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Study of competitiveness of apricot in ut of Ladakh at national level

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Abstract

Apricot is an important horticultural crop of Ladakh and is one of the major producers growing more than half of the India's supply. Though Ladakh is the largest producer of the wide varieties of apricot, the region is not a major player in the export market, either fresh apricot, dried and processed apricot products. Ladakh has the opportunity to speed up the supply as it has comparative advantage in production of apricot. In order to achieve it, assessment of export competitiveness is needed. This paper evaluates the level of competitiveness for Indian apricots among other competitors and opportunities in world market to identify the new destination for Indian apricot. The findings show that the United States of America, Germany, France and U.K. are the major apricot importing countries of the world accounting 37.3% the total world imports of apricot. Share of Indian apricot in these countries is very nominal & these can be the new Destination of Indian apricot export. The result of Revealed Comparative Advantage (RCA), comprising 9 major global exporters, shows that India has very less comparative advantage in apricot export. Based on the domestic price and International Unit price and reference price, Nominal Protection of Coefficient (NPC) shows that India is not enjoying competitiveness at international level because domestic prices of mango are higher than the International Prices. Only few years have shown competitiveness, may be due to higher production of mango in these particular years which increased the supply and decreased the price of mango in domestic market. Of the explanatory variables specified in the gravity model, Per Unit Price and Per Capita GDP of importing partners of India were found significant factors determining apricot export.

Keywords: Ladakh, apricot, trade, RCA, NPC, gravity model

Introduction

Apricot (*Prunus armeniaca*) is a Rosaceae family member and belongs to section Armeniaca. It has three centres of origin

1. The Chinese Centre.
2. The Central Asiatic Centre.
3. The Near Eastern Centre.

It is cultivated in temperate climate of all continents of the world. Asia and Europe are the largest producers, and the major apricot growing nations are China, Italy, Spain, Greece, France, Morocco and Turkey. Global apricot production was estimated at 3.8 million tonnes and Turkey was the world's largest producer, growing 750000 tonnes of fresh apricot in 2018 (FAO, 2020). Apricot is the world's 2858th most traded product constituting 0.0026% of total world trade. The majority of apricots are consumed in producing countries and approximately only 7% of production is traded (ITC, 2020). The largest volumes of apricot exports are traded fresh and have steadily increased by 3.2% from 2017 to 2019. Spain was the leading exporter of fresh apricot followed by Turkey, Uzbekistan, and whereas Germany was the leading importer of fresh apricot followed by Russia, France, and Italy (APEDA 2020). Turkey followed by Afghanistan and Uzbekistan were the largest exporter of dried apricot whereas USA followed by Germany, France and UK were the leading importers of dried apricot. India ranks at 38th in the world in terms of apricot production and the production is estimated at 14233 tonnes which constitutes 3.83 percent of the global apricot production (FAO, 2020). In India apricot is widely grown in Union Territory of Ladakh, Lahaul and Spiti of Himachal Pradesh, Kumaun and Garhwal Hills of Uttarakhand and in Union Territory of Jammu and Kashmir with scattered plantation. It ranks second to plum among the stone fruits in area, production and productivity. The Union Territory of Ladakh is the leading apricot producer in

India as it produces 62% of India's supply (Saxena.2021) [8]. Apricot is an important horticultural crop of Ladakh and is one of the major producers growing more than half of the India's supply. Though Ladakh is the largest producer of the wide varieties of apricot, the region is not a major player in the export market, either fresh apricot, dried and processed apricot products. Ladakh has the opportunity to speed up the supply as it has comparative advantage in production of apricot.

Methodology

The main objective of this paper is to evaluate the level of competitiveness for Indian apricot among other competitors and opportunities in world market to identify the new destination for Indian apricot. The study is based on secondary data which is collected from the databases of the Food and Agriculture Organization (FAO), ITC trade map and APEDA.

Statistical tools

Revealed comparative advantage ratios

Revealed Comparative Advantage index or RCA index, originally developed by Balassa (1965) [9] is a ratio of two shares. The numerator indicates the share of exports of particular commodity with total export of that country at give point of time. The denominator indicates share of exports of that particular commodity with total world exports. RCA index value lies between zero and infinity. The value of RCA index >1 indicates revealed comparative advantage for that particular commodity/industry which is calculated as follows,

$$RCA_{ij} = (X_{im}/X_{wn})/(X_m/X_n) \quad (1)$$

Where

X_{im} = Value of India's apricot export
 X_{wn} = Total India's merchandise trade
 X_m = Value of world apricot export
 X_n = Total world's merchandise export.

Nominal Price Coefficients

Price competitiveness is measured by the concept of nominal protection coefficient (NPC) (Mattoo *et al.*, 2007, Mittal, 2007) [10]. NPC is the ratio of the price of domestic produce to the price of imported/exported products, after accounting for transportation cost and other marketing costs. In other words, it is the ratio of domestic price and border price or the export reference price including other net costs. NPC basically helps in measuring the divergence of domestic price from the international price & ultimately the degree of export competitiveness of the commodity in question (Gulati, et.al, 1994) [11]. The competitiveness of the commodities under consideration is treated under export hypothesis which implies that these commodities are treated as exportable and can compete with the domestically produced commodities at foreign ports.

$$NPC_i = P_{di} / P_{wi} \quad (2)$$

Where

NPC_i = Nominal Protection coefficient of commodity i
 P_{di} = Domestic (India) price of commodity i.
 P_{wi} = World reference price (border price equivalent) of commodity i, adjusted for transportation, handling and marketing expenses.

If NPC is less than 1 then the produce is supposed to be

competitive, which implies that domestic price is less than the international price and thus India's produce is internationally competitive. Border price can be computed either by using the international price adjusted for freight and insurance. Since the information on these components is not readily available or just approximations, the study uses the other way of computing border price. The unit export price that is the 'Free On board' (FOB) price, has been used which is derived by dividing value of exports by their respective quantities.

Gravity Model: Specification and functional form

Gravity model has been utilized intensively to explain bilateral trade flows between two countries which cannot be solved by other economic theories. Timbergen was a Dutch economist who first applied gravity model to analyse foreign trade flows in 1962. In his model, while dependent variable was the trade flow between country A and B, GDP and geographical distance were independent variables. Krugman and Obstfeld (2005) also utilizes gravity model for trade activities and they provides a common model as follows:

$$T_{ij} = A Y_i Y_j / D_{ij} \quad (3)$$

Where

T_{ij} is the total trade flow from origin country i to destination country j, Y_i, Y_j are the economic size of two country i and j. Y_i, Y_j are usually gross domestic product (GDP) or gross national product (GNP) D_{ij} is the distance between two country i and j, A is a constant term.)

Since the purpose of the present study is to devise a model for the export of apricot from India to its trading partners. In our present study we applied a variation of gravity model given by Krugman and Obstfeld. In the original model, only two independent variables are introduced including GDP and distances. The model in this paper is further enhanced by adding the variables per capita GDP of the trading partners, unit price prevailing in the trading partners, Domestic consumption and distance that effects trade between India and its trading partners. The gravity model is estimated in logarithm form as follows:

$$\log T_{ijt} = \alpha_0 + \alpha_1 \log D_{ij} + \alpha_2 \log Y_j + \alpha_3 \log C_j + \alpha_4 P_j + U \quad (4)$$

Where

i = 1 (India)
j = 2, 3, 4, (partner countries)
t = 2015, 2016, 2017, 2020
 T_{ijt} : is the value of apricot export from India to the jth Indian partners
 D_{ij} : Distance between India 'i' and country 'j'.
 Y_j : are per capita GDP.
 C_j : Domestic apricot consumption of the jth partner country
 P_j : Per unit price in Jth partner country
 U_{ij} : Error term

In the model GDP per capita of trading partners was included as an independent variable in the model as it can explain the link between a country's trade and its stage of development (Batra, 2004) [3]. The distance variable is in fact, a proxy for the transportation cost of the commodities traded and is inversely related to trade. Domestic consumption in importing countries has been used as more consumption means more demand for a commodity. Per unit price prevailing in the trading countries explains the lucrative market for the

product. The model was estimated using a panel data set for 10 partner countries by employing the Fixed Effect Model (FEM) and Random Effect Model (REM) (Gujarati, 2003). In the present study Hausman's Specification Test was used to choose among the two models and its estimates revealed that FEM model is suitable for the present study.

Discussions

World Trade of Apricot

It was observed that only 14.97 percent of total world production was traded in the year 2020. The largest volume of export trade was observed in Fresh apricot (59.05%) followed by dried (25.40%) and Processed apricot (15.56%). The total world trade of fresh apricot was above 447 million dollar (53.59%) in the year 2019 and the quantity traded was 361 thousand tons. Dried apricot was traded with value of above 364 million dollar (43.61%) and the quantity traded was above 155 thousand tons. The volume of processed apricot traded was observed to be 95 thousand tons with a value of above 23.46 Million dollar (2.81%)

Table 1: World Trade Scenario

Particulars	000USD	Tons	% value	% Qty.
Fresh	447708	3,61,172	53.59	59.05
Dried	364318	1,55,350	43.61	25.40
Processed	23468	95,167	2.81	15.56
Total	835494	6,11,689	100	100

Source: ITC and FAO 2019-20

World Production	Trade	% trade
4083861	611689	14.97

Source: ITC and FAO 2019-20

India's trade of apricot

It is quite important that trade of processed apricot was absent in India. It was observed earlier that the quantity of fresh apricot traded was more followed by dried apricot. But India's fresh apricot lagged behind dried apricot in the International trade both in value and volumes. The results from Table 2, revealed that India exported 25 tons of dried apricot with a value of 101 thousand dollars and 2 tons of fresh apricot with a value of 7 thousand dollars during the year 2020. In terms of percentage India traded 93.52 and 6.48 percent of dried and fresh apricot respectively it was further observed that India's share in world trade was negligible both in quantity and in value traded.

Table 2: Trade in Quantity and Value

India	000 USD	Tons	% value	% QTY
Fresh	7	2	6.48	7.41
Dried	101	25	93.52	92.59
Processed	0	0	0	0
Total	108	27	100	100

Source: ITC, 2019-20

Table 3: India's Share in World Apricot Trade

Particular	Quantity (tons)	Value(000usd)
India	27	108
World	611689	835494
India's share in trade (%)	0.004	0.01

Source: ITC and FAO 2019-20

Dried apricot trade

World dried apricot trade stood at 448 million USD in 2020

with a total 36, 1226 tons exported at an average unit price of 1241 USD per ton. World trade of dried apricot has not witnessed a decline during the last four years however a decline of 5 percent has been recorded from 2019 to 2020. This indicates that the dried apricot market is contracting.

As shown in the Table 4 below, Turkey alone accounted 72 percent of the world market share while the remaining countries contributes 28 percent of the global dried apricot trade. Turkey is followed by Uzbekistan (4.6%), Afghanistan (4.3%), Germany (2.4%) and France (1.9%) of world market share respectively and are the top five leading apricot exporters.

Table 4: Share in World Export

Countries	% Share
Turkey	71.5
Uzbekistan	4.6
Afghanistan	4.3
Germany	2.4
France	1.9
Netherland	1.7
Krygstan	1.6
USA	1.5
S.A	1.5
Spain	1.3
Tajakistan	1.3
Turkeys share	72
Rest of world	28

Top price achievers

Analysing the world dried apricot export further the top leading exporters Germany, France and South Africa achieved higher unit price as against the average world unit price.

Table 5: Top Price Achievers.

Top unit price achievers 2020	Unit price as percent of worlds average unit price
World	2345
South africa	298.08
Denmark	272.84
Brazil	255.86
Italy	242.05
France	221.66
Germany	219.36
United kingdom	190.41
India	172.28

Source: ITC and FAO 2019-20

Top Ten Importing Countries of Dried Apricot

The data from Table 6, revealed that 136,195 tons of dried apricot were imported at the global level with a value of 362.80 million USD during the year 2020. It has been observed that there has been a decline of 3% in imports during the last five years i.e from 2016-2020 and no growth has been found from 2019 to 2020 due to COVID pandemic. USA was found to be the world's largest importer of dried apricot having a share of 12.7% in the world market followed by Germany (9%), France (8.3%), and United Kingdom 7.3 percent. India imported a volume of 2834 tons with a value of 8.9 million during the same year and recorded a share of 2.5% in the world market. It has been observed that there has been a three percent increase in the annual growth in imports during the last five years however a steep decline in the growth has been recorded from 2019 to 2020 due to COVID pandemic.

Table 6: Top Ten Importing Countries

Top ten importing countries	Value imported	QTY imported	Unit value	Share in worlds import
USA	44,955	13,664	3290	12.7
Germany	31,829	8136	3912	9
France	29,487	8635	3415	8.3
United kingdom	25,704	8224	3125	7.3
Russian Federation	18,005	11,516	1563	5.1
Brazil	14,414	4611	3126	4.1
Australia	14,332	4683	3060	4.1
Netherland	13,721	4143	3312	3.9
India	11,177	3769	2966	3.2
Poland	8941	2834	3155	2.5

Source: ITC and FAO 2019-20

Fastest growing market for dried apricot

As shown in the Table 7 Oman, Morocco, Mongolia and Pakistan recorded imported growth in double digits between the years 2016 to 2020. Pakistan is the only Asian country which is among the fastest growing import market for dried apricot.

Table 7: Fastest Growing Market.

Countries	Annual growth in value b/w 2016-2020
Oman	95
Morocco	79
Mongolia	57
Pakistan	48

Source: ITC and FAO 2019-20

Dried apricot export

India accounted 0.05 percent in the world export trade in terms of quantity and 0.07% in terms of value. India ranked 45 among the 70 odd countries that exported in 2019. During the year 2019, India shipped 76 tons of dried apricot at a unit price of USD 3053 per ton and total value of 0.2 million. Export of dried apricot has increased in the last five years with the compound annual growth rate of 83%.

Table 8: India's Export of Dry Apricot

Year	Quantity in tons	Value 000 USD
2015-2016	3	22
2016-2017	6	56
2017-2018	42	147
2018-2019	55	218
2019-2020	76	232

Source: ITC and FAO 2019-20

Table 9: India's Dried Apricot Share of Market

Particulars	Qty (Tons)
India quantity	76
World quantity	158203
India's share of world market	0.05
Particulars	USD (000)
India's export value	232
World export value	356342
India's share of market(value wise)	0.07
Unit value	2252

Source: ITC and FAO 2019-20

Importing Countries

UAE, Nepal and Turkey were the main markets where India exported dried apricot and collectively shared 60.34% in the total import trade. India exported dried apricot higher in value

than fresh apricot in the year 2019, however, compared to other exporters in the world and its production base it is insignificant. India was able to achieve a unit price 36% higher than the world average which indicates a perceived quality of the product. There is still a need to improve the quality related aspect to enhance its competitiveness in the world market.

It is worth noting that the export of dried apricot has experienced 56% decline in 2019 as compared to the previous year 2018.

Table 10: Country Wise Export of Dried Apricot

Export countries	QTY (Tons)	%share	Value(000usd)	% share
UAE	27	35.53	61	26.29
Nepal	19	25.00	66	28.45
Turkey	10	13.16	13	5.60
USA	9	11.84	46	19.83
Canada	2	2.63	8	3.45
Australia	2	2.63	7	3.02
Switzerland	1	1.32	2	0.86
Kenya	1	1.32	8	3.45
Saudi arabia	1	1.32	7	3.02
Others	4	5.26	14	6.03
World	76	100	232	100

Source: ITC and FAO 2019-20

Dried apricot imports

As shown in Table 11, India imported a volume of 4143 tons of dried apricot at value 1.73 million during the year 2019. Overall, the trade remained dynamic with the average growth rate over the last five years recorded at 18.02 percent. It is evident that import exceeds export resulting in the trade deficit. India imported the product at 35 percent higher unit price than the world average unit price. The table also revealed that the trade experienced 27% decline as compared to the previous year.

Table 11: India's Import Status of Dried Apricot

Year	Quantity in Tons	Value (000 USD)
2015-2016	3841	14017
2016-2017	2404	8203
2017-2018	5457	24829
2018-2019	5748	28240
2019-2020	4143	17302

Source: ITC and FAO 2019-20

India's import of dried apricot

India imported majority of dried apricot from Afghanistan & Turkey and these two countries alone accounted 96.24 percent of the total trade with 82.47% share of Afghanistan alone. It is worth noting that India is importing at much higher price than it is exporting. It may be of the reason that importing products are superior in quality.

Table 12: Country Wise Import of Dry Apricot.

Countries	Qty. (Tons)	% share	Value (000 usd.)	% share
Afghanistan	2329	56.22	14269	82.47
Turkey	1436	34.66	2382	13.77
Iran	252	6.08	474	2.74
Pakistan	116	2.80	165	0.95
UAE	9	0.22	11	0.06
Others	1	0.02	1	0.01
World	4143	100	17302	100

Source: ITC and FAO 2019-20

Revealed comparative advantage

The revealed comparative advantage is the ratio of the share of export of particular commodity and total export of that country at the given time with the share of export of that particular commodity and total world export. The value of RCA lies between zero and infinity. Value greater than one indicates comparative advantage for that commodity. The Table 13 revealed that the RCA remained zero from the last ten years indicating that Indian exports are very small and has not developed enough to be considered a major exporter of the product.

Table 13: Revealed Comparative Advantage (RCA) of Indian Apricot Export.

Year	Fresh	Dry
2011	0.002	0.002
2012	0.011	0.002
2013	0.006	0.010
2014	0.006	0.006
2015	0.005	0.003
2016	0.009	0.009
2017	0.017	0.025
2018	0.005	0.039
2019	0.002	0.038

Source: ITC and FAO 2019-20

Nominal protection coefficient

Price competitiveness is measured by the concept of nominal protection coefficient. NPC is the ratio of price of domestic produce to the price of imported and exported product. NPC basically measures the divergence of domestic price from the international price and ultimately the degree of export competitiveness of the commodity in question (Gulati et al, 1994) [11]. If the value of NPC is less than one then the commodity is supposed to be competitive, which implies that the domestic price is less than the international price and thus the product is internationally competitive. The Table 14 below revealed that from 2011 to 2019, except for three years 2014, 2015 and 2016, the NPC was higher than one. During these years India was competitive in apricot export which might be due to higher production of apricot in these particular years, which increased the supply and decreased the price of apricot in the domestic market. The table showed that in other years India was not enjoying competitiveness in apricot at international level because domestic price of apricot was higher than the International price.

Table 14: Nominal Protection Coefficient (NPC) of Indian Apricot Export

Year	Domestic price per Q	FOB(Price/Q)	NPC
2011	25000	14800	1.69
2012	25000	5661	4.42
2013	25000	21060	1.19
2014	30000	32560s	0.92
2015	30000	54264	0.55
2016	30000	69064	0.43
2017	40000	25900	1.54
2018	40000	29334	1.36
2019	40000	22592	1.77

Source: ITC and FAO 2019-20

Estimates of gravity model

The gravity model was estimated using a balance panel data set comprising of 9 countries for 10 years from 2010-2020. The estimates of Hausman's specification test revealed that

Fixed Effect Model gives a best fit for the model. The coefficients obtained from the estimated model along with their standard errors and corresponding level of significance are presented in table 75. The explanatory variables included in the model explained 47% of the total variation in export value of Indian apricot. The analysis of the model revealed that of the explanatory variables specified in the model, Per Unit Price and Per Capita GDP of importing partners of India were found significant factors determining apricot export. More per unit price means lucrative market for the product thereby fetching more price for the product spend on the purchase of food commodities. The coefficients for distance and domestic consumption turned insignificant determiner of Indian apricot export as the importing countries import majority of apricot from other countries to meet their domestic consumption.

Table 15: Estimation of Gravity Model of Indian Apricot Export

Explanatory variable	Coefficients	Standard error	T value	P (> t)
P _j	0.67	0.30	2.17	0.03**
Y _j	7.56	2.31	3.26	0.00**
C _j	-1.26	1.14	-1.09	0.28
D _{ij}	0.22	0.40	0.55	0.58
Intercept	-3.06	4.02	-0.76	0.44
R ² 0.47				

Source: ITC and FAO 2019-20

Significant at 5% level of significance

Conclusion

The study revealed that only 14.97 percent of total world production was traded in the year 2020. The largest volume of export trade was observed in Fresh apricot (59.05%) followed by dried (25.40%) and Processed apricot (15.56%). India traded 93.52 and 6.48 percent of dried and fresh apricot respectively. It was further found that India's share in world trade was negligible both in quantity and in value traded. Turkey alone accounted 72 percent of the world market share while the remaining countries contributes 28 percent of the global dried apricot trade. Turkey was followed by Uzbekistan (4.6%), Afghanistan (4.3%), Germany (2.4%) and France (1.9%) of world market share respectively and are the top five leading apricot exporters. In terms of import, USA was found to be the world's largest importer of dried apricot having a share of 12.7% in the world market followed by Germany (9%), France (8.3%), and United Kingdom 7.3 percent. The study found that there has been a three percent increase in the annual growth in imports during the last five years however a steep decline in the growth has been recorded from 2019 to 2020 due to COVID pandemic. India accounted 0.05 percent in the world export trade in terms of quantity and 0.07% in terms of value. India ranked 45 among the 70 odd countries that exported in 2019. UAE, Nepal and Turkey were the main markets where India exported dried apricot and collectively shared 60.34% in the total import trade. India imported majority of dried apricot from Afghanistan & Turkey and these two countries alone accounted 96.24 percent of the total trade with 82.47% share of Afghanistan alone. RCA remained zero from the last ten years indicating that Indian exports are very small and has not developed enough to be considered a major exporter of the product. Except for three years i.e. 2014, 2015 and 2016, the NPC was higher than one. During these years India was competitive in apricot export which might be due to higher production of apricot in these particular years, which increased the supply and

decreased the price of apricot in the domestic market. Of the explanatory variables specified in the gravity model, Per Unit Price and Per Capita GDP of importing partners of India were found significant factors determining apricot export. This is consistent with the basic theory on which the gravity model is based upon (Tinbergen, 1962) ^[7].

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