



India's Soyabean Export: Trends, Directions and Way Forward

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Abstract: The key objective of this paper is to analyze the trends of India's soyabean, exports and its directions and way forward. This research work highlighted the post-independence performance of soyabean productivity and changing pattern of crops that pave the way for promoting soyabean cultivation. The present study revealed that India is seventh largest country by area, the second most populous country after China. This work investigates the trend in area production and yield of soyabean in India from 1980-1981 to 2019-2020. The results indicate that expansion of area was continued during whole study period. However, the expansion is higher in soyabean area than that of yield of soyabean. The finding exhibits that the exports of soyabean was highly volatile but increased during given time period. The composition changed from traditional tropical to horticulture and sea foods. The present study has been focused on analyzing demand, supply and export of soyabean in India. This study revealed that United States of America turned out to be India's biggest soyabean buyers followed by Canada, Belgium. According to data China termed as top importer of soyabean but India's exports were nominal to China. The analysis also covered the comparative price difference in Indian export verses imports of China during 2020. This paper contributes by providing significant suggestions for improving the market structure for acquiring higher market share. In addition to that this study also provides suggestion regarding, how to create significant opportunities to increase the exports which strengthen the balance of payments position.

Keywords: Soyabean, Export, Directions, India, China

Background

Soyabean is the second contributor in world vegetable oil production (FAO Stat, 2021) after palm oil. It contributed to the total vegetable oil around 29 % during BE 2019. Soyabean originated in China and was introduced to India between the first century AD and 100 AD¹ through the Himalayan routes and also brought in via Myanmar. Soyabean has been cultivated in China for more than 4,000 years (Hymowitz, 1970). The use of soyabean has back to the beginning of China's agricultural age. The utilization of this crop has been

mentioned in China's medical compilations dating back 6000 years². In the recent time oilseeds crops takes an important role in the Indian agriculture and edible vegetable oils dominate the food basket. Due to fast growth in consumer's income, increasing population, and urbanization in the past two decades, the demand for edible oils and oilcake meals is growing rapidly worldwide and also in India (BIRTHAL *et al.*, 2010 and Gowda *et al.*, 2009).

Soyabean is an important crop in terms of food and nutritional security. It plays a significant role to overcome it, especially in developing countries due to its high-value nutritive values (Thoenes, 2004). The prospects of soyabean expanding further into a major crop in India are looking bright due to high use of vegetable oil by the Indians. The soyabean farming in India is already considerable and industry gradually aware of the varied uses of soyabean. The soyabean has come to be recognized as one of the premier agricultural crops today for various reasons. Besides that, its multiple nutritive qualities, it carries functional properties that opened avenues for producing new products and improving the quality of existing standard of food products. Therefore, the present study is focused on changing trend of soyabean productivity and exports pattern.

In the 18th century, soyabean was introduced into United States of America, and it was transformed from inefficient fodder type crop to a highly productive plant through systematic breeding during 1940s and 1950s. Later on, United States of America became the largest producer of soyabean in the world (Hymolwitz & Harlan, 1983). Soyabean termed as largest source of vegetable oil and protein in the world. However, wide ranging soyabean has been cultivated in a few countries named as Brazil, United States of America, Argentina, China, India, Paraguay, and Canada respectively during 2019 (FAOSTAT, 2021).

Since independence, In India limited importance has been given to soyabean until mid-1960 because India dealt with other major projects. In addition to it, India had low yield of soyabean due to lack of processing facilities, lack of commercial markets, and lack of short season erect variables. During late 1960s, soyabean found fit nicely into India's climate and cropping patterns as well. Even then soyabean cultivation in India was negligible until 1970, but it grew at significant pace thereafter. Particularly in the initial years of 1970s, the high-yielding varieties of wheat and rice in India spread rapidly. Meanwhile the marginal lands were being used for soyabean crops. Later on, soyabean scientist exported possible inches in India which including intercropping relay cropping, rotation and cultivation fallow lands where these crop could grow. As a result,

that niche was found in Madhya Pradesh, where major field were left fallow to conserve season. This was the big soyabean achievement in the promotion of soyabean cultivation.

In the early 1970s, domestic prices of edible oil increased sharply in 1977 to 1988, the imports of edible oil increased which constituted about 30 percent of the total availability of edible oils in India³. The government of India launched the Technology Mission on Oilseeds (TMO) in May 1986 for covering the shortage of edible oils in the country. Subsequently, market intervention operations started imports were regulated through canalization and high tariffs and strong policy for technology diffusion with marketing and price support accelerated the production of soyabean started from 1980 till 1990-1991.

The present study intended to cover the trends, directions and finding potentiality of Indian soyabean exports. The objective of the study is to find out the performance of soyabean economy and its changes over time. This research has been focused on the Trends of area, production and yield of soyabean in India. The analysis work also included the demand, supply and export of soyabean in India during last two decades. This study focused on major soyabean importer countries and Indian export direction. The present research also highlighted Comparative Price difference on Indian export v/s China's import during 2020. The analysis also reveals that the current market leader positively influences the other exporters. This study examines the Indian soyabean market in a holistic way, analysis the land use and other major determinants of soyabean exports particularly soyabean productivity international prices and demand and supply of soyabean.

Data and Methodology

The present study based on the secondary data collected from different public sources. Data on area, production and yield collected for the period of 1980-81 to 2019-20 from Agriculture statistics at a glance, Directorate of Economics and Statistics, Ministry of agriculture, Govt. of India. Data on soyabean demand and supply collected for the period 2000 to 2019 form the (Food Balance Sheet, 2021), Food and Agriculture Organization of the United Nations. Data on India soyabean trade relation collected for the year of 2019 from The International Trade Centre (ITC) and some data collected from Ministry of commerce, Govt. of India. Estimation of relative prices released from different countries are using formula as below:

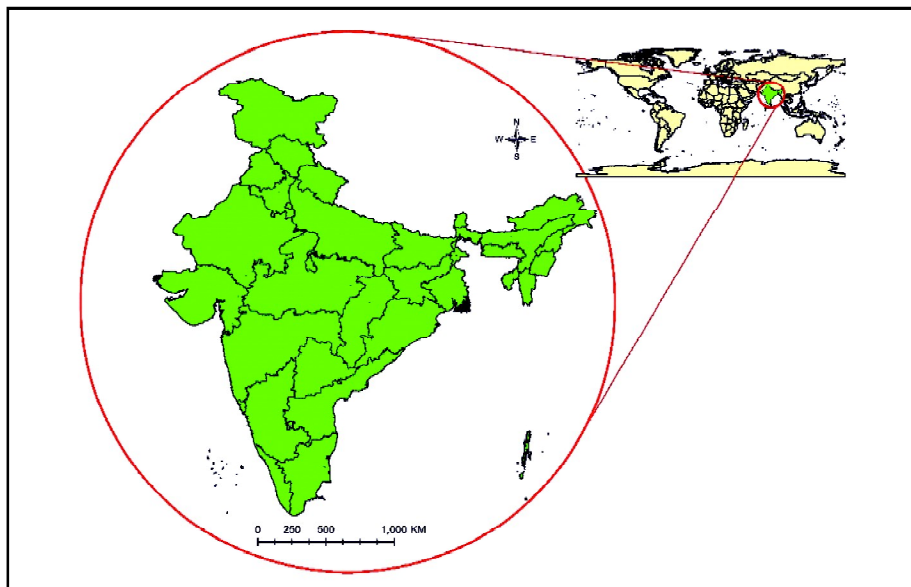
$$EP_{it} = \frac{EV_{it}}{QE_{it}}$$

Where

EP_{it} = Export price of soyabean to i^{th} country for t^{th} time

EV_{it} = Export value of soyabean to i^{th} country for t^{th} time

QE_{it} = Export quantity of soyabean to i^{th} country for t^{th} time



Map 1: Location of the Study Area

This given Map 1 depicts the location of the study. India is located in South Asia region of the world. It occupied the seventh-largest country by area, the second-most populous country after China. The map shows the geographical location of India, which is a very important factor for international trade. Soyabean did not grown in all states of the country, the major soyabean growing states are Madhya Pradesh, Maharashtra, Rajasthan, Karnataka and Telangana.

Performances of Soyabean Production in India

This present section focuses on an analysis of trend in area production and yield of soyabean which provide significant insights into the development of the crop. Table 1 presented the changing status of area, production and yield of soyabean in India from 1980-81 to 2019-20.

Table 1: Changing Status of Area, Production and Yield of Soyabean in India

<i>TE Year</i>	<i>Area (000 ha)</i>	<i>Production (000ha)</i>	<i>Yield (Kg/ ha)</i>
1980-81	470	341	725
1985-86	1140	864	759
1990-91	2184	1985	909
1995-96	4574	4591	1004
2000-01	6376	6500	1019
2005-06	7278	7656	1052
2010-11	9616	10868	1130
2015-16	11411	10268	900
2019-20	11218	11809	1053

Source: Agriculture statistics at a glance, Directorate of Economics and Statistics, Ministry of agriculture, Govt. of India.

The ready market for soyabean provided owing to oilseeds growers. With a few input support that helped in fast growth in producing and area production and yield of soyabean in the country has been noticed. The soyabean crop was introduced basically for utilizing the kharif fallow lands. Thus, rapid expansion of area, under soybean crop during initial years was from fallow land (Bapan *et al.*, 1992; Bisaliah, 1986; Chand, 2007). In 1980-81 area was 470000 ha. Production 341000 ha and yield was 725 kg/ ha. Shown in the Table 1, subsequently, the crop started replacing other food gram crops such as sorghum, pearl millet and black gram (Birthal *et al.*, 2010).

The expansion of area was continued during whole study period. However it was higher under soyabean area than the yield of soyabean. Although, the productivity of soyabean increased from 725 kg/ha in 1980-81 which reached at 1130 kg/ha in 2010-11 which depicted in the figure 1 that indicate the upward trend but significant setback has shown between 2010-11 to 2015-16.

This productivity of soyabean increased with rising opportunities in the lag behind status. Mainly rapid area expansion of soyabean was Madhya Pradesh, Maharashtra, Rajasthan, Karnataka, Telangana, Gujrata and Chhatisgrath. This shown in the Map 2, where major soyabean has grown states in India was highlighted.

Later on, soyabean yield levels had shown decline in the states. The production was increased due to contribution of area and yield 1995-96. Later on yield was stable but the production was increased due to area and

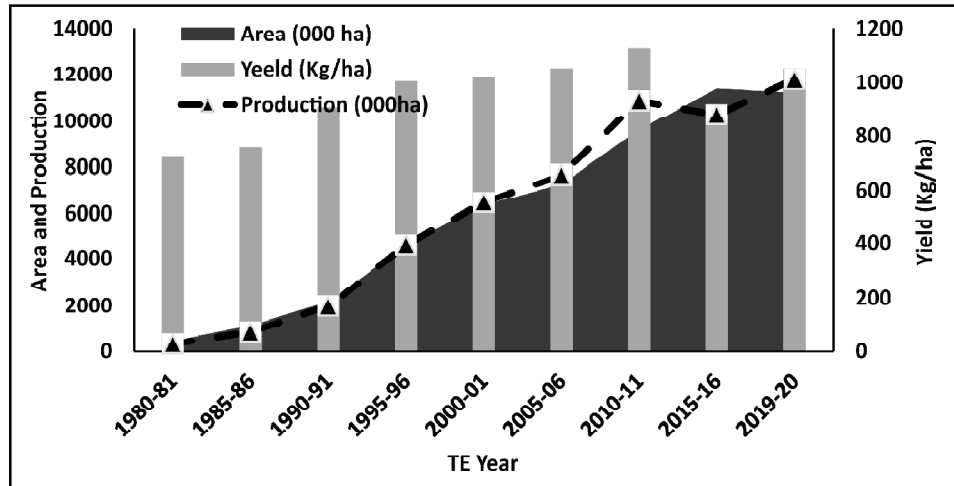
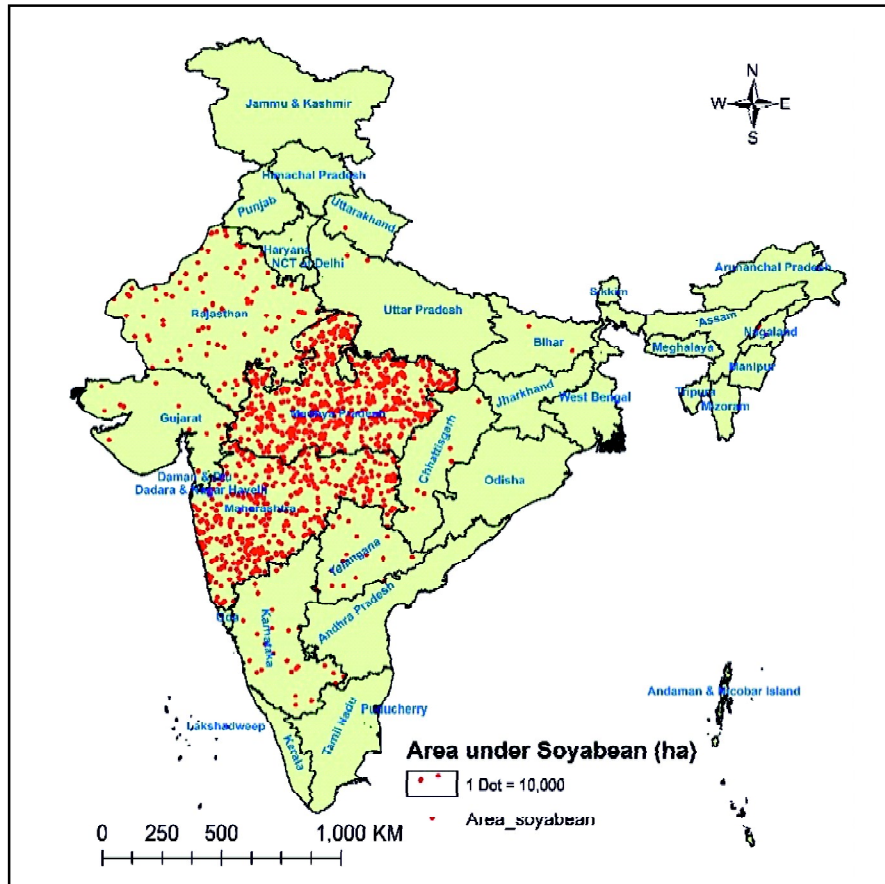


Figure 1: Trends of Area, Production and Yield of Soyabean in India

concentration mainly on two states. Soyabean is also important because it was increased in lag behind states. The crop replaced sorghum in Madhya Pradesh (Singh & Yadav, 2021; BIRTHAL *et. al.*, 2010). The trends has shown the stagnated productivity although the yield was increased. There were few years where the productivity declined due to dread droughts while includes 1993 and 1997.

In India soyabean holds a very important position in the Indian agriculture and in economy. Madhya Pradesh has the leading position among the soyabean producing states in India that followed by Maharashtra, Rajasthan and Andhra Pradesh. These states are rain fed areas. The production of soyabean is highly dependent on the monsoon and it fluctuates between the years (Bharti, 2016). The supply includes production and imports stood at 7081'000 tonnes in 1999 but it was declined during three consecutive years which dropped at 2003 that stood at 4656'000 tonnes due to drought that hit the major producing states of soyabean. Later on, due to rapid expansion, crop surpassed area, soyabean predominantly grown as rain fed crop. As a result, in 2003, that stood at 7822'000 tonnes onwards.

This improvement mainly occurred due to technological intervention in soyabean especially with varietal improvement programme, further within the parameter of social-economic development of farmers, the various rain fed states had selected this crop and it occupied significant share in gross cropped area. This consecutive improvement was intended till 2007 which stood at 10968'000 tonnes. The production increased during following consecutive years



Map 2: Major Soyabean grower States in India

except a few one. It was witnessed a noticeable changes occurred in soyabean cultivation with agro technologies across the soyabean chain. Contrary to the other nations, India encountered various challenges of having work with small farmers and fragmented land holdings. However, several initiatives were taken place that helped farmers in terms of productivity with agricultural inputs, resource conservation better extension services and market linkages.

The success of these initiatives were witnessed through increased production which reached at 13950'000 tonnes in 2018-19 but the overall trend was volatile during the given time period. As data has been depicted that total of soyabean witnessed increment due to increased production which stood at 7065'000 tonnes in 1999, which was continuously increased till 2012 that reached at 14401'000 tonnes. However, later on, it started to decline and then stability shown in the

total consumption of soyabean. On the other hand the export was highly volatile but increased over the period of time. The composition of export trade has changed from traditional tropical products towards products such as horticulture and sea foods. The developing countries like India are engaged in exporting consumption oilseeds and products, coffee and cocoa, sugar, fruits and vegetables as well (Diaze Bonilla and Reca 2000).

Table 2: Demand, Supply and Export of Soyabean in India during last Two Decades

(in 000 tonnes)

<i>Year</i>	<i>Supply</i> (<i>production+import</i>)	<i>Consumption</i>				<i>Export</i>	
		<i>Food</i>	<i>Seed</i>	<i>Loss</i>	<i>Process</i>		<i>Total</i>
1999	7081	67	385	319	6294	7065	17
2000	5276	28	381	246	4690	5345	131
2001	5963	32	366	270	5300	5968	25
2002	4656	33	393	216	4140	4782	23
2003	7822	4	454	361	6950	7769	253
2004	6877	37	462	311	6100	6910	7
2005	8275	33	500	375	7400	8308	26
2006	8858	13	533	399	7900	8845	14
2007	10968	63	571	494	9750	10878	41
2008	9905	25	584	447	8800	9856	70
2009	9965	29	573	450	8900	9952	43
2010	12736	58	611	573	11322	12564	23
2011	12215	100	650	552	10917	12219	46
2012	14667	442	732	660	12567	14401	66
2013	11949	484	696	538	9400	11118	332
2014	10378	31	558	538	9545	10672	206
2015	8584	378	461	444	5650	6933	213
2016	13224	391	708	682	6188	7969	152
2017	11013	404	588	567	8070	9629	295
2018	13950	420	742	715	8729	10606	212

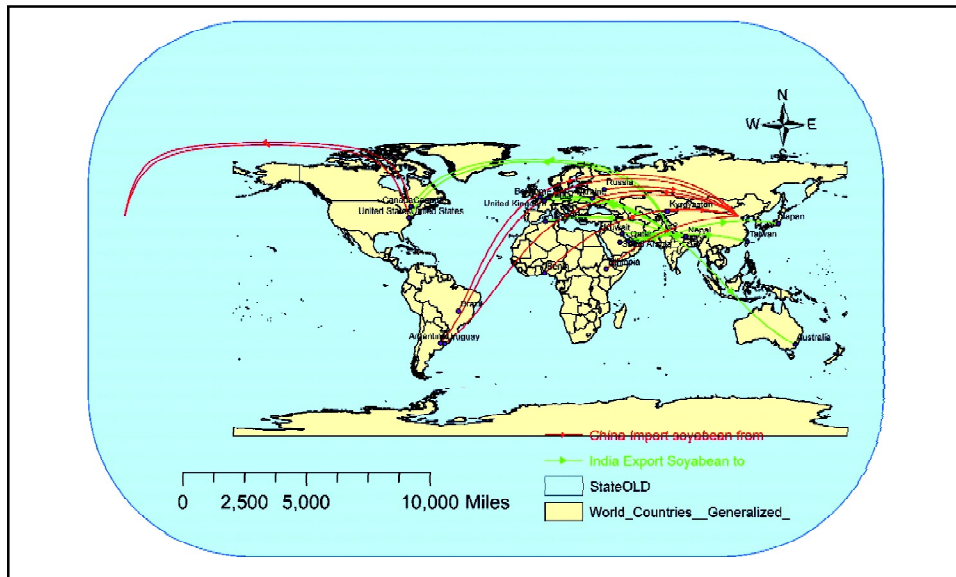
Source: Food balance sheet, FAOSTAT, FAO, 2021.

According to this table 1, significantly the United States of America has turned out to be India's biggest soyabean buyer. Soyabean exports to the United States of America increased at 30.138 ('000 tonnes) and the value realized at

18694 ('000 USD) during 2020. The United States of America recorded highest growth among importing nations Canada, Belgium were followed after United State of America as a major exporting destination of India. However, Belgium stood at third place but it realized the price higher than the United States of America and Canada which was 625 (USD/ton).

Major Soyabean Importer Countries and Indian Export Direction

The below Map depicts the direction of soyabean export from India to major destinations and the importer importing soyabean i.e. China. India and China, two big Asian countries would become the part of Asian Free Trade Area (AFTA). They also joined by Japan and South Korea. The trade block will also have potential to match economically with the European Union and North American, Free Trade Area. Both nations already signed the framework with ASEAN countries about economic agreement on the early harvest program. Both nations have made progress in the implementation of the agreement.



Map 3: Soyabean Export Direction from India and Top (China) Importer Importing Flow

Besides these agreements they are not on the same page when it comes on soyabean trade of India's exports of soyabean to China is much lower than the number of exports to other nations. The major destinations of Indian soyabean exports are United States of America, Canada which followed by Belgium.

Indian soyabean exports have touched around 30.138 ('000 tonnes) during 2020 to United States of America due to attractive high exports prices significantly overall United States recorded highest growth among importing nations. Although China termed as top importer of soyabean but India's export nominal quantity of soyabean to China due to various leading macro-economic concern which includes low technological adaptability absence of technology intensive foreign investment and low profit margins are curtailing India's exports.

China's soyabean demand was boom in the past two decades. It involves socio-economic and environmental interactions of multi-coupled systems global soyabean export increased by ten-fold featured by China's soyabean consumption (UN Comtrade 2016). Currently United States, Brazil and Argentina is the largest soyabean producers. Brazil is the largest soyabean exports (Brown, lima, cooney and cleary 2009). China has a long standing tradition of soya based diets due to high income growth in China that encouraged soyabean consumption by live-stock, capital and human. Over this period Brazil and the United States, two largest global soyabean exporters expand their exports to China. This evolution of soyabean production and trade occurred by China's soyabean boom in imports because gross domestic product of China was doubled in 2004-2011, that led to high demands for livestock products a major consumer for soyabean meals (Gale 2015)

The growth in soyabean demand increased the dependency of the country on imports from many soyabean surplus countries. On the contrary, with the increase in acreage and satisfactory rainfall expectation in major soyabean producing area, India anticipated increasing in output. The government of India is taking initiatives to increase exports in order to support the farmers and improve market sentiments for soyabean.

According to the table 2, the United States of America has turned out to be India's biggest soyabean buyer. Soyabean exports to the United States of America increased at 30.138 ('000 tonnes) and the value realized at 18694 ('000 USD) during 2020. The United States of America recorded highest growth among importing nations Canada, Belgium were followed after United State of America as a major exporting destination of India. However, Belgium stood at third place but it realized the price higher than the United States of America and Canada which was 626 (USD/ton).

Although, India's share in the world export continue to increase. This rising trend was a result of gradual lifting the quantitative restrictions and reductions in the imports duties. Despite of that, Indo-China trade in soyabean developed

Table 3: Comparative Price Difference on Indian Export v/s China's import during 2020

<i>Country</i>	<i>Indian Export</i>		
	<i>Quantity (000 tonnes)</i>	<i>Value (000 USD)</i>	<i>Price (USD/Ton)</i>
USA	30.138	18694	620
Canada	21.721	13178	607
Belgium	15.332	9599	626
Nepal	1.676	890	531
Taipei, Chinese	0.995	357	359
France	0.989	592	599
Other	1.17	816	697
World	72.021	44126	613
<i>China's Import from</i>			
Brazil	64277.6	24911366	388
USA	25887.6	10634629	411
Argentina	7455.7	2894633	388
Uruguay	1656.6	677458	409
Russian Federation	693.2	240051	346
Canada	245.3	115812	472
Ukraine	65.1	30752	472
Ethiopia	24.3	12306	506
Benin	15.0	7811	521
Kazakhstan	6.8	3124	460
Other	0.065	62.000	954
World	100327.1	39528004	394

Source: Authors estimation based on ITC data

slowly and steadily and the price realized is lesser than the former. According to the presented data, Brazil and United States of America are the two major exporters of soyabean to China. They realized the price i.e. 388 and 411 (USD/ton) respectively that are much lower than that of India received with their trading partners. However, Taipei, Chinese have share small portion in the Indian soyabean export which stood at 350 USD/ton (TP Bhat, 2006)

Way Forward

The cultivation of soyabean in India was grown at significant pace during 1970s, this crop introduced for utilizing the kharif fallow lands. Thus rapid expansion of area was noticed initially. The expansion of area was continued during whole

study period. However, the expansion of area was higher than the yield of soyabean. The productivity of soyabean was increased with the rising opportunities in the agricultural lag behind states. Later on, soyabean yield level shown decline in these states although the production increased on account of increased area contribution.

The trend has shown the stagnated productivity. Soyabean in India hold significant position in its economy. Exports over the period of time also increased but trend was volatile in nature. Further, it was witnessed a noticeable changes occurred in soyabean cultivation with agro technologies across the soyabean chain that boost up the production. On the other hand, the export was highly volatile but increased over the period of time. The composition of export trade has changed from traditional tropical to horticulture and sea food product. This paper also highlighted the pattern of India's exporting direction of soyabean where India engaged its exports to United States of America, Canada and Belgium at higher prices though china termed as top an importing country of soyabean.

According to the data, it has been shown that china imports from Brazil and United States of America. These two countries receive much lower prices of soyabean which were India got from their trading partners. The results suggest that the productivity per hectare and the land used to cultivate soyabean are the main factor for explaining soyabean exports. Soyabean considered as one of the major crop to be exported. It provides opportunity to maintain current account deficit. Export potential of soyabean is very high. Despite of having rich stock of natural resources and skilled personnel, India needs to frame suitable policies and strengthen its share in the global market. Indian soyabean focused on research and development programmes for developing quality products for exporting to other countries. India must improve the marketing structure for acquiring higher market share. Processing ability must be improved for providing the quality standards though modernization and upgrading technology. This industry need to focus on standardization of product for getting recognition in the foreign markets.

Disclaimer: Views expressed in the paper are personal and do not represent the organizations with which the authors are associated.

Notes

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