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Production and supply of pomegranate in Iran

Introduction. Agriculture is considered a critical sector in the world economy. It contributes 24% of global Gross Domestic Product and provides employment to 1.3 billion people or 22% of the world's population. In many of the developing countries, increasing agricultural production has been one of the most important priorities for agricultural development programs. The agricultural is among the major sectors of Iran's economy and 14 percent value-added benefit is belonging itself (Kohansal et al, 2013). Iran contains 12 different types of climate, and while much of its land area is dry and cannot be cultivated, each climate and its corresponding region contribute to a country that is able to grow many varieties of crops. Although 80% of the revenue from Iran's exports is from petroleum, the remaining 20% is shared with the fruits, nuts, and other horticultural crops.

Table 1. Climatic conditions of Iran

Main climate	Area (Km^2)	Percentage
Extra-arid	573884	35.54
Desert-arid	472562	29.15
Semi-arid	325109	20.08
Mediterranean	80007	4.90
Semi-humid	55097	3.37
Humid	58006	3.36
Very humid	55386	3.39
Total	1620051	100

The pomegranate (Punica granatum) is a fruit-bearing deciduous shrub or small tree that grows to between five and eight metres tall and is best suited to climates where winters are cool and summers are hot. Pomegranate can be grown from plains to an elevation of 2000 m. Under temperate climate, pomegranate behaves as deciduous but in subtropical and tropical climate it behaves as an evergreen or partially deciduous. It thrives best under hot dry summer and cold winter provided irrigation facilities are available. To maintain productivity of the plants, generally, which depends upon market factors and availability of water (Mir et al, 2012). The pomegranate is thought to have been first cultivated 5–6,000 years ago and is native to the regions from Iran through to north India (DAF, 2005). Therefore could be declared the pomegranate is native to Central Asia and Persia where its history starts (Ashton, 2006).

Figure 1. The flowers and fruit and pomegranate seeds

Today, pomegranate is cultivated throughout the world in subtropical and tropical areas in many variable climatic conditions. Globally, it is estimated that total production amounts to around 3 million tonnes of pomegranate are producers in the world, annually (Jaime et al, 2013), of which Iran produces approximately 28%. Most pomegranate farms in Iran do not use any chemical fertilizer or insecticide. Iran is the largest, producing around 28% of global production. The balance is produced by countries such as Turkey and other Mediterranean countries such as Morocco and Italy, as well as the Middle East and former Russian state.

Currently, the main use of the pomegranate is for its fresh consumption, although in recent years there has been a continual increase in the industrial production of juices and extracts from its different parts. Its ornamental use is also becoming more and more important, using both its fresh and dry fruits as a plant (Melgarejo et al, 2012).

De-Miguel and et al (2012) investigated the economic prospects of pomegranate growing and they suggested: In the production areas, an effort should be made to achieve a greater presence and availability of this fruit on the markets (home and abroad) something that is feasible, as a business structure has been established and is ready to extend the campaign, along with plant improvement and innovation programs, the use of cold storage and suitable means of transport (De-Miguel et al, 2012).

Kohansal and Rahim investigated the factors marketing pomegranate in Fars province in Iran. The result of this research showed that the total marketing margin, wholesalers and retailing are 240, 100 and 140 is Rials respectively (Kohansal and Rahim, 2013).

Babaei and et al also investigated the pomegranate marketing margins in the Neyriz, Iran. Lack of suitable storage and fridge was one of the major problems of pomegranate growers, therefore to decreasing production costs and making storages and should be made the suitable storage and fridge enough for regulation of demand and supply (Babaei et al, 2013).

Material and Methods. This study is based on data collected from the Ministry of Jihad-e-Agriculture in Iran. The Retail price of Pomegranate was calculated from Isfahan City market. Fars province of Iran was selected for this study because it is considered the main Pomegranate growing area in Iran. Primary data on the cultivation of Pomegranate in research areas was collected in the field through personal interviews of both farmers (producers) and also from the market (traders) that answered questions in a questionnaire prepared for the purpose. The fixed and variable costs were computed based on the formulae presented below.

Table 2. Fixed and variable costs to Pomegranate cultivation in Iran

Cost	Formula
Average fixed cost per pomegranate tree	Average fixed cost per hectare / Number of pomegranate tree per hectare
Average variable cost per pomegranate tree	Average variable cost per hectare / Number of pomegranate tree per hectare
Total production cost per hectare	Average fixed cost per hectare +Average variable cost per hectare
Average cost of production per pomegranate tree	Average fixed cost per Pomegranate tree+ Average variable cost per pomegranate tree
Average cost to produce one Kg pomegranate	Average cost of production per pomegranate / Average production per pomegranate

Commercial production structure and status of the Iran pomegranates. Pomegranate is a high value crop and its entire tree is of great economic importance. At the global level, Iran is the world's largest producer and exporter of pomegranates with an estimated annual production of 790,000 tons, In addition to Iran, other countries including India, China, Turkey, USA, Pakistan, Iraq, Afghanistan, Tunisia, Azerbaijan, Syria, Morocco, Spain, Uzbekistan, Egypt, Italy and Palestine also cultivate this product. Iran cultivated 57,000 ha of pomegranate groves in 2013.

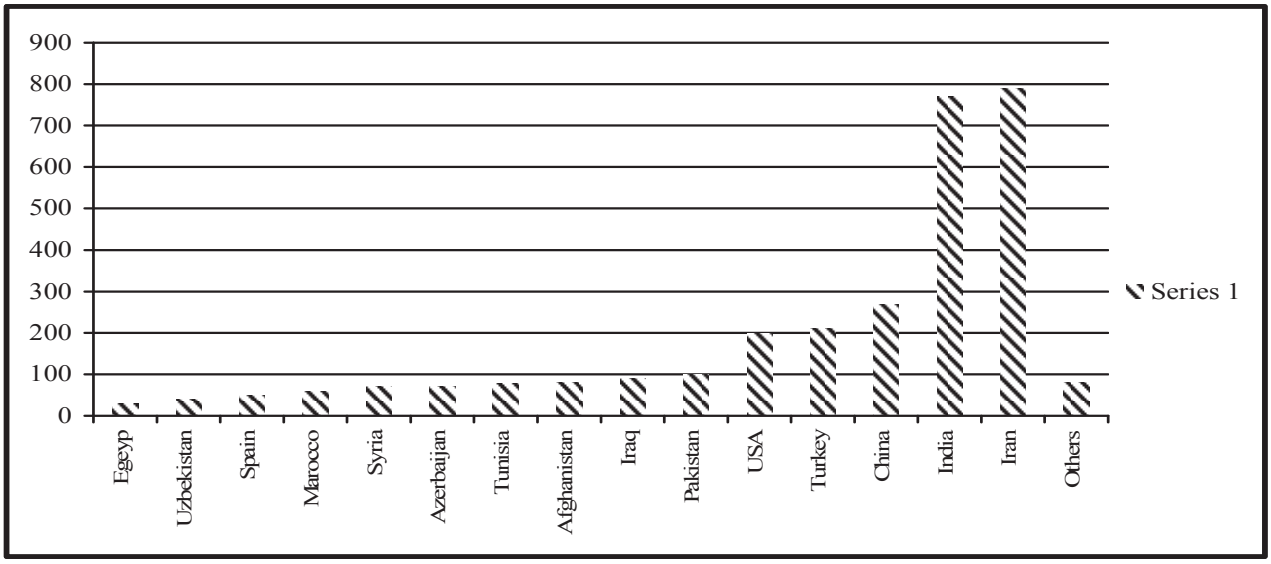

Figure 2. World production of pomegranates

Fars has the first status in pomegranate cultivation among all provinces. The cites which have the most production cultivation area are Neyriz, Arsenjan, Kazeron, Estahban, Jahrom, Marvdasht, Firoz abad, and Mamasani (Kohansal and Rahimi, 2013).

Products derived from pomegranates. All parts of pomegranate tree have great therapeutic value and are used in leather and dying industry. The calorific value of the pomegranate fruit is 65. Its juice is easily digestible and contains about 15 percent invert sugar. It is a rich source of sodium and also contains a good amount of riboflavin, thiamin, niacin, Vitamin C, calcium and phosphorus. Protein and fat contents are negligible.

1. Juices, widely marketed in different countries.

2. Dehydrated seeds. They are cooking possibilities and easy conservation.

3. Jams, preserves, jellies, liquors and other drinks; they have been traditionally homemade.

4. Pomegranate extracts. This section could include a wide range of extracts, used as cosmetics, food supplements, dietetic supplements and nutraceuticals.

5. Pomegranate powder (skin and seeds).

Recent scientific and medical research indicates that pomegranate juice has anti-bacterial, antivirus, anti-carcinogen and anti-inflammatory substances, as well as substances which control cholesterol and prevent cardiovascular problems (Melgarejo et al, 2012). Based on the report released by Iran's Customs Administrative, Iran is at the top of list of pomegranate exporting countries. Iran exported annually about 30,000 metric tons worth 20,000,000 U.S. dollars. Main im-

porting countries were: Azerbaijan, Germany, Austria, Armenia, Uzbekistan, Afghanistan, Spain, UAE, England, Ukraine, Italy, Bahrain, Belgium, Bulgaria, Pakistan, Turkmenistan, Turkey, Belarus, Romania, Japan, Sri Lanka, Sweden, Switzerland, Singapore, Saudi Arabia, Russian Federation, France, Kyrgyzstan, Qatar, South Korea, Kuwait, Canada, Moldavia, Malaysia, and Netherlands. Iran exports are mainly to Gulf countries and supplies are at peak during October-December and it decreases from January onwards.

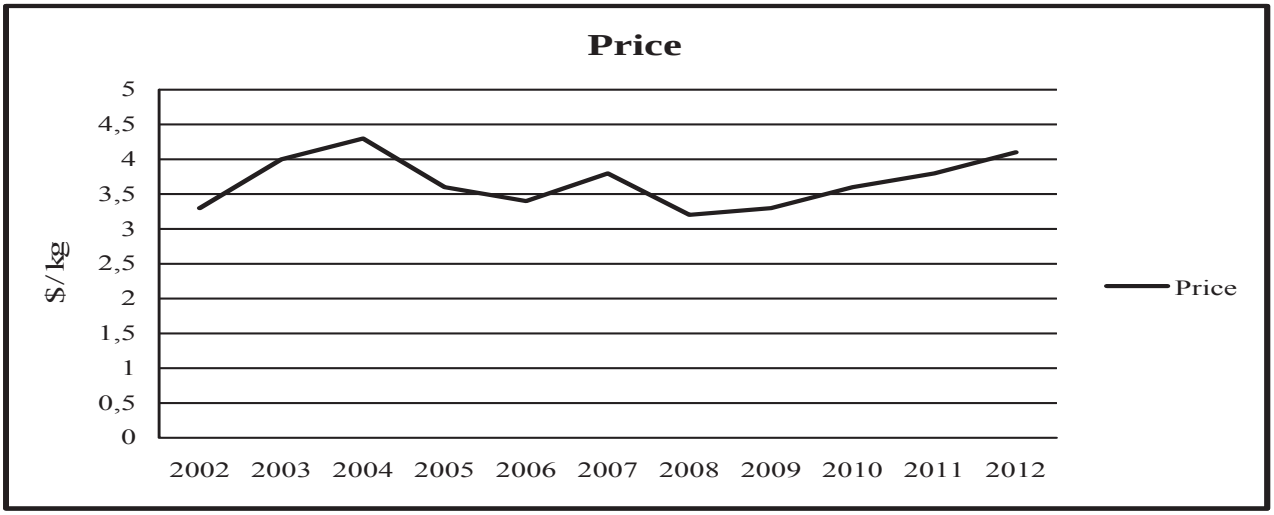

Figure 3. General time related pomegranate price trends in Europe (Rymón, 2012)

Figure 4. Price per kilo of fruit supplied to the world market (Rymón, 2012)

Analysis of production costs of pomegranates in Iran

Average of pomegranate production rate is 25 tons per hectare in Iran. This amount 8 ton has high quality, 12 ton medium and 5 ton low quality. The results show that the average cost of production of pomegranate is estimated at 1.8 $ per kg in Iran. The costs of pomegranate production in Iran shown in Table 3.

Table 3. Analysis of production costs of pomegranates in Iran

Items of Costs	Cost ($/ha)	% of total costs
Irrigation Water	300	8.1
Chemical Fertilizers	667	18
Insecticides, fungicides, herbicides and traps	165	4.5
Total manual labor cost	1265	34.2
Variable costs of owned machinery	290	7.8
Rental of machinery and labor to blend the trimmings	233	6.3
Manual Fertilizers	265	7.2

Continued table. 3

Fuel costs (pumping water)	50	1.3
Marketing	465	12.6
Total costs	3700	100
Cost per Kg	1.8	-
Land rental cost	1300	-

Conclusion. The average price of pomegranate in farm in Iran, the pomegranate categorized in three classes (A, B, and C) in based to their weight. In class one (A) that named high quality the average price in farm is 3.6 $. Also in class tow (B) that named medium quality the average price in farms is 2.1 $ and also in class three (C) that named low quality the average price in farms is 0.9 $. Iran pomegranate production has categorized in the average: 30% yield grade (A), 50 percent of grade (B) and 20 percent is to grade (C). It can be concluded that the average price of pomegranates sale for farmers is $ 2.3 per kilogram. The results show that the average cost of production of pomegranate is estimated at 1.8 $ per kg in Iran. Therefore it can be concluded gross income production of pomegranate production is equivalent to 0.14 $ per kilogram. The gross income of pomegranates farmers in Iran is 3.500 $ per hectare. Also the result of researches indicate that marketing margin for Iranian costumers of pomegranate in Iran is 0.35 $ for whole sale and 0.2 $ for retail. Therefore the marketing margin portion of producers, wholesalers and retailers of the wholesale of sale are 67, 21 and 12 percent, respectively. Given the benefits of native pomegranate production in Iran seems should be done appropriate and comprehensive research in this regard. Especially economic and social research is be needed to determine the properties of pomegranate production in Iran. The results of the research findings could be useful to planners and extension worker to help the sustainable development index of the pomegranate production in Iran.

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