

Seed spices export from India: Prospects and constraints

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Abstract

Present study analyses the export performance of major seed spices namely cumin, coriander, fenugreek and fennel from India during 1995-96 to 2017-18. During study period seed spices export from India increased faster than total national and agriculture export as well. Among the seed spices cumin export registered maximum growth followed by fennel, fenugreek and coriander. At present India is exporting 13% of total seed spice production that can be increased through articulation and implementation of export promotion policies and by using clean and safe production technologies. During study period export to production share registered positive growth in cumin, coriander and fennel indicates lowering relative domestic consumption. European markets especially United States provide greater opportunity for Indian seed spices which need to be tapped with green and quality production following importers standards in current scenario of stringent sanitary and phytosanitary measures.

Key words : Constraints, export, growth, instability, opportunities, seed spices,

Introduction

Agriculture export from a country plays a crucial role in its economic development. Spice export plays an important role in agriculture export from India. As per 2017-18 estimates, India exported 10.28 lakh tonnes total spices of worth 1792955 lakh rupees contributing 7.98% share to total agricultural export from India (DSAD, 2019). Diverse agro-climatic conditions prevailing in the country from Jammu to Kanyakumari and from Western Rajasthan to North-Eastern states provides large production base for spices in India. Consequently, India produces 63 out of 109 spices listed by International Spice Organisation and embarked as "Land of Spices". Currently India is the largest producer, consumer and exporter of spices in the world. Spices where seed is the main economical and consumable part is termed as seed spices. Out of 63 spices produced in India 20 are classified as seed spices, with major seed spices (Cumin, Coriander, Fenugreek and Fennel) and minor seed spices (Ajwain, Aniseed, Caraway, Celery, Dill and Nigella; source; ICAR-NRCSS Vision 2050). Seed spices contributes more than 45 percent to national spice acreage and have a lion's share of more than 24 per cent to spice export from the country in volume. In last three decades seed spice export from India has increased more than 11 and 57 times in terms of quantity and value respectively. Cumin, coriander and fenugreek export rose to 92, 22 and 14 times in quantity and 924, 267 and 236 times in value term respectively. Higher increase in value term indicates steep increase in prices for seed spices in world market (Figure 3). Seed

spices produced in India are largely consumed (87%) within the country due to its large population base coupled with higher per capita consumption in the country (Shivendra, 2017). With 13% of total production exported to the world market (Table 2) India caters half of world demand. Still there is great opportunity for Indian seeds spices in world market but tightened SPS measure adopted by key European markets is the big challenge. Indian products faced rejections and bans in key markets and most of these are related to non-compliance with food safety and health standards. With the remedial measures to production, marketing, processing and policy constrains it is time to step up quality production abiding all international standard. At all the stages of supply chain precautions are to be taken to tap available opportunities in high demand markets.

Methodology

This study is based on secondary data compiled from various sources. The information on area, production, productivity and export was taken from Directorate of Arecanut and Spices Development, Calicut, Spice board and Directorate of Economics & Statistics, DAC & FW for the period 1995-96 to 2017-18. To highlight the changes in spice sector during post-WTO period per cent share, compound growth rate and instability index were employed (Meena *et al.*, 2018).

Results and discussion

Agriculture export from India in post-WTO period has increased by 231166 crore rupees in 2017-18 compared

Table 1. Total national, agriculture and major seed spices exports from India from 1996 to 2018; Value in ₹ Crore

Year	Total National Export	Agri. Export	% share Total Export	Major Seed spice export	Cumin	Coriander	Fenugreek	Fennel
1995-96	106353.4	20397.7	19.18	58.5	17.39	22.43	18.67	NA
1996-97	118817.3	24161.3	20.33	77.79	34.38	31.37	12.05	NA
1997-98	130100.6	24832.5	19.09	155.57	81.36	64.35	9.87	NA
1998-99	139751.8	25510.6	18.25	124.48	59.81	45.47	19.20	NA
1999-00	159095.2	25313.7	15.91	102.27	47.19	33.46	21.62	NA
2000-01	201356.5	28657.4	14.23	254.32	178.35	37.36	19.78	18.82
2001-02	209018	29728.6	14.22	229.65	148.18	48.34	16.17	16.96
2002-03	255137.3	34653.9	13.58	192.26	93.26	55.65	25.51	17.84
2003-04	293366.8	36415.5	12.41	163.33	58.84	72.01	15.55	16.93
2004-05	375339.5	41602.7	11.08	228.8	101.90	82.09	26.61	18.21
2005-06	456417.9	45711	10.02	217.56	88.00	67.71	34.03	27.82
2006-07	571779.3	57767.9	10.1	331.71	202.24	79.60	26.07	23.80
2007-08	655863.5	74673.5	11.39	463.25	291.50	110.25	33.00	28.50
2008-09	840755.1	81064.5	9.64	862.69	544.00	203.79	71.75	43.15
2009-10	845533.6	84444	9.99	900.06	548.25	225.86	69.72	56.24
2010-11	1136964	113047	9.94	693.97	395.98	166.63	65.48	65.88
2011-12	1465959	182801	12.47	953.28	644.42	164.02	72.75	72.09
2012-13	1634318	227193	13.9	1564.43	1153.07	201.83	104.88	104.66
2013-14	1905011	262779	13.79	2265.71	1600.06	371.86	133.78	160.01
2014-15	1896445	239681	12.64	2607.45	1838.20	498.13	139.47	131.66
2015-16	1716378	215396	12.55	2364.13	1531.13	426.81	233.80	172.40
2016-17	1849429	226652	12.26	2746.8	1963.20	292.08	182.77	308.76
2017-18	1956515	251564	12.86	3136.17	2418.00	272.74	126.89	259.07
CGR	16.48	14.20	-1.96	19.63	22.91	13.62	14.06	20.08
Instability index	0.10	0.13	0.09	0.32	0.48	0.31	0.36	0.23

Source: Directorate General of Commercial Intelligence & Statistics, D/o Commerce, Kolkata.

to 1995-96. It increased by more than twelve times in value term with a compound growth of more than 14 per cent per annum (Table 1). However, the contribution of agricultural product in total national export has narrowed down from 19 to 12 per cent due to faster growth in non-agriculture sector. Spice export from the country contributes 8% to total agricultural export and 12% to India's Fresh and processed food export during 2017-18 (Goyal *et al.*, 2017; Gol, 2018). During study period seed spices export has performed better than total national as well as agriculture export from India. It increased at faster rate compared to total national as well as agriculture

export. Cumin and fennel export from India has increased more rapidly with 23 and 20 percent CGR against less than 17% in total national export. Decreasing share of agriculture export to total national export till 2006-07 bounced back since 2008-09 and their share to national export has increased from 9.94 to 13.79 per cent from 2010-11 to 2013-14 and maintained this pace in recent years is desirable for agricultural economy (Figure 2). According to the World Trade Organization (WTO), India is the 9th largest exporter of agricultural products after the EU, US, Brazil, China, Canada, Indonesia, Thailand and Australia during 2015. India has positive trade balance

Table 2. Production, exports ('000 tonnes) and export to production share (%) of major seed spices from India from 1996 to 2018

Year	Coriander				Cumin				Fenugreek				Fennel			
	Prod.	Exp.	Exp. Prod. ratio	Prod.	Exp.	Ext. Prod. ratio	Prod.	Exp.	Exp. Prod. ratio	Prod.	Exp.	Exp. Prod. ratio	Prod.	Exp.	Exp. Prod. ratio	Exp. Prod. ratio
1995-96	196.10	11.54	5.89	75.25	3.87	5.14	47.49	15.14	31.87	16.00	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1996-97	255.50	12.57	4.92	117.12	6.38	5.44	43.74	8.89	20.33	28.98	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1997-98	337.70	23.73	7.03	115.34	16.28	14.12	31.41	6.01	19.12	36.90	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1998-99	292.40	21.04	7.20	107.86	10.60	9.82	35.74	10.22	28.60	23.90	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
1999-00	235.64	14.97	6.35	70.81	7.58	10.70	40.48	10.07	24.87	19.29	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
2000-01	235.17	12.48	5.31	139.36	16.89	13.56	52.02	9.35	17.98	27.27	4.42	16.20	27.27	4.42	16.20	16.20
2001-02	319.40	15.93	4.99	139.36	17.25	12.38	136.64	6.58	4.82	38.53	4.35	11.28	38.53	4.35	11.28	11.28
2002-03	174.00	18.07	10.38	206.41	10.42	5.05	64.22	13.19	20.54	27.78	4.16	14.97	27.78	4.16	14.97	14.97
2003-04	389.80	21.02	5.39	134.75	7.96	5.91	79.01	6.93	8.77	51.93	4.22	8.12	51.93	4.22	8.12	8.12
2004-05	248.00	33.58	13.54	202.98	13.75	6.77	61.10	13.75	22.50	27.85	4.36	15.64	27.85	4.36	15.64	15.64
2005-06	223.40	23.76	10.63	176.07	12.00	6.82	35.71	15.53	43.48	61.65	5.73	9.29	61.65	5.73	9.29	9.29
2006-07	233.23	21.39	9.17	199.85	26.04	13.03	55.78	8.55	15.32	114.28	3.58	3.13	114.28	3.58	3.13	3.13
2007-08	309.60	26.00	8.40	176.51	28.00	15.86	70.16	11.10	15.82	136.98	5.25	3.83	136.98	5.25	3.83	3.83
2008-09	242.13	30.20	12.47	164.86	52.55	31.88	97.53	20.75	21.27	114.28	8.68	7.59	114.28	8.68	7.59	7.59
2009-10	236.72	47.25	19.96	283.00	49.75	17.58	88.98	21.00	23.60	83.58	6.80	8.14	83.58	6.80	8.14	8.14
2010-11	482.00	40.50	8.40	404.00	32.50	8.04	127.85	18.50	14.47	125.71	7.25	5.77	125.71	7.25	5.77	5.77
2011-12	532.90	28.10	5.27	394.00	45.50	11.55	115.93	21.80	18.80	142.95	8.10	5.67	142.95	8.10	5.67	5.67
2012-13	503.24	35.90	7.13	394.33	85.60	21.71	112.87	29.62	26.24	142.94	13.81	9.66	142.94	13.81	9.66	9.66
2013-14	496.24	45.75	9.22	445.03	121.50	27.30	110.53	35.58	32.19	135.93	17.30	12.73	135.93	17.30	12.73	12.73
2014-15	546.80	46.00	8.41	372.29	155.50	41.77	134.10	23.10	17.23	78.57	11.65	14.83	78.57	11.65	14.83	14.83
2015-16	572.90	40.10	7.00	503.26	97.79	19.43	248.35	33.33	13.42	129.35	15.32	11.84	129.35	15.32	11.84	11.84
2016-17	863.53	30.30	3.51	500.36	119.00	23.78	310.07	34.68	11.18	148.56	35.15	23.66	148.56	35.15	23.66	23.66
2017-18	866.8	35.19	4.06	500.38	143.67	28.71	311.28	29.28	9.41	148.64	34.55	23.24	148.64	34.55	23.24	23.24
CGR (%)	5.43	5.54	0.11	9.01	16.39	6.76	8.77	7.13	-1.5	10.71	12.92	2.46	10.71	12.92	2.46	2.46
Instability index	0.32	0.27	0.43	0.29	0.45	0.48	0.36	0.4	0.62	0.39	0.32	0.48	0.39	0.32	0.48	0.48

in spices, which is an important contributor to India's agricultural trade with 2781 million dollars exchange earnings to the Indian economy. Harnessing geographical advantages, India is producing and exporting whole and processed spice products to more than hundred developed and developing countries including the United States (US), the European Union (EU), Vietnam and the Middle Eastern countries. During Triennial Ending 2017-18, India produces 16.97 lakh tonnes of seed spices from 17.63 lakh hectare area, out of that 2.86 lakh tonnes of seed spices (valued at 5899.67 crore rupees in world market) was exported. Coriander is the largest produce seed spices (42%) followed by cumin (33.23%). Whereas reverse trend in export is there, cumin is the largest exported seed spices (42%) followed by coriander (12%; Table 4). Seed spices export quantum comes to the 13.39 percent to their production in the country. Seed spice export from India caters about 50 percent of international demand for seed spices. Among seed spices grown in India major seed spices namely coriander, cumin, fennel and fenugreek are in good demand in world market. During study period export of seed spices increased sharply as result of increased export of cumin, coriander, fenugreek and fennel. Seed spices (comprising cumin, coriander, fenugreek and fennel) export from India increased from 30550 to 242685 tonnes and in value term it raise from 58.50 to 3076 crore rupees from 1995-96 to 2017-18 respectively. During this period, seed spices export increased at higher pace than total spices (Meena *et al.*, 2018). Highest growth in quantity exported as well as in value term was recorded in cumin followed by coriander (Table 2). From the table it can be seen that in all the major seed spices export increased at faster rate than their production during study period indicates increasing surplus of seed spices. During 1995-96 to 2004-05, alike other agricultural commodities seed spices export also decelerated may be due to adverse impact of globalisation on agriculture trade during this period (Ramphul 2007; Rajur & Patil 2013). Growth performance of total spices as well

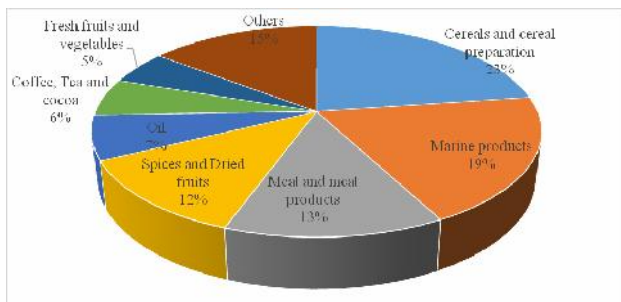


Fig. 1. Share of different commodities in India's fresh and processed food export in 2016-17 (in value term).

Table 4. Item-wise area, production and export of seed spices from India (qty. in tonnes & value in ₹ lakhs) during triennial 2017-18 with share in total seed spices.

Item	Area (Ha)	Prod. (MT)	Export			% share	
			Quantity(MT)	Value (₹ lakh)	Production	Export	Export
Coriander	611413.33	717560.00	35195.00	33054.23	42.28	12.32	
Cumin	851773.33	564093.33	120153.33	197077.50	33.23	42.08	
Dill/poddy/celery	32376.57	30960.00	27398.33	21743.73	1.82	9.59	
Fennel	77186.57	127283.33	28340.00	24673.87	7.50	9.92	
Fenugreek	190790.00	257433.33	32430.00	18115.37	15.17	11.36	
Curry powder/paste	N.A.	N.A.	28400.00	58234.67	N.A.	9.95	
Spice oils and oleoresins	N.A.	N.A.	13645.00	237067.47	N.A.	4.78	
Seed spices	1763540.00	1697330.00	285561.67	589966.83	100.00	100.00	

Source: Export data from DGCI&S, Kolkata and area production data from DASD Calicut

Table 3. Growth and Instability of export of spices from India in Quantity (in tonnes) and Value (in lakh Rupees) term from 1996 to 2018

Particulars		1996 to 2005	2006 to 18	CGR	Instability
Cumin	Quantity	11296.50	60894.41	16.39	0.56
	Value	8206.61	73057.10	22.91	0.51
Coriander	Quantity	18493.40	34484.70	5.54	0.55
	Value	4925.27	20896.53	13.62	0.43
Fenugreek	Quantity	10013.50	20551.74	7.13	0.42
	Value	1850.19	7509.38	14.06	0.34
Fennel	Quantity	4299.4*	13319.7	12.92	0.32
	Value	1775.2*	11184.8	20.08	0.27

Note: * indicates value from 2000 to 2005

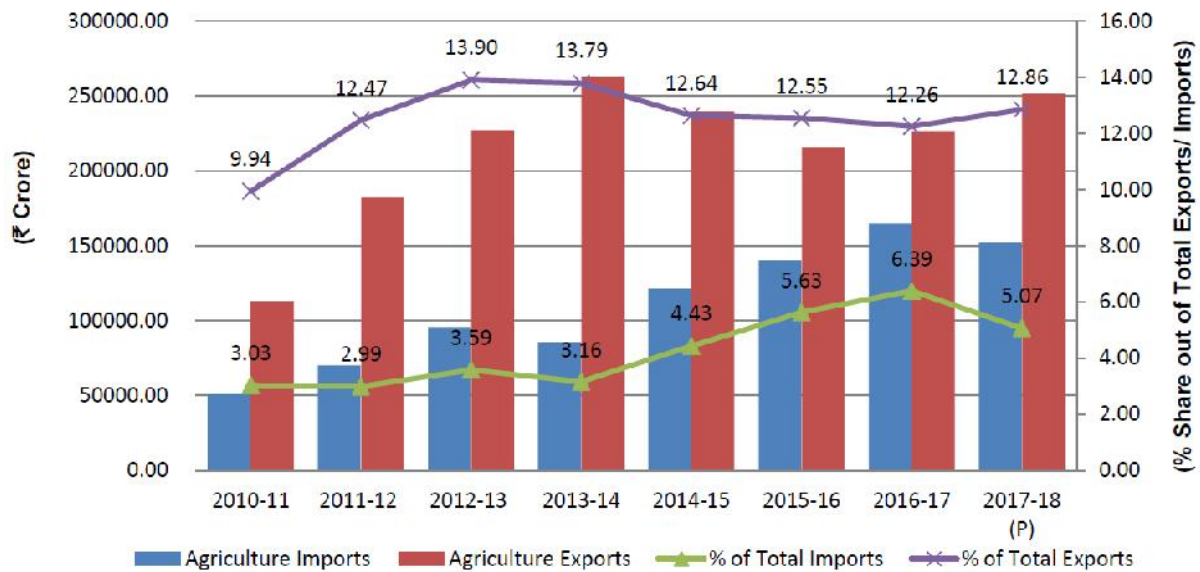


Fig. 2. Trend in agriculture export and import from India

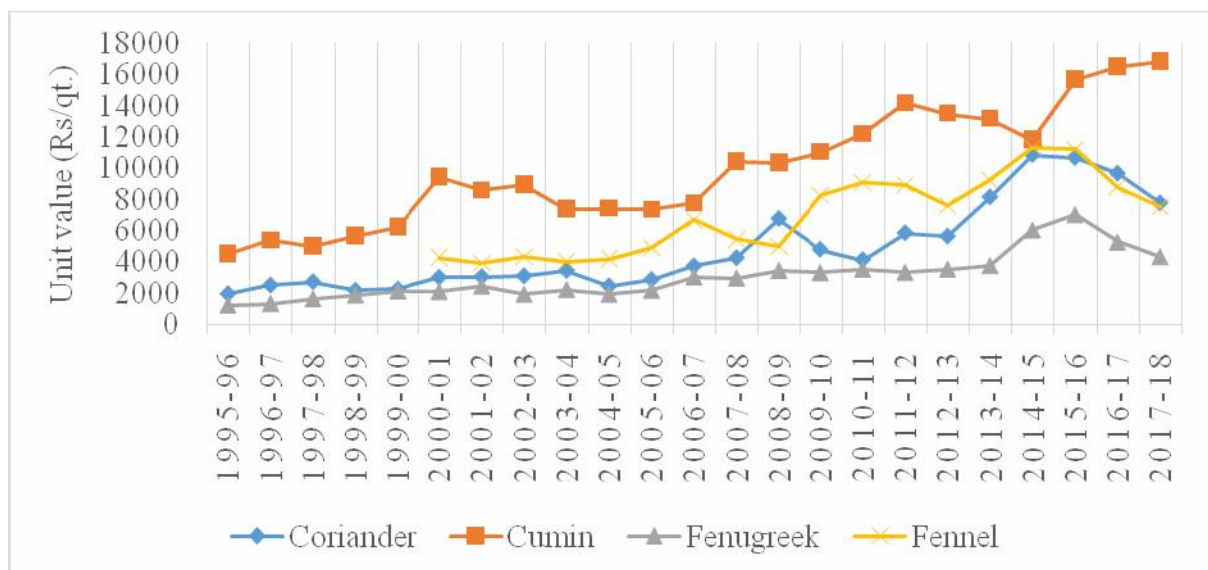


Fig. 3. Unit value of major seed spices in international market

as seed spices export shown good recovery after 2006-07. Cumin export recorded highest growth (16.39%) in quantity exported was followed by fennel (12.92%), fenugreek (7.13%) and coriander (5.54%). Increasing unit prices of seed spices in international markets may be one of the important factors for this growth (Figure 3). Cumin is the single largest exported seed spices with almost half of total seed spices export from India (Table 3). Since 2006-07 India is exporting more of its cumin production with a maximum of 42% to total production during 2014-15.

Prospects for seed spice export from India

Indian spices have global reputation in world market due to their distinct aroma and flavour. The analysis of growth and instability of major seed spice exports for the study period 1995-96 to 2017-18 presented in table 2 reveals that seed spices exports have bright prospects and future in business as usual scenario. As per Observatory of Economic Complexity (2017), seeds spices (include cumin, coriander, anise, fennel, caraway, etc.) of worth \$898M were traded in world market (2017). India was the top exporters to the world market having a share of 49.88% (\$448M) to the world seed spice trade. During 2017, cumin seed valued \$486M was traded in the international market, of that 71.8% was supplied by India (\$349M) alone, followed by Syria (\$62.8M), Turkey (\$21.5M), Spain (\$4.38M) and Egypt (\$4.24M). The top importers of cumin are Vietnam (\$105M), the United States (\$44.3M), Bangladesh (\$37.1M), Egypt (\$24.3M) and the United Arab Emirates (\$23.4M). Similarly coriander seeds of value \$162M were traded in international market. India was the main supplier of coriander seeds (\$52.3M) supplying one third of international demand followed by Russia (\$20.7M), Italy (\$14.8M), Syria (\$12.7M) and Bulgaria (\$8.83M). The top coriander importers are Malaysia (\$19.7M), United Kingdom (\$8.73M), the United States (\$8.43M) and Egypt (\$7.07M). Among studied major seed spices cumin is the most export earning seed spice having a lion's share of 77% (2418 crore rupee) to seed spice export earnings during 2017-18. The cumin export from India increased from 3.9 in 1995 to 144 thousand tonnes in 2017 with CGR of more than 16% per annum. During this period the country exported on average 15.39% of its national production. It varies from 5% (2002-03) to 42% (2014-15) resulting in an instability of 45% in export to production share in cumin. Similarly fenugreek and fennel export in volume has also increased at 7 and 13% respectively, revealing the overwhelming preference for both the seed spices in international market. Still there is great scope to increase their export to harvest more returns.

In post-WTO period India exported less of her seed spice production signals great opportunity to expand its export in near future. Indians are spice lovers; at present 87% of national seed spices production is consumed domestically due to large population base and higher per capita spice consumption. A surplus after meeting domestic need is exported. Study shows that per capita spice consumption in the country is changing. The rising importance of mixed spices is consistent with people's inclination towards ready-to-cook, ready-to-eat and processed food products (Shivendra, 2017). So there is great scope to enhance the export earning with seed spice processing and export promotion. In today's scenario food safety and health standards are of more concern calls need for clean and safe cultivation of spices. It signals the demand for increasing organic production may be through contract farming and farmer producer organisation (FPO) approach. Disturbance in Syria, the second top supplier of spices to the world market, provides good opportunities resulting in increased demand for Indian spices in recent years. It opens more clientele base to Indian spices in world market should be harvested.

Constraints to spice export from India

With the inclusion of agriculture under the General Agreement on Tariffs and Trade (GATT) tariff barriers have narrowed down but non-tariff barriers continue to be a key obstacle to the agricultural export from India. Since the mid-1990s sanitary and phytosanitary (SPS) measures acted as a major impediment to spice export from India. In present system every importing country has the right to set and implement own food safety and health standards to protect their human, animal or plant health. Country to country varying maximum residue limits (MRLs) for pesticides, drugs and other contaminants results in lack of harmonisation of standards, have been identified as major hurdles to export (Goyal *et al.*, 2017). A number of studies show that Indian exporters are facing difficulties in exporting food products to European Union (Chaturvedi and Nagpal, 2003; Mehta, 2005; Jafee, 2005; Chaudhari *et al.*, 2012; Das, 2008). These are related to non-compliance with food safety and health standards. Contamination with pest & disease inoculums, presence of food bacteria, banned chemicals by the importing country's food law are the major reasons for rejection of export consignment. Border rejection in proportion to notification and destruction of consignment for India during 2005 to 2017 was highest compared to Brazil, China, Turkey and Vietnam (Table 5). India had the highest number of interceptions raised for the presence of harmful organisms in the plant and produce imported as compared

to other developing country exporters to the EU. Lack of awareness among farmers about the judicious use of chemicals on the fields coupled with improper handling during logistic are the main reasons for rejections. Fifty one pesticides that have been banned in various developed countries are still being used in India as of December 2016 (Goyal *et al.*, 2017).

So far Indian spice trade is successful in earning a global reputation for consistent supplier of quality material. Recent regulatory changes in selected destinations such as USA (one of the largest importer of Indian spices) has urged changes to be implemented in production, post-harvest, and processing activities and technologies so as to ensure better quality assurance and efficient supply chain management systems. During 1970 to 2013, there were many spice recalls took place in the United States, FDA monitored 31 recalls involving 12 spice recalls contaminated with *Salmonella* bacteria. Outbreak of Salmonella illness in many regions in US during 2008-2009 due to the consumption of microbiologically contaminated ground spices namely white pepper, black pepper and red pepper resulted in strict regulation on spices (Food and Drug Administration, 2013). So in recent years an upward trend of recalls in dried spices due to bacterial contamination from US. Higher dosage and injudicious use of chemical fertilizers, plant protection chemicals detrimental to human, animals and soil health, inefficient agricultural practices, postharvest activities, toxic substances like Sudan dyes and other dyes which are harmful, are the factors responsible for such recalls. These major issues are needed to be address to ensure quality export from India. Excessive and inappropriate use of fertilizers and chemicals led to a tremendous decline in Indian-USA trade in spices (Kallummal & Gurung, 2014; Chawla, 2016). High levels of pesticide residue make these spices unfit for consumer and export consequences in threatening the long term sustainability of spice growers. Scarcity of the farm labour is the burning issue and identifies as top rated constraints in agriculture by many researchers (Reddy *et al.*, 2017). Other issues such as lack of skilled labour, social issues such as child labour and unhealthy working conditions are common constraints (Sharma & Sharma 2017). The Spices Board of India, American Spice Association along with FDA suggested all the spice supply chain stakeholders to adhere international market standards via good agricultural, processing and marketing practices to meet (Chawla, 2016). Today consumers are more concern about farm origin of the food items calls need for tagging and traceability. In India, the concept of product tracing to the

farm, where farms are of small size and raw materials are procured by processing units or exporters through traders is very difficult task. Traceability of spice produce makes it difficult to find out the cradle for SPS issue. Shortage of processing infrastructure due to high capital requirement is another challenge. Involvement of multiple agencies like spice board, EIC, APEDA, Directorate of Plant Protection, Quarantine and Storage, National Accreditation Board for Testing and Calibration Laboratories (NABL), Bureau of Indian Standards (BIS), FSSAI are the major complexities in seed spice export, has to be eased by replacing with single window system approach.

Production constraints

As per agriculture statistics 2018, 86% of the farmers in India are small (17.69%) and marginal (68.52%) having average land holding of 1.41 and 0.38 hectare respectively (2015-16; GoI, 2018). Such a small farm size is subjected for subsistence farming and unable to reap the economies of large scale operation. Good cultivation and manufacturing practices at different stages of supply chains fulfilling HACCP standards is big challenge for Indian spice industry. Prakash & Varadharaj (2014) in their study on quality standard of spices highlighted that 64.8 % farmers used to apply high dosage of fertilizers due to their untrue perception that the high dosage brings more production. Only 5.8% of cultivators are involved in organic farming. Only 17.2% of the cultivators adopted modern cultivation practices. Only 25.7 % of the farmers have the access to the irrigation facilities like ponds, rain water harvesting etc. In lack of knowledge regarding agriculture finance from institutional sources more than 40% of the farmers are still dependent up on non-institutional sources with higher rate of interest. In case of institutional sources farmers report the inadequacy of loan amount, complex bank formalities etc. Many times farmers unable to repay the loan due to low production, low prices, diversion of fund to non-agricultural and social activities. Emerging labour scarcity due to alternative employment opportunities with higher wages or working conditions as well as decline in the migration of labourers from the other states to spice growing belt is the big concern. Considering the above constraints farmers are shifting to other crops with higher mechanisation. Majority of farmers think that price, output and earnings are highly fluctuating and increase in spice prices is insufficient to compensate the hike in input prices is the highest ranked constraints by farmers.

Marketing Constraints

Marginal and small seed spice grower in the country left with small surplus produce and the distant terminal spice

specific markets like Onjha in Gujarat; Kota, Ramganj mandi in Rajasthan and Neemach and Mandsour in Madhya Pradesh are big marketing constraints in seed spices. Therefore over dependence of farmers on local traders and middleman is the big market challenge. No minimum support price (MSP) in case of seed spice results in high price fluctuation in these crops. Price crash in year of bumper harvest results in low the income of seed spice growers consequents in inability to repay loan in time. Advance during crops in field forces the farmers to sell their produce to particular trader and refusal of agents to offer farmers the right price of good quality produce are common practices for spice growers. Even though there is technology and online availability of market information but farmer fail to get timely information about the market and price fluctuations due to no trainings to use web services. In the markets there are unfair auction, poor weighing, grading and sorting facilities. Marry (2012) mentioned that 73.1% of Indian farmers are illiterate and are unable to access to the market information and latest trends in the spice market. Delay in payments from agents, collection of excess commission, shortage of warehouse and storage facilities and less availability of finance on ware house receipts are the prevailing challenges in the country. India loses about one-third of its produce roughly estimated \$10 billion worth each year to spoilage, because there are lack of proper storage facilities, refrigerated trucks and adequate highways (Kumar & Kalita, 2017). Prakash and Varadharaj (2014) mentioned post-harvest constraints like poor transportation facilities connecting villages to the central market, inadequate cold storage, weighing facilities, generator, electricity, telephone, internet, toilets, cafeteria, stalls for merchants, transport, etc. services in market yards. Under developed spice parks in very few region of seed spice belt has to be taken care in years to come.

The Way Forward

To harness the fruits of global reputation in world market India must implement domestic reforms like product traceability, adoption of good agriculture and processing

techniques. There is urgent need for restriction on use of chemicals and pesticides banned in major importing countries. It is time to switch to the organic cultivation of seed spices adopting bio-fertilisers and green inputs. Spice board should organise stakeholders meeting for bilateral discussions, mutual collaboration and knowledge sharing among business partner. There is need to raise the issue in multilateral trade forums such as the WTO. Single window approach for export control, traceability and laboratory testing is the need of hour. It will smoothen the export with low cost and increased accountability. India should have a comprehensive agro-export policy (Prasad, 2017) which will identify the issues affecting agriculture exports and clearly lay down measures on how to attain compliance with SPS conditions of the key export markets, and how to create good infrastructure and marketing facilities. India must have world class export infrastructure to help exports consequently seed spice growers in the country.

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Table 5. Number of Notifications Raised by the EU in RASFF Portal (April 1, 2005-May 31, 2017)

Country	Notifications	Border rejections	Border rejections in proportion to notifications (%)	Destruction of consignment
Brazil	1139	717	62.9	None
China	3374	1730	51.3	391
India	2240	1490	66.5	583
Turkey	3296	2018	61.2	431
Vietnam	1049	372	35.5	136

Source: Taken from Goyalet *et al.*, 2017.

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