



Saffron Industry Value Chain Development In Iran Diagnostic Study Report

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Introduction

Saffron is a spice obtained from the dried stigma of the flower of saffron crocus (*Crocus Sativus*). Saffron is native to Iran and is considered as the world's most expensive spice.

More than 96% of the worldwide saffron production comes from Iran. However, the share of Iranian saffron in the international market is about 70%. Most of the Iranian saffron is exported in bulk and companies in other countries such as Spain manage the packaging, marketing and distribution. In Iran there are about 120 saffron processing and packaging enterprises of which about 70 are formal and 50 are informal. Most of these enterprises only work in the domestic market and very few are exporters. Furthermore, most of the exporting enterprises use very basic packaging, once at destination the product is repacked accordingly to the final customer requirement. The farming component of the value chain has been largely disregarded in recent years; the productivity is very low, 3.5 Kg per Ha in comparison with 5-7 kg per hectare in the other production countries.

Agriculture Bank of Iran is one of the leading governmental institution promoting SMEs and value chain development in agro related sectors in Iran, and plays a substantial role on policy making in Iran. This project has been designed and is implemented by UNIDO, in collaboration with the Agriculture Bank of Iran, to assist the private sector to enter the global value chain.

The objectives of the project are to:

- (1) Increase the export volume and export value of saffron and saffron products.
- (2) Increase the income of stakeholders along the value chain.

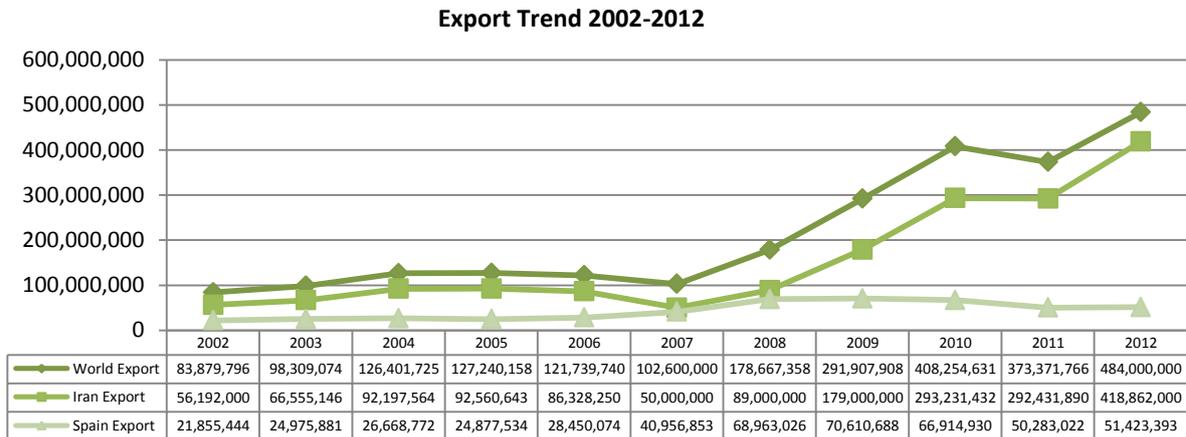
The expected outcomes of the project are:

- Improved saffron production, Kg/Ha;
- Enhanced processing and packaging technology;
- Increased direct share of Iranian SMEs in the saffron global market;

International Scenario

Global Saffron Export Trend

Between the years 2008 to 2012, an overall of 1.736 Million dollar worth of saffron was traded worldwide.



Values: US \$

Sources: ITC UN COMTRADE

The export trends for the period 2008-2012 indicate that Iran, with a rate of 73.3%, is the major exporter of saffron in the world. Second to Iran, stands The United Arab Emirates. However, due to lack of reliable data, no exact information is available on trends of all years. After Iran and The Emirates, Spain, with a rate of 17.8%, is the third major exporter of saffron in the world.

The global trend of saffron export shows that there is a direct relation between the increase of saffron export from Iran and the overall increase of saffron export in the world. This confirms that Iran is the main supplier of saffron in the world.

This is explained by the fact that other exporting countries basically buy saffron from Iran and then re-export it to other countries. Spain, France, Italy, UAE import saffron bulks and after repackaging, they re-export saffron or sell it in the local markets.

In 2012, Iran has exported 139 tons of saffron with a worth of \$418 Million. The difference in export volume compared to 2013 is 3 tons (136 tons, worth of \$ 200 Million) however; the difference in the value is 200 million dollars. This discrepancy is due to currency exchange as well as new customs rules.

The export value of saffron in Iran experiences several fluctuations due to change in custom and fiscal rules. As an example in 2009, some facts mentioned below have caused a considerable increase in the export value in the next year, 2010:

- In 2009, the value of exported saffron was 3,500 USD per Kg that encouraged the exporters to increase the volume of export in the next year. Hence, this led to an increased export value in 2010.

- Tax exemption of the exported goods, which was an incentive for exporting more.
- Financial tools such as loans for the exporters.

However, this increase lasted until early 2011. The high exchange rate of foreign currencies versus Rials in mid-2011 and 2012 caused decrease in exported saffron value in USD. In 2010, the value was 3,000/4,000 USD per Kg, while in 2011-2012, the value decreased to 1,000/1,500 USD per Kg saffron.

India, which after Iran is the biggest producer, is among the top 10 importers of saffron. Greece stands in the third place in terms of production volume but the export trends of saffron in Greece indicate a considerable decline in export from this country. This decrease is mainly due to economic crisis in this country in the recent years. The table below shows the export trend of the major producer countries.

Export of Major Saffron Producer (2008-2012)

Exporters	Exported value in 2012	Exported value in 2011	Exported value in 2010	Exported value in 2009	Exported value in 2008	Total	Share of Total World Export
World	484,000,000	373,371,766	408,254,631	291,907,908	178,667,358	1,736,201,663	100%
Iran	418,862,000	292,431,890	293,231,432	179,000,000	89,000,000	1,272,525,322	73.3%
Spain	51,423,393	50,283,022	66,914,930	70,610,688	68,963,026	308,195,059	17.8%
Greece	886,101	568,394	606,240	2,397,861	372,453	4,831,049	0.3%
France	2,368,359	6,246,959	4,846,250	5,200,244	3,476,849	22,138,661	1.3%
Italy	922,182	835,184	730,126	622,684	649,026	3,759,202	0.2%
Portugal*	3,856,733	4,421,488	5,982,007	5,233,802	1,972,536	21,466,566	1.2%
India	2,170,576	1,516,234	1,496,374	952,036	1,480,724	7,615,944	0.4%
Other Countries	3,510,656	17,068,595	34,447,272	27,890,593	12,752,744	95,669,860	5.5%

Values: US \$

Sources: ITC UN COMTRADE

* Portugal is not a producer country, but in recent years, it has been one of the biggest exporter countries.

Major Exporters of Saffron

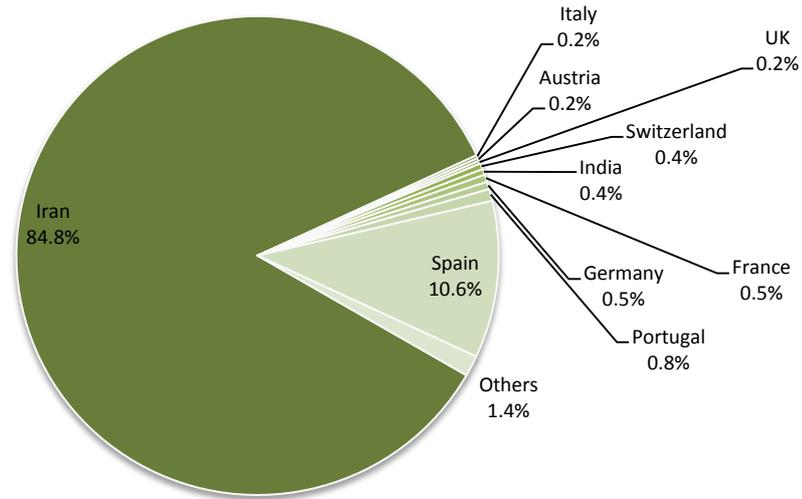
The UAE is the second major exporter of saffron after Iran. Few data are available, however we estimate that 90% of the saffron imported to UAE is re-exported to India, China and Persian Gulf countries, Far Asian countries and even Europe. 95% of saffron is imported from Iran. Free trade zone as well as proper export facilities, and economic stability have made UAE a major hub for saffron trade.

Countries such as Portugal, Switzerland, Austria, Germany and England do not produce saffron however, they are saffron exporters. Countries such as Spain, Italy and France produce saffron however; their production is irrelevant compare to their export. Spain produced 2.3 tons of saffron in 2010 but exported some 50 million dollar worth of saffron. Iran's lack of active and

effective participation in saffron trade has directed other countries to trade Iranian saffron and to generate more added values.

The chart below shows the major exporting countries. Please note that UAE is the second major exporter country however as its share of export is not registered in international databases, we have not shown it in the chart below.

Major exporting countries in 2012



Major saffron exporters in recent years

Exporters	Exported value in 2009	Exported value in 2010	Exported value in 2011	Exported value in 2012
World	291,907	409,722	374,359	484,000
Iran	179,000	293,231	292,432	418,000
Spain	70,611	66,915	50,283	51,423
Portugal	5,234	5,982	4,421	3,857
Germany	1,722	2,737	3,391	2,571
France	5,200	4,846	6,247	2,368
India	952	1,496	1,516	2,171
Switzerland	5,524	2,480	3,316	2,159
UK	1,253	1,284	1,794	1,012
Italy	623	732	836	920
Austria	714	862	681	891
Other Countries	21,074	2,9157	9,442	6,628

Values: Thousand US\$
Sources: ITC UN COMTRADE

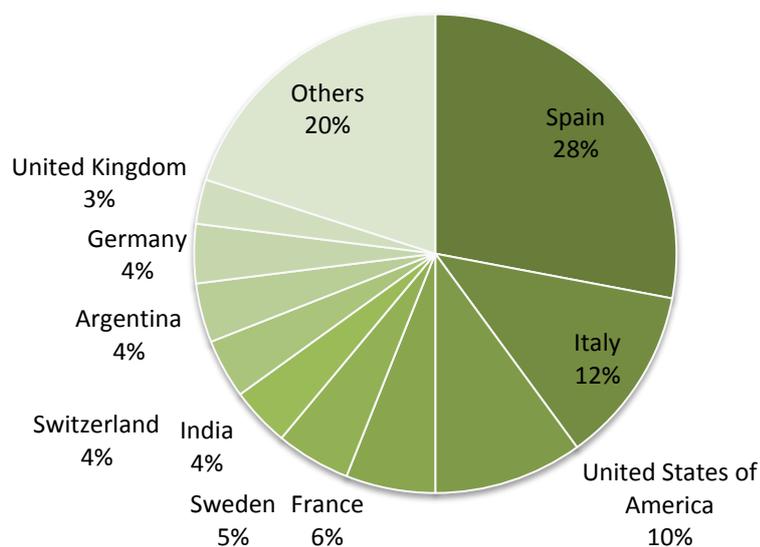
Major Importers of Saffron

The UAE, Spain, Italy, the US, France, Germany, Switzerland, India, Sweden, Argentina and England are the major importers, followed by Hong Kong, Japan, Canada, Portugal and Austria.

The US, Austria, Argentina, Japan, Canada, Switzerland and Sweden consume the most part of the imported saffron while Italy, Spain, and UAE consume only part of the imported saffron and re-export the rest.

For countries such as UAE, Saudi Arabia and Kuwait reliable statistics are not available for all years. However based on non-official data we have estimated their share in the import market of saffron. In 2013, Saudi Arabia imported more than US\$14 million worth of saffron from Iran, followed by the UAE US\$80 million and Qatar 2 million US\$.

10 major global importers of saffron in 2012



In recent years, Portugal, Argentina and Qatar emerged as importing countries.

Top ten saffron importer countries from Iran in 2013

NO	Country	Weight (kg)	Imported value (IRR)	Imported value (USD)
1	UAE	53808	1997968874994	80308302
2	Spain	35421	1371309165018	55020281
3	Saudi Arabia	11987	364397096709	14679214
4	Hong Kong	6183	234693588538	9442918
5	India	5103	197345900530	7951844
6	China	4738	181324503896	7305950
7	Italy	3975	238198887283	9542380
8	Germany	2199	89366566988	3597118
9	Qatar	1683	64773098051	2601134
10	Sweden	1231	40228112883	1614796

Major saffron importers in recent years

Importers	Imported value in 2009	Imported value in 2010	Imported value in 2011	Imported value in 2012
World	229026	312644	267937	149326
Spain	66662	53115	38715	42644
Italy	42011	30459	21578	19043
United States of America	13730	14728	14007	14715
France	12653	14030	10390	8650
Sweden	14852	8008	7921	7188
India	4982	4760	8353	6133
Switzerland	12788	9744	6910	5603
Argentina	11609	6783	5101	5519
Germany	5184	6942	5199	5233
United Kingdom	6326	6420	5356	3764
Others	38229	157655	144407	30834

Values: Thousand US\$

Sources: ITC UN COMTRADE

Production of Saffron in the World

Due to very specific climate requirements, saffron grows in few countries. Unfortunately, the data are not available for all producer countries regarding the saffron yield. According to recent statistics published by producing countries the average yield is as follows:

Production and yield (2010)*

No.	Region/Country	Surface (Hectares)	Production (Tons)	Efficiency (Kg/Hectare)	Share in the world (Production)
1	Iran (Khorasan)	67297	239	3.5	90.7%
2	India (Kashmir)	3200	12.5	3.9	4.4%
3	Spain (Castilla La mancha)	165	2.3	14	0.8%
4	Greece (Kozzani)	1750	7	4	2.5%
5	Azerbaijan	30	0.2	6.6	0.06%
6	Morocco	200	2.6	3.2	0.9%
7	Italy (Sardinia)	500	1	2	0.3%
8	Afghanistan	800	0.8	4	0.2%
9	China	500	1	2	0.3%
Total		85949	288.4	-	100%

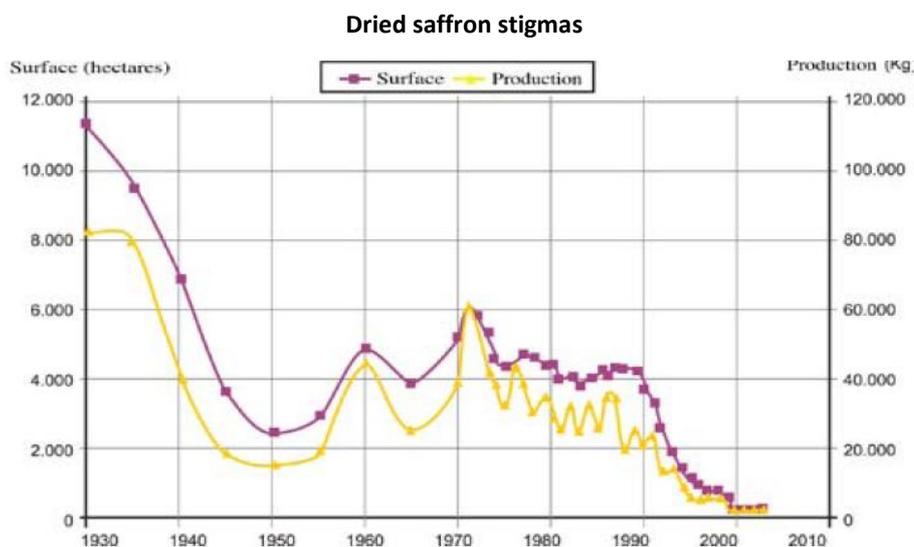
* Iran and Spain data's source: ITC

Other countries data's source: Diverse

Very small production areas, less than 10 hectares, are reported in New Zealand, France, Switzerland, England, and the US. In the Abruzzo region, in Italy, saffron is cultivated in L'Aquila. No exact data are available for producing countries such as Afghanistan, Morocco, Azerbaijan and China and generally very different numbers are available about the cultivation in these countries. It seems that the cultivated land in Azerbaijan is less than 30 hectare or in Afghanistan, it would be more than 800 hectares.

In Greece in 2012 due to draught and economic crisis, cultivation of saffron declined to 1.7 tons per year. (Compared to 7 tons in 2010 as shown in the table)

Until 1970, Spain was the major producer of saffron with 60 tons production per year. Spain also, had experienced the production of 120 tons in 1930. The graph below shows changes in the cultivation and production of saffron in Spain throughout the 20th century.



Source: Spain Ministry of Agriculture

Upon the increase in wages and other factors, cultivation of saffron in Spain declined to the point that today, only around 165 hectares of saffron farms have remained. However, its production of 14 kg/Ha is the highest globally. A study conducted in Spain shows that the yield of irrigated saffron increases up to 18 to 19 kg/Ha, while the average production for dry farming is 9 kg/Ha.

In the period 2000-2010, the increased price of saffron as well as the economic crises in Europe resulted in an increased cultivation area in Spain, as shown in the table below. Also the cultivation and production of saffron in west China, Afghanistan and Greece is expected to increase in coming years.

Surfaces and crop yields - industrial cultivation -Saffron (stigmas roasted)2000-2010

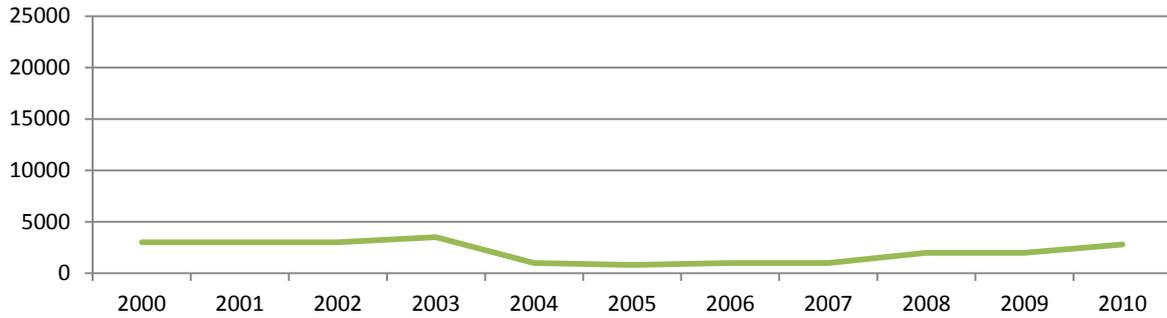
Year	Surface (Hectare)	Yield (kg/ha)	Production (kilogram)	Average price perceived by farmers (euro/100kg)	Value (thousands of euros)
2000	233	12.11	2.822	92.800	2.619
2001	233	12.09	2.818	99.608	2.807
2002	238	11.84	2.818	117.127	3.301
2003	235	14.55	3.420	121.342	4.150
2004	87	12.08	1.051	130.695	1.374
2005	83	9.88	820	131.236	1.076
2006	116	11.47	1.330	131.236	1.745
2007	112	12.01	1.345	141.179	1.899
2008	136	13.55	1.843	176.734	3.257
2009	143	12.79	1.829	273.403	5.001
2010	165	14.13	2.332	300.792	7.014

Cultivation area in Spain 2000-2010



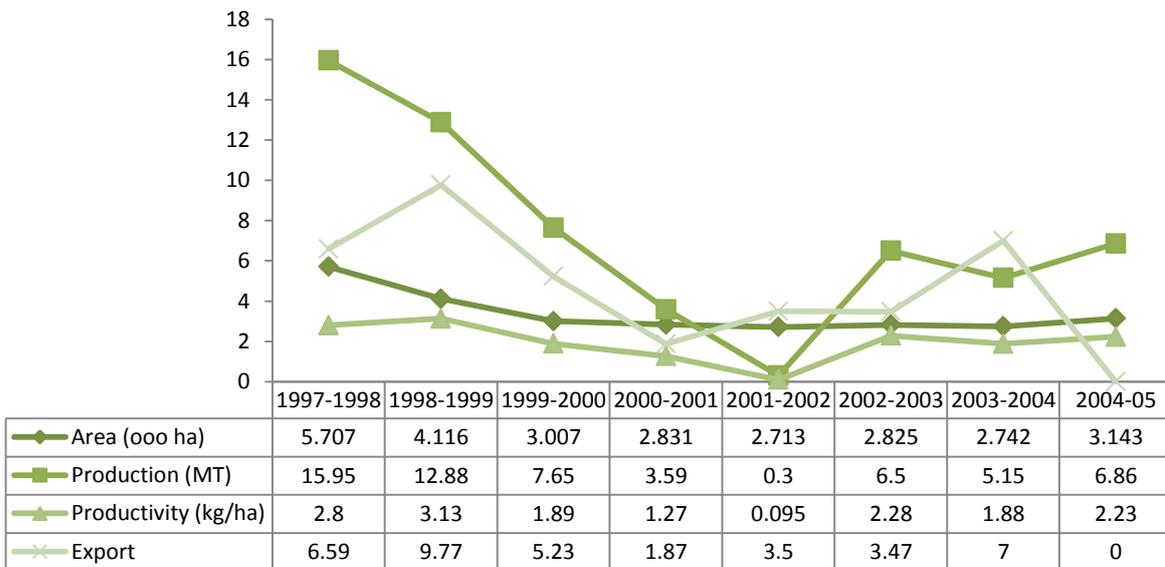
Source: Spain Ministry of Agriculture

Saffron production volume in Spain 2000-2010

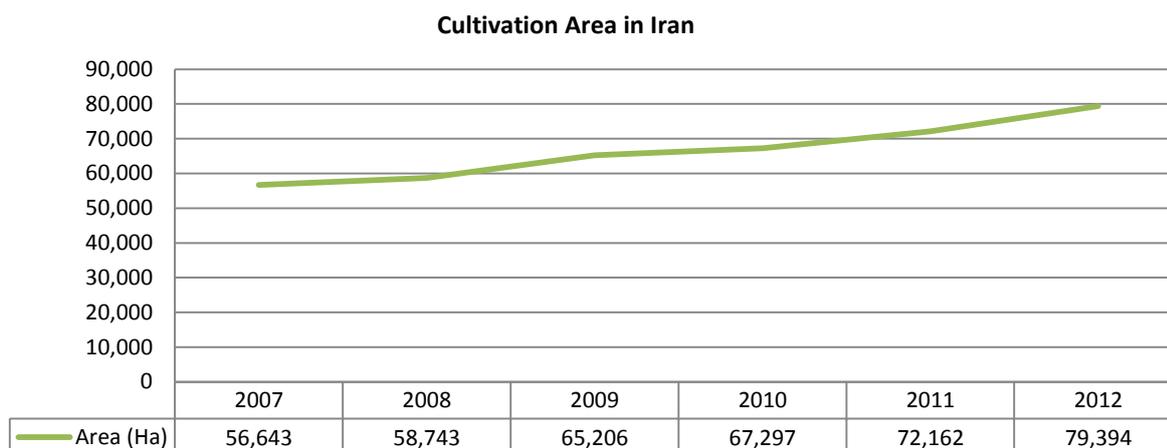


Source: Spain Ministry of Agriculture

Cultivation area in India



Source: India Ministry of Agriculture



Source: Iran Ministry of Agriculture

The production rate of saffron in Iran has grown in the past 20 years. Overall, the cultivation of Saffron in Spain and Italy, which in the past were considered as two major producers, has decreased (Studying the last 50 years) but as the agriculture practices have improved, therefore the yield per Hectare has increased and is 14 Kg/Ha in Spain and 6.1 Kg/Ha in Italy.

One of the main reasons for decreasing the cultivation area in different countries is the fact that cultivation and harvesting of saffron and also the processing are very labor intensive. For the moment the mechanization of cultivation, harvesting and separating the stigma from petal is not possible. Hence, all these operations need the human work-force and this causes an increase in the cost.

For one kg of dry saffron we should harvest 78.5 kg of Saffron flowers, meaning about 170,000 flowers handled by workers. Due to high rate of human's wage in the countries such as Spain, Italy and Greece the production of saffron is not economical comparing to Iran, India, Morocco or Azerbaijan.

Changes in climatic conditions have also affected saffron cultivation in some regions.

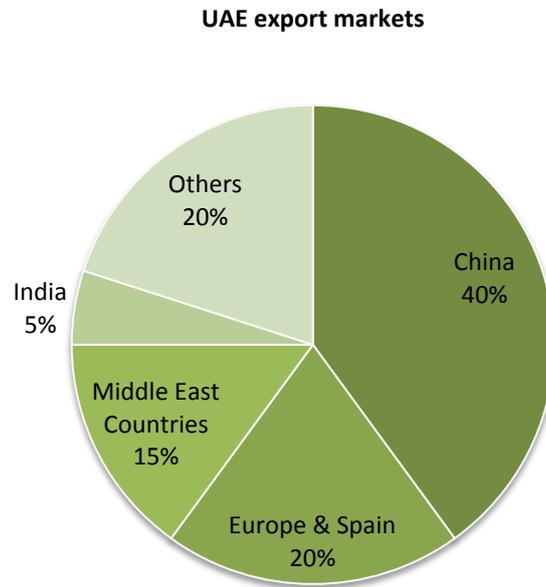
Saffron environmental requirements are as follows:

- Snowy winters and dry and hot summers
- 300 mm of rain during the growth period
- Temperature ranging from a minimum of -18°C to a maximum of 40°C.
- Latitude from 32 to 36° north and up to 1,000m above sea level.

Target Markets of Exporting Countries

1- The United Arab Emirates (UAE)

According to available data and other information collected from traders in the UAE, these are the main export markets for UAE:



Source: ITC UN COMTRADE

In addition, almost all saffron exported by UAE is in the form of bulk and is combined with fake ingredients as well.

2- Spain

Spain is one of the forerunners of saffron export and it was the largest producers of saffron in the world in the early 20th century. Recently, Spain has been regarded as the third exporter country, following Iran and the United Arab Emirates. However, Spain generates more added value and benefit from international saffron trade compared to Iran and Arab Emirates.

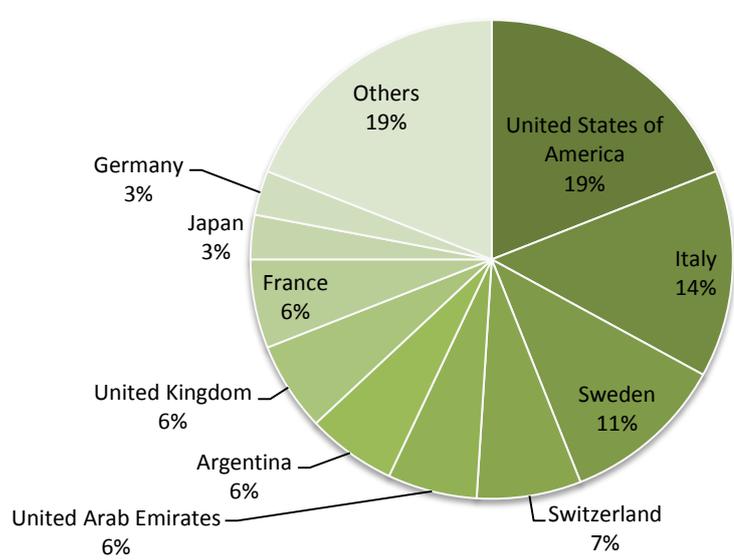
The main reasons of generating more added values are commercial repute of this country in the market of saffron and also strong presence in the international markets, international retail sector, and more accessibility to market channels.

Over 95% of exported saffron by Spain is exported in the small packages, which is sold and exported to selling companies, large chain stores, and the final consumer in international level. Spain exported \$51,423,000 Saffron in 2012 which shows a 3% increases compared to 2011.

Over 83% of exported saffron from Iran in 2012 was exported to only five countries (in form of bulk). These countries are UAE, Spain, Arabie Saudite, Italy and Hong Kong (China). These countries re-export the saffron. However, the saffron exported by Spain was exported in small packages and over 90% of it, is consumed in final consumer's markets.

Even some countries such as UAE, have started to import packaged saffron from Spain and to re-export to the final target markets.

Importers from Spain in 2012



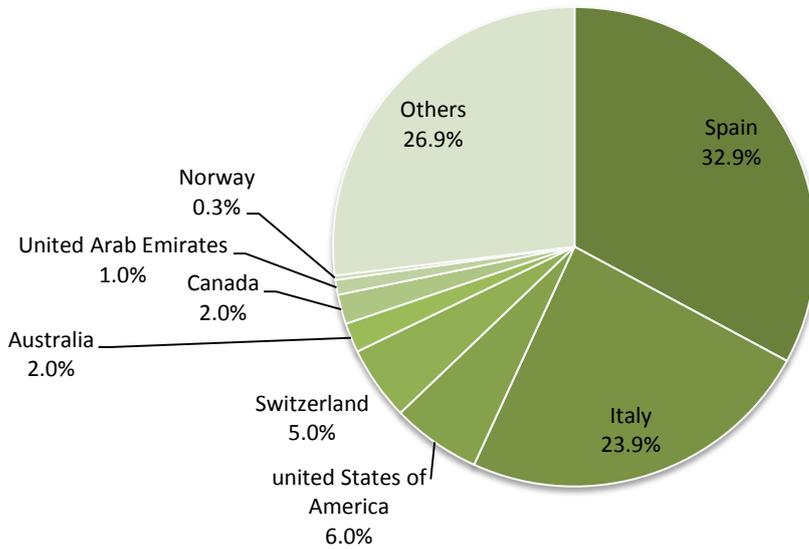
Source: ITC UN COMTRADE

3- Greece

Although Greece is not any longer regarded as a large exporter of saffron over the recent years, it is still considered as one of the largest producers of saffron due to its great previous potential and production ability. Over the past ten years, Greece has had the largest saffron cultivated area after Iran and India. The production rate in Greece has decreased due to different reasons such as drought in recent years.

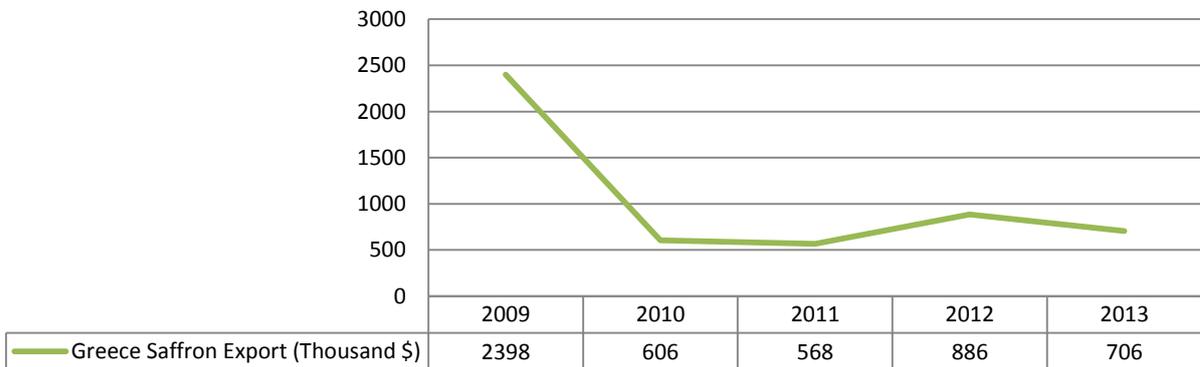
Despite an unprecedented recession in Greece this country has focused on Saffron cultivation and exportation, since in poor economic conditions and lack of primary sources, saffron is regarded as a plant requiring less input. Therefore, some regions, previously abandoning saffron cultivation, re-started to cultivate this product and it is predictable that Greece will increase exporting saffron in the next years as it did in 2000 to 2005. Greece exported \$885,000 Saffron to different countries in 2012 which shows a dramatic rise in exportation of saffron from this country compared to \$568,000 in 2011. The major importing countries from Greece are shown in the chart below:

Importers from Greece in 2012



Source: ITC UN COMTRADE

Greece Saffron Export



4- India

Currently, India, in Kashmir region, has the highest cultivation area after Iran. India has a strong tendency to increase saffron cultivation which is mainly due to improvement of its economy. However, there have been no significant changes in cultivated area in this country over the recent years. Nevertheless, India is one of the important exporters and consumers of spices all over the world. India in order to protect its domestic saffron has set a 35% tariff for saffron imports. As the most of the saffron imported into this country is either from other origins or is being imported under the name of other commodities, it is impossible to have any accurate and official statistics of imported saffron into this country. UAE is the major saffron importer from India.



Source: ITC UN COMTRADE

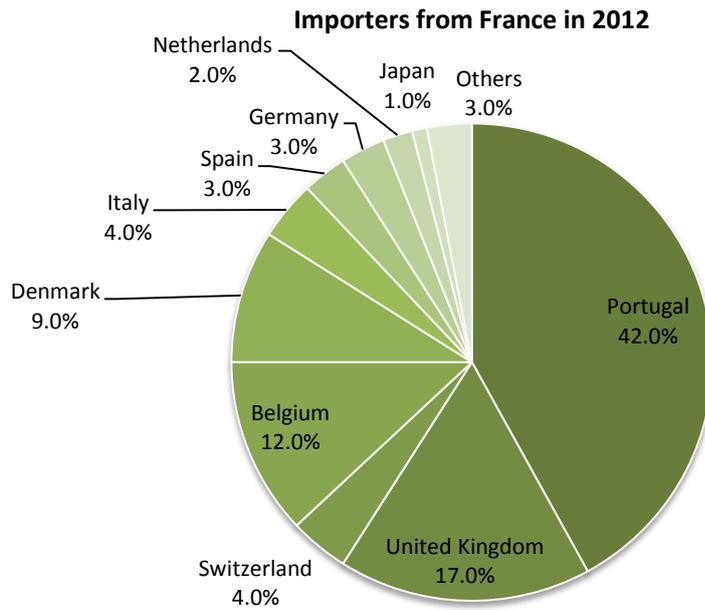
Saffron produced in India does not have a high quality and it is not highly welcomed among buyers due to its high humidity and dark appearance.

Over \$2 million saffron export from India was recorded in 2012 which was mainly purchased by the United Arab Emirates, Italy, Qatar, Oman, and Spain. Except Emirates and Spain, other countries, which purchase saffron from India, buy it in small packages. The major buyers of this product in importing countries are basically the Indian residents in those countries who prefer to purchase saffron produced by India.

5- France

France is one of the top ten saffron importer countries and is one of the most important consumer countries. France imported \$8,650,000 Saffron in 2012 while exporting only \$2,368,000 of it to other countries. In other words, over 72% of imported saffron to this country has been domestically consumed.

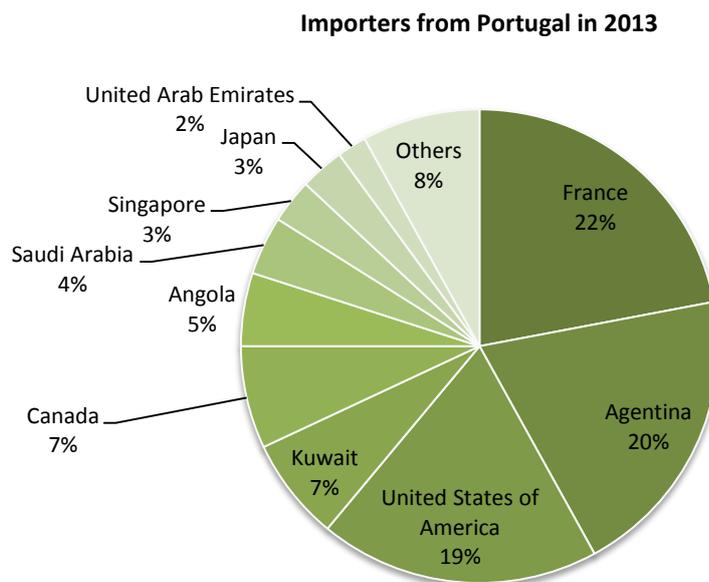
According to the field surveys, less than five companies in France export saffron and four of these companies are Iranian. The major application of saffron in this country is in culinary and also in beverages and cosmetic industry. Also France imports saffron from Spain and UAE. Major saffron importer countries from France in 2012 include:



Source: ITC UN COMTRADE

6- Portugal

Since 2004, Portugal has been one of the major export intermediaries of saffron. Due to commercial and cultural relationships between this country and Latin American and South American countries such as Argentina, Mexico, and also due to inability of Iranian exporters in developing international markets, Portugal has seized the opportunity. Portugal mainly imports saffron from Spain and small amount from Iran and other countries. Major countries purchasing Saffron from Portugal include:



Source: ITC UN COMTRADE

International Trend of Saffron Price

The price of saffron at the international level has experienced huge fluctuations over the recent years. A survey shows a gradual increase of price from 1998 to 2003. Also saffron price doubled from 2004 to 2005. This trend is upwardly and continuously occurring in a way that the price of Saffron in global market reached to more than \$2000 per Kg in 2007.

The price of saffron in global markets was around \$ 350 per Kg in 2003 which has experienced a dramatic rise, making it cost around \$2000 per Kg in 2007.

In early 2011, Iran was selling saffron to international buyers for three or four thousand dollars per Kg; however, saffron price changed a lot due to changes in currency rates from mid-2011 to 2013. From mid-2011 to 2012, the exchange rate of dollar versus Rial experienced a 3- to 3.5-times increase. At the beginning of 2011 and before that, one gram of saffron was sold at an average of \$3.5 (i.e. 35,000 Rials) to foreign purchasers. During and after the currency crisis saffron was being exported to other countries ranging from \$1 to \$1.5 as buyers were calculating the saffron price based on the local currency.

Main buyers of Iranian saffron in global markets are classified into two groups in terms of their nationality:

- 1- Saffron buyers who are Iranian residents in foreign countries
- 2- Foreign buyers of Saffron (companies or individuals with different nationalities)

Iranians constitute the first group of buyers residing outside Iran in different countries. This group of buyers constitutes over 75% of buyers of Iranian saffron. Naturally, these buyers are familiar with modern developments in Iran and do their shopping with Iranian currency (Rial). They usually pay the money by their relatives living in Iran. These buyers usually purchase saffron in bulk and attempt to sell it in small packages or in bulk. Therefore, rising or falling dollar price has no impact on their purchase, in fact saffron exporter or seller in Iran gains no profit from the rise in dollar exchange rate and the foreign seller benefits the most. Although the purchase price for foreign importer has decreased, the final price for end user went down only 10%.

Foreign companies basically constitute the second group of buyers. Spanish buyers make a huge part of this group. Given the long commercial history with Iran, they are well familiar with internal changes in Iran. Iranian producers cut the price to get the foreign buyers for themselves as a client; hence, they cause a negative competition in the market. This group of buyers, like those in the first group, benefits the most; out of dollar exchange rate versus Rial.

Factors Affecting the Global Price of Saffron

The price of every Kg. of exported saffron in bulk was traded from \$1100 (for different Saffron category) to \$1700 (For Negin Momtaz Saffron) in 2012 and 2013. Some factors affecting price fluctuations of saffron in Iran are:

- 1- Exchange rate of Dollar versus Rial

2- Seasonal fluctuation; in other words, saffron price during fall, reaches its lowest limit and up to March (Esfand), coinciding with Iranian New Year, increases and after the new year the price changes based on the level of supply.

3- During the lunar months, Muharram and Ramadan the price of this product rises due to higher domestic demand and Islamic markets' demand.

4- Christian New Year. Each year and with approaching New Year, the price increases a bit.

5- Changes in exporting policies, pricing and export's incentives;

6- Annual changes in general business expenses (annual increase in input's expenses which lead to an increase in final price.)

7- Climactic changes. During drought due to low supply of the product, saffron price will rise and during rainy years due to further supply, the price will decrease. However, according to gradual supply of saffron by farmers in rainy years, the price experiences less fluctuation.

In other countries of the world, saffron price is affected by several factors including climatic changes, global economic developments (such as economic crisis and natural disasters). Political and environmental factors are less influential in the area of trade and business of saffron. In wholesale markets, the average price of Iranian saffron in bulk in 2013 was:

Average price of Iranian Saffron in bulk in 2013

No.	Type of Product	Average exporting price in bulk FOB (per Kg.)	Explanations
1	Saffron (Dasteh)	\$ 1100	Mainly exported to Arabic Countries
2	Saffron (Poushal)	\$1350	Poushal, Sargol and Negin Saffron are available in different categories based on their quality and there is a \$200 difference between their top and ordinary quality.
3	Sargol Saffron	\$1500	
4	Negin Saffron	\$1700	

No exact information about other saffron exporters is available, but surveys demonstrate that the price of saffron exported by Arab traders to other countries has been from 10% to 30% more than the Iranian price. Countries such as Spain do not export saffron in bulk except for their special buyers such as food companies.

Moreover, in retail markets of saffron in Europe saffron packages weight from less than one gram up to 1 gram and one gram saffron goes for 5 Euros. It should be noted that this figure in American markets will sometime reach to more than 8 to 14 Euros.

Generally, saffron price in retail sector, experiences a lot of price fluctuations and it does not follow a special rule and based on package type, brand name and its quality many different prices are available in the market.

In addition it should be noticed that some traders in the global markets manage the price through mixing the low quality saffron with higher quality ones in order to increase their profit margin. Some Spanish dealers purchase Iranian saffron, combine it with saffron imported from other countries, and after packaging stages, sell saffron in various markets with the higher price. (8000 USD per kg)

Use of Saffron and Its Applications

Saffron is known since antiquity for its color, flavor and medicinal properties and it is used in many cuisines; however, over the recent years due to tendency of different countries to utilize natural additives, using saffron instead of different kinds of chemical substances in food has increased. Nowadays, general usage of saffron is in cooking, confectionary industry, alcoholic and non-alcoholic beverages. Using saffron in America is allowed for coloring sausage, Margarine, and shortenings. The most important applications of saffron with different amounts are listed in the table below:

Most significant applications of Saffron as an ingredient

No.	Uses of Saffron	Amount (ppm)
1	Cooking	10
2	non-alcoholic beverages	1.3 to 7.5
3	Ice-cream	1.3 to 9
4	Meats	260
5	alcoholic beverages	200
6	Seasoning	50

In dairy industry saffron is mostly used for producing cheese and butter and to improve its color and flavor.

Also, in Southeast Asian countries especially China and Japan, saffron is used as a sedative and analgesics. Saffron is mainly used as a kind of seasoning for special recipes as a flavor. But recent researches have proved its medical and healing property.

There is some evidence that saffron may have anti-cancer effects and may help lower cholesterol and triglycerides. Saffron is also sometimes used to help with certain conditions, such as baldness. Its effect on strengthening male fertility is also known. In addition, it has some positive effects on ALS disease.

Academic and Research Institutions of Saffron in the World

Over the recent years and according to exact identification of saffron ingredients, many studies have been performed on therapeutic effects of saffron ingredients, attracting attention to its biological effects and pharmaceutical applications. Several research centers are working and studying on saffron such as following:

Saffron research centers

No.	Name of Institution	Location
1	Cancer Research Center of Amala	Kerala, India
2	Central Institute of Food Technology	Mysore, India
3	Medical Faculty of Minnesota University	Minneapolis, Minnesota, USA
4	The Agricultural University of Athens	Athens, Greece
5	Azerbaijan Academy of Sciences	Baku, Azerbaijan
6	Kyushu University	Fukuoka, Japan
7	Tokyo University	Tokyo, Japan
8	University of Murcia	Murcia, Spain
9	National Institute of Health Sciences	Tokyo, Japan
10	Queretaro University	Queretaro, Mexico
11	Chiba University	Chiba, Japan
12	Crocus Bank	Madrid, Spain
13	Research and development Institute of Asia and Middle East	International
14	Committee of Assisting Afghan Refugees (Dakar)	Herat, Afghanistan
15	University of Washington	Herat and Washington
16	Khorasan Research Institute for Food Science and technology	Mashhad, Iran
17	Faculty of Pharmacy, University of Mashhad	Mashhad, Iran

Moreover, the European Union has started working on a project since 2003 named “*Saffron Project*” collaborating with some European universities in order to develop and improve saffron cultivation and processing in Italy, Spain and Greece and also financed the research activities of these three countries.

Conclusion

The trend of demand and also export in terms of value indicates a 500 percent rise from 2002 to 2012. This proves that saffron is introduced as a new commodity in the world and is in the initial steps of product life cycle. The main features of saffron market are shown in the table below.

Main Features of Saffron Market

Key Features of the Market	Features
Saffron International Trade Volume in 2012	484 million dollars
Average Annual Growth Rate during 2008-2012	31%
Saffron's share in global trade of spices	3-4%
Volume of global trade of Saffron in 2006	121.7 million dollar
Market growth during 2002-2012	500%
The market share of 5 major countries exporting Saffron	94.5%
The market share of 5 major countries importing Saffron	62%

EU member states are the largest saffron importers which import around 60% of world's saffron, so they are one of the most attractive international markets for saffron. It is predicted that the

usage of saffron will experience a huge increase due to tendency of users to natural food colors and organic plants.

The following factors are the main reasons of increasing demand of saffron in international markets:

- 1- Getting familiar with saffron and saffron's medical applications, its use in pharmaceutical and cosmetic products and alternative use of saffron as an additive instead of chemical and unnatural colors.
- 2- Tendency to organic products and changing consumption style.
- 3- Development of activities of companies supplying and commercializing saffron which help consumers get familiar with this product.
- 4- Development of saffron based products

As mentioned before, increase in saffron cultivation in Iran and decrease in overall production in other countries, have led to a more than 90-percent share of saffron production in Iran. But lack of an appropriate research and development strategies to develop the new products along with other factors, caused that the most part of the Iranian saffron be exported to other countries in its raw form, hence generating less added value for the saffron industry in Iran.

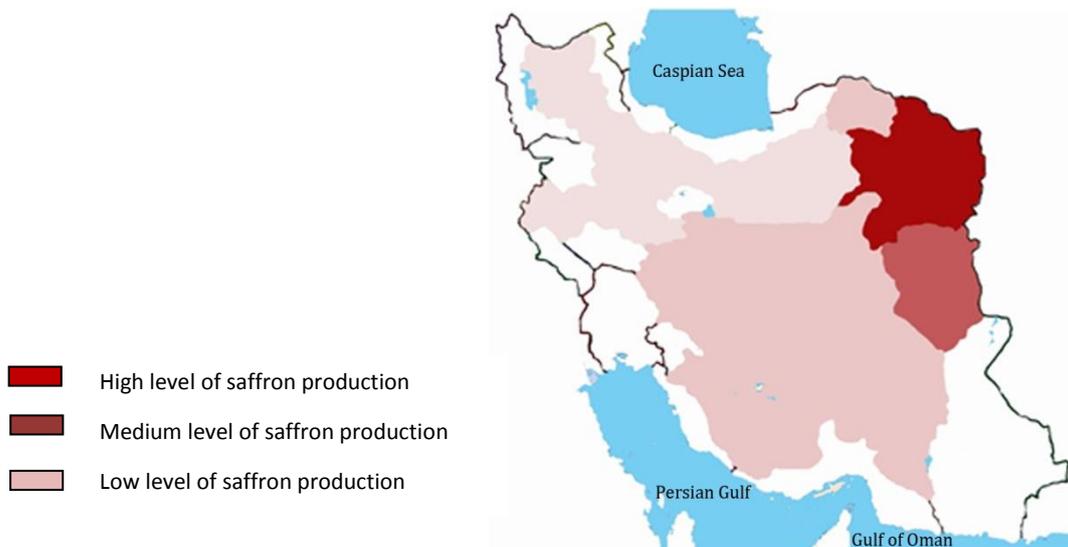
National Scenario

Saffron is one of the most valuable agricultural products of Iran which typically grows in Mediterranean climates and regions with latitude of 30-50 north degree and altitude of 10 western degrees and 80 eastern degrees in semi-arid regions with cold winters and hot summers. Saffron has such unique qualities that its production technology, however complex, has been maintained by generations of farmers.

Saffron Production in Iran

Producing saffron has experienced several fluctuations during the recent years and depends mostly on the volume of precipitation in the cultivated areas. Observing Iran's saffron production rate indicates that this plant can be produced almost in any region in Iran. However considering its special climatic demands and its flowering period (7 years in Khorasan and in other regions 3-4 years), production of saffron in semi-arid regions of Eastern parts of the country is more suitable and more beneficial. More than 96% of saffron is being produced in Khorasan Razavi and Khorasan Jonubi provinces. Years of traditional techniques of farming, restoring, planting and harvesting have created a special culture among people of Khorasan.

Distribution of Saffron producers in Iran



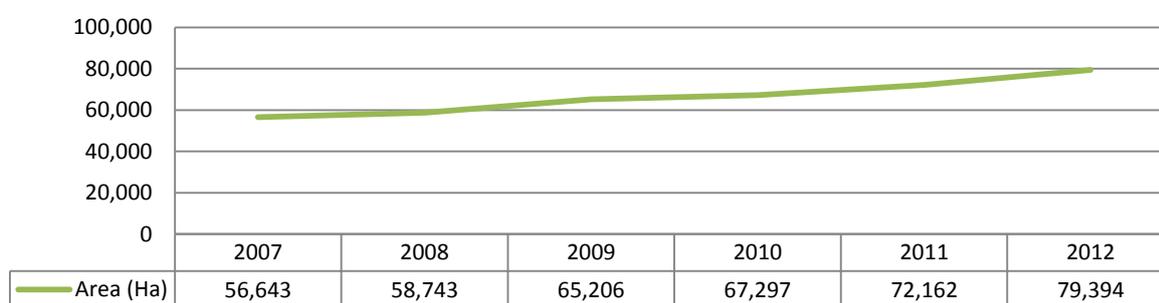
In recent years, due to an increase in price of saffron and its profitability compared to other agricultural products, general shortage of water and little need of saffron for water; other provinces such as Isfahan and Eastern Azerbaijan have also started cultivating saffron. However, due to the dispersion of these provinces and their minor volume of production they have not affected the rate of production in general in Iran.

In recent years as a result of an increase in price and added value of saffron compared to other agricultural products, there has been a wave of saffron producing even in provinces which have no background and knowledge of it. This resulted in poor quality products. The trend of cultivated farms and production in the last 6 years:

Trend of Saffron farming in Iran

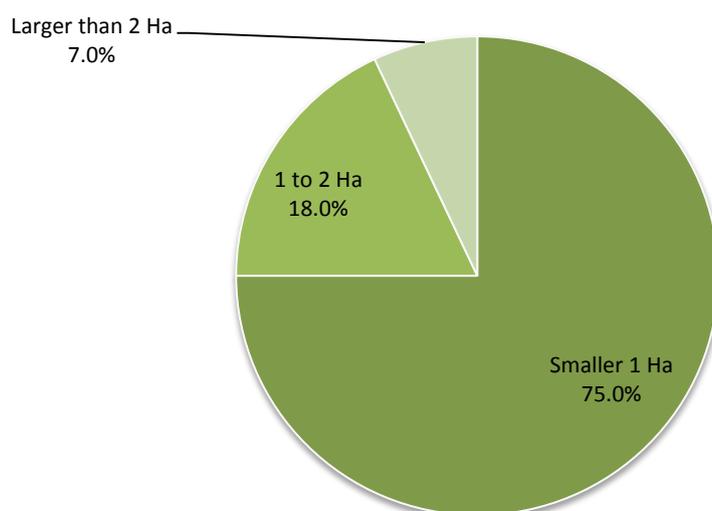
Year	Cultivation Area(Hectare)			Production Volume	Efficiency (Kg/Ha)
	Fruitful	Non-Fruitful	Total		
2007	56,643.3	2,262,6	58,906	230,413.56	4
2008	58,473	3,463	61,936	37,900	0.6
2009	65,206	1,291	66,497	215,110	3.2
2010	62,297	2,746	70,044	239,244	3.5
2011	72,162	957	73,119	254,060	3.5
2012	78,804	589	79394	261,519	3.3

Cultivation area change in the period 2007-2012



In 2012 with 65,222 hectares of cultivated land, Khorasan Razavi was the biggest saffron producer of the country and Khorasan Jonubi with 14262 hectares was the second one on the chart. In average, Khorasan Razavi and Jonubi together possess 96% of saffron farmlands and 95% of saffron farmers work in these two provinces.

Distribution of Saffron farms based on the space



In 2011 the number of saffron processors was 155500. 95% of saffron is produced in these two provinces (Razavi 77%, Jonubi 18%). More than 98% of packaging and exporting companies are also in these two provinces.

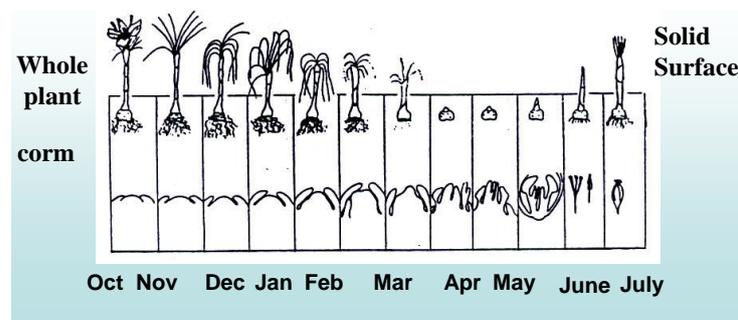
75% of the total cultivated lands have the area of less than 1 hectare, 18% between 1 and 2 Hectare and only 7% of the farms have the area of more than 2 hectare. The ratio of efficiency per hectare for saffron in the last 2 decades has been between 3-4 kilograms per hectare and on average 3.3-3.5 kilograms per hectare.

Key factors in efficiency improvement of the saffron cultivation in Iran

Most farmers supply fertilizers, saffron bulbs and other required resources from other farmers and nearby regions. Saffron bulb normally starts to reproduce other bulb after three years. Farmers, who possess saffron plants of 3 years or more, sell the excess bulbs to others who are willing to cultivate for the first time or farmer who are renewing their farm. Saffron bulb, as its best species, weighs 8 grams or more. Yet, producers in Khorasan, especially the ones who start cultivating in new lands, usually use bulbs lighter than 8 grams. In 2013, Saffron bulbs (depending on their weight and quality) were priced 0.8 to 1.2 USD. Obviously, bulbs are sold cheaper in areas like Torbat Heydarieh, Zaaveh that have experienced a long history of Saffron cultivation. In newly cultivated area, the farmers supply their bulb from other towns like Torbat Heydarieh and after a few years, they start to sell out their exceeding bulbs. Many farmers are rather unable to distinguish the good bulbs and are also unfamiliar with principles of cultivation. This has led to neglecting the importance of selecting good bulbs by the farmers. Absence of an industrial cultivating center that reproduces proper Saffron bulbs is a critical obstacle to efficiency improvement in the cultivation segment.

Although the local branch of Ministry of Agriculture and few governmental centers have made some efforts to reproduce improved bulbs, many farmers are unaware of these centers. Also, those bodies are not able to produce them in high volumes. Thus, bargaining high-grade bulbs is not a thriving activity amongst the actors of this sector. Many experts and researchers in the country have studied the methodical production, processing and sorting of saffron bulbs, but the findings have not become commercialized due to lack of investment. The optimal quantity of bulbs to b is 5 tons.

Saffron Life cycle in one year



a. Animal fertilizers and additives

Nourishing the soil is a primary principle in cultivating the land efficiently. Yet saffron production lands have mostly gone under cultivation without testing their nutrition facts. Even in some areas, poor soil quality that is an outcome of constant cultivation of the land, improper depth of cultivation, and inherent poor soil quality has severely decreased the crop yield. According to principles of saffron cultivation, the soil needs to be plowed so that the soil bacteria get enough oxygen and replicate. Moreover, animal fertilizers must be added to nourish the soil. However, due to the accompanying cost and/or unawareness of the farmers, these operations are also neglected.

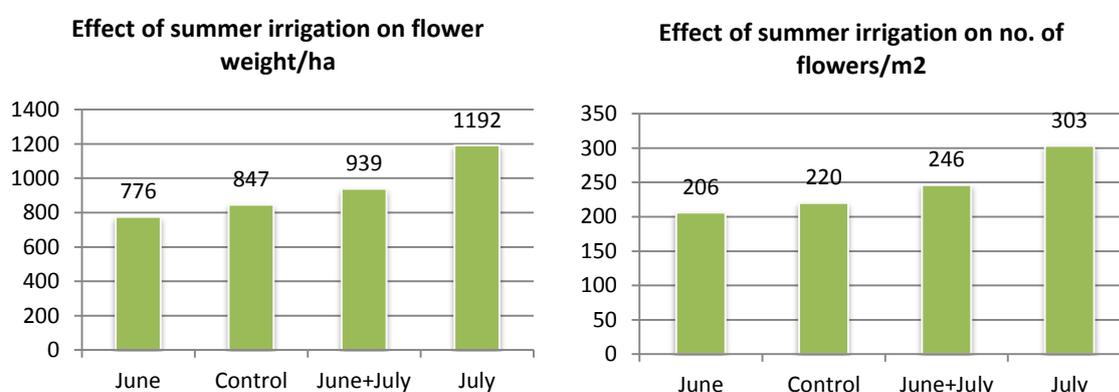
Studies show that a hectare of land that is going under cultivation of saffron for the first time needs 25 to 30 tons of animal fertilizers (cow manure is preferred). In 2013, the cost for this amount of fertilizer was 1000 USD.

b. Irrigation and water requirements

The minimum requirements of saffron in terms of irrigation are the irrigation of the land in the following sequence: first, after planting; second, when forages grow; third, when sleeping period of the plant is done; and finally, two times prior to harvest. It is also suggested that one irrigation in July in addition to conventional irrigations is appropriate for a better production.

However, due to drought and dehydration of the land, especially in central and southern parts of Khorasan, the anticipated harvested flowers are low. In addition, dehydration makes saffron bulbs weak that shortens the life of saffron farms.

Most of the farmers' share water from water-wells but this water is not enough to irrigate the farm so they are highly dependent on rain. For example, most farmers withhold irrigation in summer (in summer the saffron bulbs are in their rest period). However, in towns like Torbat Heydarieh, Neyshabur, Zaaveh, Rashtkhaar and Kaashmar that are located in plain areas, access to water is not considered as a challenge. Therefore, production volume and the amount of cultivated land in these areas is higher.



Water requirement:

About 3000 m^3

Once irrigation in July

Highest rate of requirement in March and April, 2.5 mm/day

The best time of irrigation in Khorasan early September.

Interval 15 days

Drought has imposed a critical situation on saffron farms in different areas, so that most years local public authorities provide farmers with financial credits and grants to help them overcome the dryness. Saffron in such regions is mostly cultivated in small farms, so that in drought farmer irrigate their lands by shipping water in vehicle containers. This applies more risk to the cultivation process of saffron.

c. Pesticides

Although the farmers are encouraged to give up using pesticides for forage removal, a few farmers, especially the ones who own large saffron farms still use pesticides. They also use some other toxics to kill the rats in the saffron farms. Using pesticides in the farm leads to decreased quality of product and even changes the properties of the final product.

Several mixtures of organic and/or chemical nutritious substances are used in the rest period of the saffron bulbs to nourish them. These mixtures enhance the performance of the farm, the bulb's fertility and their growth. These mixtures are distributed by public agricultural organization and subsidies are given to farmers who spray them to their plants. However, in recent years, such subsidies have decreased dramatically.

Concerning the calculation of the costs of this activity, it should be noted, that seven liters of the mixture are added to water to spray saffron bulbs planted in 1 hectare. The mixture, depending on the brand, costs 1.5 to 1.8 USD per liter. Farmers are quite unaware of the proper mechanism of applying these mixtures to plants. Initiatives aim at training farmers for weeding without utilizing pesticide, how to use nutrition mixtures, soil mixture and nutritive needs of Saffron seems to be necessary for any improvement in this part of the value chain.

d. Business Development Service providers in the agriculture segment

The local branches of ministry of agriculture is the only agent that offers consulting services or runs workshops in an organized fashion for this business. Local offices and public sector experts provide their services. However, due to lack of human resource and insufficient time the trainings have not been efficient. In recent years, few private companies have started up offering consulting in improvement of cultivation and production performance. These firms are mostly managed by recently-educated agricultural engineers who lack field experience.

Although, these firms offer services related to different agricultural products, their most reliable source of income is earned by selling fertilizers, pesticides and mechanization of the agricultural operations. Hence, there are not many enterprises offering specialized services specific to one or few products. Also, there rarely exists an enterprise whose main source of income is proportional

to their success in increasing the yield of their clients. Due to extremely large landscape in which these companies are located an accurate database of their number and properties is not available. However, there are approximately 50 enterprises who offer consulting services to the landowner (their services are not exclusive to specific agricultural products). In addition, there is no record of buying services from these BDS providers by the local agriculture organization.

No training center on cultivation and processing of saffron exists. There are two research centers in Gonabad and Mashhad that are focused on studying on improvement of cultivation and production of saffron, yet no direct transaction between these centers and cultivation sector is observed.

Moreover, no other services (financial services for instance), are available for the agricultural sector. General agricultural tools and equipments are provided by local retailers and there are only three workshops that supply saffron producers with small volumes of heaters and sifter.

e. Comparison of agricultural earnings of saffron: Iran vs. Spain

Not much data is available on production costs or sale price of saffron by farmers around the globe. Only some information on cultivation and sales is available on Iran and Spain. According to Spain's Ministry of Agriculture, the revenue of sales for Saffron in 2010 was a bit more than 7 million Euros. This is while the average sale rate for Saffron on the agriculture side is around 3000 Euros (Almost 132 million Iranian Rials) per each kilogram. In Iran, the sale rate for saffron for middlepersons or other buyers per kilogram has been an average of 700 to 900 Euros per kilogram and in 2012 this number has been 900 to 1100 Euros per kilogram.

This threefold difference in sales rate that exists between Iran and Spain, expresses higher costs in cultivation of saffron in Spain. Another factor would be the efficiency in production and generally the high costs of production. Also, higher expenditures on watering, paying higher amounts for buying better corms, spending more on consultancy and finally investing more in human resources in the country. As well as all this, the higher number of farmers in the country brings about a state of competitiveness to produce more. All this has resulted in higher sale rates. The production rate and the added value for producing saffron in Iran is in fact the lowest in the world.

Volume and value of saffron production in Spain

Production (kilograms)	Average price received by farmers (euros/100kg)	Value (thousand euros)
2.822	98.800	2.619
2.818	99.608	2.807
2.818	117.127	3.301
3.420	121.342	4.150
1.051	130.695	1.374
820	131.236	1.076
1.330	131.236	1.745
1.345	141.179	1.899
1.843	176.734	3.257
1.829	273.403	5.001
2.332	300.792	7.014

Source: Spain Ministry of Agriculture

Iran's Saffron Export

With more than 90% of worldwide saffron production and 73% of total global export (the average during 10 years), Iran is the biggest saffron producer and exporter in the world. In year 2012 with more than 410 million dollars 84.7% of the total saffron export of the world was allocated to Iran. According to Islamic Republic of Iran's Custom Administration, in 2013 there were about 54 potential export destinations for Iran's saffron around the world, but 83% of the exported saffron was destined to only 5 countries.



As mentioned before, the major importers of Iranian saffron re-export the Iranian saffron to the other countries. In fact the defect in Iran's commercial and marketing system has created an opportunity for other countries to have access to the final market.

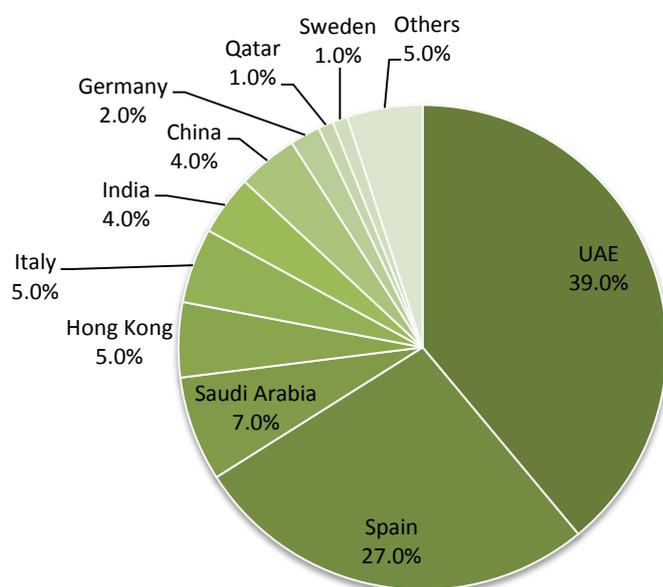
Most customers of Iran's saffron are Iranians who live in other countries around the world. 80% of the exported saffron is bought by them and then re-exported to the final destination. In fact saffron vendees, Iranian citizens or foreigner companies, they both have found saffron producers themselves and only a few Iranian saffron producers and exporters have done marketing for finding potential customers around the world.

Few attendances in international exhibitions, lack of knowledge of English or other International languages, shortage of professional marketing and commerce work force in exporting companies, lack of professional knowledge in international trade among business owners, and contentment with local markets are the most important parameters of non-efficiency of saffron exporters in Iran.

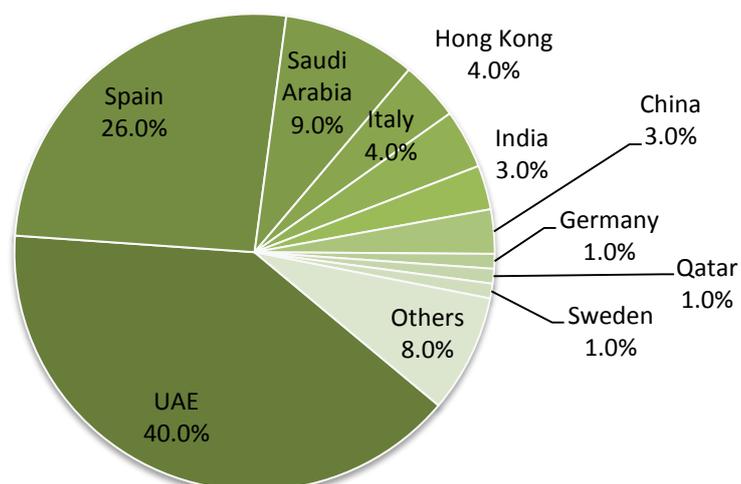
The role of exporting companies in Iran is commercial kind of activities or is as an agent between the farmers and foreign customers (these foreign customers work as mediums themselves). Around 50% of saffron exporters do not have the packaging or processing workplace and they

mostly buy saffron from smaller businesses or intermediate buyers and perform small changes on the appearance or sorting of the product and re-export it in bulk.

Importers from Iran in 2013

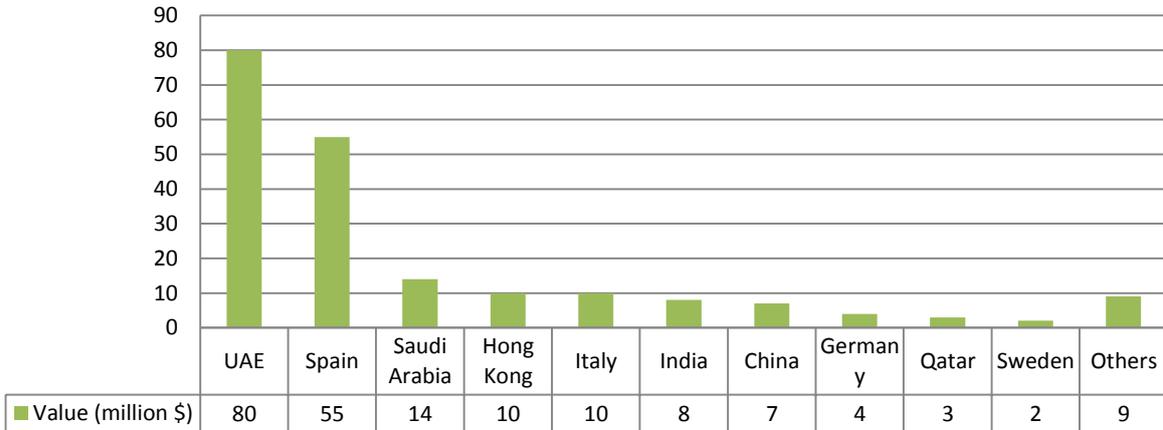


Top 10 countries that buy Iranian Saffron (in terms of volume and value)



In year 2013 an overall of 136 tons of Saffron with value of 200 million dollars was exported to 54 countries. Share of the top ten countries is as bellow:

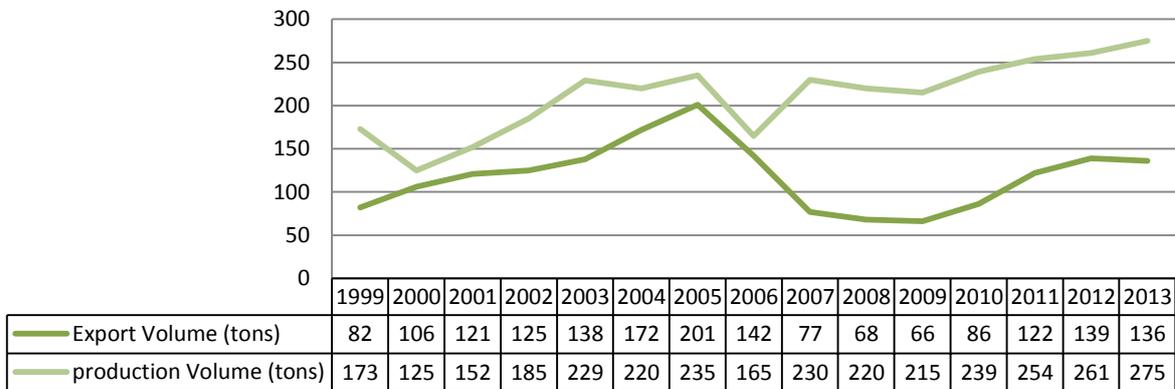
Value of Saffron exported in year 1392/2013 by Islamic Republic of Iran



The increasing trend of saffron export by Iran in the last 10 years is an indicator of growth. International familiarization with nutritious, medicinal and therapeutic qualities of saffron along with an increase in saffron production in Iran has increased the demand for saffron.

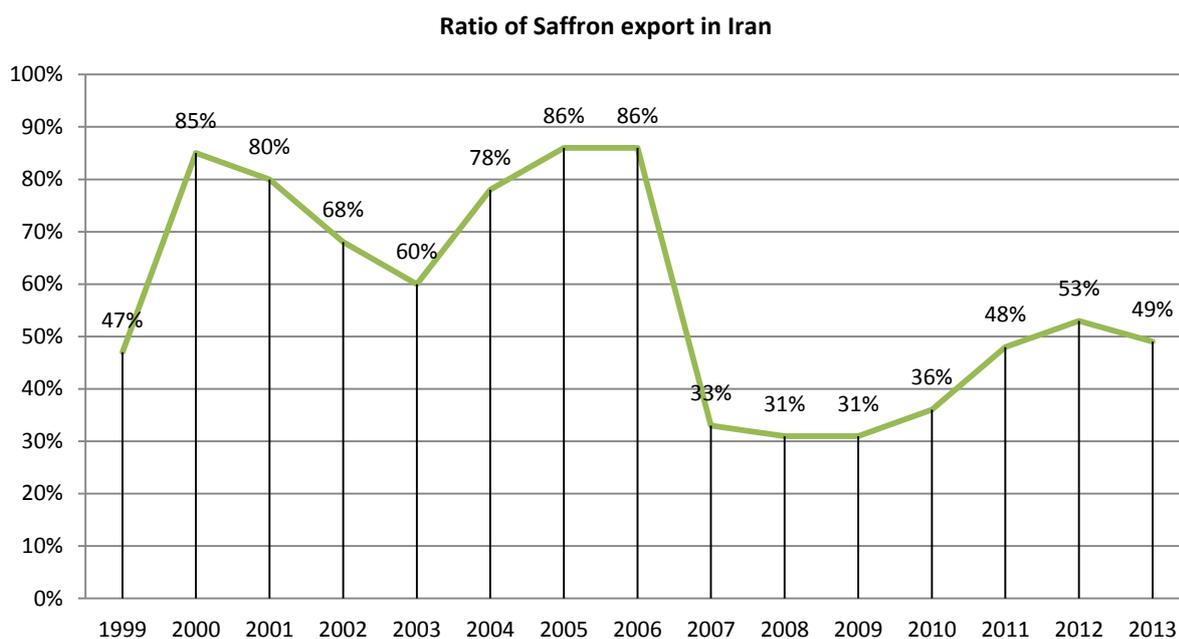
In addition, the growth of Iranian commercial companies in 1990s, regulating new export policies and incentives by Iranian authorities in 1990-2000, promoting standards and improving saffron qualities in Iran, have been the main reasons of the boost in international marketing and introducing saffron to the world.

Trend of Saffron production and export in Iran



Statistics show that till 1986 Iran's saffron export had a traditional and minor nature and since 1988 till present it has improved due to the government's incentive policies. However applying series of incorrect policies such as applying an inappropriate exchange rate of export currency has decreased the saffron export to 31.6 Tons in 1995.

Elimination of these regulations has again boosted the export in such a way that it reached to 121 tons in 2001. Due to export incentives given by the Government, Iran's saffron export has improved a great deal in recent years.



Although in 1999, only 47% of the whole saffron produced in Iran was exported to international markets, this trend has increased to 86% in 2006. This increase is due to the improvement in commercial businesses in Iran, the implementation of incentive policies, elimination of export treaties and taxes and applying of export rewards and incentives.

It has to be mentioned that the increase in the saffron production in one year has the effect on the next year's export.

The decrease observed in the chart about the export rate of saffron in years after 2008 are due to two reasons:

- Change in granting export rewards and tax enactment on exporting saffron in the form of bulk.
- Change in custom estimation about the value of saffron

These two changes in rules along with contradicting agricultural statistics led to not having exact export data during these years. As an example in 2013 according to the Jihad of Agriculture, more than 260 tons of saffron has been produced in Iran but only 136 tons was exported. It has been underestimated that the average consumption of saffron in Iran is less than 35-45 tons a year. This underestimation led to having of 100 tons of excess production. This is thought to be due to the lack of accurate statistics and absence of direct render by farmers.

Studying the 25 years (1981-2006) trend of saffron production and export in Iran shows that in 1981, 20 tons of saffron was produced and only 1% of it was exported. However this amount has increased to 165 tons in 2006 and the export has reached to 86%.

Comparing Iran's saffron production with Spain in a similar period shows that when Iran produced 20 tons of saffron, amounts of production was 40 tons in Spain. This pattern has

changed due to the improvement of plantation and production in Iran, an increase in human labor cost, change in cultivation methods, mechanization and substitution of other agricultural products in Spain. Annual production of Spain has decreased to only 6 tons in the last 30 years which has caused its elimination between the major producer countries. In fact one of the most important factors of Iran's export growth has been the decrease of Italy's and Spain's saffron production.

Saffron Domestic Market in Iran

Trend of consumption and exportation in Iran shows that the internal market of saffron in 1981 had a volume of 20 tons and 30 tons in 2006 and although there's no recent accurate statistics it is estimated that the consumption of saffron in Iranian market has reached to 45 tons a year in recent years.

The slow rhythm of internal saffron consumption is worth noticing because although the population has increased 140% between years 1981-2011, Iran's saffron market has only increased 65%. This small growth is mainly due to these reasons:

- 1- Lack of attention to medicinal aspects of saffron and as a result not producing pharmaceutical products
- 2- Lack of producing new saffron based products
- 3- Lack of innovative usages for saffron
- 4- Lack of educating consumers of disadvantages of chemical coloring substitutes
- 5- Lack of research and development projects about edible coloring additive
- 6- Lack of communication between research centers and production sector

In fact the attractiveness of international market is a key factor to the deterioration of the local market. This attractiveness could lead to lose the market for saffron based products inside and outside of Iran.

Saffron in Khorasan Provinces

An Introduction to Khorasan Razavi Province

Khorasan Razavi province is spread on an area of approximately 128420 square kilometers, covers 7.8% of the country's area and includes 20 townships, 62 districts, 163 rural districts, 8861 villages and it has a population of 6 million. 62% of the population lives in urban areas and 38% live in rural areas.

Saffron production areas in Khorasan Razavi



An Introduction to Khorasan Jonubi Province

Khorasan Jonubi province situated in East of Iran, is 82864 square kilometers big and has a population of 600568. It covers 5.47% of the country's area. The climate here is deserted and arid with average annual precipitation of 150 millimeter. It can get to 44 Celsius degree hot and the lowest degree could reach -21 centigrade.

Saffron production areas in Khorasan Jonubi



Khorasan's Geographical and Cultural Situation

Vastness of Khorasan province along with surrendering mountains and desert areas and various wind types have created many different climates.

Northern and central Khorasan generally have temperate and mountainous climate. These areas are the most fertile and populated part of the region, most booming business activities are done here and it has the best facilities. This area includes, Bojnourd, Ghoochan, Shirvan, Mashhad, Dargaz, Chenaran and Sarakhs. These cities have the area of 58,000 square kilometers and cover

18.5% of the whole province. Most of the population and business facilities are located around Mashhad and Ghoochan.

Central Khorasan includes cities of Sabzevar, Esfrine, Neyshabour, Torbat Heydariye, Kashmar, TorbateJaam, Taybad and Khaaf which cover about 85,000 square kilometers equal to 27.2% of the province's area. This area has mild semi arid climate and the most common business activity there, is agriculture which is done in vast area from plains of southern Binalood foothills to the salt desert and deserted lands near Afghanistan border. These plains are considered arid and semi-arid and the amount of rain fall is 200-250 millimeter per year. This area has the highest production rate of Iran's total saffron. Southern area of Khoarasan has arid and deserted climate. This area which is 170,000 square kilometers consists of cities of Birjand, Tabas, Ferdos, Gonabad, Ghaenat and Nahbandan. This area covers half of both Khorasan Razavi and Khorasan Jonubi together.

Most of the saffron producing centers is situated in Khorasan, including the southern parts of Khorasan Razavi and Khorasan Jonubi. In recent years cities like Zave, Torbat Heydariyeh, Roshtkhar and Kashmar have become main poles of saffron production. Also in Khorasan Jonoubi the areas of Ghaen, Ferdows and Sarayan have been as the main production sites.

Geographical condition along with lack of water for cultivation of other agricultural products and being as a profitable plant have encouraged the farmers to cultivate saffron and other cities in Khorasan have started the cultivation of saffron.

The cultivated land from 1973 till 2005 has experienced an average annual growth of 50% and has multiplied by 15 during this period.

This growth naturally has increased the production from 17 tons in 1973 to 260 tons in 2013. This numbers show the 40% annual growth. (The production volume has multiplied by 16). In 2013 in Khorasan Razavi 243 tons of saffron has been produced.

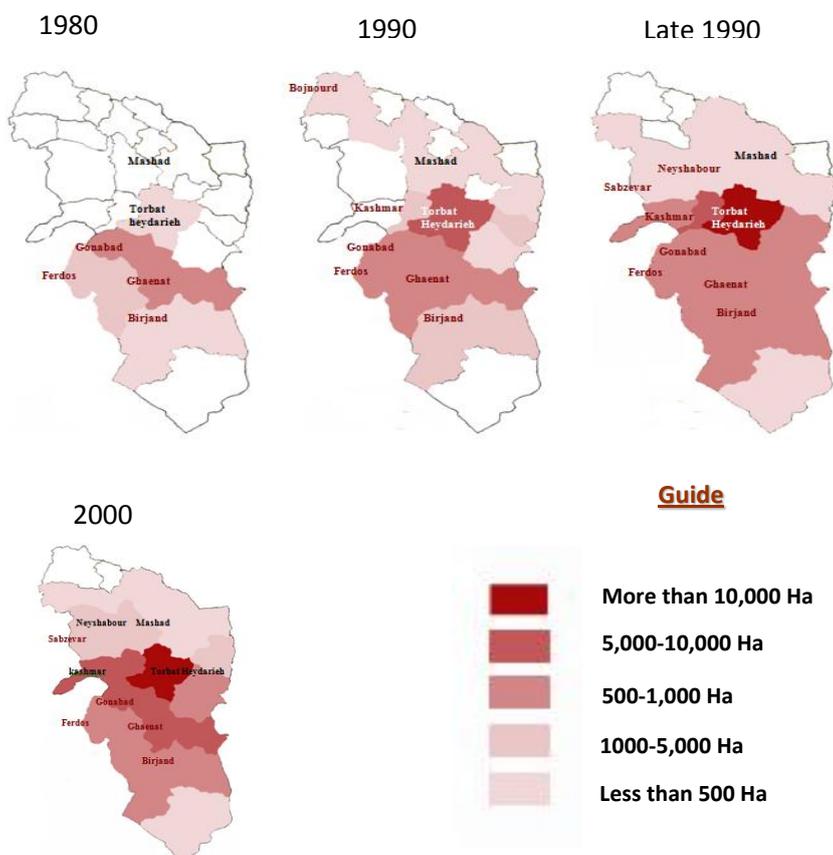
However during the recent years the efficiency of production has not changed a lot due to draught and increasing in the size of cultivated lands.

Also increase in the surface of cultivated lands has caused mismanagement of these lands and along with inappropriate choice of cultivated lands, not using of modern technologies and using chemical pesticides, the production efficiency has decreased. (Also we can note that use of many types of chemical pesticides has prevented the farmers to be able to produce organic saffron)

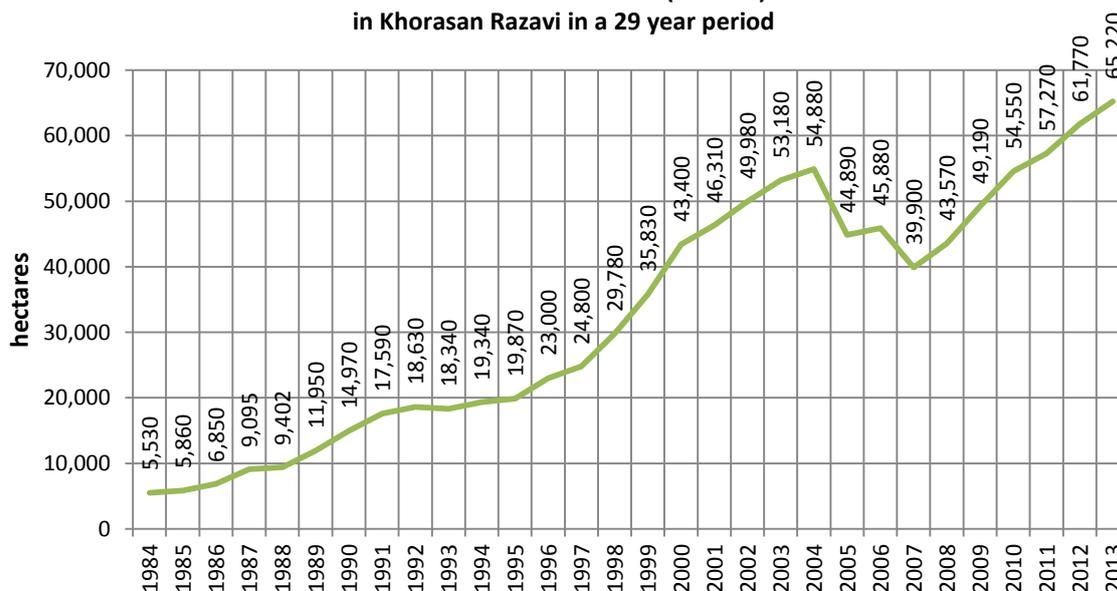
In the recent decades because of lack of water in Khorasan Jonoubi and several draughts, the cultivated lands in this province have dried out.

Today the biggest farmlands are in cities of Zave, Torbat Heydariye, Rashtkhar and kashmar. Among all cities Neyshabour and Torbat Heydareiye have the most fertile lands and it is predicted to be the main poles of production in the near future.

Trend of allocating the farmlands to saffron in Khorasan provinces



Trend of Saffron farmlands (hectare) in Khorasan Razavi in a 29 year period

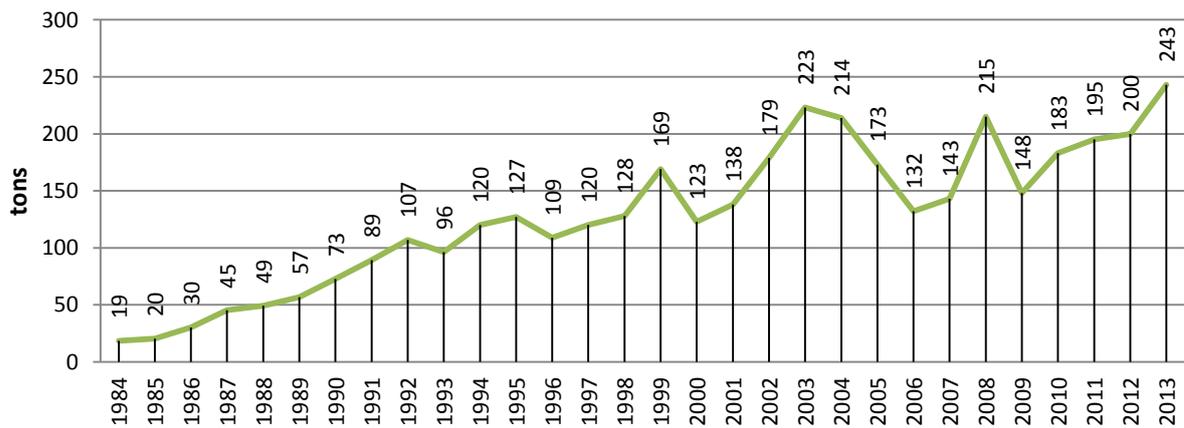


Studying trend of saffron farmlands in the last 30 years is an indicator of dramatic growth in saffron production. Improvements in producers' knowledge and skill especially in the new

generation of farmers who confronts the lack of lands and water sources from one hand and on the other hand their eagerness for taking economic advantages of saffron have compensated the unkind geographical situation like draught. It is predicted that this pattern will even improve more and number of farmlands will multiply by 2 in the next 5 years.

An increase in production is the natural result of increasing farmlands. However as saffron has the least amount of flowering in the first year, we witness a swing in saffron production in some years. Although on the whole, the trend was rising during the last 29 years.

Trend and amount (ton) of Saffron in Khorasan Razavi province in a 29-year period

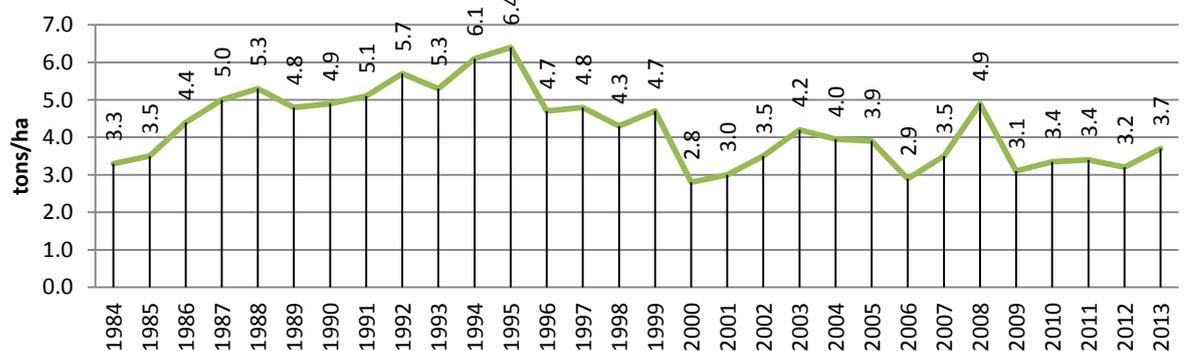


Trend of Efficiency per Hectare in Khorasan Razavi

In 1990s because of the small sizes of farmlands, more amount of rainfall and skillfulness of the farmers the ratio of production per hectare was around 7 kilograms. Although the amount of farmlands has been multiplied in recent years the average production per hectare is between 3-3.5 kilograms due to mismanagement of these lands.

In general, most of the saffron farmlands in Iran are under dry farming. Therefore, the farming mostly depends on spring and winter precipitation. During some periods if the amount of precipitation is not enough in spring or winter, most farmlands have not enough water resource in order to compensate this lack of precipitation. In contrast, the farmlands that use irrigation techniques have much better efficiency rather than the farms with dry farming method.

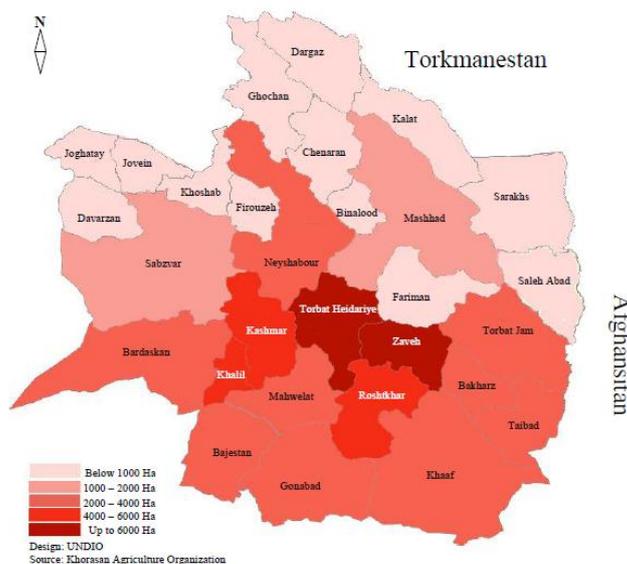
Trend of yield per Hectare in Iran during 30 years



Reasons for the drop in efficiency are as follow:

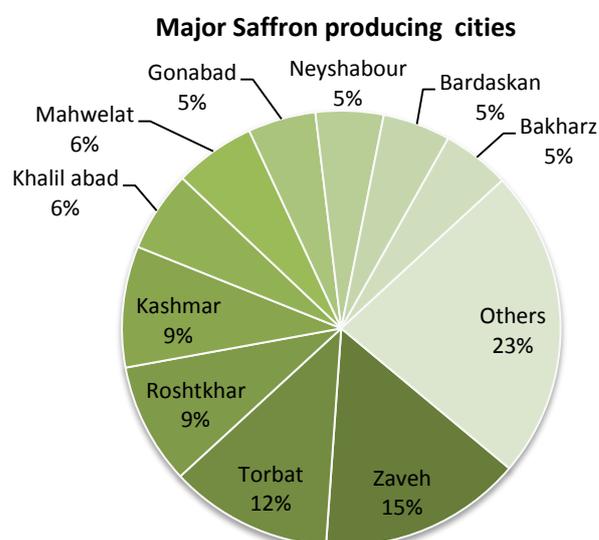
- Lack of farmers knowledge on appropriate planting methods,
- Time and situation of planting,
- Not enough soil preparation for planting,
- Using low quality corms,
- Lack of water recourses and irrigation methods,
- Lack of appropriate supervision on weeding and using pesticides,
- Lack of adequate cultivation and fallowing methods,
- Lack of appropriate fertilizers

Geographical distribution of farmlands in Khorasan Razavi province



Total area of farmlands in Khorasan Razavi province was 65227 hectare in 2013. Cities of Zaveh 15%, TorbatHeydariye 12%, Roshtkhar 9%, Kashmar 9%, Meh Velat 6% and Gonabadi 5% were among the biggest Producers in this province.

Study of trends shows that other than above mentioned cities, there are other cities coming to be the producers of saffron; cities such as Neyshabour and Sabzevar.



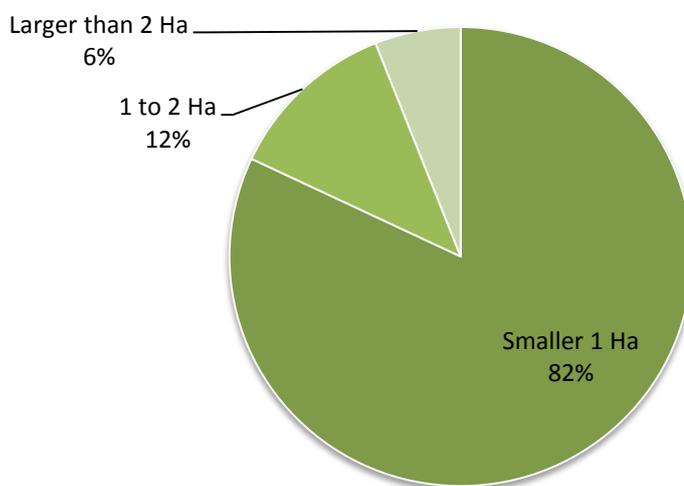
Diversity of farmlands in size

There were 121455 farmlands in Khorasan Rzavi in 2013 with average life span of 5 years. 82% of saffron farmlands are smaller than one hectare. 12% of Saffron farmlands are 1-2 hectare big and only 6% of the whole farmlands in this province is bigger than 2 hectares.

Trends have shown that the number of under 1-hectare farmlands is mounting. The reason is that most of these lands are being handed out from generation to generation.

Another reason for downsizing is that working in large size farmlands is much more difficult and the holistic supervision of the farms due to peculiarity of the product is almost impossible.

Distribution of Saffron farms based on the space

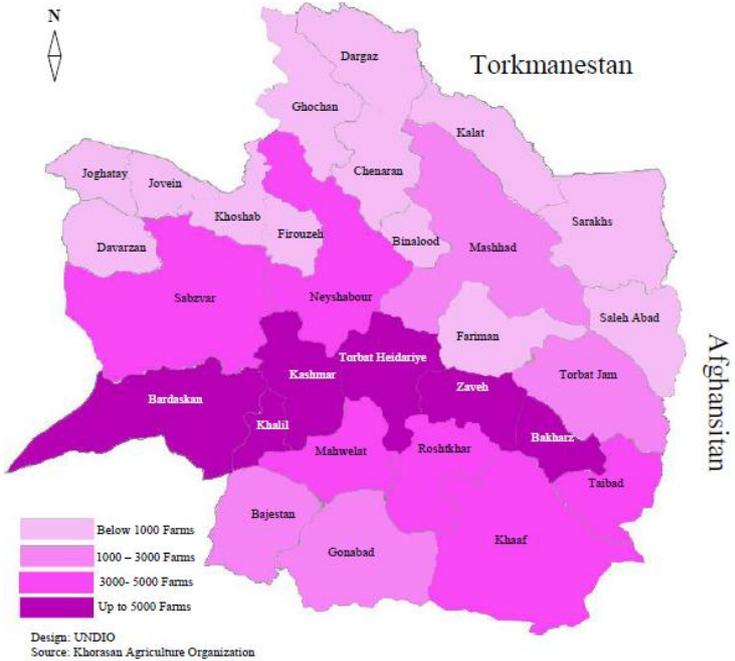


Studies show that small farmlands are more beneficial. This benefit is achieved as supervising and managing small farms and other farm works such as fertilizing and weeding are much easier. On the other hand, due to lack of water resources, even farmers with huge farmlands prefer to use smaller farmlands for saffron plantation. Saffron lands with more than 1 or 2-hectare area are concentrated in the most fertile places with good amount of rainfall. Such farmlands are mostly situated in Torbat and Neyshabour plains.

Distribution of farmlands under 1 hectare in Khorasan Razavi

There are 99553 farms under 1 hectare, constituting 82% of total number of farms in this province. 16% of such farms are in Khaaf, 14.1% in Kashmar, 12% in Torbat Heydariye, 9% in Zave, 8.2% in Bardsekan, and 5.8% in Khalil Aabaad. These cities constitute 64% of the total number of farms under 1 hectare.

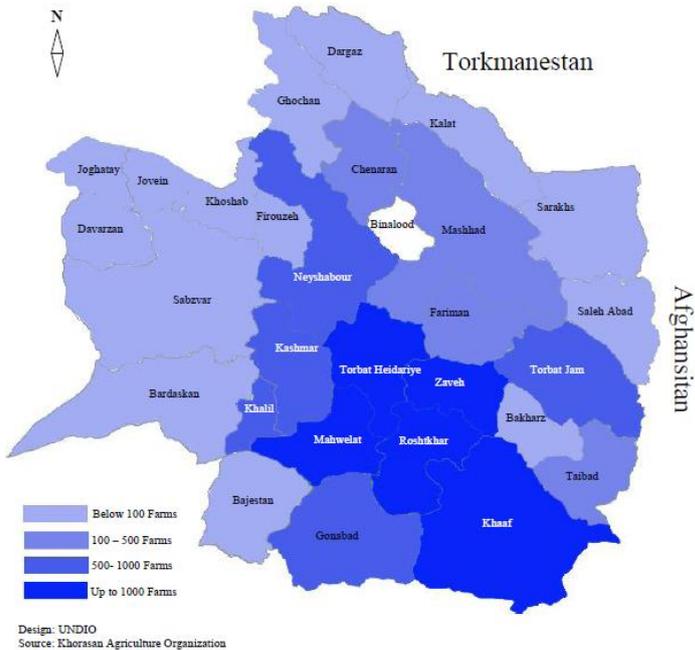
Concentration of saffron under 1 hectare farmlands



Diversity and distribution of farmlands 1-2 hectares in Khorasan Razavi

Total number of farmlands below than 1-2 hectare is 15015 which constitute 12.3% of total saffron farmlands. 26% of the total such farmlands are located in Zaveh, 16.3% in TorbatHeydariye, 10% in Roshtkhar, 9.2% in Mehvalat, 6.3% in Kashmar. These cities all together cover 68% of all saffron farmlands between 1-2 hectare.

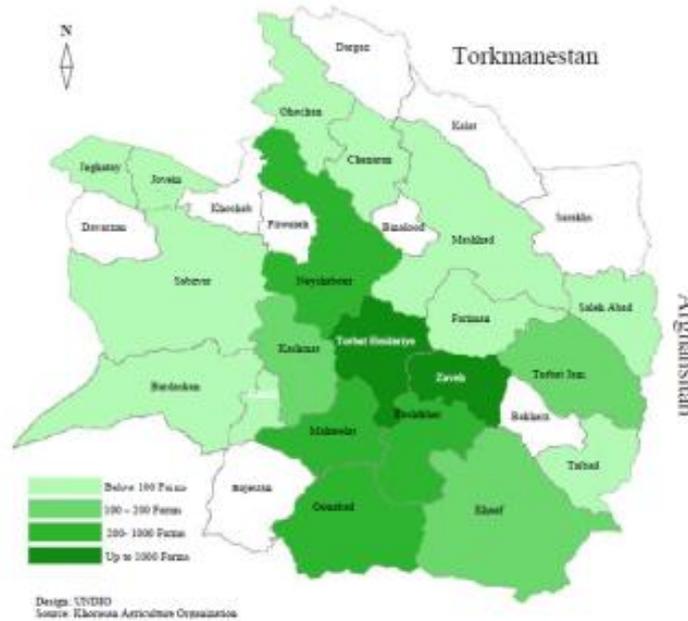
Concentration of saffron 1-2 hectare farmlands in Khorasan Razavi



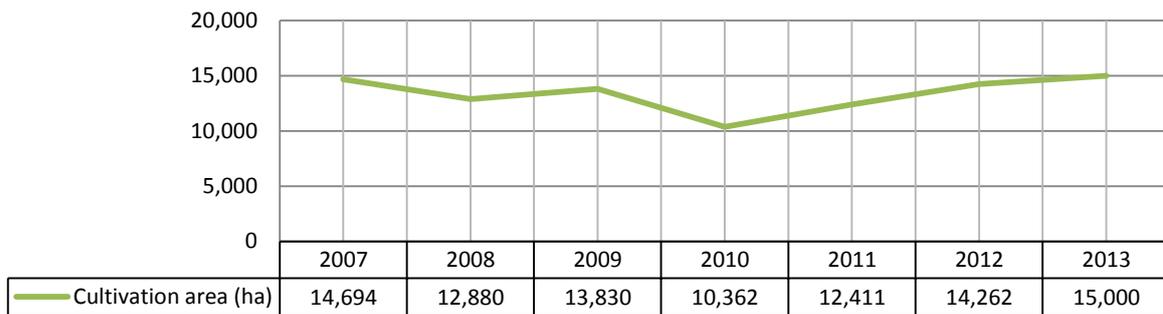
Diversity and distribution of farmlands more than 2 hectare in Khorasan Razavi

Total number of farmlands over 2 hectares is 6887 which constitutes 5.6% of all farmlands. 37% of such farmlands are located in Zaveh, 24.3% in TorbatHeydariye, 12.4% in Rashtkhar, 6.6% in Mehvalat, 5.1% in Gonabaad. All these cities together constitute 85% of all farmlands over 2 hectare.

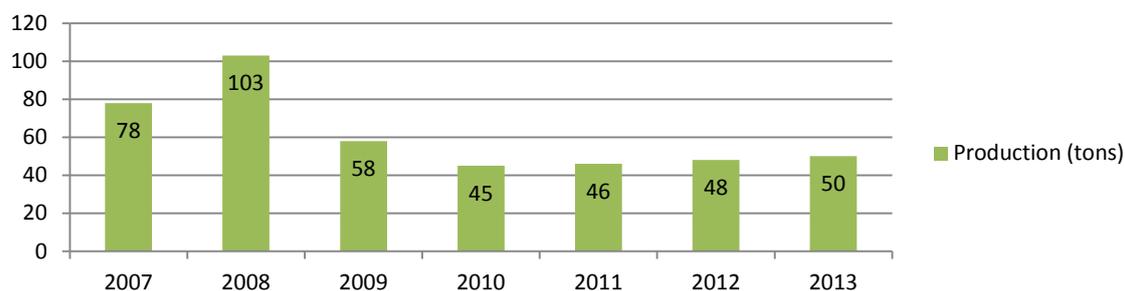
Concentration of saffron more than 2 hectare farmland in Khorasan Razavi



Trend of Saffron farmland in Khorasan Jonubi



Amount and trend of Saffron production in Khorasan Jonubi



Map of khorasan Jonoubi



Northern parts of Khorasan Jonoubi province are responsible for more than 80% of saffron production in this province. Cities of Ghaen, Zirkooh, Ferdos and Sarbisheh have the most cultivated areas. In southern parts due to salty water resources and lack of water, farming is not successful. Ghaen and Ferdos are among the most productive Saffron centers.

Production volume and cultivation area in South Khorasan in 2012

Town	Boshrevieh	Birjand	Ghaen	Sarbishe	Sarayan	Ferdous	Darmian	Nehbandan	Khosf	Zirkouh	Tabas	Total
Area(Ha)	955	880	4,287	655	2,660	2,025	245	232	538	1,425	260	14,262
Production Volume (Ton)	3.6	2.8	14.5	2.2	8	7.8	0.65	0.52	1.7	4.7	1.75	48.22

In Khorasan Razavi and Jonubi, cities like Torbat heydariye, Kashmar, Gonaabaad, Ghaen and Ferdos are the well-functioning centers. In general, the average of saffron production in Khorasan provinces is 3-3.5 kilograms per hectare.

Cultivation area and production volume in last 30 years (Khorasan Razavi)

Year	Area (ha)	Volume (ton)
1984	5,530	18.5
1985	5,860	20.4
1986	6,850	30.2
1987	9,095	45.3
1988	9,402	49.4
1989	11,952	56.9
1990	14,971	72.7
1991	17,593	89.4
1992	18,634	107.0
1993	18,344	96.4
1994	19,348	119.8
1995	19,872	126.7
1996	23,000	109.0
1997	24,800	120.0
1998	29,788	127.8
1999	35,832	168.8
2000	43,408	123.0
2001	46,319	138.0
2002	49,989	178.5
2003	53,180	222.8
2004	54,881	213.6
2005	44,895	172.6
2006	45,887	131.9
2007	39,904	143
2008	43,578	215
2009	49,198	148
2010	54,550	183
2011	57,275	195
2012	61,775	200
2013	65222	243

Social and economic aspects of saffron production in Khorasan Razavi and Jonoubi provinces

According to statistics, around 128273 farmers (producers) work in Saffron business in Khorasan Razavi. Due to low cost of resources and on the other hand high benefit this business plays an important role in creating employment for local people and preventing the young work force from immigrating to other cities seeking for a job. Another important fact is that saffron production in this province is mostly family oriented and is done on small domestic scale.

Statistics shows that the range of literacy among these farmers is low with 25% illiteracy and 45% elementary literacy.

Saffron affects family economy in two ways:

- First, the income gained by selling Saffron
- Second, income gained by labor

Most farmers rent a piece of land and water supplies from landlords to do farming and gain profit. But in recent years as saffron price has gone up, renting has become less common because landlords themselves have started producing saffron and the rent for a piece of land has gone very expensive.

In southern parts of Khorasan due to lack of water supplies and dryness, farmers are more interested in planting saffron, since it needs much less water and is far more beneficial rather than other agriculture products. The profit from one square meter water is 2000 IRR for wheat, 4000 IRR for cotton and 9000 IRR for saffron.

In harvest season saffron plant flowers every day and as farmers have to pick the flowers, they do not have time to clean them themselves as well. So they have the flowers cleaned by middlemen or sell them to wholesale sellers in cities like Torbat heydariye and Kashmar or sell them to the mobile middle men.

Generally, minor farmers do the cleaning, separating stigma and drying themselves in their houses and sell them to Mashhad saffron centers in order to gain more profits. The farmers know by experience that in harvest time the price of saffron is cheaper. Therefore they keep most or part of their saffron and sell them to wholesalers in different part of the year. That is why the price of saffron varies in different time of the year. (For example, near the New Year as the farmers need the cash they sell their saffron, this irregular selling of saffron can cause fluctuations and sometimes an increase of price)

So pre-vending is not popular with saffron as the price depends on its harvest conditions from day to day. For instance, on rainy days when the saffron flowers are wet or not fresh due to late harvest the price drops by 50%. Also near mourning holidays because of not having labor force the price of saffron flower decreases dramatically.

Around the harvest time great numbers of seasonal workers immigrate to Khorasan province for work. On their leave they get half paid and for the rest of the half they get equal amount of saffron. Some get only saffron to take to their own cities to make more profit.

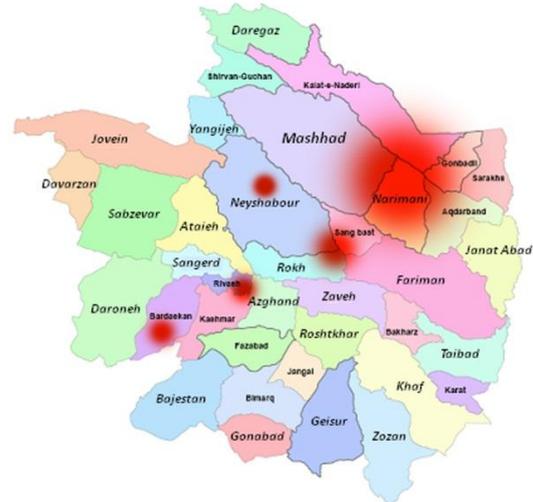
More than 60% of saffron flower or dried saffron is sold to local buyers and major buyers in Mashhad market. In harvest time, farmers or even others who have other businesses get involved in saffron business for making profit. They buy saffron from their relatives in small villages and sell it more expensively to Mashhad shops or other buyers

Here below the maps of saffron production and packaging in Khorasan Razavi and Jonubi are shown:

Geographical distribution of Saffron processing and packaging units in Khorasan Jonubi



Geographical distribution of Saffron processing/packaging units in Khorasan Razavi



Most saffron processing and packaging companies are located in Mashhad (more than 80%), there is a big one in Ghaen and around 10 centers in Khorasan Jonoubi. Centers of Mashhad were established around 40-70 years ago but the ones in Birjand and Khorasan Jonoubi are newly established.

The reasons for recent growth of saffron centers are:

- Growth of export and added value of saffron
- Short term loans given to new-comers into the business which created 40% of the new saffron centers in Khorasan Jonoubi

These new centers have invested in new technology, new products like Saffron pills, freeze-dry Saffron and Saffron extract.

Distribution of Saffron shops (wholesale and retail) in Mashhad



Saffron value chain analysis

Value Chain

Value chain can be defined as those value added activities, required to turn raw materials into finished products and sell them. Individual companies rarely undertake alone the full range of activities that is required to bring a product or a service from conception to the market. The design, production and marketing of products involve a chain of activities divided between different enterprises often located in different places, sometimes in different countries. Scholars believe that the value chain perspective is analytically useful for three main reasons.

1. First, the focus moves from manufacturing only to the other stages of activity involved in supplying goods and services to consumers. Particularly, more attention is paid to the “intangibles” phases, such as distribution and marketing.
2. Second, this type of analysis captures the flows of information as well as goods between the stages of activity in the chain, making clear that linkages between firms are often not at arm’s length and involve skills and knowledge that are scarce and command large financial rewards.
3. Third, the key to understanding the global appropriation of the returns to production is the ability to identify high return activities along the value chain.

The literature stresses the role played by global value chain leaders, and particularly by the buyers, in transmitting knowledge along the chains. For small firms in developing countries, participation in value chains is a way to obtain information about the upgrading necessary to gain access to the global market. That is why the prospects of upgrading with respect to the pattern of value chain governance is of great importance. In continue we explain and analyze Iran saffron value chain which covers different aspects of this industry at the local and global levels.

Local Actors of the Chain

Major Actors

Saffron production and cultivation units, dealers, dry saffron buyers (main dealers) and packaging units for both domestic use and export can be considered as the actors of the saffron value chain. Based on their activities and the level of influence in the value chain, these actors have relationships within themselves and with other actors. In order to reach a better understanding of the main actors’ role and their share in the value chain they can be divided into the three following categories:

1. Processing, packaging and exporting units (A); this category is constituted of two groups: Group A1 includes 8-10 advanced companies and group A2 includes 12-15 experienced companies in processing, packaging and exporting;
2. Packaging and processing units which work in the domestic market (B);
3. Suppliers of dry Saffron in bulk (C);
4. Tier 1 dealers (D1);
5. Tier 2 dealers (D2);

6. Farmers (F).

Main features of each category**Category A**

This group of processing and packaging companies has the following characteristics:

1. Over 70% of the products in this category are exported;
2. About 80% of them are certified in terms of quality standards;
3. Over 90% of them are formally registered companies;
4. Over 60% of them have registered a trademark;
5. Over 90% of them have an active website;
6. Over 80% of managers are owners of the company;
7. 40% of them have located their production units in industrial parks;
8. Trading process, export and marketing are mostly managed by the owners of these units;
9. Actors in this category handle over 60% of the total saffron production (10 units from them are responsible for 60% of the saffron production);
10. They procure saffron mainly from the “C” or “D1” categories.
11. The majority of these units are interested in having their own branch or subordinates overseas. Meanwhile, some of them have already registered companies out of Iran. However, these initiatives are not considered as presence in the global market. It is just used for facilitating the sale of products in bulk.
12. Less than 20% of these units regularly participate in international fairs and events.
13. Except for few cases, the inter-firm relationships are not strong and effective enough and there is no vertical relationship between the firms.

Actor categories based on quantity, distribution, volume and value added

Description	Category A	Category B	Category C	Category D1	Category D2	Category F
Numbers of actors	25	70	100	2,000	500	128,000
Employment	280	210	500	3,000	500	128,000
Geographic Distribution	85% Khorasan Razavi, 10% southern Khorasan, 5% other provinces	85% Khorasan Razavi, 15% Southern Khorasan	70% Khorasan Razavi, 30% southern Khorasan, and other provinces	60% Khorasan Razavi, 40% southern Khorasan	80% Khorasan Razavi, 20% southern Khorasan	78% Khorasan Razavi, 22% southern Khorasan
Added value in million USD	210 USD	54 USD	198 USD	240 USD	39 USD	288 USD
Sales Volume	136 tones	40 tones	170 tones	200 tones	30 tones	240 tones

Category B:

These actors are the processing and packaging units which are mainly active in the domestic market. Moreover, export constitutes a small portion of their business. They have the following characteristics:

1. 10% of their product is exported (they are not exporting on a regular basis);
2. All the units are equipped with packaging equipments;
3. The products are mainly sold through formal distributing channels (to assure them in regard to receiving the price of the sold saffron);
4. They supply Saffron mainly from the “C” or “D1” units;
5. 80% of them have commercial trademarks of which 60% are registered;
6. 50% of the units are formally registered;
7. In 50% of them, the managers are the owners of the units;
8. 50% of them have set up their own websites;
9. 20% are located in the industrial parks;
10. A major part of trade and sales is managed by the owner of the company;
11. Most of these units are financially dependent on the “C” group. As group C is strong financially and in regard to supply of saffron to group B (with delayed payments);
12. There is a lack of professional human resource in all segments (In some cases, units just employ experts for the laboratories);
13. Almost 30% of the units have already received financial loans to cover their fix and variable costs, but the amount of these loans is very small and mostly below 2,000 million Rials (equal to 64,000 USD) which is provided by the banking system as a short-term loan;
14. As the firms receive the cheques with the late date of submission they mostly use forfaiting as an opportunity to manage their financial needs.

Category C:

These actors are mainly involved in trading dried saffron in bulk on a daily basis. They do not have any packaging or processing units by their own. Their main characteristics are as follows:

1. They are considered as the dealers;
2. They purchase saffron mainly from the farmers and the “D1” category;
3. There is almost no packaging and they sell their products in bulk;
4. They are financially strong enough to cover their costs;
5. They have small informal workshops for mixing and packing saffron in bulk;
6. They generally have a good relationship with farmers and the “D1” category;
7. Few of them export their goods directly; however this is not sustainable but it creates a negative competition and cuts the price in the export market;
8. Almost none of these actors have any registered firm;
9. None of them has a website;
10. Trade is carried out by the owner;
11. Some of the actors in this group supply saffron for foreign companies;

12. Generally, they do not receive any loan. Only few of them receive small loans in order to make them more credible in the banking system. However, these loans do not exceed 1,000 million Rials (equal to 32,000 USD) annually.

Category D1:

These actors purchase dried saffron or saffron flowers in areas where farmers are situated and deal with group “B” and group “C” (for high volume sales). In addition, they directly purchase saffron from farmers and dry saffron either personally or by sub-contractors (at home workers).

1. They work in rural areas and small cities;
2. They have close relations with the farmers who depend on these actors financially;
3. They have extensive financial relationships with “C” and “B” actors;
4. Most of them are composed of one or two personnel(s);
5. Their major role is to supply dry saffron with different qualities for “C” and “B” actors;
6. Generally, they have secondary education or below;
7. Less than 30% of them run their business in a small storage in their village or rural location;
8. In the harvesting season, they prepare temporary saffron cleaning areas at their houses or other different places;
9. Due to their individual activities, they receive financial support neither from banks nor from other financial institutions.

Category D2:

These actors, purchase dried saffron or saffron flower, seasonally and temporarily in small scales within the main saffron growing areas. As intermediaries, they are involved in several dealing activities of saffron or its unprocessed flowers.

1. They have seasonal activity (temporarily);
2. These actors usually will become D1 group actors after a few years;
3. Their financial capabilities are very limited. Therefore, they trade in small scales;
4. They do not have any specific/fixed place for their business. Thus, they are mobile and frequently commuting through villages and saffron farms;
5. Their educational level is very low;
6. They are generally farmers that collect their own product as well as their neighbors’;
7. They have good relations with some saffron cleaning sub-contractors;
8. They do not have access to any financial support from neither banks nor financial institutions.

Category F:

Saffron farmers are the actors in this category which their distribution, size and the method of their activities have been fully discussed in the national and regional procedures' section. Tables below illustrate the relationship between different categories of actors:

Inter-firm relationship matrix of the major actors

Description	Category A	Category B	Category C	Category D1	Category D2	Category F
Category A	4	2	4	2	1	2
Category B	2	2	4	3	2	3
Category C	4	4	2	5	3	4
Category D1	2	2	5	1	3	5
Category D2	1	2	3	3	2	5
Category F	2	3	4	5	5	2

5: Strong relations including vertical and horizontal connections and intense cooperation.

4: Average relations including minimum horizontal connections.

3: Normal relations excluding horizontal or vertical connections.

2: Weak, subjective and temporary relationships.

1: No relations or extremely weak relationships.

The matrix of major actors' relationships with business service providers

Description	Category A	Category B	Category C	Category D1	Category D2	Category F
Technology services	4	4	1	1	1	2
Production/ business consultancy services	3	2	0	0	0	2
Financial services	3	2	0	0	0	0
Laboratory services	5	3	3	2	1	0
Research and development	4	1	0	0	0	0
Local marketing services	0	4	3	0	0	0
International marketing services	2	1	0	0	0	0
Printing and packaging services	4	4	2	2	0	0
Quality management services	4	3	0	0	0	0
Training services	3	3	0	0	0	2
Land transportation services	2	4	3	2	2	2
Air transportation services	4	4	2	0	0	0

5: Strong relations including vertical and horizontal connections and intense cooperation

4: Average relations including minimum horizontal connections

3: Normal relations excluding horizontal or vertical connections

2: Weak, subjective and temporary relationships

0: No relations or extremely weak relationships

The matrix of major actors' relationships with supporting governmental agencies

Description	Category A	Category B	Category C	Category D1	Category D2	Category F
Industry, mine, commerce	4	4	2	0	0	0
Labor	3	2	0	0	0	2
Food control and observation institute	2	1	1	0	0	0
Standard institute	4	4	1	1	0	0
Custom	3	1	0	0	0	0
ISIPO	4	4	0	0	0	0
Food science research center	4	2	0	0	0	0
Jihad agriculture	2	2	2	1	1	3
Universities and high educational institutes	0	0	0	0	0	0
Embassies and ministry of foreign affairs	2	0	0	0	0	0

5: With efficient relations.

4: With average efficient relations.

3: With weak efficient relations.

2: With extremely weak and inefficient relations.

1: With conflicts and improper relations.

0: No relations.

The matrix of major actors' relationships with financial institutions/banks

Description	Category A	Category B	Category C	Category D1	Category D2	Category F
Private financial institutions	4	4	5	3	2	0
Mehr Imam Reza's fund	0	0	0	0	0	2
Private banks	4	3	4	2	0	0
Governmental banks	4	3	3	2	0	2
Unofficial financial support networks	5	5	5	4	4	0

5: With extremely good relations.

4: With average efficient relations.

3: With weak efficient relations.

2: With extremely weak and inefficient relations.

1: With conflicts and improper relations.

0: No relations.

The matrix of major actors' relationships with national/international markets

Description	Category A	Category B	Category C	Category D1	Category D2	Category F
Specific local purchasers of small amount of in bulk	1	5	2	0	0	0
Specific local purchasers of large amounts in bulk	1	5	3	1	0	0
Local retailer	2	4	0	0	0	2
Local distributing network	2	5	1	0	0	0
Foreigner wholesale purchaser in bulk	5	3	2	0	0	1
Foreigner wholesale purchaser in packages	1	0	0	0	0	0
International distributing network	0	0	0	0	0	0
International retailer	0	0	0	0	0	0
Specific international purchasers in bulk or in packages	1	0	0	0	0	

5: Strong transactions.

3: Average transactions.

1: Weak transactions.

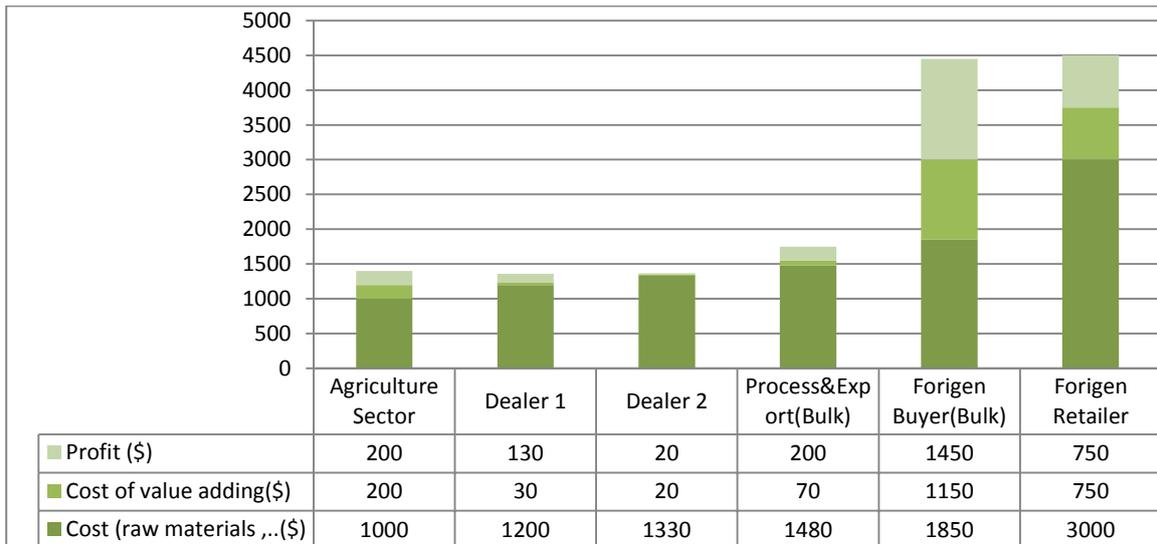
0: No transactions.

Value Distribution along the Chain

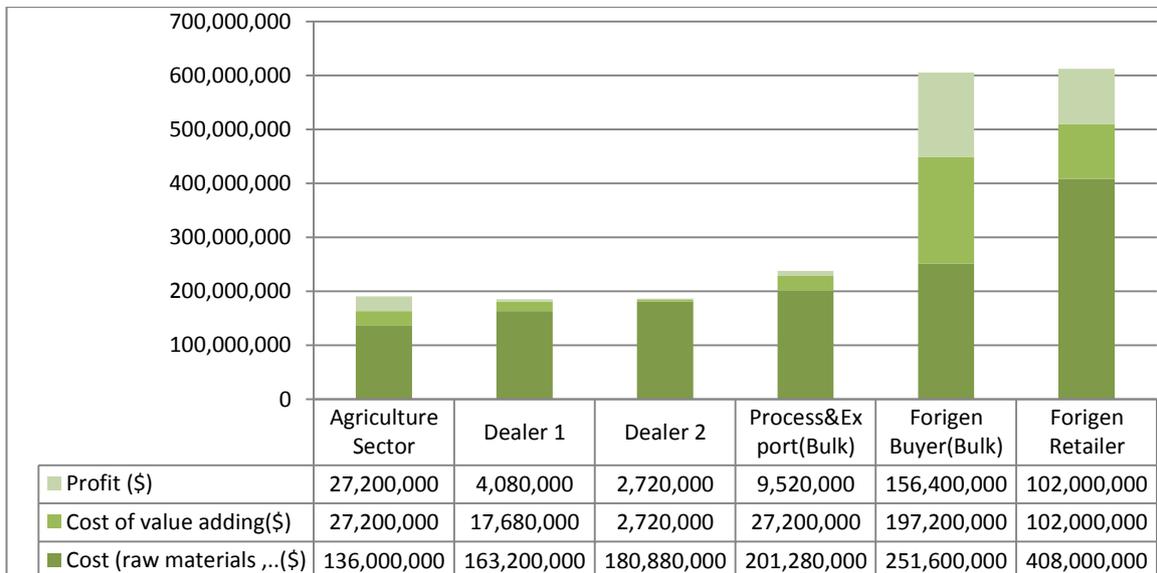
Distribution of input cost, cost of value adding and profit along the saffron chain

To analyze the saffron value chain, the cost, profit and value added of each major actor along the chain is calculated and shown per each kilogram and overall in the figures below.

Distribution of input cost, cost of value adding and profit along the chain for each Kg of saffron



Distribution of total input cost, cost of value adding and profit along the saffron chain



In 2013, a total amount of 136 tons of saffron was exported from Iran. Islamic Republic of Iran Customs Administration claims that Iran has exported a little more than 200 million USD of saffron in 2013. According to this information, the Iranian exported saffron is worth approximately 1,550 USD per kilogram. Based on the estimations above, the total global value

added of saffron was 374 million USD (distributed from the agriculture sector to the consumption of the product). While Iranian farmers enjoy a 200 USD profit per kilogram, foreign buyers, who add 1,450 USD of value to the product per kilogram, enjoy a 1,150 USD profit. This means that a foreign buyer spends 300 USD on packaging, marketing and advertisement. On the other hand, it gains 1,150 USD per kilogram.

Although, the profitability of processing and packaging units in Iran is less than farmers, but exporters make more revenue than farmers due to their low number (50 exporters versus 128,000 farmers). Value added by domestic exporters in processing and packaging for export is an outcome of re-sorting, transportation and exporting process. This all cost 130 USD per kilogram plus a margin profit of 70 USD. Thus, considering the 136,000 kilograms export of saffron, domestic exporters add a total value of 27,200,000 USD to the product.

It can be concluded that a significant amount of the value added by foreign buyers who buy saffron in bulk and retail it in foreign markets is profit gained from the business. Buying saffron in bulk and retailing the products adds a 299 million USD value, whilst total value added in Iran is 74.8 million USD. In addition, it should be noted that a part of value that is added in Iran is pseudo-value since it is an outcome of dealership.

According to these calculations, foreign buyers acquire 80 percent of the profit of the Iranian saffron. Iranian exporters are deprived of a large proportion of value added in the saffron business. This implies the necessity of value chain promotion toward international market. Iranian exporters should become connected to international pioneers of the business, distribution networks and retailers. Moreover, it is interesting to note that as end-users pay up to three times more for Iranian saffron it can be argued that besides the higher price of the product there is an increasing demand for it.

Iranian exporters sell their product in bulk instead of small packages (which has a much higher value added). Thus, in order to gain more value out of the business, Iranians should settle a new industrial structure capable of processing and packaging with direct access to the end market. Iranian exporters are mostly unaware of end-users' needs and preferences and are rather satisfied with their current fast-achieved profit. Therefore, they have been missing a greater added value and profit gained from other segments of the value chain.

Being a part of the global value chain, having consistent relations with markets networks, development of existing markets and building new markets for Iranian saffron, developing new products with Saffron as an ingredient, using saffron in cosmetics and medicine can improve Iranian exporters' capacity to create value and ultimately help other actors of the chain within the country.

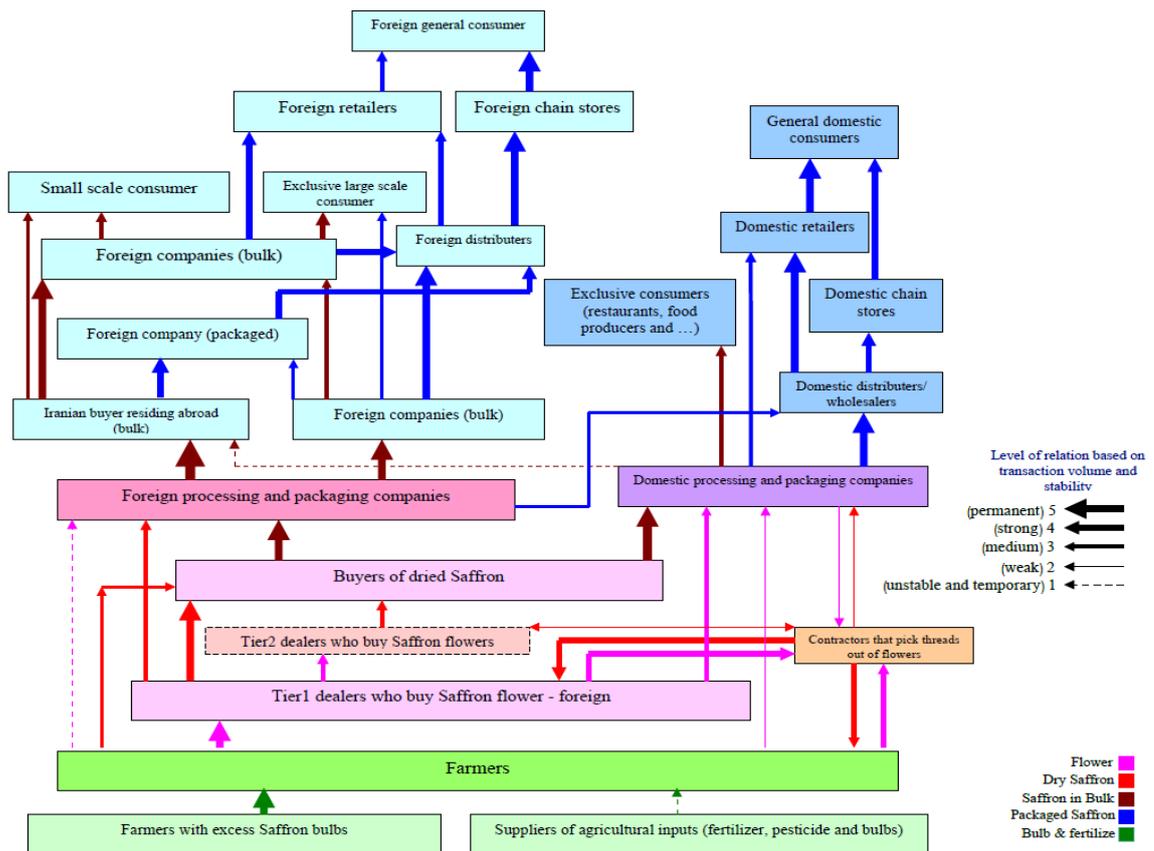
Saffron value chain map

A value chain map provides a visual representation of the value chain system. This map identifies business operations (functions), chain operators and their linkages, as well as the chain supporters within the value chain. Chain maps are the core of any value chain analysis.

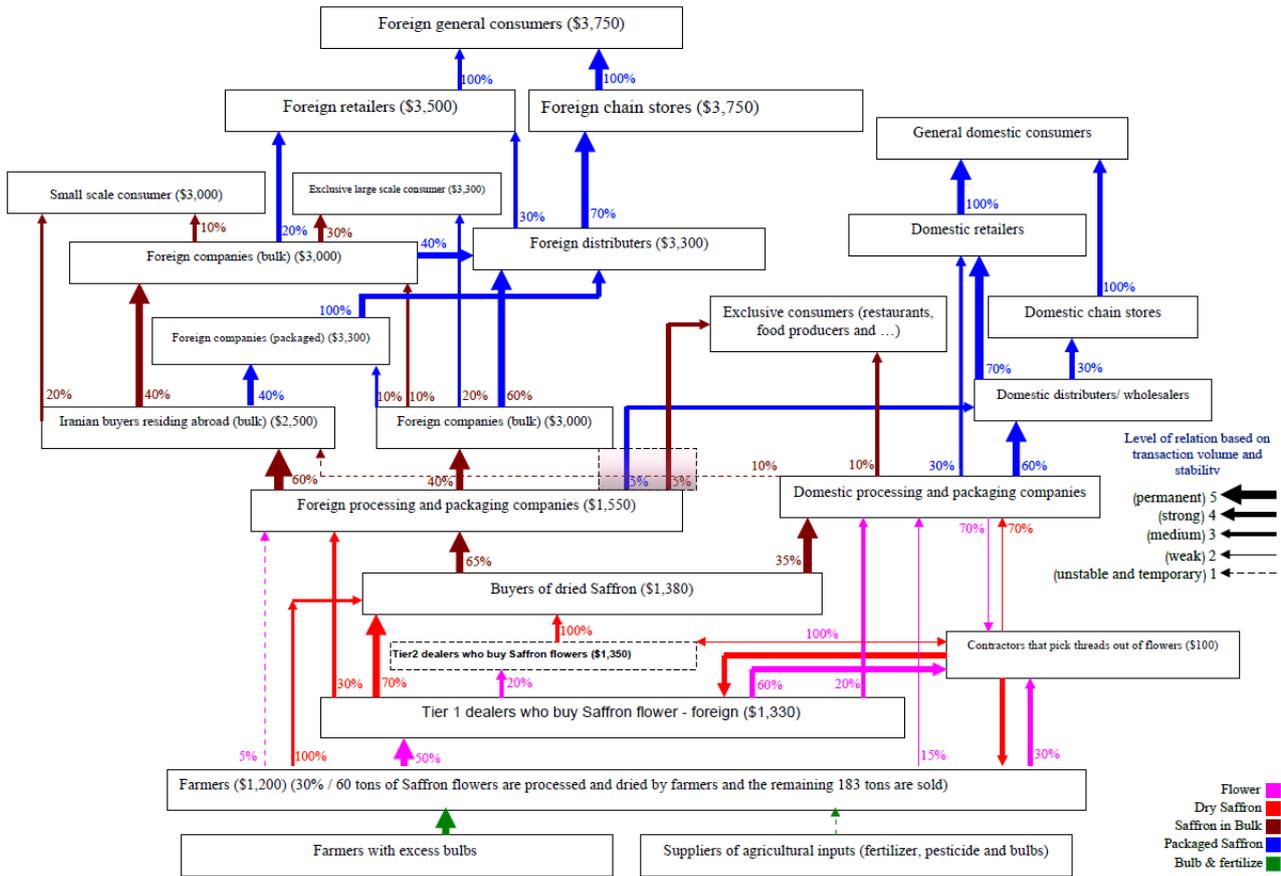
Quantifying and describing value chains in detail includes attaching numbers to the basic chain map, e.g. numbers of actors, the volume of produce or the market shares of particular segments in the chain. Economic analysis of value chains is the assessment of chain performance in terms of economic efficiency. This includes determining the value added along the stages of the value chain, the cost of production and, (if possible) the income of operators. In this study, in addition, we used “sub value chains” to show exact information regarding the flow of goods, value etc. The map below illustrates the relationship among different actors in terms of kind of relationship and their strength.

The second following map illustrates the main value creating parts of the chain, which is indicated by the blue color and the strong arrow in which the value of activities is much more than the other parts. This part includes the relations between processing and packaging units and sales actors and end users.

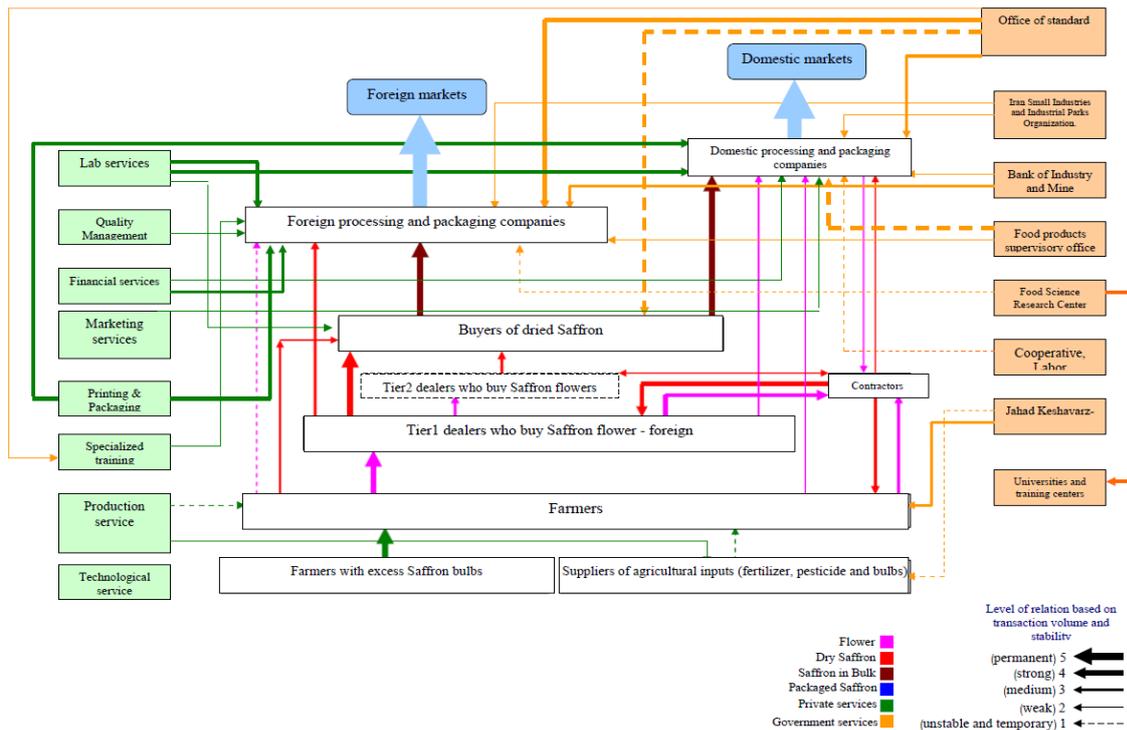
Saffron Value Chain Map



Actors' relationships and cash flow map



Business development services map



Analysis of Saffron Value Chain Financing

As mentioned earlier, Saffron producers procure their agricultural input in the harvesting season, i.e. mid-October to January. Thus, financial resources are mostly assigned to procurement of agricultural inputs in this period resulting in higher supply and lower costs of materials.

Unlike many other businesses, dealers in this market, who are mediators between farmers and processors, do not have a negative influence on the business. These dealers have emerged as saffron suppliers of large-scaled producers and assure that agricultural inputs are procured from credible suppliers. There are also too many small-scaled farmers in the business whose products (flowers or threads) are collected by the dealers and delivered to large-scaled processors. This is because; large-scale processors don't have enough time and resources to collect their need from numerous small-scaled farmers. Hence, dealers in this chain bring about a win-win situation for both small-scaled and large-scaled producers. However, the lack of cash and absence of a structured financing system throughout the chain are the main reasons that have led to the emergence of a multi-level dealer system. Dealers collect products of small-scale producers and pay them few months later (long term payments). In this way they somehow provide finance for their own buyers (large-scaled processors). On the other hand, small-scaled producers are okay with getting paid by these dealers after 2, 3 or even 6 months, since, obviously, this entails a higher price for their product.

Dealers, also, sell the collected goods to their buyers in long-term payments and benefit from the interest rate. Currently, the interest rate of a long-term payment is 2.5 to 3.5 percents per month. Many domestic packaging units and exporters take advantage of this system as a way to secure their input.

In the agriculture segment, there is only the Agriculture Bank that provides saffron producers with financial services. The amount of loans granted by the bank is less than 100 million Rials (equal to 4,035 USD). These loans are given to producers who are introduced to the bank by agriculture related public organizations such as the Ministry of agriculture offices in the provinces and cities. These loans are given for general uses.

However, since granted loans are relatively small in amount, the bank does not bother to control its outcome and effectiveness. The extent to which these loans are injected in to the saffron industry is also under question.

Other public banks do not target their financial services to the agriculture sector at all. It is noteworthy that there is no sign of granting financial aid to Business Service Development providers of the Saffron chain by any of the commercial/ public/ private banks. Yet none of them has provided finances by opening domestic letter of credit (LC) or buying producers' product. Thus, there exists no organized system to provide the actors with finances.

Most of the farmers, who have managed to receive low interest loans in the past years, defaulted on their debt and thus are deprived of receiving any more finance. Some others, who have been loan guarantors of their relatives or acquaintances, are also deprived of receiving finances due to

the borrower's default on the debt. Additionally, powerful associations are nonexistent in the agriculture segment. This has severely decreased the bargaining power of farmers to negotiate with credit institutes or to establish joint investment funds which is a major defect in the financing system of the saffron industry in Khorasan.

Dealers and exporters of saffron enjoy high balances in their bank accounts, thus are more likely to receive loans. Furthermore, most of the dealers and processing/packaging units and some exporters use their customers' pay cheques as collateral to receive loan from credit/financial institutes. Although, these finances come with higher interest rates, dealers and processing units along with some exporters are still willing to take advantage of the credit because in this way they manage to improve their capital turnover through bargaining higher scales of saffron. Even in some cases, superficial paychecks are used as collateral.

Imam Reza Fund is a micro-financing institution that grants small amounts to few actors in the agricultural segment of this value chain. No remarkable finances have yet been granted to processors, BDS providers or exporters by this institute. Imam Reza Fund addresses its mission in terms of establishing new firms.

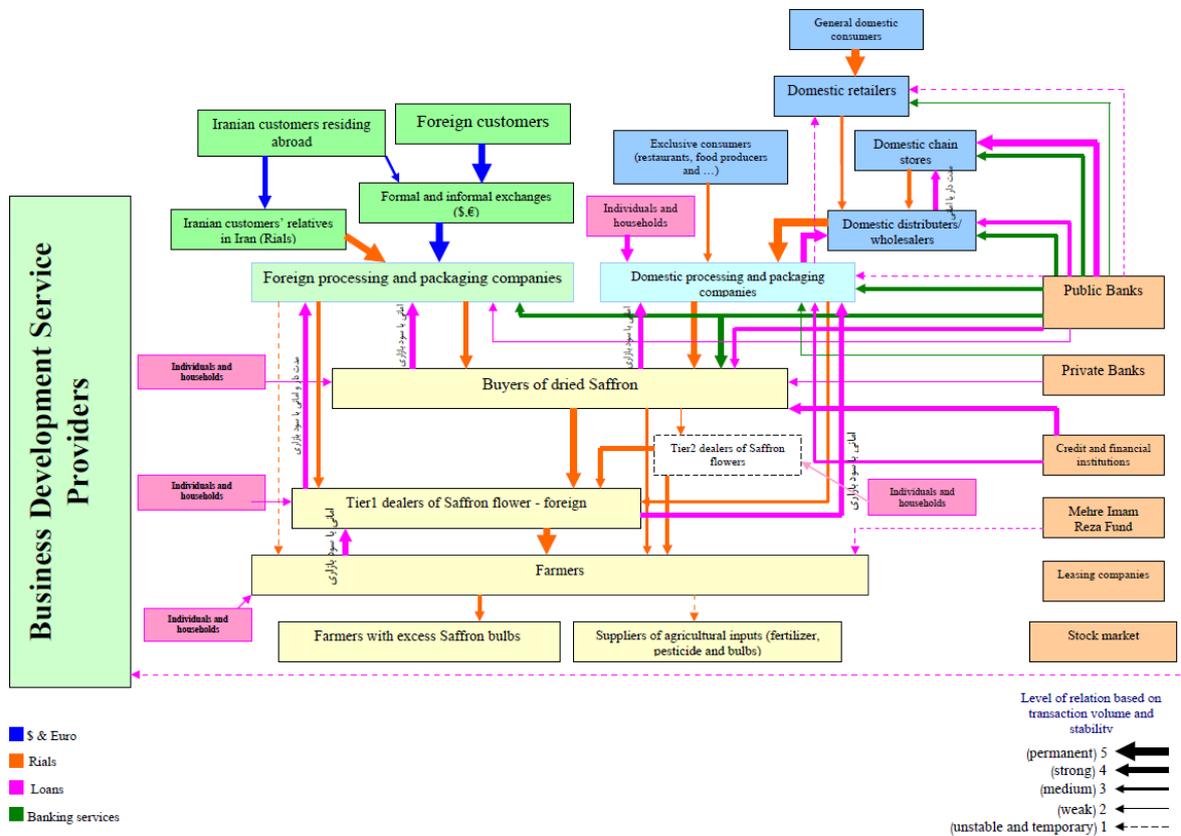
Increased price of saffron, the primary input of processing units, is considered a major challenge to these firms for years. Furthermore, we can refer to sudden changes of regulations, public authorities' personal preferences, the high cost of materials and most importantly, international sanctions as other challenge threatening saffron producers in Iran.

In regard to currency exchange rates, obviously, most of the enterprises that require global currency are exporters. They receive finances provided by the Export Development Bank. However, due to the high inflation rate in Iran, they would have to pay back much more than what was anticipated. This has directly increased their variable costs of production. Furthermore, default on payments is another outcome that reduces the exporters' credit and holds them up from receiving finances provided by other banks and institutions.

Limitations in specialized finances provided by public banks along with growing price of Saffron has directed producers toward applying for private banks' finances that has higher interest rates. Securing finances with higher interest rates would increase production costs and make producers more demanding of new capital resources. This vicious circle provokes Saffron producers' liquidity crisis, especially in the buying season of Saffron flowers.

Saffron production is a seasonal business. So, actors have to have access to finance at a specific period during the year. Otherwise, they have to buy saffron from dealers. Besides, the supply of cultivated saffron is decreased in other seasons. All this together, raises the price of saffron. Hence, if packaging/processing units are not properly financed at the right time, they would have to apply for grants provided by private banks and/or informal agents leading to additional production costs.

Financial relationships of the actors, cash/banking services map



International sanctions have also had undesirable impacts on exporting of saffron. For instance, many international customers do not accept the letter of credit (LC) provided by Iranian banks. Moreover, some foreign companies add risk related expense to their prices when dealing with Iranian customers. For example, a German machine manufacturing company, adds 12% to prices as risk expenses when dealing with Iranian customers! All in all, Limitations in transferring money abroad and international distrust, has made Iranian producers clearly weak in business negotiations.

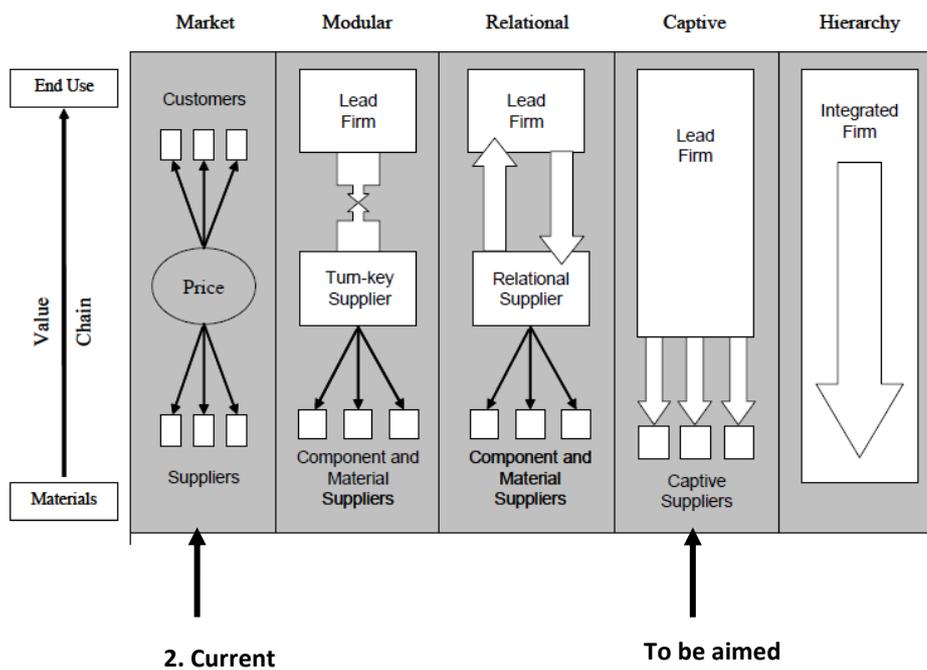
Saffron Value Chain Governance Structure

Governance Structure

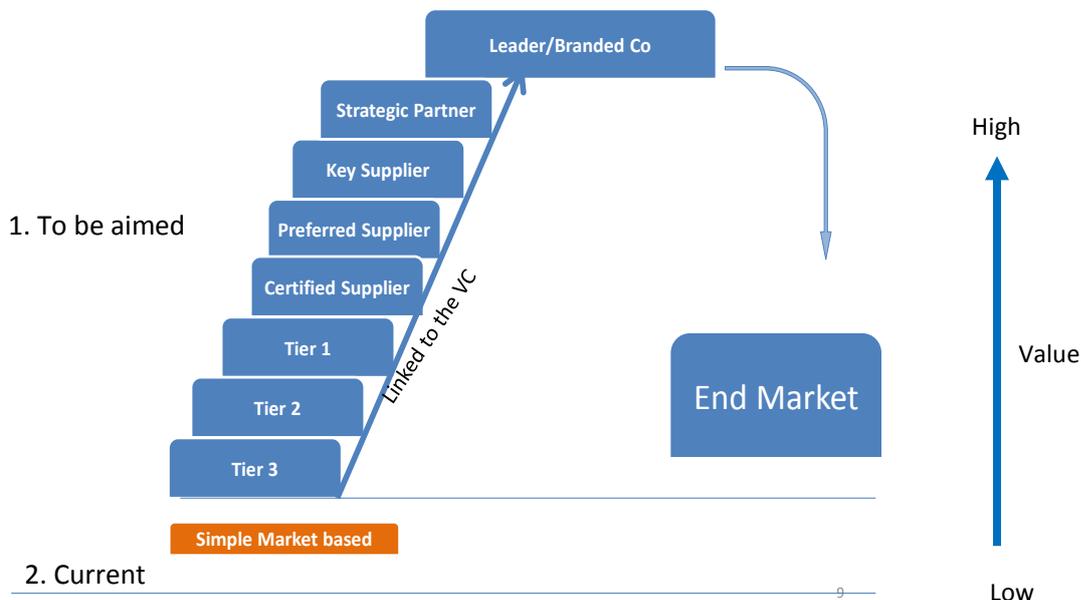
The performance of the chain as a whole is directly related to its governance structure. Governance refers to the way business activities in a value chain are vertically coordinated. We can distinguish different forms of governance, of which the most important are markets (or arms-length), modular value chains, captive relationships and vertical integration. While in a “market based” value chain an independent supplier makes products without any relationship with the buyer (and the only criteria is price), “captive” relations describe a form of governance, in which small suppliers depend on a larger lead company.

As shown in the figure, the overall current governance type of the Saffron sector is market-based which can be guided towards the captive one. The main component of shifting path from arms-length to the captive structure is vertical networking between suppliers and buyers in different layers of the chain. Nevertheless, linking to the chain doesn't mean that the firms could acquire proper share in the chain. They need to be upgraded and developed in this context to be able to link with actors in upper part of the chain. To upgrade the firms, being qualified and powerful enough to bargain in the global market and building sustainable links to the global buyers are required.

Current and proposed governance structure for saffron value chain



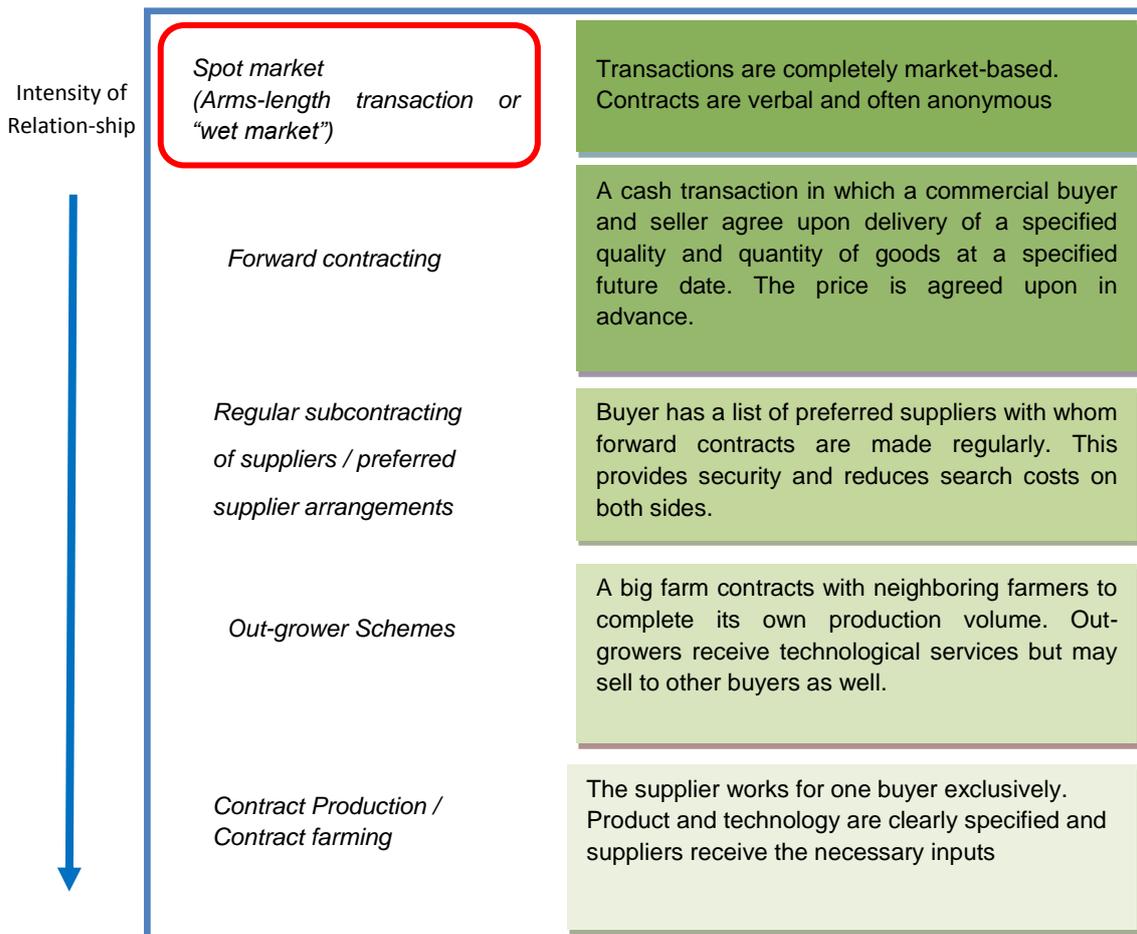
A multi-tier captive structure



Strengthening vertical business linkages serves several purposes: One is to link small enterprises to high-value markets brokering contracts with domestic or international buyers. This includes strengthening the contractual position of small producers to improve the distribution of benefits in favor of enterprises providing income to the poor people. A second objective is the improvement of efficiency, reducing the costs of contract supervision and the information costs, and building trust between business partners. As value chains upgrade from traditional to high-value products, the types of contractual relationships between suppliers and buyers evolves: Standard commodities, such as wheat, are mostly traded in spot markets (“arms-length” transactions), as the standard quality can be met by many producers. Both suppliers and buyers can easily switch between trading partners.

In the case of high-value, perishable or branded products with differentiated characteristics more sophisticated forms of contracting are required to assure quality and reliability of supply. Hence, product upgrading involves the “upgrading” of contractual agreements imposing demands and discipline on the partners, and especially on suppliers. The different forms of contractual arrangements are listed in the box below in which the current arrangement of Saffron sector in Iran is shown by a red circle.

Current and proposed types of relationship among farmers



The list is organized in order of an increasing degree of detail and mutual obligations. Spot markets are anonymous and fragmented, whereas the other contracting arrangements are characterized by the important role of buyers and even written contract documents.

As shown in the box, due to the annual or even seasonal price fluctuation, Saffron farmers prefer to keep the products and sell them gradually, so that nobody would like to have, for example, “forward contract” which put him under pressure of commitment to the buyer. It means, in parallel, no money, information, learning etc. would flow from the buyer side to the supplier side. In addition, the most important point in the Saffron agriculture sector is that in the period of harvesting and immediately selling of the Saffron, there is a huge lack of fund. Local financial institutions such as governmental and private banks don’t have the proper flexibility in order to support formal buyers, mainly processors and packagers. Therefore, the gate is open for dealers to buy raw Saffron. These dealers normally gather in the “Saffron flower collection terminals” located in the center of each city. Existence of this market place is the best indication of typical arms-length relationship among the actors.

This type of market-based relation is also visible in the supply of Saffron flower and/or Saffron stigma to the processors/packagers. Saffron processing and packaging firms purchase their small or large portion of requirement from dealers or farmer-dealers without any contractual relationship. Lack of sustainable relationship among the actors creates no pull for the farmers to enhance their production volume using new method and technology. In that, the volume of production per hectare has not increased in the past but, allocation of new lands to the cultivation of Saffron even by new farmers in the new areas and territories was the source of Saffron production increase in the region.

Regarding the relationship between packaging segment and the final market, it should be noticed that actors in this part just package the Saffron and a few of them process or mix Saffron with other materials producing new products such as Saffron tea and so on. Almost all packaging firms sell the products in a passive manner waiting for being contacted by international buyers and deliver the bulk or in package which will be repacked in the target market by buyers. This group has no long term contractual relationship with international buyers. The important point here is that all the actors with a little more sustainable relationship with buyers are those which process, even simply, the Saffron. Being equipped with any techniques of processing, from powder producing to Saffron tea, make the actors capable of having long term relationship with buyers. For example 2 firms that use Saffron as flavoring raw material for their different type of processed foods, have long term relationship and sometimes contract with domestic and regional buyers.

Therefore, in the processing and packaging part of the chain, we need to differentiate simple packagers from processors. A little capacity of contractual and long term relation could be realized in the simple packaged Saffron global value chain; however, the best opportunity would be created and realized through focusing on processed Saffron. The nature of unprocessed packaged Saffron with no special differentiation leads to the arms-length transactions as the standard quality can be met by many producers available in the market. On the other hand, processing creates the condition of relationship with buyers, at least in a “captive” format.

Shifting from arms-length to the captive relation by processing and packaging units pull them to build long term – formal or informal – relation with farmers which will result in investing on training and equipping them with new techniques and know how.

In order for the Saffron to be sustainable, contractual relationships must be mutually beneficial and allow both supplier and buyer to advance. However, the more specific and detailed the arrangement, the greater the demands on the productive and organizational capacity of suppliers. Responding to new forms of contracting can pose problems to small producers. Linking a large number of small-scale farmers or packager/processors to the firms in upper tier of a chain doesn't mean that they are linked with the main leaders of Saffron global value chain.

Single small suppliers are unable to meet separately the volume required by leading firms. Thus, they need to co-work with other similar firms in the same situation within the business-oriented networks. Market-based relationship in the chain leads them not to feel and realize the necessary of cooperation, so that there is no any business-oriented association in the chain in Khorasan. Either associations are established with direct governmental supports (such as Saffron Export Fund and Saffron National Council) or their mandate is lobbying (like South Khorasan Saffron Union).

The fragmentation of supply, the low degree of market organization and widespread mistrust often prevent investment in contracts or bilateral long term relation. In that, although there are many advertisement signs visible everywhere in Mashhad, it doesn't mean that there is a powerful company representing a strong supply chain or it is the power of the sector in distribution of revenue along the chain. Nevertheless, most of the support institutions in the region support only this sort of companies.

Enterprises collaborate horizontally for two main reasons – business advantages and common economic interests. The business motive is to overcome the limits set by the size of enterprises. Small and medium enterprises achieve economies of scale through bulking of produce and joint sorting, grading and marketing. Business partners prefer to negotiate with few suppliers and expect reliable supply and quality. Often, forming an association is a precondition for obtaining sales contracts. By associating, small enterprises qualify as business partners and increase their bargaining power vis-à-vis buyers. A related purpose of collaborating is the joint access to support services. Beyond the direct business advantages, entrepreneurs benefit from cooperating by resolving common problems, by organizing upgrading action and by joint learning. External facilitators need horizontal networks as multipliers of information to a wider group of people. Farmers and micro enterprises do not qualify as clients of public support individually. This purpose can be achieved in enterprise networks – or by associations that are sufficiently big to organize service provision for their members. Accordingly, the types of horizontal collaboration differ between associations acting as businesses (chain operators) and associations that perform a supportive role. In both cases informal groups and formal organizations can be found. In the box below we showed the type of horizontal collaboration exist in saffron sector (green part) and needs to be (blue part).

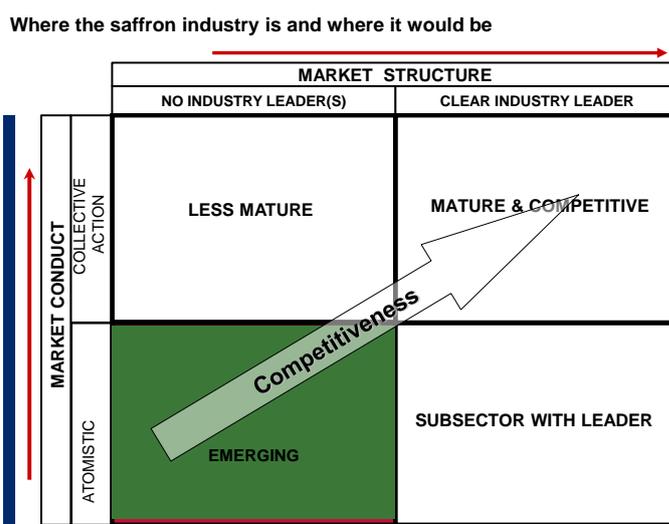
Type of collaboration among farmers

	Micro level	Meso level
Informal	producer groups mainly in agriculture sector	Enterprise networks
Formal	Producer association like cooperatives	Umbrella network Such as large association

As pointed out in previous chapters, although there are more than 40,000 state built rural cooperatives and also 48 family cooperatives which are means of applying for financial supports, a lack of cooperation among the chain, particularly in the farming sector, is visible. However, many informal producer groups are identified during the inception phase. In the processing and packaging section, the situation is similar and there is a lack of business-oriented networks.

Furthermore, as the firms are mainly micro and small, for upgrading them the engagement of local institutions who can be involved in technology, quality, and finance and logistics improvement is necessary. Although all these institutions are well-established in the region, they are working in isolation from each other. Through a captive governance it is expected to see numerous refers to these sort of institutions that pull institutions toward the right direction in the resource allocation, research and development.

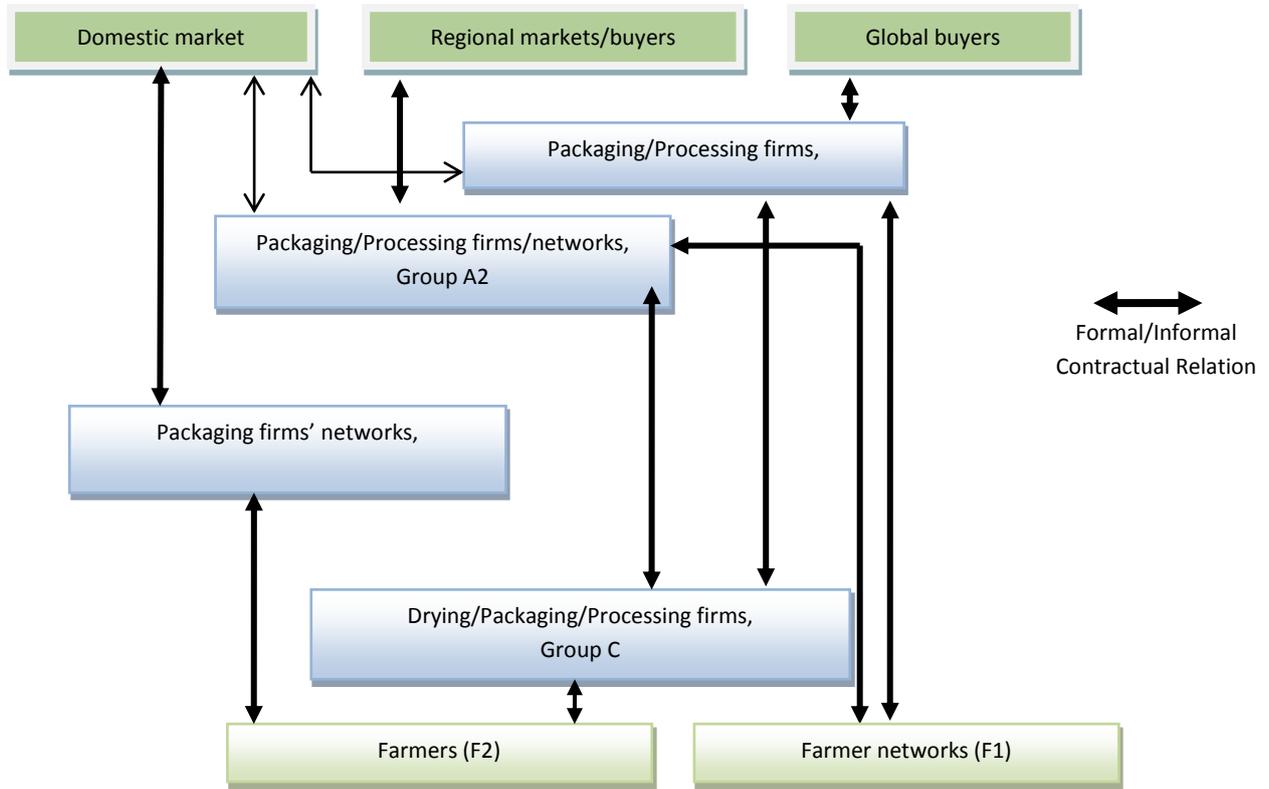
To conclude, the saffron sector in Khorasan is an atomistic with weak or hostile business enabling environments. Weak supply chains and high-entry and exit rates characterize this industry. Entrepreneurial resources are devoted to keeping one's own business afloat, rather than worrying about the whole industry. It needs to shift to the situation where a relatively high degree of inter-firm cooperation exists in which more competitive lead firms are present, while multiple firms have recognized the importance of at least some degree of collective action around shared objectives.



Start point would be the contractual linking of local packaging and specially processing firms in group A to the global buyers. Then, it would be possible to develop vertical networks among the

local buyers and suppliers. In this case, investment by buyers in the local supplier firms will be developed.

Proposed Structure and Contractual Relationship between Actors along the Value Chain



Development Strategy

A) Strategy for European markets

Europe is considered as the great importer of saffron. Almost every member of the European Union, especially those located in the Western Europe and Scandinavia regions are the most significant consumers of this product. Exceptions are Spain, Greece and to some extent Italy who are known as major re-exporters of saffron. Even, France and Portugal that run a thriving business by re-exporting saffron, consume a substantial amount of their imported saffron within national markets. Germany, Sweden, Switzerland, France and the UK are the most remarkable consumers of saffron who could be addressed as major destinations for Iranian saffron and related processed goods to develop Iranian Saffron Industry.

Although an accurate survey of saffron consumption in different European zones is not available, field studies show that more than 50% of the saffron is used directly by the individuals/households for making food and pastry. This is mostly saffron powder or threads. The saffron used by food and drink companies is anticipated to constitute 20% of the consumption and the rest is taken into various sectors such as medicine and cosmetics. According to a survey made by the EU in 2006, more than 60% of the saffron is delivered to final consumers at hypermarkets and chain department stores in packages less than 2 grams in the form of powder and threads. Notably, Iranian labeled saffron is visible in none of these stores, whereas almost 90% of the packages contain Iranian products and are labeled as products of countries such as Spain who merely sorting and packing the product.

Iranian, Indian and Arab merchants who reside in the EU and own stores throughout continent constitute a part of the saffron suppliers in the European Union. These merchants mainly introduce their product in bulk or brand-less wholesale packages.

Consumption of saffron in Scandinavia reaches its peak in traditional holidays and the last days of each year. It is mostly used to cook and bake special recipes for the event. Also, using saffron to make sea food is most observed in the Mediterranean countries. Regarding the therapeutic feature of the saffron, the proportion of uninformed users is striking. Most of them use the product threads and even in some countries people do not realize how to use the saffron so that it is merely used directly as food dressing.

An effective way of emersion in branded saffron retailing market is to join distribution networks that deal with major chain department stores and retail networks in an organized fashion. Another solution would be production of processed saffron such as saffron concentrate, Kerosene and Saffranal extracted from the saffron stigma and threads to be used in medicine and cosmetics. Currently, due to lack of technology and technical knowledge, there is not even one Iranian company that has managed to operate in this field.

Additionally, introducing processed/blended goods can be another way of entering into European market. For instance, saffron tea, herbal drinks blended with saffron, saffron chocolate, saffron pastry and ice cream or saffron flavored milk. Obviously, there exist strict standards and rigorous

requirements for exporting food and drinks to the EU. Hence, production and distribution under credible brands of designated countries is an efficient and consistent path to penetrate in European markets. This would not only ease vertical development of the value chain by taking orders from credible European companies, but also increases the technological capacity of Iranian producers and transfers authentic standards and knowledge into the country of origin. In addition, the value added of processed saffron product is much more than just packaging the product.

In the next section, for each of the three following groups of the saffron products according to the aforementioned findings, we'll discuss the possible strategies on how to enter the European markets separately:

1- Packaged Saffron

Selected strategy for this group of consumer products is as follows. Given the findings provided in the previous section, Iranian Saffron actors are generally absent in the European market. Thus, developing the packaged Saffron market is introduced as the entrance strategy to the European market.

Market strategy for packaged saffron in EU

	Current Products	New Products
Current Markets	Market Penetration	Product development
New Markets	Market Development	Diversification

Field studies reflect high pricing flexibility of Iranian Saffron exporters. On the other side, they are either unaware of general and/or consumer specific standards or neglecting them. In this context, we suggest to take cost leadership as the mainstream strategy. Currently, designing product for specific segments is not a plausible action. In case we manage to enter the unmet markets and earn a consistent position within the chain, then it would be justified to discuss the possibility of focusing on specific segments.

Focus of market strategy for packaged saffron in EU

	Uniqueness	Low Cost
Broad Market Scope	Differentiation	Cost Leadership
Narrow Market Scope	Segmentation	

Considering the market value chains of current consumers (countries), two strategic actions are suggested:

- a- Linking with retail distribution network through a branded chain retailer network (by either the A1 or the A2 companies);
- b- Production and packaging as a subsidiary of branded companies with their trademarks (A2 companies can take over this strategy).

2- Saffron used in the food industry

This market constitutes of food production and processing sectors, hotels, restaurants etc. The customer demand emerged in this market has its own specific properties that is not yet met by the suppliers. So, the products ordered by the costumers of this market would be completely new to Iranian producers.

For this section of the market, obtaining diversification in order to join buyer companies is recommended. In this context, the inter-firm relationship between buyers and suppliers would be captive. Both A1 and A2 actors can take this strategy.

Market strategy of saffron sector linked with food industry in EU

	Current Products	New Products
Current Markets	Market Penetration	Product development
New Markets	Market Development	Diversification

3- Saffron for cosmetics and medicine sector

This market is almost completely unknown to most of Iranian actors. Thus, a proper strategy for this market would be categorized under the new markets and new products category.

Also in this context, diversification is suggested as a selected strategy to focus on. There would be a captive relationship between Iranian actors and their buyer. In addition, only the A1 group would have the ability to enter in this sector. To conclude, strategies for entering European market is summarized in the table below:

Product group, market strategy and relevant actors for EU market

Product group	Market strategy	Involved actors in the chain
Packaged Saffron	Market Development	A1, A2
For use in food industry	Diversification	A1
For use in pharmaceutical and cosmetic industries	Diversification	A1

B) Strategy for the East Asian market

Hong Kong, Japan, China, Singapore are major costumers of Iranian Saffron within East Asia. Given the per capita income of the East Asian countries and the up going trend of spice consumption by these countries, they constitute a potential growing market. Bigger markets such as Hong Kong, China and Japan beside, South Korea, Macao, Maldives, Malaysia, and Indonesia are instances of these potential markets.

Buddhism has had a great influence on the culture and food habit of people residing in this part of the globe. They mostly believe in the food as a medicine. Also, high rate of income per capita in China, Malaysia, Hong Kong etc made the trade of luxury products a thriving business.

Additionally, the boom in tourism has severely increased their capacity for retailing luxury stuff within hotels or commercial and tourism centers.

On the other hand, increasing business of herbal plants along with emergence of companies pioneering in production of plant-based drugs and medicine in the region has aroused the possibility of production and promoting products processed /blended with saffron. These pioneers have become professional in introducing and marketing of new products.

Today, East Asian countries haven't yet regulated the import of saffron, except for Japan that imports saffron mostly in bulks. Also, exporting saffron from Iran directly to China is unlikely due to specific custom of herbs. China imports mostly from Hong Kong and Malaysia. High influence of media on people, especially visual media is a noteworthy feature of the East Asian countries. This has resulted in easier commercial communication and trade with the mentioned countries that also lowers the business risk. Strong R&D centers along with acceptable technological capabilities located in these countries have provided a desirable context for production of various saffron processed food and drinks.

Ease of competition in these markets which is mainly a consequence of absent established saffron exporters such as Spain and United Arab Emirates, is proven to be a good opportunity to emerge new markets to promote Iranian saffron.

Also considering the culture and habits of East Asian people helps to anticipate a great market for saffron flavored drinks such as green tea, herbal drinks and saffron-flavored dairies. Especially low level of awareness about how to use saffron and peoples' tendency to eat-out has made this assumption more likely to be right.

To summarize, restaurants, hotels, tourists' sweet spots (places to sell souvenirs and gifts), food and drink industries, producers of plant-based medicine in the East Asian countries are supposed to constitute a high potential market in this region.

According to surveys made to study consumption rates of spices and pharmaceutical plants, these goods are much more consumed in the East Asian countries. This implies that the region is a desirable environment to invest on creating a new market for Iranian saffron. Although the East Asian and European markets enjoy some similarities, we must take two distinguishing feature of Asian market into account:

- Huge hidden demand (potential)
- The possibility of focusing on herbal products

Yet, the standard level of some countries in the region is as low as A2 companies can also enter to this market.

Based on what we discussed, strategies to be undertaken in the East Asian countries should be summarized in the following table:

Product group, market strategy and relevant actors for East Asian market

Product group	Market strategy	Involved actors in the chain
Packaged Saffron	Market Development	A1, A2
For use in food industry And herbal foods	Diversification	A1,A2
For use in pharmaceutical and cosmetic industries	Diversification	A1

C) Strategy for the Middle East market

Saffron is a well-known good in the Middle Eastern market so that Persian Gulf Arab countries are major consumers of saffron around the globe.

UAE, Saudi Arabia, Oman, Qatar, Bahrain and Kuwait have significant demand for Saffron amongst the Middle Eastern countries. Some others have a very low level of consumption rate like Jordan, Greece and Yemen. However, trading of saffron is increasing in countries such as Lebanon aiming at re-exports to the USA, Israel and Latin America.

Saudi Arabia is the second greatest consumer of saffron in the Middle East after Iran. Saudi Arabia meets most of its demand by importing saffron from Iran in bulks and distributes the product in domestic market with just a simple packing.

UAE a great importer and also a great exporter in the region, consumes a small proportion of imported saffron and exports more than 90% of the imported product to other countries. Other customers of the UAE's saffron are other Persian Gulf Arab countries whom their relationships are stronger as compared to Iran.

Most of the merchants in the UAE are originally Iranians who have become the citizens of the UAE. These merchants are fully informed of the price fluctuations in Iran and import their merchandise by personally travelling to Iran and carrying it their hand bags. In this way, they reduce the cost expenses and transportation fees. This process would also lead to inaccuracy in import/export statistics of Saffron.

Multiple daily flights between Iran and the UAE and cultural similarities plus adjacency of the two countries has turned the UAE in to a very appealing market for Iranian producers.

The income per capita in Persian Gulf Arabic countries is significantly high. Thus, although at the moment all of the saffron exported to these countries is in thread bulks, introducing processed Saffron products to their market would still be justified. Obviously, it can bring more value added to the pockets of Iranian producers.

Most of the saffron traded in this market is delivered to the end-user unprocessed and packaged. There are just a few food producers who use saffron as an ingredient. Plus, cosmetics and medicine industry is quite undeveloped in the region. Thus, developing market for Iranian saffron in the Middle East should be focused on introducing packaged saffron and saffron flavored products to the Persian Gulf Arab countries.

1. Packaged Saffron

Market condition of the designated countries implies choosing “product development” as market development strategy.

Market strategy of packaged saffron in Middle East market

	Current Products	New Products
Current Markets	Market Penetration	Product development
New Markets	Market Development	Diversification

Within the said framework, Iranian producers should focus on product differentiation.

Focus of market strategy for packaged saffron in Middle East market

	Uniqueness	Low Cost
Broad Market Scope	Differentiation	Cost Leadership
Narrow Market Scope	Segmentation	

2. Saffron flavored products

Processing and packaging units that are producing packaged saffron and other related products such as saffron tea have the potential of doing business in the Persian Gulf Arab countries. Therefore, “product development” would be an efficient approach.

Market strategy of saffron flavored product in Middle East market

	Current Products	New Products
Current Markets	Market Penetration	Product development
New Markets	Market Development	Diversification

Besides, there exists in the region actors who put their emphasis on having competitive price. Thus, along with “product development” efforts, Iranian producers would obtain more added values by pursuing “differentiation”.

Focus of market strategy for saffron flavored product in Middle East market

	Uniqueness	Low Cost
Broad Market Scope	Differentiation	Cost Leadership
Narrow Market Scope	Segmentation	

Iranian packaging and processing firms are currently following standards that would satisfy potential buyers’ expectation in the Persian Gulf Arab countries. However, entering distribution networks and complying with their specific standards would be a key factor to obtain a steady position in the new market. To conclude, the chosen strategy to develop this market is as followed:

Product group, market strategy and relevant actors for Middle East market

Product group	Market strategy	Involved actors in the chain
Packaged Saffron	Market Development	A2
Processed Saffron (such as Saffron tea)	Diversification	A1, A2
For use in pharmaceutical and cosmetic industries	-	-

D) Strategy for the Domestic Market

All Iranians are familiar with saffron. They normally prefer to use saffron fiber and mash it by themselves and use it as an additive to traditional foods therefore; saffron packagers and sellers usually supply the unprocessed-simple packaged Saffron. In this context, most of the firms have concentrated on meeting this simple huge market needs, so that the domestic market is saturated from simple packages of saffron with or without any trade name or mark. However, there is a huge unmet market for the processed saffron or food products with saffron an ingredient such as saffron tea, ice-cream etc.

The main strategy in this market would be product development with focus on differentiation which would be implemented by chain actors in group B.

Market strategy of saffron in domestic market

	Current Products	New Products
Current Markets	Market Penetration	Product development
New Markets	Market Development	Diversification

Focus of market strategy for packaged saffron in domestic market

	Uniqueness	Low Cost
Broad Market Scope	Differentiation	Cost Leadership
Narrow Market Scope	Segmentation	

In short, the strategy for the sector in domestic market would be as drawn in following table:

Product group, market strategy and relevant actors for domestic market

Product group	Market strategy	Involved actors in the chain
Packaged Saffron	-	-
Processed Saffron (such as Saffron tea)	Diversification	B
For use in pharmaceutical and cosmetic industries	-	-

Saffron Value Chain “Upgrading”

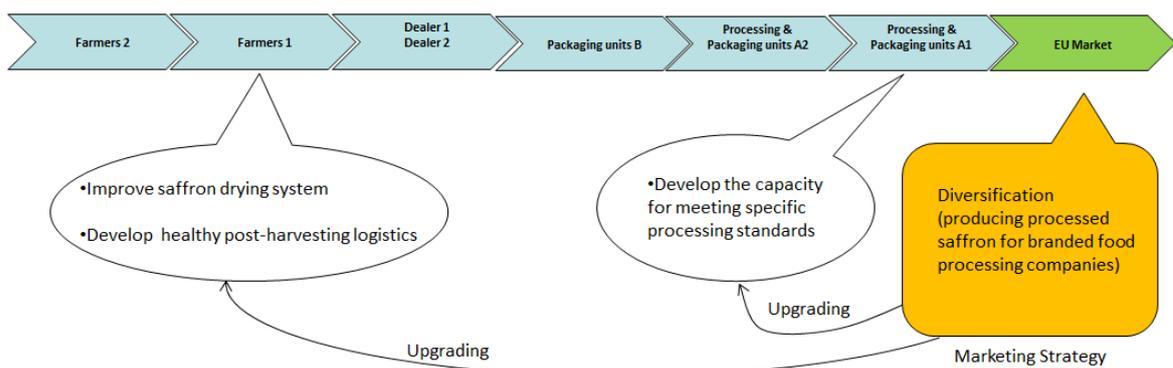
Upgrading

The concept of upgrading (that is, making better products, making them more efficiently, or moving into more skilled activities) has been used often in the literature on competitiveness (Porter, 1990; Kaplinsky, 2000). Generally speaking, upgrading and innovation are intertwined, particularly because upgrading is defined as innovation which increases value added.

In addition, innovation is clearly not defined only as a breakthrough into a product or a process that is new to the world. It is, rather, a matter of marginal, evolutionary improvements in products and processes that are new to the firm and that allow it to keep up with an international (moving) standard. This involves a shifting into activities, products and sectors that have a higher value added and higher barriers to market entry.

Process upgrading refers to transforming inputs into outputs more efficiently by reorganizing the production system or introducing superior technology. Product upgrading means moving into more sophisticated product lines in terms of increased unit values. Functional upgrading refers to acquiring new, superior functions in the chain, such as design or marketing, or abandoning existing functions that have a low value added to focus on higher value added activities. Inter-sectoral upgrading denotes applying the competence acquired in a particular function to move into a new sector. In sum, upgrading within a value chain implies going up the value ladder, moving away from activities in which competition is of the “low road” type and entry barriers are low.

An example of interpretation of a strategy to “upgrading”



For diversion in food industry sector in European market, farmers as one the target groups require to use different ways of upgrading as outlined in the table below, like improving the production and drying systems and so on. Another group of actors like Group A1 require using another upgrading strategy as mentioned in the table.

According to these sets of upgrading, the necessary intervention will be designed; this intervention is a kind of action plan which is the guideline for implementation of saffron industry value chain development.

From development perspective, the upgrading idea cannot solely be based on competitive advantage but has to be linked with related actors at the same time. We have to make sure there is a potential for improved distribution of the additional chain income across groups of operators. All actors should have the chance of getting their share of the value created. Therefore, we need to interpret the market strategy to actors' upgrading language. In this case, specific upgrading objectives will be defined for all actors along the value chain.

In below tables the market strategies for each target market (EU, East Asia, Middle East and Domestic market) are interpreted to "Upgrading" for each group of chain actors.

1. EU Market

Product group	Strategy	Upgrading in Processing & packaging firms	Actors to be involved	Upgrading in farming
Packaged Saffron	<u>Market development</u> 1. Linking with retailing chain 2. Processing and packaging as subcontractor of branded companies in the target markets	1. Improving relevant Packaging and labeling standards 2. Meet specific processing standards	Group A1, A2	1. Improve production system (productivity) 2. Improve Saffron drying system 3. Develop healthy post-harvesting logistics
For food industry	<u>Diversification</u> Producing processed Saffron for branded food processing companies	1. Developing the capacity for meeting specific processing standards	Group A1	1. Improve Saffron drying system 2. Develop healthy post-harvesting logistics
For pharmaceutical and cosmetic ind.	<u>Diversification</u> Producing processed Saffron for European pharmaceutical and cosmetic companies	1. Developing the capacity for specific processing and quality standards	Group A1	1. Improve Saffron drying system 2. Develop healthy post-harvesting logistics

2. Domestic Market

Product group	Strategy	Upgrading in Processing & packaging firms	Actors to be involved	Upgrading in farming
Processed Saffron	<u>Product Diversification</u> 1. Producing a variety of SaffronSaffron-flavored food (variety of products such as Saffron tea, Ice-cream etc.) to be distributed in target market	1. Improving packaging technology 2. Branding	Group B	1. Improve production system (productivity) 2. Improve Saffron drying system

3. East Asia

Product group	Strategy	Upgrading in Processing & packaging firms	Actors to be involved	Upgrading in farming
Packaged Saffron	<u>Market development</u> 1. Linking with retailing chain 2. Processing and packaging as subcontractor of branded companies in the target markets	1. Improving relevant Packaging and labeling standards 2. Meet specific processing standards	Group A1, A2	1. Improve production system (productivity) 2. Improve Saffron drying system 3. Develop healthy post-harvesting logistics
For food industry and herbal foods	<u>Diversification</u> 1. Producing processed Saffron for branded food processing companies	1. Developing the capacity for meeting specific processing standards	Group A1, A2	1. Improve Saffron drying system 2. Develop healthy post-harvesting logistics
For pharmaceutical and cosmetic ind.	<u>Diversification</u> 1. Producing processed Saffron for European pharmaceutical and cosmetic companies	1. Developing the capacity for specific processing and quality standards	Group A1	1. Improve Saffron drying system 2. Develop healthy post-harvesting logistics

4. Middle East

Product group	Strategy	Upgrading in Processing & packaging firms	Actors to be involved	Upgrading in farming
Packaged Saffron	<u>Market development</u> 1. Linking with retailing chain 2. Processing and packaging as subcontractor of branded companies in the target markets	1. Improving relevant Packaging and labeling standards	Group A1, A2	1. Improve production system (productivity) 2. Improve Saffron drying system 3. Develop healthy post-harvesting logistics
Processed and herbal foods	<u>Product Development</u> 1. Producing processed and packaged Saffron to be distributed in target market	2. Meeting target market packaging and labeling standards	Group A1, A2	1. Improve Saffron drying system



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