

Trading Signals in Overseas Markets for Indian Legumes during WTO Regime: Foreign Trade Research and Policies

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Abstract

India is the largest consumer, producer and importer of pulses such as 27% of global consumption, 25% of global production and 14% imports of pulses in the world. The study period is from 1990-91 to 2017-18. The selected legumes were beans, chickpea, lentils and peas. APEDA, FAO STAT, CMIE, DGCIS and Agricultural Statistics at a glance 2018 were the secondary data sources. The current study analysed the growth rate, elasticity and instability of export quantity, prices of selected legumes and their export destinations in the Indian and global market. The study found that Indian peas have more demand in overseas market. Export price of chickpea was more than other legumes in India. The export prices of Indian legumes were stable. India should export their beans to Brazil, China and Australia for making profits in the international market as the stability of prices associated with the highest growth rate. India exported more quantity of chickpea to Canada followed by Argentina and USA. Export price of chickpea was more in Mexico, Australia and Argentina. Canada, Mexico, Ethiopia and UAE were stable in export quantity of chickpea. India should expand lentils exports by making appropriate strategies in global markets because some of the exporting countries realized instability of export prices. The export price of beans, chickpea and peas were stable in all countries. Indian legumes should export to the highly demanded countries such as Argentina, Canada and USA in an overseas market. The major destinations are Brazil, Japan and UK for beans; Pakistan, Bangladesh and Spain for chickpea; Turkey, Sri Lanka and Bangladesh for lentils; and China, Belgium and Bangladesh for peas. The research assists in planning price policies and schemes of pulse for enhancing exports and foreign earnings for legume crops across the globe. India should adopt multi strategies to enhance the production and marketing of legumes. India should seek for new developed markets for the legume crops.

Keywords: CAGR; Elasticities; Legumes; Trading Signals; Destinations; Trade Policy; India and Multispeed World

Introduction

India is the largest consumer, producer and importer of pulses such as 27% of world consumption, 25% of global production and 14% of pulses imports in the globe. Pulses reported nearly 20% under food grains area, which contributed approximately 7 - 10% of the India's total food grains production. During the period of 2017-18, India holds first place in production of gram and beans sharing 61.42% and 20.35% in the world that accounted to be 9075 and 6390 ('000MT of production), respectively [1]. At the same period, globally India holds second place in peas production sharing 16%, fifth place in peas production sharing 4.52%, which accounted to be 1220 and 732.78 thousand MT, respectively [2].

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The growth rate of total world production of pulses between 2016 and 2025 will be about 1.8% per annum. Of the total increase in 18 MT of annual global pulse production, the model envisaged that 5 MT will come from India, 4 MT from Sub-Saharan Africa, 3 MT from Canada, 3 MT from Myanmar, and 1 MT from Brazil, Australia and Russia individually [3]. India is the largest importer of pulses despite of being the second largest producer of pulses. Growing import dependency and rising prices forced government to adopt duty-free import policy. Canada, Australia, Myanmar and China were among the top exporters of pulses in the world. The major importers of pulses to India were Australia, Canada, Myanmar, Tanzania and US [4]. India exported more pulses to Algeria, United Arab Emirates, Sri Lanka, Turkey, and USA [2]. Imports helped to retard the hastier rise in the prices of many types of pulses. Pulses import helped to slow down the cut in the net per capita food grains availability [5]. Government remove curbs on pea imports to meet shortage of pulses [6]. In the context of India’s legumes sectors, there remain limited studies on its export markets and trends.

Aim of the Study

This study aims to address these gaps in knowledge through an analysis of trade signals such as trends in exports, price growth rates, elasticity, instability and profitable destinations in overseas markets for Indian legumes such as beans, chickpea, lentils, peas exports.

Methodology

Data were collected on the quantity, value and price of exports, international prices of Indian legume crops and their destinations in the global market. The selected legumes were beans, chickpea, lentils and peas for the purpose of study. India exports these commodities nearly to 150 countries. Food and Agricultural Organization Statistics (FAO), Centre for Monitoring Indian Economy (CMIE), Agricultural and Processed Food Products Export Development Authority (APEDA), Directorate General of Commercial Intelligence and Statistics (DG-CIS), and Agricultural Statistics at a glance 2018 were the secondary data sources. CAGR in the export quantities, prices, price elasticity, and instability index for Global exports were assessed. India’s exported Top 10 Individual country legumes among 150 countries analyses were also completed. India’s exported countries were categorized and ranked to identify the top ten countries, which accounted for the major share of Indian exports and their destinations for each commodity.

Economic precision of pulse crops are of high relevance. There are very limited studies on the global trade of pulse crops especially legumes. Hence, the current study analysed the growth rate, elasticity and instability of export quantity, prices of selected legume crops in India and top 10 countries of world according to commodity wise. The research also has dealt with the export destinations of Indian legumes.

The compound growth rates, price elasticity, and instability index of exports were estimated by using the following formulae [7].

Growth rate: CAGR was computed by fitting an exponential function to the parameters during the period from 1990 - 1991 to 2017-18.

$$Y_t = Y_0(1+r)^t \dots\dots\dots(1)$$

Assuming a multiplicative error term in equation (1), the model may be linearized by logarithmic transformation:

$$\ln Y_t = A + Bt + \epsilon \dots\dots\dots (2)$$

Where A (=lnA₀) and B (=ln(1 + r)) are the parameters to be estimated by OLS regression, t = time trend in year, and r = exp (B)-1.

Price elasticity of exports

$$\sum P_e = \% \text{ change in quantity exports} / \% \text{ change in price.}$$

The percentage change in quantity of exports is %ΔQ, and the percentage change in price is %ΔP. We computed %ΔQ as ΔQ/Qave and calculate %ΔP as ΔP/Pave, so the price elasticity of exports is expressed as (ΔQ/Qave)/(ΔP/Pave).

Instability index

Coefficient of variation (CV) = Standard deviation × 100

Mean

Results and Discussions

Exports quantity, value and price growth rates for Indian legumes

Growth rate of exports quantity and price for Indian legumes from 1990-91 to 2017-18 have presented in table 1. During the period of 1990-91 to 2017-18, the export quantity of peas (16.17%) was higher growth rate than other legumes followed by chickpea (10.77%). It means Indian peas has a great demand in the international markets followed by chickpea. The export price of chickpea (4.37%) was found to be the highest growth rate followed by beans (2.14%). The export prices of Indian legumes were stable. However, the export quantity and value of Indian legumes were unstable.

Legumes Name	Parameters	1990-91	2001-02	2012-13	1990-91 to 2000-01	2001-02 to 2011-12	2012-13 to 2017-18	1990-91 to 2017-18
Beans	Quantity	2335	726	2162	-14.68 (214.78)	2.37 (88.30)	50.52 (71.89)	7.56 (135.77)
	Value	1649	509	2449	-17.59 (231.81)	9.74 (91.63)	53.53 (72.19)	9.86 (171.55)
	Price	706.21	701.10	1132.75	-3.41 (41.96)	7.19 (40.30)	2.00 (20.84)	2.14 (51.97)
Chickpea	Quantity	5490	1427	143712	-7.39 (104.59)	61.98 (95.66)	-9.55 (58.22)	10.77 (133.76)
	Value	2854	566	183838	-9.81 (110.73)	81.91 (105.34)	-4.82 (39.27)	15.62 (131.25)
	Price	519.85	396.64	1279.21	-2.7 (16.98)	12.3 (36.60)	5.23 (27.44)	4.37 (47.20)
Lentils	Quantity	5257	106109	779	43.24 (117.49)	-44.52 (118.71)	64.83 (106.50)	2.21 (135.98)
	Value	3959	51391	823	36.79 (109.22)	-39.26 (122.06)	63.21 (106.76)	3.31 (128.91)
	Price	753.09	484.32	1056.48	-4.49 (18.52)	9.47 (44.22)	-0.97 (9.64)	1.07 (37.15)
Peas	Quantity	75	887	158	28.79 (135.78)	-7.04 (122.38)	93.62 (91.67)	16.17 (128.84)
	Value	66	297	146	18.78 (97.77)	3.62 (90.77)	67.85 (93.14)	13.35 (129.86)
	Price	880	334.84	924.05	-7.77 (32.32)	11.48 (46.86)	-13.31 (26.47)	-2.43 (37.15)

Table 1: Global export price growth rates of legumes in India (1990-91 to 2017-18)

(Quantity in 'tonnes, Value in '000 US\$ and Price in 'US\$/Ton).

Source: DGCIS⁸, FAOSTAT⁹ & CMIE¹⁰; Note: Figure in parenthesis indicates the CV (%)

The study found that more quantity of chickpea exported after the peas. It means peas have higher demand in overseas market. Export price of chickpea were more when compared to other legume crops. The export prices of Indian legumes were stable but the quantity and value of exports were unstable.

Individual country wise exports quantity and price growth rates

The decade wise growth rates of Indian exports quantity and price of beans for the topmost 10 countries during the period from 1990-91 to 2017-18 has depicted in table 2. During the period of 1990-91 to 2017-18, Egypt (16.23%) had the highest growth rate of export quantity followed by Brazil (15.44%) and Uganda (13.18%). During the same period, Brazil (6.89%) had the highest growth rate of export price followed by China (4.68%) and Australia (2.80%).

Countries	1990-91 to 2000-01		2001-02 to 2011-12		2012-13 to 2017-18		1990-91 to 2017-18	
	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price
Myanmar	16.90 (39.71)	-4.71 (22.05)	4.36 (28.97)	13.29 (52.61)	-13.67 (36.82)	-3.98 (16.57)	4.78 (47.79)	1.89 (54.70)
USA	-3.64 (17.52)	-0.66 (7.07)	1.52 (16.18)	3.53 (13.96)	-0.34 (4.86)	0.54 (3.60)	-0.20 (18.26)	1.59 (18.86)
China	-2.30 (23.58)	1.44 (11.43)	4.00 (15.03)	8.86 (35.80)	-14.63 (33.10)	5.23 (12.50)	-1.03 (29.65)	4.68 (52.09)
Argentina	5.19 (26.03)	-6.04 (23.45)	2.84 (21.53)	6.69 (36.80)	1.12 (37.76)	-3.76 (18.09)	3.12 (31.44)	0.62 (33.59)
Canada	9.50 (36.93)	-2.05 (11.08)	-1.41 (12.01)	7.95 (29.52)	5.37 (9.50)	-5.04 (12.62)	5.04 (37.85)	1.73 (33.99)
Uganda	7.81 (74.04)	-11.76 (8.55)	32.26 (61.54)	6.75 (7.49)	60.67 (87.62)	-9.72 (15.18)	13.18 (156.94)	-1.67 (5.42)
Ethiopia	0.00 (88.14)	0.00 (70.18)	18.38 (59.41)	15.68 (40.37)	4.97 (15.17)	-1.78 (11.21)	0.00 (107.26)	0.00 (51.06)
Brazil	7.08 (81.89)	15.75 (43.66)	24.32 (106.32)	5.39 (45.08)	25.31 (56.49)	-4.55 (10.52)	15.44 (159.57)	6.89 (41.55)
Australia	18.26 (93.52)	-0.60 (17.78)	6.17 (86.92)	7.97 (43.47)	2.33 (39.14)	1.91 (12.20)	8.28 (2.41)	2.80 (42.99)
Egypt	36.21 (138.00)	-2.87 (15.39)	11.27 (66.99)	10.34 (46.94)	3.67 (18.31)	0.06 (26.82)	16.23 (98.10)	1.00 (40.51)
Other Countries	-3.84 (15.34)	0.06 (11.04)	4.12 (14.45)	5.18 (25.75)	9.21 (19.16)	-1.47 (8.73)	2.02 (27.66)	1.93 (25.23)
World	2.50 (11.71)	-2.09 (8.46)	3.82 (16.81)	8.53 (16.81)	-1.90 (5.89)	-2.32 (5.46)	2.41 (26.42)	1.94 (34.73)

Table 2: Top 10 Country Wise Decadal Exports Quantity and Price Growth Rates of Beans (%) during 1990-91 to 2017-18 (Export Quantity in Tonnes, Export Price in '000US\$/Ton).

Source: DGCIS [8], FAOSTAT [9] and CMIE [10]; Note: Figure in parenthesis indicates the CV (%).

India should transport beans to Brazil, China and Australia for making revenue as it has highest export price growth rate associated with stability in the international market. The export quantity of beans was stable except Uganda, Ethiopia and Brazil. However, the export price of beans was stable during the study period.

The decadal growth rates of India's chickpea exports quantity and price for the top 10 countries during the period from 1990-91 to 2017-18 has depicted in table 3. During the period of 1990-91 to 2017-18, Canada (36.18%) had the highest growth rate of chickpea export quantity followed by Argentina (27.62%) and United States (15.13%). During the same period, Mexico (2.91%) had the highest growth rate of chickpea export price followed by Australia (2.68%) and Argentina (1.61%). The export quantity of chickpea is unstable except Canada, Mexico, Ethiopia, UAE and Union Republic of Tanzania. However, the export price of chickpea was stable in all countries.

Countries	1990-91 to 2000-01		2001-02 to 2011-12		2012-13 to 2017-18		1990-91 to 2017-18	
	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price
Australia	13.48 (55.99)	-2.32 (22.04)	4.55 (52.80)	6.28 (25.66)	14.26 (44.05)	3.01 (15.72)	11.85 (104.31)	2.68 (35.35)
USA	23.47 (89.35)	-1.18 (9.81)	8.08 (56.17)	3.92 (17.45)	19.42 (61.89)	-0.54 (6.89)	15.13 (116.90)	1.25 (16.87)
Argentina	2.62 (84.05)	1.24 (50.55)	67.27 (161.51)	4.03 (28.63)	14.18 (49.90)	1.81 (23.78)	27.62 (181.32)	1.61 (38.25)
Canada	126.72 (249.62)	-5.14 (31.30)	-7.13 (32.32)	10.31 (35.67)	26.98 (50.05)	-0.48 (17.24)	36.18 (85.04)	1.31 (34.23)
Russia	0.00 (162.24)	0.00 (55.38)	31.60 (110.30)	11.17 (47.09)	-1.78 (34.07)	7.43 (37.32)	0.00 (131.28)	0.00 (50.95)
Mexico	11.39 (52.76)	0.39 (15.20)	-12.82 (35.77)	7.95 (25.98)	-7.63 (27.32)	3.30 (12.33)	3.67 (42.47)	2.91 (27.80)
Ethiopia	0.00 (117.83)	0.00 (72.72)	89.02 (62.63)	2.52 (32.72)	-0.47 (18.68)	4.96 (26.53)	0.00 (90.87)	0.00 (74.96)
UAE	0.00 (81.72)	0.00 (34.37)	14.95 (62.81)	4.39 (26.79)	23.25 (36.90)	5.59 (19.58)	0.00 (93.88)	0.00 (34.63)
Myanmar	0.00 (331.66)	0.00 (331.66)	1.98 (41.57)	9.25 (37.50)	-11.31 (59.13)	8.17 (27.37)	0.00 (106.10)	0.00 (41.07)
United Republic of Tanzania	0.00 (38.11)	-2.70 (64.09)	9.05 (38.58)	12.30 (44.49)	-3.88 (30.92)	5.23 (28.71)	0.00 (63.42)	0.00 (81.77)
Other Countries	-9.78 (36.78)	2.23 (28.52)	-2.12 (11.91)	9.66 (33.63)	1.77 (28.65)	3.14 (20.25)	-0.70 (26.64)	3.85 (39.87)
World	5.36 (28.51)	-0.80 (26.23)	1.08 (17.07)	6.61 (24.04)	9.61 (24.09)	1.88 (14.35)	7.32 (63.67)	2.23 (28.16)

Table 3: Top 10 country wise decadal exports quantity and price growth rates of chickpea (%) during 1990-91 to 2017-18 (Export Quantity in Tonnes, Export Price in '000US\$/Ton)
Source: DGCIS [8], FAOSTAT [9] and CMIE [10]; Note: Figure in parenthesis indicates the CV (%)

The study found that India exported more quantity of chickpea exports to Canada followed by Argentina and US. Export price of chickpea was found to be higher in Mexico, Australia and Argentina across the world. Export quantity of chickpea in Canada, Mexico, Ethiopia and UAE was stable. Stability of chickpea prices were observed in all countries.

The decadal growth rates of India’s lentils exports quantity and price for the top 10 countries during the period from 1990-91 to 2017-18 has depicted in table 4. During the period of 1990-91 to 2017-18, Sri Lanka (29.59%) had recorded the highest growth rate of export quantity followed by Australia (24.27%) and Canada (10.30%). During the same period, other countries had the highest growth rate of export price followed by turkey and Australia. Export quantity of lentils were stable in Canada, USA, Turkey and Syrian Arab Republic. Export prices of lentils were stable except Kazakhstan (171.09%).

Countries	1990-91 to 2000-01		2001-02 to 2011-12		2012-13 to 2017-18		1990-91 to 2017-18	
	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price
Canada	16.13 (39.71)	-2.75 (13.40)	9.00 (46.13)	9.67 (42.21)	7.84 (26.68)	1.87 (9.64)	10.30 (84.30)	1.43 (36.05)
Australia	49.39 (259.96)	-0.97 (37.92)	1.92 (46.59)	8.00 (44.40)	17.76 (58.44)	1.43 (14.01)	24.27 (122.00)	1.76 (40.45)
USA	2.37 (24.50)	-1.55 (10.52)	5.02 (29.28)	6.69 (26.85)	8.86 (17.59)	3.56 (10.60)	5.62 (58.06)	1.83 (24.42)
Turkey	-8.50 (37.83)	1.20 (16.59)	2.97 (36.56)	5.80 (53.00)	5.98 (15.99)	1.83 (15.99)	0.32 (32.99)	2.09 (44.28)
UAE	0.00 (59.73)	0.00 (40.18)	8.49 (108.40)	6.98 (43.07)	41.04 (51.24)	5.45 (14.96)	0.00 (134.07)	0.00 (40.97)
Kazakhstan	0.00 (331.66)	0.00 (331.66)	0.00 (331.66)	0.00 (331.66)	85.75 (134.90)	87.21 (14.01)	0.00 (333.12)	0.00 (171.09)
Russian Federation	0.00 (244.93)	0.00 (123.20)	151.15 (133.41)	0.00 (87.89)	26.68 (102.93)	3.95 (19.41)	0.00 (228.26)	0.00 (86.28)
Mexico	0.00 (81.33)	0.00 (63.79)	17.10 (57.45)	4.09 (20.37)	124.01 (208.97)	-6.81 (16.52)	0.00 (404.89)	0.00 (41.33)
Syrian Arab Republic	-7.33 (89.07)	-1.09 (28.08)	2.70 (61.84)	5.74 (64.13)	-6.08 (39.11)	-6.28 (15.65)	-2.65 (88.42)	-1.02 (54.49)
Sri Lanka	5.05 (87.46)	-0.87 (76.05)	77.47 (147.46)	0.02 (38.08)	7.63 (46.96)	-2.13 (7.37)	29.59 (152.71)	-0.78 (53.05)
Other Countries	14.90 (46.71)	-1.76 (18.41)	-6.19 (50.11)	10.44 (44.16)	0.96 (18.63)	4.43 (8.69)	2.20 (50.22)	3.14 (45.34)
World	7.77 (25.74)	-2.37 (11.81)	5.24 (24.31)	7.95 (39.88)	11.09 (18.85)	1.54 (9.82)	7.31 (61.74)	1.19 (32.77)

Table 4: Top 10 Country wise decadal exports quantity and price growth rates of lentils (%) during 1990-91 to 2017-18 (Export Quantity in Tonnes, Export Price in '000US\$/Ton)
 Source: DGCIS [8], FAOSTAT [9] and CMIE [10]; Note: Figure in parenthesis indicates the CV (%).

The study found that India exported more quantity of lentils to Sri Lanka followed by Australia and Canada. However, the same commodity, export prices were found to be higher in Turkey and Australia. India should expand exports of lentils by making appropriate strategies to those global markets, where exports quantity and prices are more stable. Export quantity of lentils were stable in Canada, USA, Turkey and Syrian Arab Republic. Export prices of lentils were stable except Kazakhstan.

The decadal growth rates of India’s peas exports quantity and price for the top 10 countries during the period from 1990-91 to 2017-18 has depicted in table 5. During the period of 1990-91 to 2017-18, Canada (11.68) has shown the highest growth rate of export quantity of peas followed by Argentina (7.79) and Bulgaria (7.24%). During the same period, Australia (1.59%) has shown the highest export price of peas followed by USA (1.51%) and Canada (0.95). Export quantity of peas were stable in Canada, Ukraine, USA, France, Australia and Argentina. However, the export prices of peas were stable in all countries.

Countries	1990-91 to 2000-01		2001-02 to 2011-12		2012-13 to 2017-18		1990-91 to 2017-18	
	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price	Export Quantity	Export Price
Canada	27.15 (63.89)	-5.02 (17.37)	3.78 (34.75)	9.06 (32.46)	10.93 (17.47)	-4.91 (10.67)	11.68 (57.60)	0.95 (33.50)
Russian Federation	0.00 (206.88)	0.00 (128.40)	37.53 (102.92)	7.62 (40.15)	11.95 (45.00)	-6.51 (12.61)	0.00 (143.65)	0.00 (73.46)
Ukraine	0.00 (142.48)	0.00 (50.01)	4.51 (51.27)	10.43 (48.28)	27.38 (66.36)	-7.81 (17.34)	0.00 (89.40)	0.00 (52.02)
USA	-3.91 (13.04)	-0.27 (7.67)	12.24 (52.61)	5.41 (23.01)	1.06 (19.40)	0.90 (6.55)	3.82 (66.66)	1.51 (20.39)
France	-5.62 (19.79)	-8.39 (34.28)	-5.38 (39.96)	9.99 (39.96)	0.96 (26.84)	-5.07 (14.75)	-5.51 (58.75)	-0.30 (35.52)
Romania	0.00 (202.39)	0.00 (89.32)	-19.66 (132.45)	8.48 (38.58)	141.13 (186.47)	-6.67 (26.63)	0.00 (375.12)	0.00 (56.79)
Australia	2.85 (27.88)	-3.38 (11.85)	-3.18 (48.85)	8.00 (33.87)	4.22 (20.97)	-4.96 (9.74)	0.03 (37.37)	1.59 (35.73)
Lithuania	0.00 (186.65)	0.00 (55.94)	32.92 (113.56)	7.74 (42.37)	59.91 (86.23)	-7.28 (17.99)	0.00 (221.50)	0.00 (51.65)
Argentina	3.61 (44.01)	-0.66 (17.01)	22.88 (79.63)	1.38 (33.84)	-7.83 (38.11)	-2.60 (34.07)	7.79 (86.01)	0.17 (31.51)
Bulgaria	-40.78 (157.41)	7.32 (60.72)	-8.02 (82.22)	6.31 (31.97)	121.98 (157.03)	-13.12 (32.38)	7.24 (270.10)	0.60 (43.05)
Other Countries	-7.84 (27.27)	-2.56 (9.67)	-1.72 (14.89)	8.70 (36.12)	5.01 (16.45)	-4.87 (13.23)	-1.41 (36.57)	1.63 (40.53)
World	2.28 (13.23)	-6.52 (22.85)	3.21 (21.42)	8.46 (31.49)	10.99 (19.25)	-5.62 (11.98)	3.53 (30.19)	-0.01 (30.90)

Table 5: Top 10 country wise decadal exports quantity and price growth rates of peas (%) during 1990-91 to 2017-18 (Export Quantity in Tonnes, Export Price in '000US\$/Ton). Source: DGCIS [8], FAOSTAT [9] and CMIE [10]; Note: Figure in parenthesis indicates the CV (%).

The study revealed that India exported more quantities of peas to Canada followed by Argentina and Bulgaria. However, the export prices of peas were higher in Australia, USA and Canada. India should be benefitted if export of peas to Australia, USA and Canada which associated with highest price growth rate with stability of prices in global market.

Export elasticity

The sensitivity of export quantities to change in global prices is of higher importance. Price elasticity’s of exports are signs for exporters to rise or hollow their exports as they imply an export sensitivity to changes in price. The export price elasticity of legumes in India has summarized in table 6. During the period from 1990-91 to 2017-18, the highest export price elasticity has been found in peas (1.98) when compared to other crops. Indian peas have high elasticity, which meant that the peas has highly competitive and demand in international market. The other legumes such as beans, chickpea and lentils price export elasticity were less elastic i.e., 0.53, 0.30 and 0.57, respectively. It means that it has more domestic demand than other countries demand.

Commodity	1990-91 to 2000-01	2001-02 to 2011-12	2012-13 to 2017-18	1990-91 to 2017-18
Beans	0.93	0.17	0.89	0.53
Chickpea	0.83	0.31	1.80	0.30
Lentils	1.61	1.00	1.06	0.57
Peas	2.52	-1.21	2.13	1.98

Table 6: Export price elasticity (%) of Indian legumes between 1990-91 and 2017-18.

Source: FAOSTAT [9].

Individual country wise export price elasticity in world

Top 10-country wise export price elasticity (%) of India’s beans have presented in table 7. The export price elasticity of all countries except USA (-0.10), China (-0.10) and Uganda (-74.67) was found to be positive. Egypt (184.41) had shown high export price elasticity followed by Brazil (9.35) and Argentina (7.07). India should export to Egypt, Brazil and Argentina.

Commodity	1990-91 to 2000-01	2001-02 to 2011-12	2012-13 to 2017-18	1990-91 to 2017-18
Myanmar	-9.84	0.21	2.83	3.84
USA	4.81	0.39	-0.62	-0.10
China	-1.35	0.36	-1.88	-0.10
Argentina	-1.42	0.35	-0.33	7.07
Canada	-7.89	-0.11	-1.31	4.70
Uganda	-1.57	16.68	-24.25	-74.67
Ethiopia	0.00	1.34	-3.20	0.00
Brazil	0.30	11.32	-10.07	9.35
Australia	-74.95	0.71	1.23	6.85
Egypt	-83.00	1.14	66.50	184.41
Other Countries	-56.79	0.76	-7.75	1.06
World	-1.47	0.36	0.82	1.32

Table 7: Top 10 country wise exports price elasticity (%) of beans during 1990-91 to 2017-18 (%).

Source: DGCIS [8], FAOSTAT [9] and CMIE [10].

Top 10 country wise export price elasticity of India's chickpea have presented in table 8. Canada (9956.50) has shown the highest export price elasticity of chickpea followed by Argentina (1342.05) and USA (110.02) during the period of 1990-91 to 2017-18. India should export the chickpea to the Canada, Argentina and USA.

Commodity	1990-91 to 2000-01	2001-02 to 2011-12	2012-13 to 2017-18	1990-91 to 2017-18
Australia	-12.15	0.67	5.92	18.82
USA	-64.57	2.50	-53.90	110.02
Argentina	2.26	351.58	10.02	1342.05
Canada	-8756.71	-0.31	-95.96	9956.50
Russian Federation	0.00	7.74	-0.20	0.00
Mexico	48.92	-0.65	-1.86	1.40
Ethiopia	0.00	2061.56	-0.08	0.00
UAE	0.00	5.64	5.90	0.00
Myanmar	0.00	0.15	-0.94	0.00
Union Republic of Tanzania	0.00	0.43	1.80	0.00
Other Countries	-2.53	-0.62	2.47	-0.27
World	-8.93	0.13	5.96	7.07

Table 8: Top 10 country wise exports price elasticity (%) of chickpea during 1990-91 to 2017-18.

Source: DGCIS [8], FAOSTAT [9] and CMIE [10].

Top 10 country wise export price elasticity of India's lentils have summarized in table 9. Australia (587.08) had the highest export price elasticity of lentils followed by Canada (28.16) and USA (5.35). Therefore, it is important to export the Indian lentils to Australia, Canada and USA for making benefits in overseas market.

Commodity	1990-91 to 2000-01	2001-02 to 2011-12	2012-13 to 2017-18	1990-91 to 2017-18
Canada	-14.23	0.90	4.72	28.16
Australia	-586.14	0.18	17.25	587.08
USA	-1.82	0.69	2.77	5.35
Turkey	-4.65	0.45	3.56	0.12
UAE	0.00	1.30	15.08	0.00
Kazakhstan	0.00	0.00	527.73	0.00
Russian Federation	0.00	0.00	10.59	0.00
Mexico	0.00	7.81	-186.33	0.00
Syrian Arab republic	5.13	0.41	0.97	2.14
Sri Lanka	-7.64	126969.16	-4.36	-5712.89
Other Countries	-18.55	-0.28	0.20	0.61
World	-5.22	0.58	8.69	15.16

Table 9: Top 10 country wise exports price elasticity (%) of lentils during 1990-91 to 2017-18 (%).

Source: DGCIS [8], FAOSTAT [9] and CMIE [10].

Top 10 country wise export price elasticity of India's peas have depicted in table 10. Argentina (135.95) had the highest export price elasticity of lentils followed by Canada (64.03) and Bulgaria (31.89). Therefore, India should export its peas to Argentina, Canada and Bulgaria to enhance the profits in the overseas market.

Commodity	1990-91 to 2000-01	2001-02 to 2011-12	2012-13 to 2017-18	1990-91 to 2017-18
Canada	-24.94	0.33	-3.05	64.03
Russian Federation	0.00	21.40	-2.65	0.00
Ukraine	0.00	0.33	-7.05	0.00
USA	12.31	3.14	1.17	3.51
France	0.75	-0.27	-0.21	10.21
Romania	0.00	-0.71	-275.86	0.00
Australia	-1.11	-0.24	-1.02	0.01
Lithuania	0.00	14.64	-30.04	0.00
Argentina	-6.64	46.47	2.72	135.95
Bulgaria	-0.97	-0.67	-104.71	31.89
Other Countries	2.45	-0.12	-1.25	-0.58
World	-0.51	0.30	-2.73	-922.05

Table 10: Top 10 country wise exports price elasticity (%) of peas during 1990-91 to 2017-18.

Source: DGCIS [8], FAOSTAT [9] and CMIE [10].

The results shown that India should export their beans to Egypt, Brazil and Argentina, chickpea to Canada, Argentina and USA, lentils to Australia, Canada and USA, and peas to Argentina, Canada and Bulgaria for making higher benefits in the international market. It means Indian legumes should export to the highly demanded countries such as Argentina, Canada and USA in an overseas market.

The export destinations of Indian legumes such as beans, chickpea, lentils and peas were represented from the table 11 to 14. India exported legumes to nearly 150 countries. From each commodity, top 10 countries were explained which accounted major share of exports. The major destinations are Brazil, Japan and United Kingdom for beans; Pakistan, Bangladesh and Spain for chickpea; Turkey, Sri Lanka and Bangladesh for lentils; and China, Belgium and Bangladesh for peas.

Countries	Total Quantity	Total Quantity (%)	Total Value	Total Value (%)
Brazil	146985.30	5.64	94683.75	4.77
Japan	132775.40	5.10	123759.80	6.23
UK	122676.00	4.71	96254.14	4.84
USA	114019.20	4.38	102713.00	5.17
Mexico	111526.80	4.28	89370.11	4.50
Italy	96213.79	3.69	94311.57	4.75
China	73274.79	2.81	42862.64	2.16
Pakistan	65899.71	2.53	32826.82	1.65
Canada	40490.71	1.55	36834.00	1.85
Iran	19665.36	0.75	16980.71	0.85
Other Countries	1681339.00	64.55	1256190.86	63.23
World	2604866	100.00	1986787.54	100.00

Table 11: Top 10 export destinations of Indian Beans between 1990-91 and 2017-18.

Source: DGCIS [8], FAOSTAT [9] and CMIE [10] (Total Quantity in Tonnes, Total Value in '000US\$).

Countries	Total Quantity	Total Quantity (%)	Total Value	Total Value (%)
Pakistan	115553.4	11.54	67905.46	9.74
Bangladesh	91684.14	9.16	49267.21	7.07
Spain	52757.96	5.27	50134.68	7.19
UAE	51864.36	5.18	35116.52	5.04
Algeria	49024.96	4.90	48717	6.99
Saudi Arabia	28306.96	2.83	16405.11	2.35
UK	24668.54	2.46	20686.82	2.97
Iran	22695.32	2.27	18825.26	2.70
USA	19820.36	1.98	17097.61	2.45
Turkey	14009.29	1.40	15699.64	2.25
Other Countries	530591.9	53.01	357220.2	51.25
World	1000977.173	100.00	697075.52	100.00

Table 12: Top 10 export destinations of Indian Chickpea between 1990-91 and 2017-18.

Source: DGCIS [8], FAOSTAT [9] and CMIE [10] (Total Quantity in Tonnes, Total Value in '000US\$).

Countries	Total Quantity	Total Quantity (%)	Total Value	Total Value (%)
Turkey	135205.9	9.06	94784.13	9.08
Srilanka	96707.11	6.48	62839.39	6.02
Bangladesh	91439.54	6.13	65502.57	6.27
Egypt	83578.46	5.60	60257.86	5.77
UAE	68784.21	4.61	54936.07	5.26
Pakistan	58920.21	3.95	33839.71	3.24
Algeria	58482.32	3.92	40932.29	3.92
Colombia	55829.00	3.74	28941.68	2.77
Iran	36809.95	2.47	31069.89	2.98
Mexico	30806.00	2.06	17875.46	1.71
Other Countries	775671.00	51.98	553135.40	52.98
World	1492234	100.00	1044114.46	100.00

Table 13: Top 10 export destinations of Indian Lentils between 1990-91 and 2017-18.

Source: DGCIS [8], FAOSTAT [9] and CMIE [10] (Total Quantity in Tonnes, Total Value in '000US\$).

Countries	Total Quantity	Total Quantity (%)	Total Value	Total Value (%)
China	352748.40	9.41	122272.00	9.55
Belgium	209478.20	5.59	51240.11	4.00
Bangladesh	195244.80	5.21	64172.11	5.01
Pakistan	113407.50	3.03	51919.07	4.05
Germany	176084.50	4.70	49565.14	3.87
Italy	94943.11	2.53	27143.54	2.12
USA	63061.64	1.68	32521.64	2.54
Myanmar	41791.50	1.12	15015.75	1.17
Ethiopia	23946.88	0.64	18675.88	1.46
France	25732.25	0.69	11807.29	0.92
Other Countries	2450693.00	65.40	836104.40	65.30
World	3747132	100.00	1280436.93	100.00

Table 14: Top 10 export destinations of Indian Peas between 1990-91 and 2017-18.

Source: DGCIS [8], FAOSTAT [9] and CMIE [10] (Total Quantity in Tonnes, Total Value in '000US\$).

Conclusion

India is the largest consumer, producer and importer of pulses such as 27% of global consumption, 25% of global production and 14% of pulses in the world. Data were collected on the quantity, value and price of exports, international prices, and destinations of Indian legume crops. The study period is from 1990-91 to 2017-18. The selected legume crops were beans, chickpea, lentils and peas for the purpose of study. APEDA, DGCIS, FAOSTAT, CMIE and Agricultural Statistics at a glance 2018 were the secondary data sources. The current study analysed the growth rate, elasticity and instability of export quantity, prices of selected legumes and their destinations. The study found that quantity of chickpea exported more after peas. It means peas have more demand in overseas market. Export price of chickpea were more when compared to other legume crops. The export prices of Indian legumes were stable but the quantity and value of exports were unstable. India should transport beans to Brazil, China and Australia for making economy as it has highest growth rate of export price associated with stability in the international market. The export quantity of beans was stable except Uganda, Ethiopia and Brazil. However, the export price of beans was stable. India exported more quantity of chickpea to Canada followed by Argentina and USA. Export price of chickpeas were more in Mexico, Australia and Argentina. The export quantity of chickpea is unstable except Canada, Mexico, Ethiopia and UAE. However, the export price of chickpea was stable in all countries. India exported more quantity to Sri Lanka followed by Australia and Canada. Export price of lentils were higher in Turkey and Australia. Export quantity of lentils were stable in Canada, USA, Turkey and Syrian Arab Republic. Export prices of lentils were stable except Kazakhstan. India should expand exports of lentils by making appropriate strategies to those global markets, where exports quantity and prices are more stable. The study revealed that Canada exported more quantities of peas followed by Argentina and Bulgaria. However, the export prices of peas were higher in Australia, USA and Canada. India should be benefitted if export of peas to Australia, USA and Canada which associated with highest price growth rate with stability of prices in global market. The results of export price elasticity has shown that India should export their beans to Egypt, Brazil and Argentina, chickpea to Canada, Argentina and USA, lentils to Australia, Canada and USA, and peas to Argentina, Canada and Bulgaria for making higher benefits in the international market. It means Indian legumes should export to the highly demanded countries such as Argentina, Canada and USA in an overseas market. The major destinations are Brazil, Japan and UK for beans; Pakistan, Bangladesh and Spain for chickpea; Turkey, Sri Lanka and Bangladesh for lentils; and China, Belgium and Bangladesh for peas.

Suggestions

The research revealed that legumes have international demand from a few developed countries. The current research also provided new information for importing countries to understand global price competition for Indian legumes. The research assists in planning price policies and schemes of pulse crops for expanding exports and foreign earnings for legume crops in all countries. India should adopt multi-strategic policies to enhance the legumes production and expand the marketing across the world. India should seek for regulated and newly developed markets for the legume crops.

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