



Trends in Agricultural Trade of Asia Pacific Region

P. Soumya^{1*} and R. A. Yeledhalli¹

¹Department of Agribusiness Management, College of Agriculture, UAS Dharwad, India.

Authors' contributions

This work was carried out in collaboration between both authors. Author PS conducted the study, involved in data collection, analysis, tabulation and writing the research paper. Author RAY is the chairman of the advisory committee involved in planning, constant monitoring throughout the study, analyzing and interpreting the results. Both authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2021/v40i1031358

Editor(s):

(1) Dr. Hamid El Bilali, University of Natural Resources and Life Sciences (BOKU), Austria.

Reviewers:

(1) Gui Ying Ning, Liuzhou Institute of Technology, China.

(2) Wang Lina, Hainan Normal University, China.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/68721>

Original Research Article

Received 10 March 2021

Accepted 17 May 2021

Published 20 May 2021

ABSTRACT

The present study was carried out to assess the growth rate in agricultural exports and imports of Asia Pacific region. Data for a period of 27 years i.e., from 1992 to 2018 is considered for analysis. The agricultural exports from Asia Pacific region and the world showed positive and significant annual growth rate of 7.90 per cent and 7.09 per cent, respectively. And also, there is increasing trend in import of agricultural commodities to Asia Pacific region (7.29%) and world (6.94%). In case of Asia Pacific agricultural exports as well as imports, the share of Animal and Fibre products decreased whereas share of Vegetable and Food products increased gradually over the study period. The growth rate of Vegetable products is 9.33 and 9.29% in case of exports and imports, respectively. The growth rate of both agricultural exports and imports is increasing for entire Asia Pacific region due to increasing share of Vegetable products. To maintain the increasing trend there is a need to focus on liberalizing logistics, facilitating adoption of modern information and communication technologies promoting competition among service providers and improving access to credit and trade finance.

Keywords: Trend; CAGR; agricultural commodities; growth rate.

*Corresponding author: E-mail: soumyapasupuleti@gmail.com;

1. INTRODUCTION

Asia Pacific region is an important region player in the world with a contribution of nearly one-fourth of world's agricultural trade. Several countries of various types and structure are there in this region. The Asia Pacific region includes world's second and third largest economies China and Japan. Most of the emerging economies of east and South east Asia are also included in this region. There is rapid change in agricultural trade during the recent past in this region.

Most of the countries present in Asia-Pacific region are dependent on Agriculture. The countries like Singapore and Lao's people democratic republic have represented the diverse structure in their economies which have led to provision of resources and there is scope for growth in trade due to transformation, diversification and smoothening of trade barriers for smoother integration into the regional and world economies, cross border trade, investment and technology.

The share of agriculture sector in GDP is high for poorer countries whereas for richer countries agriculture share in GDP is low in this region. So, for most of the countries change in agricultural trade brings change in economic growth due to high impact of agricultural exports and imports on GDP of the country.

Major trading countries in Asia Pacific region in case of agricultural products are China, India, Australia, Indonesia, Thailand, Malaysia, New Zealand and Vietnam for exports and China, Japan, Korea, India, Vietnam, Indonesia and Bangladesh for Imports. Major agricultural commodities exported from Asia Pacific region are palm oil, cotton and aquaculture products whereas major agricultural commodities imported are meat, vegetable and Animal fats and aquaculture products.

Some of the past studies taken were explained to clearly understand concepts and tools

Thomas and Sheik [1] analyzed growth and performance of agricultural exports from India during post reform era. The compound growth rate for India's agricultural exports during the period 1991-92 to 2008-09 grew 9.2 per cent per year. Cereals and cereal preparations, fruits, pulses, spices, tobacco, cotton, meat and its preparations, dairy and poultry products showed

higher compound annual growth rate than that of India's total agricultural exports.

Carter and Steinbach [2] attempted to study growing role of China in agricultural trade. The period considered for the study was from 2002 to 2011. Compound annual growth rate of agricultural exports and imports were 12 per cent and 19 per cent per annum respectively. On an average the total trade increased at the rate of 16 percent per annum.

Nabi and Dhami [3] analyzed pattern of India's agricultural exports during pre- and post-WTO regime. On an average during the pre-WTO period (1980-81 to 1994-95) the annual growth of agricultural exports showed negative figure of - 2.8 per cent. During post-WTO period the growth rate has increased to 9.5 per cent per annum. This showed that WTO has positive impact on India's agricultural exports.

Gupta [4] analyzed trends in imports and exports of India during the period 1970 to 2011. The growth rates of both imports and exports showed fluctuations during the entire study period. The growth of export showed a sharp decrease in 1990-91 and highest growth in 2010-11. The growth rate of imports showed a sharp decrease during 2008-10 due to global financial crisis during 2008.

Serrano and Pinilla [5] studied changes in composition of international trade in agri-food industry. Food and agricultural products were classified into three product groups i.e., homogeneous goods, reference priced goods and differentiated products based on Rauch's classification. Trade flows of forty countries during the period 1963 to 2010 were considered for the study. Results indicated growth in reference priced and differentiated products due to home market effect whereas homogeneous goods show reverse effect.

Singh [6] analyzed the trends in trade between India and Bhutan using the time series data for the period 1985 to 2012. In order to see the impact of Agreement on SAARC Preferential Trading Arrangement (SAPTA) on India's trade with Bhutan, the whole time period was divided into three sub-periods: 1985 to 1995 (pre-SAPTA period), 1996 to 2005 (SAPTA period) and 2006 to 2012 (post-SAPTA period). India's trade with Bhutan increased at compound annual growth rate (CAGR) of 4.5 per cent, 11.3 percent and 11.1 per cent during pre-SAPTA, SAPTA and post-SAPTA period which implied trade

performance improved significantly during SAPTA period.

Sinha [7] analyzed structural changes in composition of India's export during post-economic reform period. Engineering goods, petroleum products, chemicals and allied products, gems and jewellery, textiles, electronic goods etc., contributed over 80 per cent of total Indian exports. Gems and jewellery were the major contributor to the India's export basket. On an average overall mobility and turnover was 12.3 per annum. Concentration ratio of composition of commodities showed positive and significant annual compound growth rate. The concentration ratio was found to be 0.071 on an average.

Karnik and Burange [8] made an attempt to examine trends and patterns of merchandise trade between India and Japan using data from 1990-91 to 2015-16. The results revealed that India's exports to Japan increased at the rate of 6.77 per cent per annum whereas India's imports from Japan increased at the rate of 9.61 per cent per annum.

Though Asia Pacific is contributing one fourth of world's trade, not many studies are done in this area. The study is an attempt to analyze the growth rate agricultural trade in Asia Pacific region.

2. METHODOLOGY

2.1 Description of the Study Area

All the countries coming under the ambit of Asia Pacific region are

Asia: Afghanistan, Bangladesh, Bhutan, Brunei Darussalam, Cambodia, China, DPR Korea, India, Indonesia, Iran, Japan, Kazakhstan, Lao PDR, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, Timor-Leste, Uzbekistan and Vietnam.

Pacific: Australia, Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, New Zealand, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.

2.2 Nature and Sources of Data

Data related to composition of trade were based on Harmonized System coding (HS 1992). Data

considered for analysis for a period of 27 years i.e., from 1992 to 2018.

The research study completely based on the secondary sources of data. The data from UNCOMTRADE is obtained by using World Integrated Trade Solution (WITS) software.

2.3 Compound Annual Growth Rate

The Compound Annual Growth Rate (CAGR) is a useful measure of growth over multiple time periods. In the present study. The CAGR was used to analyse the trends in agricultural exports and agricultural imports in terms of value for Asia Pacific region and also for World during the period 1992 to 2018.

The agricultural commodities are categorised into 4 groups such as Animal products, Vegetable products, Food products and Fibre products. CAGR is calculated for all the groups both in case of exports and imports for a period from 1992 to 2018.

The compound growth rate (CAGR) is estimated by fitting a semi-log trend equation of the following form:

$$Y_t = AB_t u_t \quad (1)$$

Where,

Y_t = Export or Import during time t

A = Constant

t = Time period

u_t = Error term

$B = (1+g)$, where g = growth rate

By taking the logarithm, equation (1) was reduced to the following form.

$$\log Y_t = \log A + t(\log B) + \log u_t \quad (2)$$

Where $\log A$ and $\log B$ were the parameters of the function obtained by ordinary least square (OLS) method. Once the above equation is estimated, g can be computed as:

$$g = [\text{Antilog}(B) - 1]100 \quad (3)$$

3. RESULTS AND DISCUSSION

3.1 Trends in Agricultural Commodity Exports

The data on agricultural commodity exports in terms of value from Asia Pacific region and world are presented in Table 1. During the study period i.e., from 1992 to 2018, the average agricultural commodity export from Asia Pacific region is

2,06,769.51 million USD and for world is 9,31,708.16 million USD. The Asia Pacific region and the world showed positive and significant annual growth rate of 7.90 per cent and 7.09 per cent respectively. The CAGR of both Asia Pacific and world are significant at 1%. The growth rate is highest for Asia Pacific region than that of the world. The Coefficient of Variation (C.V) of agricultural commodity export (Million USD) for Asia Pacific and world are 59.97 and 51.78 per cent respectively. The share of Asia Pacific exports in exports of world lies between 17.76 to 24.52%. This share decreased at first but increased gradually over the study period.

Fig. 1 depicts the trends in agricultural commodity exports in from Asia Pacific region

and world. The peaks and troughs are clearly seen in case of plot of world whereas for Asia Pacific region the plot does not show much clear peak or trough.

3.2 Composition of Asia Pacific Agricultural Exports

The CAGR and composition of various categories in total Asia Pacific agricultural exports are calculated and presented in Table 2. The study is done for the entire period but the results of only three years are presented to get an idea. Whereas CAGR for the entire period is calculated and tabulated.

Table 1. Time series data agricultural commodity exports for the period from 1992 to 2018

Year	Asia Pacific (in Million USD)	World (in Million USD)	Percentage of Asia Pacific to world
1992	70326.44	278317.24	25.27
1993	71289.94	298587.89	23.88
1994	85564.50	418880.14	20.43
1995	93377.79	508275.82	18.37
1996	99925.81	535181.76	18.67
1997	102763.75	538833.85	19.07
1998	91401.77	514747.22	17.76
1999	91271.57	494818.52	18.45
2000	100015.73	492262.96	20.32
2001	102344.03	513026.47	19.95
2002	109288.38	544066.46	20.09
2003	125070.29	633873.41	19.73
2004	144906.43	720925.88	20.10
2005	156585.46	771190.31	20.30
2006	175169.07	852871.01	20.54
2007	204337.22	1013142.49	20.17
2008	247402.01	1219948.66	20.28
2009	216825.61	1080570.98	20.07
2010	281240.38	1235277.35	22.77
2011	365018.42	1504258.10	24.27
2012	363706.12	1514550.31	24.01
2013	382191.60	1601576.02	23.86
2014	391976.56	1628746.69	24.07
2015	359447.81	1466167.48	24.52
2016	356574.42	1480381.11	24.09
2017	393286.97	1618254.87	24.30
2018	401468.56	1677387.27	23.93
Average (Million USD)	206769.51	931708.16	-
C.V (%)	59.97	51.78	-
CAGR (%)	7.90**	7.09**	-

Note: ** represent significant at 1% probability level

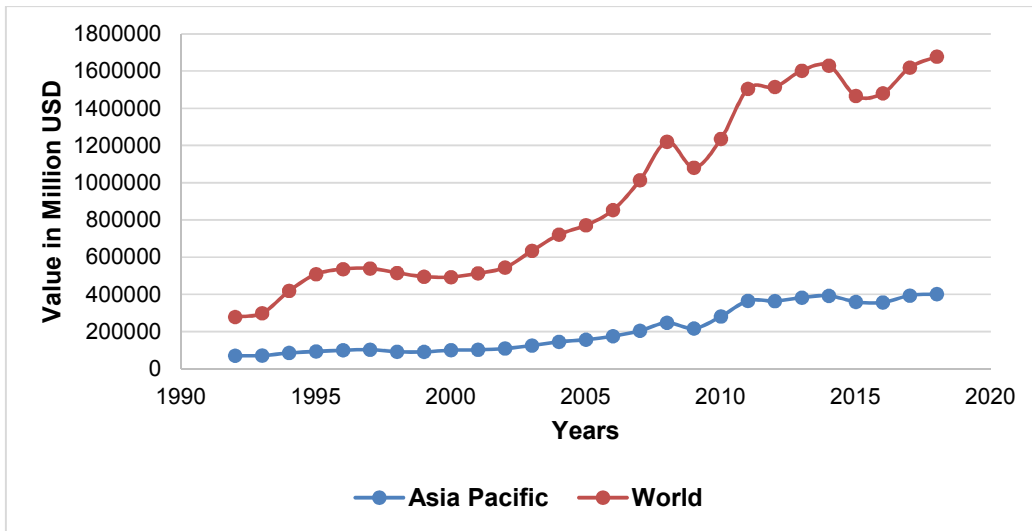


Fig. 1. Trends in agricultural commodity exports from Asia Pacific region and world

During the study period, in Asia Pacific agricultural exports the share of Animal and Fibre products decreased whereas share of Vegetable and Food products increased. In 1992, Animal products have contributed major share of 29.60 % to total exports. whereas during 2005 and 2018 Vegetable products contributed major share of 31.22 and 36.62% to the total respectively. The CAGR is highest for Vegetable products (9.33%) followed by Food (9.17%), Animal (6.24%) and Fibre products (5.63%). These growth rates are significant at 1% probability level. The growth rate of agricultural exports from Asia Pacific region showing increasing trend due to increasing contribution by Vegetable products.

3.3 Trends in Agricultural Commodity Imports

The time series data for agricultural commodity imports in terms of value to Asia Pacific region and world are presented in Table 3. Fig. 2 portrays the trends in agricultural commodity imports to Asia Pacific region and world. From the Table 3, the average agricultural commodity import to Asia Pacific region and world are 2,27,268.56 and 9,53,304.19 million USD respectively. There is increasing trend in import of agricultural commodities (in value terms) to Asia Pacific region (7.29%) and world (6.94%). The agricultural imports of both Asia Pacific and world are found to be significant at one per cent. The Asia Pacific region has highest growth rate than the world in case of imports. The results showed that coefficient of variation in agricultural

commodity import (Million USD) for Asia Pacific region is 57.48 per cent and for world it is 50.03 per cent. The percentage of Asia Pacific imports in the world imports varied from 19.35 to 30.85 during the study period.

Fig. 2 portrays the trends in agricultural commodity imports to Asia Pacific region and world. In case of Asia Pacific the plot shows a gradual growth whereas for world, peaks and troughs are clearly seen.

3.4 Trends in Agricultural Commodity Imports

The details of CAGR and composition of various categories in total Asia Pacific agricultural imports are presented in Table 4. In case of imports, the share of Animal and Fibre products decreased whereas share of Vegetable and Food products increased gradually over the study period. Animal products contributed major share (33.37%) in the year 1992 whereas Vegetable products contributed a major share of 34.04 and 41.82% in the year 2005 and 2018, respectively. All the categories of products show positive growth rate and this is highest for Vegetable products (9.29%) followed by Food (8.10%), Animal (4.91%) and Fibre (4.61%) products. CAGR calculated for all the groups of products is found to be significant at 1%. The growth rate of agricultural imports is increasing for entire Asia Pacific region due to increasing share of Vegetable products.

Table 2. Changes in composition of Asia Pacific agricultural exports (in million USD)

Year/ Category	Animal products	Vegetable products	Food products	Fibre products	Total
1992	20815.93 (29.60)	20093.33 (28.57)	15100.59 (21.47)	14316.59 (20.36)	70326.44 (100.00)
2005	42666.93 (27.25)	48887.37 (31.22)	38606.29 (24.66)	26424.87 (16.88)	156585.46 (100.00)
2018	86763.32 (21.61)	147008.58 (36.62)	121673.30 (30.31)	46023.36 (11.46)	401468.56 (100.00)
CAGR (%)	6.24**	9.33**	9.17**	5.63**	7.90**

*Note: Figures in parenthesis represent percentages to total; ** represent significant at 1% probability level*

Table 3. Time series data of Agricultural commodity imports for the period from 1992 to 2018

Year	Asia Pacific (in Million USD)	World (in Million USD)	Percentage of Asia Pacific to world
1992	85525.56	277223.20	30.85
1993	85618.54	306304.77	27.95
1994	103450.76	431092.48	24.00
1995	120062.10	518110.93	23.17
1996	126221.73	554573.73	22.76
1997	122093.32	554321.93	22.03
1998	105070.63	543061.11	19.35
1999	109887.60	532800.16	20.62
2000	118710.33	528728.48	22.45
2001	118677.37	545657.70	21.75
2002	121218.87	580421.07	20.88
2003	138030.26	669353.13	20.62
2004	162571.29	765268.21	21.24
2005	168246.78	808733.01	20.80
2006	176321.06	885348.47	19.92
2007	208081.33	1055761.75	19.71
2008	263000.44	1272219.56	20.67
2009	234010.77	1109128.05	21.10
2010	301819.38	1259393.75	23.97
2011	384680.41	1537970.72	25.01
2012	390727.07	1509841.83	25.88
2013	408893.72	1583511.43	25.82
2014	409854.67	1621739.74	25.27

Year	Asia Pacific (in Million USD)	World (in Million USD)	Percentage of Asia Pacific to world
2015	402241.33	1487958.80	27.03
2016	388728.97	1487123.83	26.14
2017	427404.04	1639691.92	26.07
2018	455102.86	1673873.41	27.19
Average (Million USD)	227268.56	953304.19	-
C.V (%)	57.48	50.03	-
CAGR (%)	7.29**	6.94**	-

Note: ** represent significant at 1% probability level

Table 4. Changes in composition of Asia Pacific agricultural imports (in million USD)

Year/ Category	Animal products	Vegetable products	Food products	Fibre products	Total
1992	28541.02 (33.37)	25145.06 (29.40)	18527.93 (21.66)	13311.55 (15.56)	85525.56 (100.00)
2005	45949.90 (27.31)	57273.15 (34.04)	45278.60 (26.91)	19745.12 (11.74)	168246.78 (100.00)
2018	99956.15 (21.96)	190308.80 (41.82)	131032.26 (28.79)	33805.66 (7.43)	455102.86 (100.00)
CAGR (%)	4.91**	9.29**	8.10**	4.61**	7.29**

Note: Figures in parenthesis represent percentages to total; ** represent significant at 1% probability level

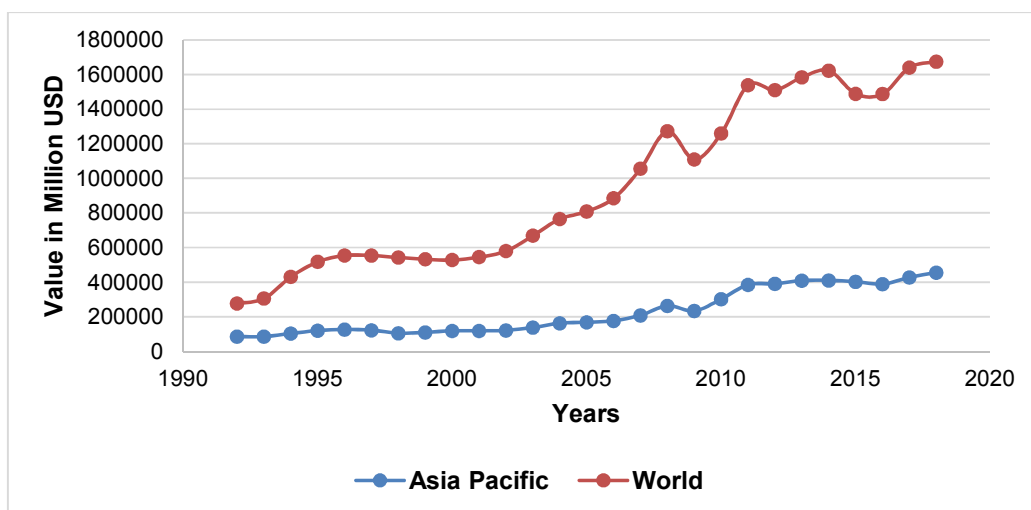


Fig. 2. Trends in agricultural commodity imports to Asia Pacific region and world

4. CONCLUSION

In the present study compound annual growth rate is determined for agricultural exports and imports and it is highly significant for both Asia Pacific region and world. In case of agricultural exports as well as imports, the share of Animal and Fibre products decreased whereas share of Vegetable and Food products increased gradually over the study period. The growth rate of both agricultural exports and imports is increasing for entire Asia Pacific region due to increasing share of Vegetable products. Both Asia Pacific and world are showing positive growth rates in both exports and imports but the growth rate of Asia Pacific is somewhat high compared to world because significant progress has been made by countries in the Asia Pacific region in reducing the tariffs during the past decades. However, to maintain this increasing trend efforts must be made to address non-tariff barriers to trade. Implementation of trade facilitation measures featured in the WTO Trade Facilitation Agreement are critical to reducing trade costs and increasing participation in global value chains. In such circumstances the reforms must focus on liberalizing logistics, facilitating adoption of modern information and communication technologies promoting competition among service providers and improving access to credit and trade finance.

ACKNOWLEDGEMENTS

Authors are thankful to Department of Agribusiness Management, College of Agriculture, UAS, Dharwad, for providing

encouragement, constant support and giving valuable suggestions during whole research.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Thomas S, Sheikh W. Growth and composition of Indian agricultural exports during reform era. *National Monthly Ref J Res Commer Mgmt.* 2012;1(6):92-104.
2. Carter CA, Steinbach S. China's growing role in agricultural trade. *ARE Update.* 2013;17(1):9-11.
3. Nabi T, Dhama JK. Analysis of India's agriculture export performance in pre and post WTO regime. *International J Enhan Res Manage Computer App.* 2013;2(4): 1-5.
4. Gupta S. A comparative study of Indian economy in pre and post reform period: An econometric analysis. *Glob J Res Anal.* 2014;3(2):51-56.
5. Serrano R, Pinilla V. Changes in the structure of world trade in the agri-food industry: The impact of the home market effect and regional liberalization from a long-term perspective, 1963–2010. *Agribusiness.* 2014;30(2):165-183.
6. Singh H. Bilateral trade between India and Bhutan since 1985. *Int J Econ Commer. Res.* 2016;6(4):13-22.

7. Sinha MK. Structural change in composition of India's export during post-economic reform period. *Business Analyst*. 2016;37(1):99-116.
8. Karnik NN, Burange LG. Trends and patterns of bilateral merchandise trade between India and Japan. *J Indian Sch Pol Econ*. 2018;30(1):31-110.

© 2021 Soumya and Yeledhalli; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/68721>