

Growth of Agriculture Trade in the Indian Economy

M. Tamizharasan

*Ph.D., Research Scholar, Department of Econometrics, School of Economics,
Madurai Kamaraj University, Madurai-625 021, Tamil Nadu, India*

Abstract: India is the world largest producer of major agriculture products and it is based on agro-climatic conditions and rich in natural resources and it improves the living conditions of rural people. Indian agriculture products are strong position in the global market in recent times. This study explained why there is increase in agriculture imports and decline in agriculture exports in India. The objectives of the study is divided into three categories such as: the first objective is the growth of agriculture imports and exports, balance of trade, the second objective is the Share of agriculture imports and exports and trend analysis and the third objective is the share of agriculture GDP to total GDP and the relationship between agriculture imports and exports and total GDP. This study is based on the time series data from 1990-91 to 2014-15 of the value of crores in Rupees. The data were collected from Agricultural Statistics at A Glance 2016 and Hand Book of Statistics on The Indian Economy 2016-17. The study analysis of agriculture imports and exports are calculate based on annual growth rate, index numbers, percentage, compound growth rate and the simple linear regression model and semi-log linear regression models are used.

Key Words: Agriculture Imports, Exports, Balance of Trade, Agriculture GDP and GDP

I. INTRODUCTION

India is the world largest producer of major agriculture products and it is based on agro-climatic conditions and rich in natural resources and it improves the living conditions of rural people. In 1990s Globalization and Liberalization policy implies that increase in agriculture exports and improved access to domestic and international markets. This study explained why there is increase in agriculture imports and decline in agriculture exports in India. There is much reason for agriculture trade competitiveness such as low agriculture price, oversupply of agriculture commodities in the world, low investment of agriculture sector, and structure of global markets.

Indian agriculture products are strong position in the global market in recent times. This study aims at studying three categories such as: the first objective is the growth of agriculture imports and exports, balance of trade, the second objective is the Share of agriculture imports and exports and trend analysis and the third objective is the share of agriculture GDP to total GDP and the relationship between agriculture imports and exports and GDP. This study is based on the time series data from 1990-91 to 2014-15 of the value of crores in Rupees. The data were collected from Agricultural Statistics at A Glance 2016 and Hand Book of Statistics on The Indian Economy 2016-17. The study analysis

of agriculture imports and exports are calculate based on annual growth rate, index numbers, percentage and the simple linear regression model and semi-log linear regression models are used.

The study divided into seven chapters: the first three chapters is introduction, review of earlier studies and methodology of the study. The fourth chapter is growth of agriculture imports and exports and balance of trade of the study. The fifth chapter is share of agriculture imports and exports, agriculture GDP to total GDP at factor cost and trends. The sixth chapter is relationship between agriculture imports and exports and GDP of the study. The last chapter is conclusion of the study.

II. REVIEW OF EARLIER STUDIES

In the literature, studies on the growth of the India's agricultural trade are very very limited. Some of the related studies are: Ali Ghufuran and Syed Fahad Ashraf (2012), Bhalla, G.S. and Gurmail Singh (2009-10), Biswajit Dhar and Murali Kallummam (2004), Dhanmanjirt Sathe and Deshpande, R.S. (2006-2007), Kanaka, S. and Chinadurai, M. (2012), Sandip Das (2012), Sunny Thomas and Waheeda Sheikh, C. and Vandana Tyagi (2012) and so on. However, studies on the growth of agricultural exports, agricultural imports, balance of trade and pattern of agricultural trade are not available much.

III. METHODOLOGY

This study is based on the time series data from 1990-91 to 2014-15. This time period divided into two sub periods namely, 1990-91 to 1999-2000 and 2000-01 to 2014-15. The data were collected from Agricultural Statistics at A Glance 2016 and Hand Book of Statistics on The Indian Economy 2016-17. The study variables agriculture imports and exports are measured in value of crores in Rupees and agriculture GDP and GDP at factor cost are measured in billions of Rupees. For the analysis of agriculture imports and exports are calculate based on annual growth rate, index numbers, percentage and the simple linear regression model and semi-log linear regression models are used. This study to analyse the relationship between agriculture imports, exports and GDP, simple linear regression model is used by taking GDP as dependent variables and agriculture imports, exports as independent variables. The regression coefficients have been tested against null hypothesis that their value is zero using the t test.

IV. GROWTH OF AGRICULTURE IMPORTS, EXPORTS AND BALANCE OF TRADE

4.1 Growth of Agriculture Imports

Table 1 explain that the agriculture imports of India, during the period from 1990-91 to 2014-15 and the agriculture import was Rs.1,205.86 crores in Rupees in 1990-91. It was increased continuously year by year and reached Rs.16,066.73 crores in Rupees in 1999-2000. The agriculture import was slightly decreased in Rs.2,327.33 and Rs. 5,890.10 crores in Rupees in 1993-94 and 1995-96. This time period, the growth of agriculture imports is negative. The average value of agriculture imports is Rs.6,574.50 crores in Rupees. Index numbers shows that the agriculture import has increased by 13 times and the average annual growth rate is 136.93 per cent in this period.

During the second decade, the agriculture import was Rs.12,086.23 crores in Rupees in 2000-01. It increased continuously year by year and reached Rs.1,21,319.02 crores in Rupees in 2014-15. Only four time period 2005-06, 2007-08, 2010-11 and 2013-14 the agriculture imports is slightly decline and also the growth of agriculture imports is negative. The average value of agriculture imports is Rs.43,956.79 crores in Rupees. Index numbers shows that the agriculture import has increased by 10 times and the average annual growth rate is 64.56 per cent in this period.

Table 1

Agriculture Imports during (1990-91 to 2014-15)

(Value in Rs Crore)

Year	Agricultural Imports	Agricultural Exports	Annual Growth Rate	
			Imports	Exports
1990-91	1205.86	6012.76	-	-
1991-92	1478.27	7838.04	22.59	30.36
1992-93	2876.25	9040.30	94.57	15.34
1993-94	2327.33	12586.55	-19.08	39.23
1994-95	5937.21	13222.76	155.11	5.05
1995-96	5890.10	20397.74	-0.79	54.26
1996-97	6612.60	24161.29	12.27	18.45
1997-98	8784.19	24832.45	32.84	2.78
1998-99	14566.48	25510.64	65.83	2.73
1999-00	16066.73	25313.66	10.30	-0.77
Average	6574.50	16891.62	136.93	35.67
2000-01	12086.23	28657.37	-24.77	13.21
2001-02	16256.16	29728.61	34.50	3.74
2002-03	17608.83	34653.94	8.32	16.57
2003-04	21972.68	36415.48	24.78	5.08
2004-05	22811.84	41602.65	3.82	14.24
2005-06	15977.75	45710.97	-29.96	9.88
2006-07	23000.28	57767.87	43.95	26.38

2007-08	22549.81	74673.48	-1.96	29.26
2008-09	28719.24	81064.52	27.36	8.56
2009-10	54365.29	84443.95	89.30	4.17
2010-11	51073.97	113046.58	-6.05	33.87
2011-12	70164.51	182801.00	37.38	61.70
2012-13	95718.89	227192.61	36.42	24.28
2013-14	85727.30	262778.54	-10.44	15.66
2014-15	121319.02	239681.04	41.52	-8.79
Average	43956.79	102681.24	64.56	52.60

Source: Agricultural Statistics at A Glance 2016.

4.2 Growth of Agriculture Exports

The agriculture exports of India, during the period from 1990-91 to 2014-15 and the agriculture export was Rs.6,012.76 crores in Rupees in 1990-91. It was increased continuously year by year and reached Rs.25,313.66 crores in Rupees in 1999-2000. The agriculture export was slightly decreased in 1999-2000 and this time period, the annual growth rate is negative. The average value of agriculture export is Rs.16,891.62 crores in Rupees. Index numbers shows that the agriculture export has increased by 4 times and the average annual growth rate is 35.67 per cent in this period.

During the second decade, the agriculture export was Rs.28,657.37 crores in Rupees in 2000-01. It increased continuously year by year and reached Rs.2,39,681.04 crores in Rupees in 2014-15. The average value of agriculture exports is Rs.1,02,681.24 crores in Rupees. Index numbers shows that the agriculture export has increased by 8 times and the average annual growth rate is 52.60 per cent in this period.

4.3 Balance of Trade for Agricultural Goods

The value of exports minus the value of imports is defined as the balance of trade. During the period 1990-91 to 2014-15, the value of exports is greater than the value of imports. Therefore, the balance of trade remains positive. That is, balance of trade is surplus for agricultural goods during the period under investigation. Table 5 shows that, the different values of balance of trade for agricultural goods expressed in crores of Indian Rupees during the period 1990-91 to 2014-15. The value of balance of trade is increasing, except four years. It has grown from Rs.4,806.90 crores in 1990-91 to Rs.9,246.93 crores in 1999-2000. Table 2 shows that, the balance of trade is decreasing four years. It was grown from Rs.16,571.14 crores in 2000-01 to Rs.1,18,362.02 crores in 2014-15. Surplus balance of trade for agricultural goods indicates that for the past 25 year periods, we have a good export potential in the case of agricultural goods and for a few selected commodities we have surplus in production.

V. SHARE OF AGRICULTURE IMPORTS, EXPORTS TO TOTAL IMPORTS, EXPORTS AND TRENDS

5.1 Share of Agriculture Imports to Total Imports

Table 3 shows that, the share of agriculture imports to total imports during the period from 1990-91 to 2014-15. The share of agriculture imports to total imports was 2.79 per cent in 1990-91. It increased and reached 7.45 per cent in 1999-2000. The average share for this decade was 5.11 per cent. The agriculture imports slightly decreased in three time periods 1993-94, 1995-96 and 1999-2000. The highest share was 8.17 per cent in 1998-99 and the lowest share was 2.79 per cent in 1990-91.

In the next decade, the share of agriculture imports to total imports was 5.29 per cent in 2000-01. It decreased and reached 4.43 per cent in 2014-15. The average share for this decade was 3.95 per cent. Only six time periods, the agriculture imports increased in 2001-02, 2003-04, 2006-07, 2009-10, 2012-13 and 2014-15 and other time periods the agriculture imports has decreased. The highest share was 6.63 per cent in 2001-02 and the lowest share was 2.09 per cent in 2008-09.

Table 2
Balance of Trade for Agricultural Goods during 1990-91 to 2014-15
(Value in Rs Crores)

Year	Agricultural Exports	Agricultural Imports	Balance of Trade
1990-91	6012.76	1205.86	4806.90
1991-92	7838.04	1478.27	6359.77
1992-93	9040.30	2876.25	6164.05
1993-94	12586.55	2327.33	10259.22
1994-95	13222.76	5937.21	7285.55
1995-96	20397.74	5890.10	14507.64
1996-97	24161.29	6612.60	17548.69
1997-98	24832.45	8784.19	16048.26
1998-99	25510.64	14566.48	10944.16
1999-00	25313.66	16066.73	9246.93
Average	16891.62	6574.50	10317.12
2000-01	28657.37	12086.23	16571.14
2001-02	29728.61	16256.16	13472.45
2002-03	34653.94	17608.83	17045.11
2003-04	36415.48	21972.68	14442.80
2004-05	41602.65	22811.84	18790.81
2005-06	45710.97	15977.75	29733.22
2006-07	57767.87	23000.28	34767.59
2007-08	74673.48	22549.81	52123.67
2008-09	81064.52	28719.24	52345.28
2009-10	84443.95	54365.29	30078.66
2010-11	113046.58	51073.97	61972.61
2011-12	182801.00	70164.51	112636.49
2012-13	227192.61	95718.89	131473.72

2013-14	262778.54	85727.30	177051.24
2014-15	239681.04	121319.02	118362.02
Average	92895.54	38430.91	54464.63

Source: Agricultural Statistics at A Glance 2016.

5.2 Share of Agriculture Exports to Total Exports

Table 4 shows that, the share of agriculture exports to total exports during the period from 1990-91 to 2014-15. The share of agriculture exports to total exports was 18.49 per cent in 1990-91. It decreased and reached 15.91 per cent in 1999-2000. The average share for this decade was 17.91 per cent. The agriculture exports slightly increased in three time periods 1993-94, 1995-96 and 1996-97 and other time period decreased. The highest share was 20.33 per cent in 1996-97 and the lowest share was 15.91 per cent in 1999-2000.

Table 3
Share of Agriculture Imports to Total Imports
(Value in Rs Crores)

Year	Agricultural Imports	Total Imports	Percentage
1990-91	1205.86	43170.82	2.79
1991-92	1478.27	47850.84	3.09
1992-93	2876.25	63374.52	4.54
1993-94	2327.33	73101.01	3.18
1994-95	5937.21	89970.70	6.60
1995-96	5890.10	122678.14	4.80
1996-97	6612.60	138919.88	4.76
1997-98	8784.19	154176.29	5.70
1998-99	14566.48	178331.69	8.17
1999-00	16066.73	215528.53	7.45
Average	6574.50	112710.24	5.11
2000-01	12086.23	228306.64	5.29
2001-02	16256.16	245199.72	6.63
2002-03	17608.83	297205.87	5.92
2003-04	21972.68	359107.66	6.12
2004-05	22811.84	501064.54	4.55
2005-06	15977.75	660408.90	2.42
2006-07	23000.28	840506.31	2.74
2007-08	22549.81	1012311.70	2.23
2008-09	28719.24	1374435.55	2.09
2009-10	54365.29	1363735.55	3.99
2010-11	51073.97	1683466.96	3.03
2011-12	70164.51	2345463.24	2.99
2012-13	95718.89	2669161.96	3.59
2013-14	85727.30	2715433.91	3.16
2014-15	121319.02	2737086.58	4.43
Average	43956.79	1268859.67	3.95

Source: Agricultural Statistics at A Glance 2016.

In the next decade, the share of agriculture exports to total exports was 14.23 per cent in 2000-01. It decreased and reached 14.17 per cent in 2013-14. The average share for this decade was 12.25 per cent. The agriculture exports slightly increased in five time periods 2006-07, 2007-08, 2009-10, 2011-12 and 2012-13. The highest share was 14.23 per cent in 2001-02 and the lowest share was 9.64 per cent in 2008-09.

Table 4
Share of Agriculture Exports to Total Exports
(Value in Rs Crores)

Year	Agricultural Exports	Total Exports	Percentage
1990-91	6012.76	32527.28	18.49
1991-92	7838.04	44041.81	17.80
1992-93	9040.30	53688.26	16.84
1993-94	12586.55	69748.85	18.05
1994-95	13222.76	82673.40	15.99
1995-96	20397.74	106353.35	19.18
1996-97	24161.29	118817.32	20.33
1997-98	24832.45	130100.64	19.09
1998-99	25510.64	139751.77	18.25
1999-00	25313.66	159095.20	15.91
Average	16891.62	93679.79	17.99
2000-01	28657.37	201356.45	14.23
2001-02	29728.61	209017.97	14.22
2002-03	34653.94	255137.28	13.58
2003-04	36415.48	293366.75	12.41
2004-05	41602.65	375339.53	11.08
2005-06	45710.97	456417.86	10.02
2006-07	57767.87	571779.28	10.10

2007-08	74673.48	655863.52	11.39
2008-09	81064.52	840755.06	9.64
2009-10	84443.95	845533.64	9.99
2010-11	113046.58	1136964.22	9.94
2011-12	182801.00	1465959.31	12.47
2012-13	227192.61	1634318.29	13.90
2013-14	262778.54	1905011.00	13.79
2014-15	239681.04	1896445.47	12.64
Average	102681.24	849551.04	11.96

Source: Agricultural Statistics at A Glance 2016.

5.3 Trend Analysis of Agriculture Imports and Exports

The results of trend analysis for the agriculture imports and exports are given in table 5. The agriculture imports increased annually by Rs.1,622 crores in Rupees in 1990-91 to 1999-2000 and Rs.6,900 crores in Rupees in 2000-01 to 2014-15. This value is statistically significant at one per cent level. The value of adjusted R^2 is 0.867 and 0.789 and it implies that the agriculture imports have registered a linear trend in this period. The agriculture imports increased at the compound growth rate of 33.78 and 17.12 per cent per year.

The agriculture exports increased annually by Rs.2,535 crores in Rupees in 1990-91 to 1999-2000 and Rs.16,924 crores in Rupees in 2000-01 to 2013-14. This value is statistically significant at one per cent level. The value of adjusted R^2 is 0.92 and 0.82 and it implies that the agriculture exports have registered a linear trend in this period. The agriculture exports increased at the compound growth rate of 19.01 and 18.89 per cent per year. The trend growth rate of agriculture output in India is marginally ahead of the population growth. Therefore, it is necessary that the growth rate of agriculture sector needs greater acceleration.

TABLE 5
Results of Trend Analysis for the India's Imports and Exports of Agricultural Product

Year	Variables	Model	a	b	SE of b	T	R ²	Adj.R ²	CGR
1990-91 to 1999-2000	Imports	Simple linear	-2349.288	1622.507	209.829	7.733	0.882	0.867	-
		Semi-log linear	6.862	0.291	0.023	12.886	0.954	0.948	33.78
2000-01 to 2014-15		Simple linear	-11244.768	6900.194	943.954	7.310	0.804	0.789	-
		Semi-log linear	9.157	0.158	0.014	10.982	0.903	0.895	17.12
1990-91 to 1999-2000	Exports	Simple linear	2949.077	2535.008	237.422	10.677	0.934	0.926	-
		Semi-log linear	8.658	0.174	0.018	9.824	0.923	0.914	19.01
2000-01 to 2014-15		Simple linear	-32712.905	16924.268	2137.278	7.919	0.828	0.815	-
		Semi-log linear	9.863	0.173	0.010	18.034	0.962	0.959	18.89

5.4 Share of Agriculture GDP to Total GDP at Factor Cost

Table 6 shows that, the share of agriculture & allied activities GDP at factor cost at current prices and GDP at factor cost during the period from 1990-91 to 2014-15. The share of agriculture & allied activities GDP to total GDP was

29.02 per cent in 1990-91. It decreased and reached 24.50 per cent in 1999-2000. The average share for this decade was 27.37 per cent. The agriculture & allied activities GDP slightly increased in two time periods 1991-92, and 1996-97.

The highest share was 29.39 per cent in 1991-92 and the lowest share was 24.50 per cent in 1999-2000.

In the next decade, the share of agriculture & allied activities to total GDP was 23.02 per cent in 2000-01. It decreased and reached 18.02 per cent in 2014-15. The average share for this decade was 18.94 per cent. The agriculture exports slightly increased in four time periods 2003-04, 2010-11, 2012-13 and 2013-14. The highest share was 23.02 per cent in 2000-01 and the lowest share was 17.74 per cent in 2009-10.

VI. RELATIONSHIP BETWEEN AGRICULTURE IMPORTS, EXPORTS AND GDP

The relationship between agriculture imports, exports and GDP at factor cost has been studied through simple linear regression model by taking GDP as dependent variable and agriculture imports, exports as independent variable for the two sub periods 1990-91 to 1999-2000 and 2000-01 to 2014-15.

Table 6

Share of Agriculture & Allied Activities of GDP to GDP at Factor Cost

Year	Agriculture & Allied Activities at Current Prices	GDP at Factor Cost	Percentage
1990-91	1543.50	5318.13	29.02
1991-92	1803.13	6135.28	29.39
1992-93	2022.19	7037.23	28.74
1993-94	2345.66	8179.61	28.68
1994-95	2701.07	9553.85	28.27
1995-96	2937.01	11185.86	26.26
1996-97	3531.42	13017.88	27.13
1997-98	3747.44	14476.13	25.89
1998-99	4303.84	16687.39	25.79
1999-00	4553.02	18582.05	24.50
Average	2948.828	11017.341	27.37
2000-01	4606.08	20007.43	23.02
2001-02	4986.20	21752.60	22.92
2002-03	4850.80	23438.64	20.70

2003-04	5446.67	26258.19	20.74
2004-05	5654.26	29714.64	19.03
2005-06	6377.72	33905.03	18.81
2006-07	7229.84	39532.76	18.29
2007-08	8365.18	45820.86	18.26
2008-09	9432.05	53035.67	17.78
2009-10	10835.14	61089.03	17.74
2010-11	13196.86	72488.60	18.21
2011-12	14990.98	83916.91	17.86
2012-13	16751.07	92026.92	18.20
2013-14	19263.72	103631.53	18.59
2014-15	20689.58	114817.94	18.02
Average	10178.41	54762.45	18.94

Source: HandBook of Statistics on the Indian Economy 2014-15.

The relationship between agriculture imports and GDP in India, during the first decade, GDP at factor cost increases by Rs.0.804 if agriculture imports decreased by one Rupee. This value is statistically significant at one per cent level. The value of adjusted R^2 is 0.927 and it implies that 93 per cent variations in GDP are explained by the variations in agriculture imports in this period. In the next decade, GDP increases by Rs.0.887 if agriculture imports decreased by one Rupee. This value is statistically significant at one per cent level. The value of adjusted R^2 is 0.921 and it implies that 92 per cent variations in GDP are explained by the variations in agriculture imports in this period.

The relationship between agriculture exports and GDP in India, during the first decade, GDP increases by Rs.0.547 if agriculture exports decreased by one Rupee. This value is statistically significant at one per cent level. The value of adjusted R^2 is 0.891 and it implies that 89 per cent variations in GDP are explained by the variations in agriculture exports in this period. In the next decade, GDP increases by Rs.0.370 if agriculture exports decreased by one Rupee. This value is statistically significant at one per cent level. The value of adjusted R^2 is 0.936 and it implies that 94 per cent variations in GDP are explained by the variations in agriculture exports in this period.

TABLE 7

Relationship between Agriculture Imports and Exports and GDP in India

Year	Variable	Model	a	b	SE of b	T	R ²	Adj.R ²
1990-91 to 1999-2000	Imports → GDP	Simple linear	5466.387	0.844	0.079	10.737	0.935	0.927
2000-01 to 2014-15		Simple linear	15787.651	0.887	0.069	12.852	0.927	0.921
1990-91 to 1999-2000	Exports → GDP	Simple linear	1781.648	0.547	0.063	8.657	0.904	0.891
2000-01 to 2014-15		Simple linear	16813.238	0.370	0.026	14.389	0.941	0.936

VII. CONCLUSION

The study explained the growth of agriculture trade in Indian economy. The growth of agriculture imports and exports increased from 10 and 8 times during the period from

1990-91 to 2014-15. The percentage share of agriculture imports increase from 2.79 per cent to 4.43 per cent and the decrease in agriculture exports from 18.49 per cent to 12.64 per cent in this time period. This means that a slow rise in agriculture imports in total imports and the agriculture exports

slowly declined in total exports in India. The declined agriculture export was mainly due to low commodity prices and oversupply in the global market. The balance of trade of agriculture commodities remained surplus throughout the period of investigation and the first and second decade expect eight years, the balance of trade is increasing. It has increased from Rs 4,806.90 crores to Rs 9,246.93 crores during the period from 1990-91 to 1999-2000 and Rs 16,571.14 crores to Rs 1,18,362.02 crores during the period from 2000-01 to 2014-15.

The trend analysis reveal that agriculture imports increase annually by Rs 1,622 crores to Rs 6,900 crores and the compound growth rate is 33.78 per cent and 17.12 per cent during the period from 1990-91 to 1999-2000 and 2000-01 to 2014-15. The trend analysis reveal that agriculture exports increase annually by Rs 2,535 crores to Rs 16,924 crores and the compound growth rates is 19.01 per cent and 19.48 per cent during the period from 1990-91 to 1999-2000 and 2000-01 to 2014-15. In all the years, agriculture exports are greater than agriculture imports. The percentage share of agriculture GDP decrease from 29.02 per cent to 18.02 per in this time period. This means that the agriculture GDP decreased to total GDP and it implies that the agriculture GDP contribute to the very low in economic growth. So the government should encourage agriculture and allied activities on more subsidy, employment opportunities, infrastructure development, new

former welfare scheme and public investment in agriculture sector in the Indian economy.

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