimination of the need and to consider and to be differentiated from the standard varieties of cotton.

As of 2002/03 period, it was seen that 63% of the world cotton subsidies were given to their own...
have accelerated in parallel with the increase in demand. Therefore, breeding studies of cotton seed varieties should be initiated the textile industry in need of a solid structure and fine, long fiber characteristics. Cotton is the most important raw material for textile. To protect the position of Turkey and to remain competitiveness with the world’s textile trade in the textile industry, quantity and quality of cotton needs to be brought at the best level.

International obligations in terms of foreign trade in cotton in Turkey are shaped within the framework of the World Trade Organization Agriculture Agreement and the EU Customs Union. Within this framework, Turkey can not perform the quota on imports and tariffs, other protection measure; including the EU countries and other countries, large amounts of low price cotton than the domestic cotton price enters the country thus prices are getting under pressure. Even if the level is not sufficient to meet the cost of production of cotton in domestic support in Turkey, cotton cultivation is at the point of withdrawal because the price of cotton is getting under pressure at the domestic market. To achieve this, imports of cotton should be controlled or domestic support should be increased.

REFERENCES