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AN ECONOMIC ANALYSIS OF INDIA'S SPICES EXPORTS

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ABSTRACT

The Spices is one of the key sectors of the Indian economy. It is the economically and commercially significant agriculture crops in the world. Indian spices are the most sought-after globally, given their exquisite aroma, texture, taste and medicinal value. Traditionally, spices in India have been grown in small land holdings, with organic farming gaining prominence in recent times. The following objectives are made of the present study. (i) To analyze the trends and growth rate of spices exports in India during 1991-92 to 2016-17. (ii) To examine the impact of liberalization on spices exports in India. (iii) To identify the determinants of spices exports in India. The study was mainly based on secondary data on various aspects of determinants of spices exports in India. Secondary data and information have been collected from various sources like Journals Directorate General of Commercial Intelligence and Statistics (DGCI&S), World Trade Organization Trade Statistics, Hand Book of statistics on Indian Economy, Reserve Bank of India (RBI), United Nations Trade Data, Commodity Trade Statistics, World Bank database, Spices Board of India. The data were analyzed using descriptive statistics such as tables, percentages, Annual average growth rate. Similarly, an attempt is made in this part to present collected data through line graph, bar diagram etc. Linear Model has been applied to analyze the trends and growth rate of spices exports in India. Semi Log Model and Compound Growth Rate has been applied examine the impact of liberalization on spices exports in India. Multiple Regression Model is also used to get an idea about the determinants of spices export in demand side and supply side during the study period.

Introduction

Agriculture exports plays crucial roles in economic development in India, such as provision of food to the nation, enlarging exports, transfer of manpower to

non-agricultural sectors, contribution to capital formation, and securing markets for industrialization (Johnston,1961). spices exports of a country play a major role in the growth of an economy. Spices are high value and low volume commodities of commerce in the world market. All over the world, the fast-growing food industry depends largely on spices as taste and flavor makers. Health conscious consumers in developed countries prefer natural colors and flavors of plant origin to cheap synthetic ones. Thus, spices are the basic building blocks of flavor in food applications. The estimated growth rate for spices demand in the world is around 3.19%, which is just above the population growth rate. India has been a traditional producer, consumer and exporter of spices. There are about 109 spices listed by International Organization for Standardization and India grows about 63 of these spices which include pepper (King of Spices), cardamom (Queen of Spices), chillies, ginger, turmeric, coriander, cumin, fenugreek and many others. Almost all the states in the country produce one or other spices. During the crop year 2019-20 the country produced about 10125880 tons from 4317552 hectares of area under spices (Spice Board, 2019). This paper seeks to examine the impact of liberalization on spices exports in India during the period of 1991-92 – 2019-20.

OBJECTIVES OF THE STUDY
The following objectives are made of the present study.
❖ To analyze the trends and growth rate of spices exports in India during 1991-92 to 2016-17.
❖ To examine the impact of liberalization on spices exports in India.
❖ To identify the determinants of spices exports in India.

RESEARCH METHODOLOGY
The study was mainly based on secondary data on various aspects of determinants of spices exports in India. Secondary data and information have been collected from various sources like Journals Directorate General of Commercial Intelligence and Statistics (DGCI&S), World Trade Organization Trade Statistics, Hand Book of statistics on Indian Economy, Reserve Bank of India (RBI), United Nations Trade Data, Commodity Trade Statistics,
World Bank database, Annual Reports of spices board, Indian Spices Board Statistics, published by Spices Board of India, Ministry of Commerce and Industry, Government of India.

DATA ANALYSIS AND STATISTICAL TOOLS
To analyze the trends and growth rate of spices exports and to examine the impact of liberalization on spices exports in India during 1991-92 to 2019-20 data were analyzed using descriptive statistics such as tables, percentages, Annual average growth rate. Similarly, an attempt is made in this part to present collected data through line graph, bar diagram etc. Linear Model has been applied to analyze the trends and growth rate of spices exports in India during 1991-92 to 2019-20. Semi Log Model and Compound Growth Rate has been applied examine the impact of liberalization on spices exports in India during 1991-92 to 2019-20. Multiple Regression Model is also used to get an idea about the determinants of spices export in demand side and supply side during the study period.

LINEAR MODEL

Further the researcher has used percentage and the simple linear growth rate model.

The linear growth rate model

$$Y= a+b_t$$

Where, Y - Dependent variable, T – Time, 'a' and 'b' are the parameters. The linear growth rate is obtained from the 'b' value.

SEMI LOG MODEL AND COMPOUND GROWTH RATE

Further the researcher has used the Semi log model, in order to compute the Instantaneous Growth Rate and the Compounded Annual Growth Rate (CAGR) the Semi-log is used and was computed using the following models.

If Y, = Variable at time t and Y_t= initial year value of the variable, simple compounding is explained as

$$logY=a+b_t$$

$$CGR= (Anti\ log\ b-1)100$$

MULTIPLE REGRESSION MODEL

The study used multiple regression model mainly for examining the impact of post liberalization on spices exports in India. The multiple regression model used for the present analysis are specified as follows

$$LogY=b_0+b_1 logX_1+ +b_2 logX_{2+} b_3 logX_{3} +b_4 logX_{4+} b_5 logX_{5+} b_6 logX_{6+} b_7 logX_7 +\varepsilon_t$$

Where Y is the dependent variable selected for the analysis and X_{its} are the explanatory variables selected and εt is the error term.

AN ECONOMIC ANALYSIS OF INDIA'S SPICES EXPORTS

India is a very old participant in world trade. India is making export of few traditional goods like; coffee exports, tea & mate exports, oil cakes exports, tobacco exports, cashew kernels exports, spices exports, sugar and molasses exports, raw cotton exports, rice exports, fish and fish preparations exports, meat and meat preparations exports, fruits, vegetable & pulses exports, miscellaneous processed foods exports. The present study examines the economic analysis of India's spices exports in 1991-92 to 2019-20.

TABLE.1.1. INDIA'S EXPORTS 1991-92 TO 2019-20 (US$ Million)

Year	World Exports	India's Exports	AAGR (%)	share of India in world export
1991-92	3511359	17865	-0.6	0.5
1992-93	3779172	18537	3.8	0.5
1993-94	3794694	22238	20.0	0.6
1994-95	4328264	26330	18.4	0.6
1995-96	5167620	31794	20.8	0.6
1996-97	5406052	33469	5.3	0.6
1997-98	5592319	35006	4.6	0.6
1998-99	5503135	33218	-5.1	0.6
1999-00	5719381	36822	10.8	0.6
2000-01	6457615	44560	21.0	0.7

2001-02	6194859	43826	-1.6	0.7
2002-03	6499451	52719	20.3	0.8
2003-04	7589577	63842	21.1	0.8
2004-05	9223297	83535	30.8	0.9
2005-06	10509146	103090	23.4	1.0
2006-07	12130534	126414	22.6	1.0
2007-08	14023294	162904	28.9	1.2
2008-09	16160364	185295	13.7	1.1
2009-10	12554999	178751	-3.5	1.4
2010-11	15301115	251136	40.5	1.6
2011-12	18338014	305963	21.8	1.7
2012-13	18496283	300400	-1.8	1.6
2013-14	18952269	314415	4.7	1.7
2014-15	19004933	310352	-1.3	1.6
2015-16	16489349	262291	-15.5	1.6
2016-17	15955402	275852	5.2	1.7
2017-18	15000014	303526	10.0	2.0
2018-19	19572196	330078	8.7	1.7
2019-20	20225018	313139	-5.1	1.5

Source: Hand Book of statistics on Indian Economy (RBI) and World Trade Organization 2017

Table No.1.1 that the export performance in India was the highest in 2018-19 and the lowest in 1991-92.   India's total exports increased from US $17,865 crore million dollar in the year 1991-92 to US $31,794 million dollar in the year 1995-96 again to US $44,560 million dollar in the year 2000-01 then to US $1,03,090 million dollar in the year 2005-06 then to US $2,51,136 million dollar in the year 2010-11 then to US $2,62,291 million dollar in the year 2015-16 and US $3,13,139 million dollar in the year 2019-20. Whereas, share in India's total exports gone up from 0.5 per cent to 0.6 per cent again to 0.7 per cent then to 1.0 per cent to 1.6 per cent to finally decreased to 1.5 per cent during the corresponding year.
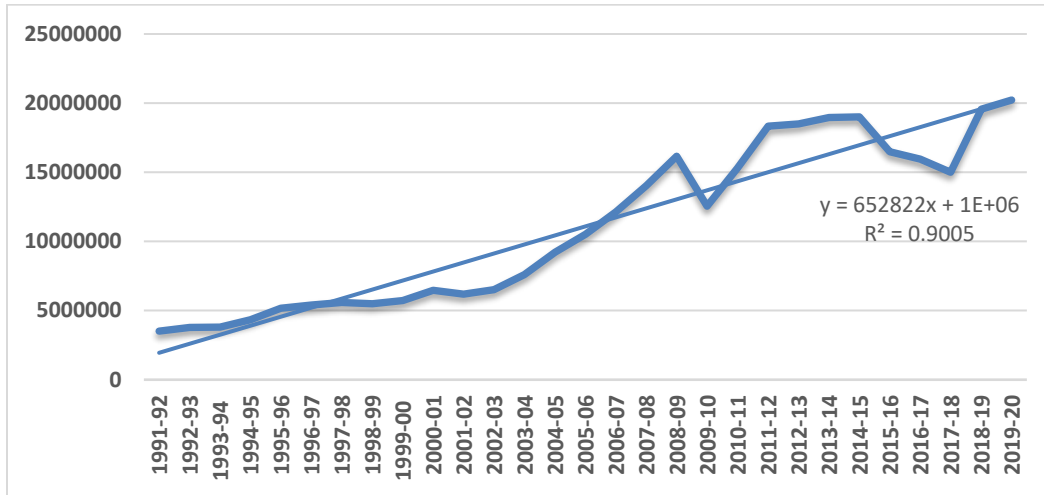
FIGURE NO.1.1. WORLD EXPORTS

Figure No 1.1 shows that the trend of exports of world is for using linear regression model. The regression equations are fitted and it is Y=652822x-1E+06. The regression equation is plotted for the period from 1991-92 to 2019-20. It denotes that the world exports increased at the rate of US \$6,52,822 million dollar per year from 1991-92 to 2019-20. As the R^2 value calculated id 0.900.the regression equation is reliable to the extent of 90 per cent. Thus, there has been a positive trend in total export during the study period.
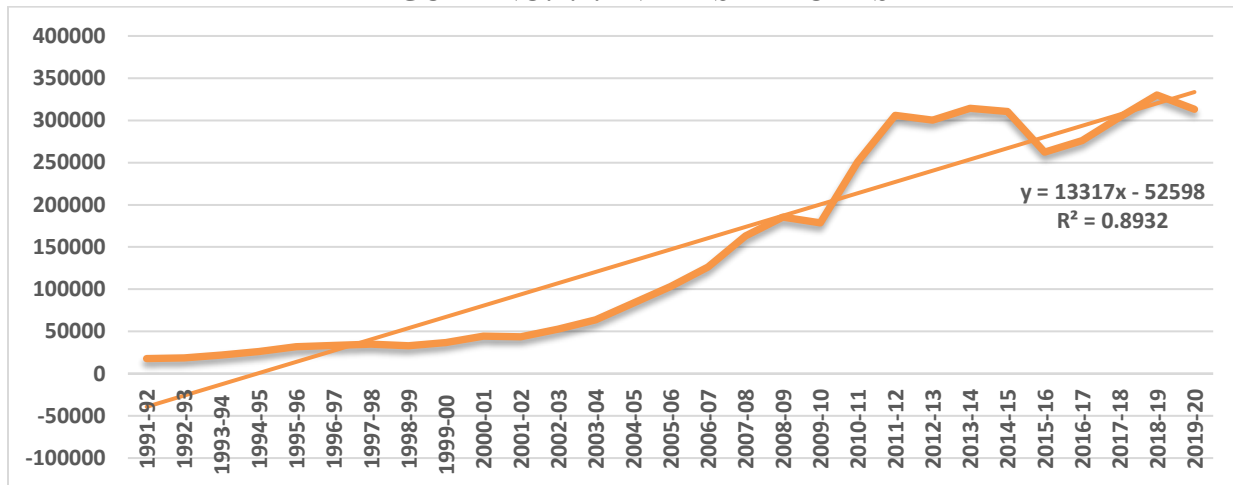
FIGURE NO.1.2. INDIA'S EXPORTS

Figure No 1.2 shows that the trend of total exports of India is for using linear regression model. The regression equations are fitted and it is Y=13317x-52598. The regression equation is plotted for the period from 1991-92 to 2019-20. It denotes that the total exports increased at the rate of US \$13,317 million dollar per year from 1991-92 to 2019-20. As the R^2 value calculated id 0.893.the regression equation is reliable to the extent of 89 per cent. Thus, there has been a positive trend in total export during the study period.

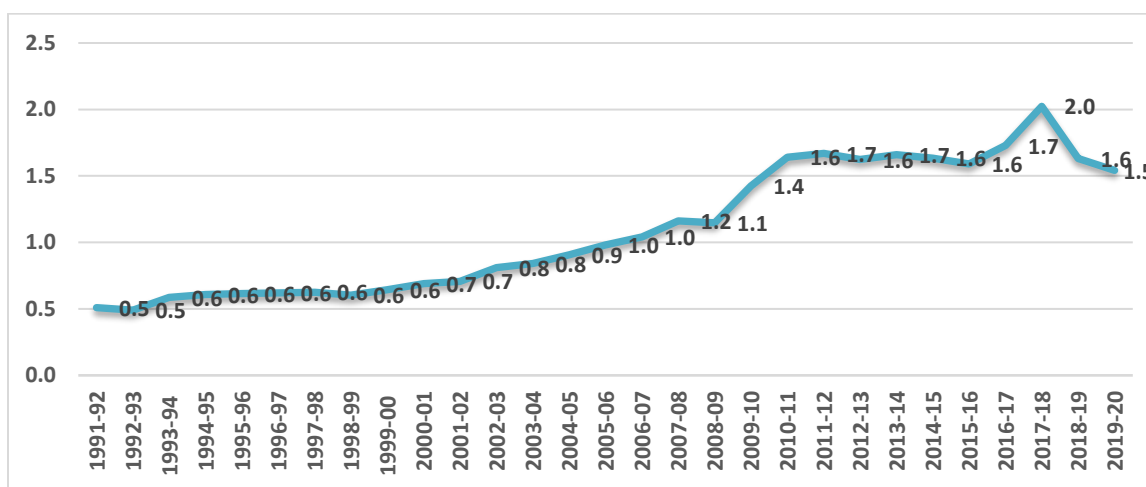## FIGURE NO.1.3. INDIA'S EXPORTS SHARE IN WORLD EXPORTS

Figure No.1.3 presents a study of India's exports share in world exports is showing significantly a rising trend.

TABLE NO.1.2, INDIA'S AGRICULTURAL EXPORTS DURING 1991-92 TO 2019-20

Year	India's Exports	Agricultural Exports	AAGR (%)	share of Agri in total export
1991-92	17865	3338	-0.5	18.7
1992-93	18537	3265	-2.2	17.6
1993-94	22238	4151	27.1	18.7
1994-95	26330	4367	5.2	16.6
1995-96	31794	6320	44.7	19.9
1996-97	33469	6828	8.0	20.4
1997-98	35006	6840	0.2	19.5
1998-99	33218	6205	-9.3	18.7
1999-00	36822	5671	-8.6	15.4
2000-01	44560	6256	10.3	14.0
2001-02	43826	6146	-1.8	14.0
2002-03	52719	6962	13.3	13.2
2003-04	63842	7889	13.3	12.4
2004-05	83535	8475	7.4	10.1
2005-06	103090	10549	24.5	10.2
2006-07	126414	13030	23.5	10.3
2007-08	162904	18879	44.9	11.6
2008-09	185295	16914	-10.4	9.1
2009-10	178751	17963	6.2	10.0
2010-11	251136	24448	36.1	9.7
2011-12	305963	37618	53.9	12.3
2012-13	300400	41017	9.0	13.7
2013-14	314415	43133	5.2	13.7
2014-15	310352	39356	-8.8	12.7
2015-16	262291	33049	-16.0	12.6

2016-17	275852	33994	2.9	12.3
2017-18	303526	34001	0.0	11.2
2018-19	330078	34589	1.7	10.5
2019-20	313139	31313	-9.5	10.0

Source: Hand Book of statistics on Indian Economy (RBI)

Table No.1.2 that the Agricultural export performance in India was the highest in 2018-19 and the lowest in 1991-92. India's total exports increased from US $3,338 million dollar in the year 1991-92 to US $6,320 million dollar in the year 1995-96 again decelerated to US $6,256 million dollar in the year 2000-01 then increased to US $10,549 million dollar in the year 2005-06 then to US $24,448 million dollar in the year 2010-11 then to US $33,049 million dollar in the year 2015-16 and finally declined to US $31,313 million dollar in the year 2019-20. Whereas, share in India's total exports gone up from 18.7 per cent to 19.9 per cent again declined to 14.0 per cent then to 10.2 per cent increased to 12.6 per cent to finally decreased to 10.0 per cent during the corresponding year.

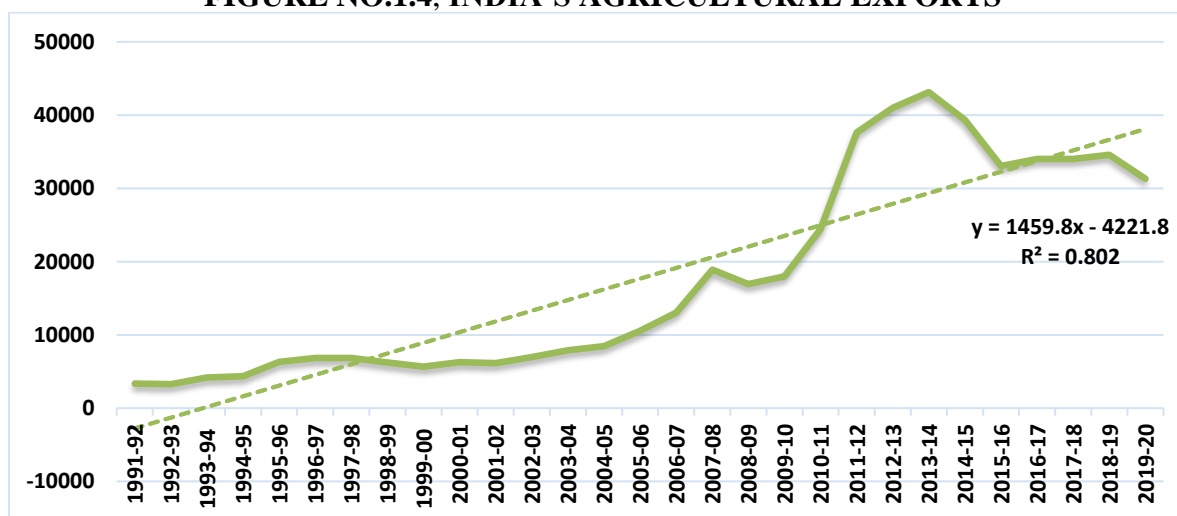**FIGURE NO.1.4, INDIA'S AGRICULTURAL EXPORTS**

Figure No 1.4 shows that the trend of agricultural exports of India is for using linear regression model. The regression equations are fitted and it is Y=1459.8x-4221.8. The regression equation is plotted for the period from 1991-92 to 2019-20. It denotes that the agricultural exports increased at the rate of US $1459.8 million dollar per year from 1991-92 to 2019-20. As the R^2 value calculated is 0.802. the regression equation is reliable to the extent of 80 per cent. Thus, there has been a positive trend in agricultural export during the study period.

FIGURE NO.1.5. INDIA'S AGRICULTURAL EXPORTS SHARE IN INDIA'S TOTAL EXPORTS
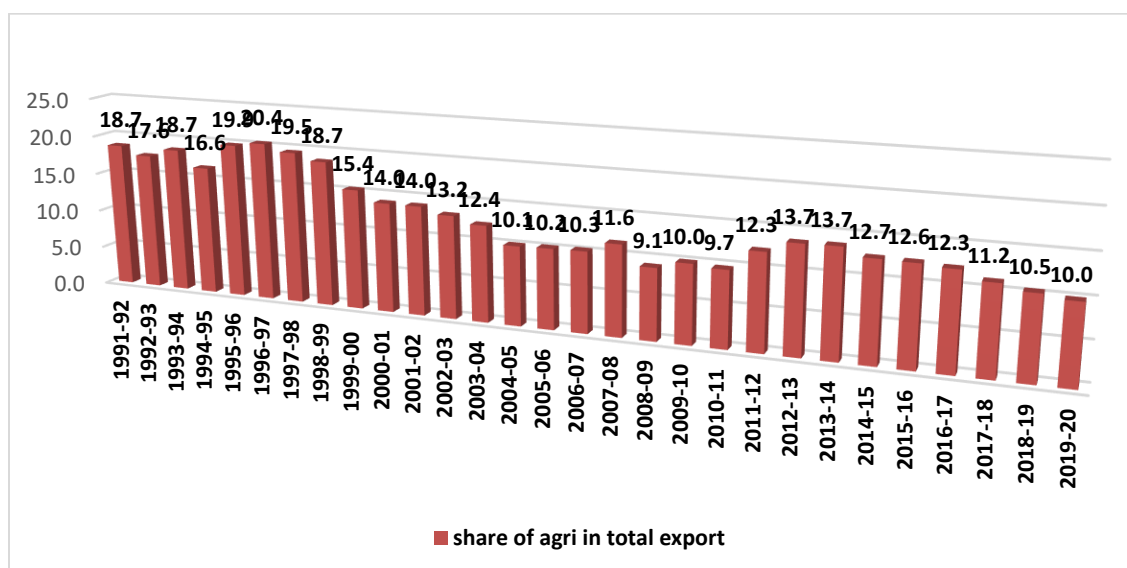
Figure No.1.5 presents a study of India's agricultural exports share in India's total exports is showing significantly a rising trend.

TABLE NO.1.3, INDIA'S SPICES EXPORTS DURING 1991-92 TO 2019-20

Year	Agricultural Exports	Spices Exports	AAGR (%)	share of India in Agri export
1991-92	3338	160		4.8
1992-93	3265	136	-15.0	4.2
1993-94	4151	181	33.1	4.4
1994-95	4367	195	7.7	4.5
1995-96	6320	237	21.5	3.8
1996-97	6828	339	43.0	5.0
1997-98	6840	379	11.8	5.5
1998-99	6205	388	2.4	6.3
1999-00	5671	393	1.3	6.9
2000-01	6256	354	-9.9	5.7
2001-02	6146	314	-11.3	5.1
2002-03	6962	342	8.9	4.9
2003-04	7889	336	-1.8	4.3
2004-05	8475	400	19.0	4.7
2005-06	10549	478	19.5	4.5
2006-07	13030	698	46.0	5.4
2007-08	18879	1044	49.6	5.5
2008-09	16914	1378	32.0	8.1
2009-10	17963	1298	-5.8	7.2
2010-11	24448	1768	36.2	7.2
2011-12	37618	2750	55.5	7.3

2012-13	41017	2824	2.7	6.9
2013-14	43133	2504	-11.3	5.8
2014-15	39356	2430	-2.9	6.2
2015-16	33049	2542	4.6	7.7
2016-17	33994	2852	12.2	8.4
2017-18	34001	3115	9.2	9.2
2018-19	34589	3322	6.6	9.6
2019-20	31313	3623	9.0	11.6

Source: Hand Book of statistics on Indian Economy (RBI)

Table No.1.3 that the spices export performance in India was the highest in 2019-20 and the lowest in 1992-93. India's spices exports increased from US $160 million dollar in the year 1991-92 to US $237 million dollar in the year 1995-96 again to US $354 million dollar in the year 2000-01 then to US $478 million dollar in the year 2005-06 then to US $1768 million dollar in the year 2010-11 then to US $2542 million dollar in the year 2015-16 and finally declined to US $3623 million dollar in the year 2019-20. Whereas, share in India's spices exports declined from 4.8per cent to 3.8per cent again gone up to 5.7 per cent then decelerated to 4.5 per cent increased to 7.2 per cent to 7.7 per cent finally to 11.6 per cent during the corresponding year.

FIGURE NO.1.6, INDIA'S SPICES EXPORTS

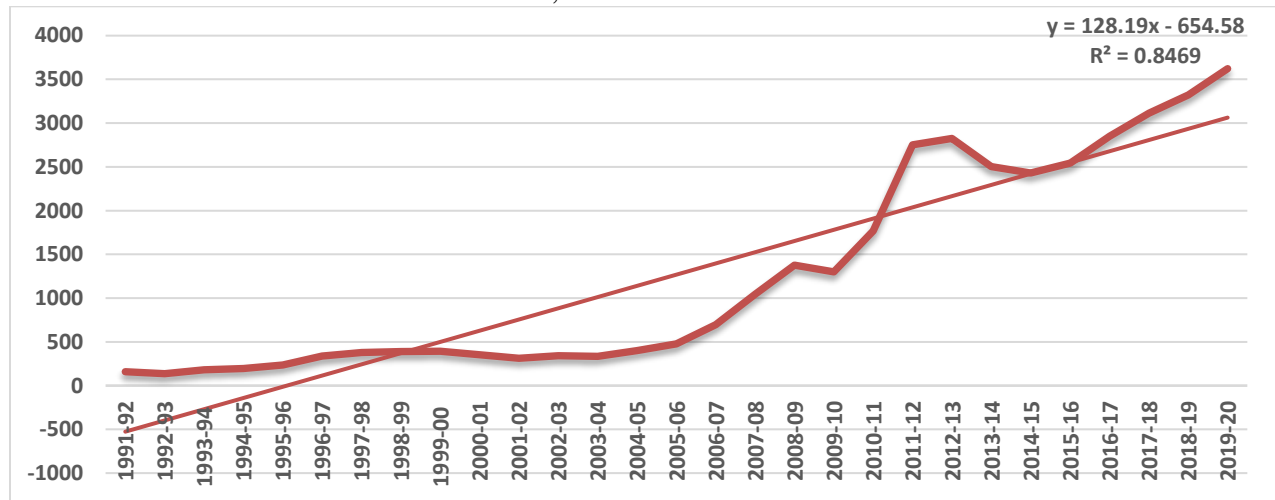
Figure No 1.6 shows that the trend of spices exports of India is for using linear regression model. The regression equations are fitted and it is Y=128.19x-654.58. The regression equation is plotted for the period from 1991-92 to 2019-20. It denotes that the spices exports increased at the rate of $128.9 million dollar per year from 1991-92 to 2019-20. As the R^2 value calculated is 0.846. the regression equation is reliable to the extent of 84 per cent. Thus, there has been a positive trend in spices export during the study period.

FIGURE NO.1.7. INDIA'S SPICES EXPORTS SHARE IN INDIA'S AGRICULTURAL EXPORTS
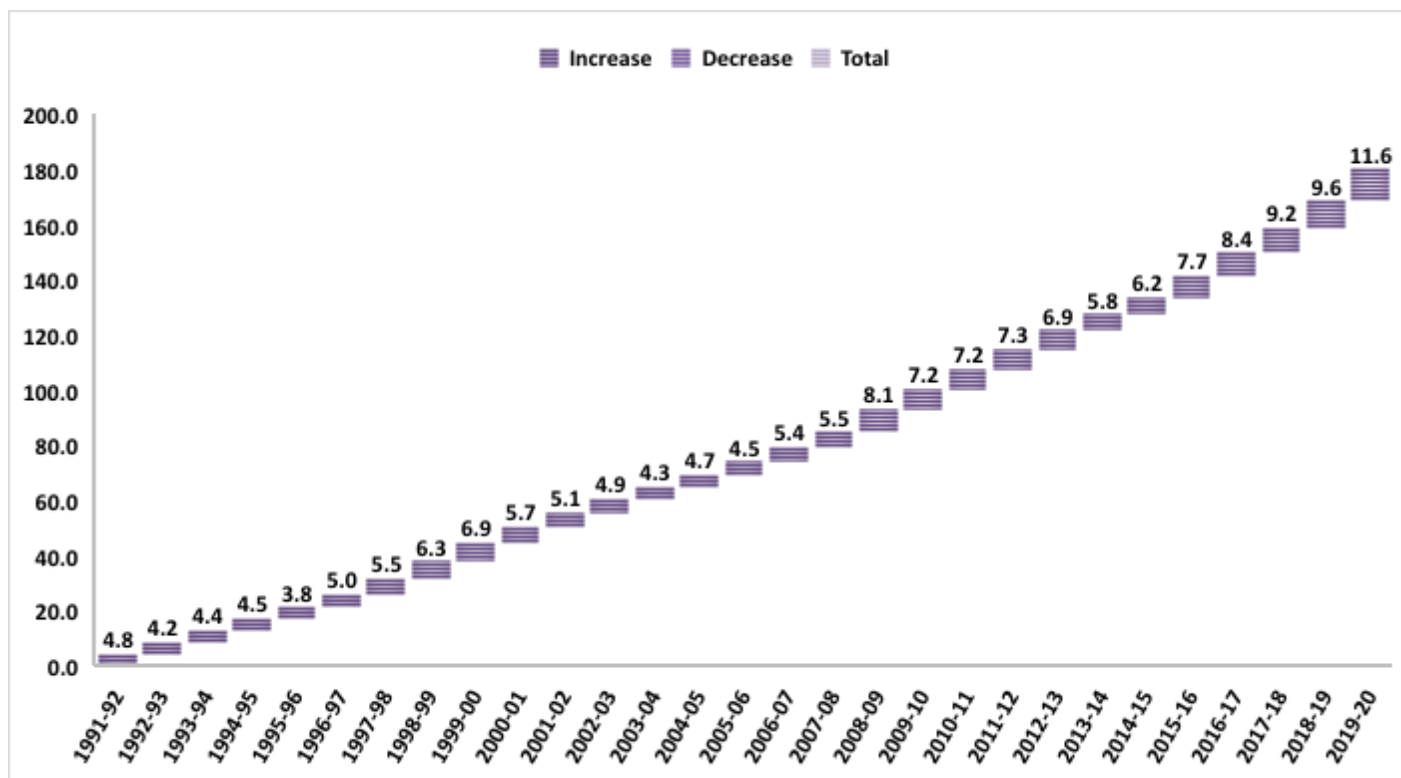
Figure No.1.7 presents a study of India's spices exports share in India's agricultural exports is showing significantly a rising trend.

TABLE NO.1.4, TREND AND GROWTH RATE OF EXPORTS IN INDIA FROM 1991-92 TO 2019-20

Variable	Linear Model				Semi log Model				CGR
	a	b	t	R^2	a	b	t	R^2	
World exports	1293175.10 (717136.75)	652822.17 (41753.31)	15.635	0.901	15.057 (0.062)	0.067 (0.004)	18.483	0.927	6.9
India's exports	-52598.33 15218.90)	13316.59 886.07)	15.029	0.893	9.665 0.092	0.119 0.005	22.333	0.949	2.7
Agricultural exports	-85487.90 (30273.83)	10530.23 (1762.61)	5.974	0.569	7.319 0.230	0.171 0.013	12.770	0.858	8.7
Spices exports	-654.576 180.167	128.190 10.490	12.221	0.847	4.763 0.108	0.124 0.006	19.671	0.935	3.2

Source: Calculated by the researcher

Figures in bracket indicate Standard Error

From the above Table No.1.4 it could be known that the t values of the trend co-efficient were found to be statistically significant at one per cent level. The R^2 values were also found to be satisfactory. World exports has the $652822.17 million US dollar in 1991-92 to 2019-20. The World export compound growth rate was witnessed in petroleum exports which has 6.9 per cent per annum. India's exports have the $13316.59 million US dollar in 1991-92 to 2019-20 and India's exports have the compound growth rate of 2.7 per cent per annum. India's Agricultural exports have the $10530.23 million US dollar in 1991-92 to 2019-20. The India's

Agricultural export compound growth rate was witnessed in petroleum exports which has 8.7 per cent per annum. India's Spices exports has the $128.190 million US dollar in 1991-92 to 2019-20 and Spices exports has the compound growth rate of 3.2 per cent per annum.

DETERMINANTS OF SPICES EXPORTS

Following the Table No.1.5 shows the multiple regression result of determinants of spices export in demand side during the study period.

TABLE NO.1.5 DETERMINANTS OF INDIA'S SPICES EXPORTS WITH DEMAND FACTORS

Constant	REER	World Demand	Openness	Tariff rate	R-Square
-18.782 (-5.447)	0.615 (2.650) *	0.634 (2.925) *	0.888 (3.595) *	-0.266 (-1.297)	0.968

Source: Calculated by the researcher
Note: Figures in bracket indicate t-value.
***Indicates that the t-values are statistically significant at 5 per cent level.

It could be seen from the Table No.1.5 that except Tariff rate all other variables in the model were statistically significant at the 5 per cent level. The explanatory variables REER, World demand and Openness had positively related with spices export. It indicated that one per cent increase in REER, World demand, Openness would increase the spices export by 0.615 per cent 0.634 per cent and 0.888 per cent respectively. The Tariff rate had favorable and significant impact on commodity, which is one per cent decrease in Tariff rate would result in increased spices export by 0.266 per cent respectively. The R^2 value fitted at the point 0.968 revealed that the model was 96 per cent good fit. The following Table No.1.6 shows the multiple regression result for determinants of spices exports in Supply Side during the study period.

TABLE NO.1.6 DETERMINANTS OF INDIA'S SPICES EXPORTS WITH SUPPLY FACTORS

Intercept	Relative Price	GDP	FDI	Domestic Demand	Openness	Tariff rate	R-square
-4.810 (-2.143)	0.392 (1.970)	0.496 (2.649) *	0.008 (2.905) *	-0.187 (-1.969)	0.249 (2.749) *	-0.229 (-0.249)	0.964

Source: Calculated by the researcher
Note: Figures in bracket indicate t-value.
***Indicates that the t-values are statistically significant at 5 per cent level.

It is understood from the Table No.1.6 that the variables capability to export, FDI, Openness were statistically significant at the 5 per cent level. The explanatory variables Relative price, capability to export, FDI, Openness had positively related with tobacco export. It indicated that one per cent increase in Relative price,

capability to export, FDI, Openness would increase the spices export by 0.392 per cent, 0.496 per cent, 0.008 per cent and 0.249 per cent respectively. The Domestic demand and Tariff rate had negatively related with dependent variable. One per cent decrease in Domestic demand and Tariff rate would result in increased spices export by 0.187 per cent and 0.229 per cent respectively. The R^2 value fitted at the point 0.964 revealed that the model was 96 per cent good fit.

CONCLUSION

The present study focused on growth performance of quantity and value of spices export. The major spice export of India shows positive trend in terms of world exports, total exports, Agricultural exports and spices exports. India is known as the home of spices and Indian spices has got a good name in the world market. The spices export share of India in agricultural exports increased from 4.8 percent in 1991-92 to 11.6 per cent in 2019-20. The impact of india's spices export anaylsis are done for the post liberlaization period the long run impact of the trade performance. In demand side, the explanatory variables REER, World demand and Openness had positively related with spices export. It indicated that one per cent increase in REER, World demand, Openness would increase the spices export by 0.615 per cent 0.634 per cent and 0.888 per cent respectively. The Tariff rate had favorable and significant impact on commodity, which is one per cent decrease in Tariff rate would result in increased spices export by 0.266 per cent respectively. The R^2 value fitted at the point 0.968 revealed that the model was 96 per cent good fit. In supply side, the explanatory variables Relative price, capability to export, FDI, Openness had positively related with tobacco export. It indicated that one per cent increase in Relative price, capability to export, FDI, Openness would increase the spices export by 0.392 per cent, 0.496 per cent, 0.008 per cent and 0.249 per cent respectively. The Domestic demand and Tariff rate had negatively related with dependent variable. One per cent decrease in Domestic demand and Tariff rate would result in increased spices export by 0.187 per cent and 0.229 per cent respectively. The R^2 value fitted at the point 0.964 revealed that the model was 96 per cent good fit. The above discussion is that India is performing well as far as exports of spices are concerned. It seems that various factors appear to play a larger role determining the performance of major spices export. Still it has the potential to perform better under such circumstances the Government should design supportive polices and development of strategies for spices exports**.** Thus, in order to improve the performance of spices export sector, policies must be introduced so that the performance of agriculture sector is improved and strengthened in future.

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