

*Review Articles***EXPORT GROWTH AND EXPORT COMPETITIVENESS OF IRAN'S PISTACHIO**

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Pistachio is the most important agricultural crop cultivated extensively in Iran's dry zones. The country earns sizable income from Pistachio export to many countries. This paper aims to study the production and export growth and export competitiveness of pistachio in Iran. Time series data on area, yield, production, export quantity and export values collected for the period 1991–2002. Also destination wise data on exports collected both for Iran and USA during the period 1996–2003. Exponential trend equation and Constant market share model were used for the aim of the study. The growth rate of area planted was 5.12 percent and significant against non significant values for production, yield, export quantity and export value for the study period. Export Quantity has changed tremendously during the period (1996–2003). It declined from 140 000 tones in 1996 to 57 907 tones in 1997 and then it increased to 124 872 tones in the successive year. Again the same trend occurred from 1999 to 2003. The market distribution effect and competitiveness effect played a major role in changes of Iran's export during period I (1996–1999), while commodity composition effect and market distribution effect were the major sources of export changes in period II (2000–2003).

Key words: export competitiveness, export growth, trend equation, export quantity, export value

INTRODUCTION

Iran is the world's largest producer and exporter in pistachio industry accounted for 52.89, 58.00, 64.79, and 65.84 percent of world production, cultivation area, export quantity and export value, respectively (FAO, 2003). Currently Pistachio export earnings stand next to petroleum. Around 10 percent of non-petroleum export value is realized from pistachio accounted for 400–500 million Dollar per year.

Pistachio is cultivated in Iranian dry regions with low rainfall of nearly 100 mm/year with also extreme geographical climate and temperatures. High salinity level of agricultural water and inadequate irrigation are the main restrictions that farmers are facing (Sedaghat, 2006). Recently the productivity of Pistachio orchards has declined and also the share of Iran in Global Market has decreased significantly (Sedaghat, 2002 and 2006). As such areas are not suitable to produce other crops economically; hence Pistachio plantation remains the only opportunity of farmers. Pistachio is one of the major exported produce of the country, so the study of production – export growth and export competitiveness is one of the major areas of research to be covered by the researchers to define the major sources of export changes and to use the

appropriate tools in retaining the country competitiveness power in world market.

The review of literature shows that exponential trend equation is widely used for the aim of studying growth pattern. Jairath (1990) computed the growth rate in area, production and productivity of sweet Potato in major growing states, Pal (1992) estimated the annual compound growth rates in the exports of principal agricultural commodities from India, Acharya (1993) studied the compound growth rates of Pulses in India, Singh et al. (1997) while assessing the regional variations in agricultural performance in India, estimated the compound growth rates of area, production and yield of pulses, Dahiya et al. (2001) quantified trend and growth rate of area, production and yield of fruit crops in Haryana.

Constant market share model is used to study the changes in exports and export competitiveness. Arshad and Gaffar (1990) analyzed the competitiveness of Malaysia's primary export commodities in the world market using the constant market share (CMS) technique, Manoharrao (1995) studied the export market competitiveness of onion in India to some countries, Tiwari (1999) investigated export competitiveness and trade cooperation among NICs.

The main objective of this paper is to study the production-export growth and export competitiveness of Pista-

chio in Iran and to define the major factors which are affecting the export of the country.

MATERIAL AND METHODS

Data base

Time series data on area, yield, production, export quantity and export values collected for the period 1991–2002 (FAO, 2003). Also destination wise data on exports collected both for Iran and USA during the period 1996–2003 (Government of Iran, 2004; USDA, 2004; USDC, 2004).

Methods of analysis

Exponential trend equation:

To estimate the compound growth rates, following exponential function was applied (Singh et al., 1997)

$$Y_t = AB^t$$

Where:

Y_t = dependent variable for which growth rate is estimated (value of area, production, productivity or export in year t)

A = intercept

B = $1 + r/100$

t = time variable (years)

r = refers to the percentage compound growth rate of different variables per annum.

By taking natural logarithms of both sides, the equation reduces to the following linear form

$$\ln Y_t = \ln A + t \ln B$$

And finally r is calculated by using the below formula:

$$r = (B - 1) \times 100 = (\text{antilog } b - 1) \times 100$$

Here r represents a uniform rate of change from one to another observation.

Constant market share model (CMS):

The constant market share model was employed to describe the country's export growth and competitive-tiveness. Here, the export performance of a particular country is compared with the world average. For this the following model was used (Leamer and Stern, 1970):

$$\Delta X = \left\{ \sum_{i=1}^n r X_i^0 \right\} + \left\{ \sum_{i=1}^n r_i X_i^0 - r X_i^0 \right\} + \left\{ \sum_{i=1}^n \sum_{j=1}^m r_{ij} X_{ij}^0 - \sum_{i=1}^n r_i X_i^0 \right\} + \left\{ \sum_{i=1}^n X_i^1 - X_i^0 - \sum_{i=1}^n \sum_{j=1}^m r_{ij} X_{ij}^0 \right\}$$

X_{ij}^0 = export of the i^{th} country to the j^{th} market in the base year ($i = 1, \dots, n, j = 1, \dots, m$)

X_{ij}^1 = export of the i^{th} country to the j^{th} market in the terminal year ($i = 1, \dots, n, j = 1, \dots, m$)

X_i^0, X_i^1 = total export by the i^{th} country in the base year and terminal year respectively

r = proportionate change in total world export

r_i = proportionate change in world exports of the i^{th} commodity

r_{ij} = proportionate change in world exports of the i^{th} commodity to the j^{th} market

Therefore, the total change in exports can be decomposed into four components, as follows:

1. World trade effect = $\sum_{i=1}^n r X_i^0$

2. Commodity composition effect = $\sum_{i=1}^n (r_i X_i^0 - r X_i^0)$

3. Market distribution effect = $\sum_{i=1}^n \sum_{j=1}^m r_{ij} X_{ij}^0 - \sum_{i=1}^n r_i X_i^0$

4. Competitiveness effect = $\sum_{i=1}^n (X_i^1 - X_i^0) - \sum_{i=1}^n \sum_{j=1}^m r_{ij} X_{ij}^0$

RESULT AND DISCUSSION

The results pertaining to compound growth rates for two sub periods, Period I (1991–1996) and Period II (1997–2002) and also the whole study period are shown in Table 1.

The compound growth rates of area planted, production, and export quantity and export value for the period 1991–1996 were 7.64, 6.17, 6.90 and 5.20 percent respectively and these growth rates were statistically significant. However, the growth in yield at –1.10 percent was not significant.

The compound growth rates calculated for the second time period 1997–2002 showed that area planted grew by 2.33 percent and significant at 5 percent level. The growth rates of production yield and export quantity were negative but not significant. The growth rate calculated of export value was positive but not significant.

The growth rates for whole period (1991–2002) showed that growth rate of area planted was 5.12 percent and significant at 1 percent level. The growth of production was positive but not significant. The growth in yield, export quantity and export value were all negative but not significant.

Tab. 1: Compound growth rate for different factors of Pistachio in Iran during 1991–2002

Factors	Period 1991–1996		Period 1997–2002		Total period 1991–2002	
	compound growth rate (%)	t-value	compound growth rate (%)	t-value	compound growth rate (%)	t-value
Area	7.64***	8.37	2.33**	3.47	5.12***	11.82
Production	6.17**	3.04	-2.50	-0.13	0.06	0.02
Yield	-1.10	-0.59	-4.72	-0.26	-4.94	-1.54
Export quantity	6.90***	5.93	-0.23	-0.06	-0.46	-0.23
Export value	5.20**	2.68	0.85	0.14	-1.37	-0.70

Note: ***, **, * indicate significance levels at 1, 5 and 10 percent, respectively

The area planted experienced a positive and significant growth rate in whole study period and also in the sub-periods. As a whole, the increase in the area planted took place mainly due to increase of the Pistachio prices during the past periods that were a signal to the producers to go for more area. Pistachio prices growth rate accounted for 811 percent for the whole previous decade from 1982 to 1991 (Rafsanjan Pistachio Cooperative, 2004). More over, shortage of water and water salinity compelled farmers to choose Pistachio as a more resistance crop.

The production increased of 6.17 percent in the first period that was mainly due to the growth rate of the area planted in the period. Export quantity and export values

also increased due to the same reason as the export prices did not vary significantly during the period.

The yield of pistachio Orchards experienced a negative but in significant growth rate for whole study period, which is an un-satisfactory situation in the industry.

The positive growth rates of production, export quantity and export values which stopped in the second period was mainly due to the decreasing trend of yield, increasing trend of input prices and unsatisfactory prices offered to the producers in this period to retain the profitability in the industry. In addition, the chief problem namely water availability and salinity created due to dryness and rainfall shortage should not be neglected.

At the moment for 70 percent of the farmers water availability is one of the main obstacles. Also 82 percent of the farmers are rendering irrigation with water salinity above 5 Milimoss/cm (Sedaghat, 2006).

Export quantity has changed tremendously during the period (1996–2003). It declined from 140 000 tones in 1996 to 57 907 tones in 1997 and then it increased to 124 872 tones in the successive year. Again the same trend occurred from 1999 to 2003.

Results obtained from CMS model are shown in Table 2. The world trade effect was positive in both time periods, indicating that the change in exports of Iran would have been positive if the country had maintained its share in world exports. The percentage share of world trade effect in total unit of export changes were 1 and 4 percent for I and II periods respectively showing a low importance of world trade effect on export changes. The commodity composition effect was negative in I period (-192.20), indicating that Iran exports were concentrated in commodity markets which have grown relatively slow. But it was positive in II period (337.41), indicating that Iran exports were concentrated in commodity markets which have grown relatively fast. The respective shares of this component in total unit of change were 7 and 41 per cent

Tab. 2: Export competitiveness of Pistachio – Results of the CMS analysis for Iran’s Pistachio exports (1996–2003) in US\$ thousands

Component	Period I (1996–1999)	Period II (2000–2003)
World trade effect	33.45 (1)	31.05 (4)
Commodity composition effect	-192.20 (7)	337.41 (41)
Market distribution effect	1201.39 (43)	411.72 (50)
Competitiveness effect	-1360.39 (49)	-39.41 (5)
Change in export	-317.75	740.77
Total unit of change	2787.43 (100)	819.59 (100)

Note: Figures in parentheses indicate percentage share of the component to total unit of changes

respectively, indicating a higher role of the commodity composition effect in II period than in I period. The market distribution effect was positive for both the time periods, indicating that exports of Iran are concentrated in relatively fast growing markets. The related shares of this effect were 43 and 50 per cent, respectively, indicating a larger role for this component in both the periods. The competitiveness effect was negative in both time periods, indicating the deterioration in the competitiveness of Iran's exports during the period. The shares accounted were 49 per cent in I period against 5 per cent in II period, indicating a relatively higher deterioration in the I period.

The market distribution effect and competitiveness effect played a major role in changes of Iran's exports in I period with 43 and 49 percent respectively. The market distribution effect positively affected the country situation, against a negative effect received from competitiveness effect. Moreover we can conclude that even though Iran selected the fast growing markets, but the negative competitiveness power pushed the country to a negative export changes in the period which is an evidence for a high competition in world Pistachio market.

Commodity composition effect and market distribution effect played a crucial role in export changes of the country in II period with 41 and 50 percent respectively. Both components influenced positively, leading to a positive total export change in the period. This indicates that during the second period, not only Pistachio export was growing fast but also the country exported the produce to fast growing markets.

In general, the market distribution effect played the most important role in competitiveness and export of Pistachio from Iran during the study period.

CONCLUSION AND POLICY IMPLICATION

The area planted increased significantly during the 1991–2002 but the yield of Pistachio orchards decreased during the same period. The increasing trend in exports stopped after banning of Iran exports by European Union in the year 1997. By maintaining its share in world market, Iran could increase the export competitiveness. Although Iran exported Pistachio to relatively fast growing markets, but still there were some deteriorations in the market which are not in country's favor. To increase the country's competition power in years ahead, the policies should be concentrated to increase the orchard yields and to achieve higher quality standards which are necessary to maintain an acceptable profitability level of Orchards on one side and to retain the country's share in global markets on the other side.

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