

World Trading Signals for Indian Agriculture during WTO Regime: Multi-Stakeholders Decision Making

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How to cite this paper: Dastagiri, M.B. and Vajrala, A.S. (2018) World Trading Signals for Indian Agriculture during WTO Regime: Multi-Stakeholders Decision Making. *American Journal of Plant Sciences*, **9**, 1868-1893.

https://doi.org/10.4236/ajps.2018.99136

Received: July 16, 2018 **Accepted:** August 20, 2018 **Published:** August 23, 2018

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Abstract

Globally, any country in the world either exporting or importing country need to look at international market signals. Agriculture is one of the most contorted sectors in international trade. The study is basically based on estimation and identification of various international trading signals to advocate their usefulness in decision making to multi-stake holders. Study period is 1990-91 to 2015-16 and the study employed is the Foreign Trade Philosophy to analyze the international market signals, trends, growth rates, elasticity's, instability index, AOI, meta-analysis and the vision. It was observed that the export and import price elasticity's for all the crops shown are positive except the wheat export price elasticity (-0.3%) and import price elasticity of soybean (-0.45%). Among cereals, pulses, oilseeds and fiber crops, rice (1.24%), peas (2.36%), mustard (0.97%) and cotton (0.75%) have high export elasticity's respectively. These trade price elasticity's are the important signals for the policy makers to layout the future trade. Study observed that the domestic support offered in the agricultural sector in Russia, India, China and New Zealand is more compared to other WTO member countries. Technical Barriers to Trade, Sanitary and Phytosanitary and Anti-dumping were found to be the most prominent in world and the highest imposed in Asia, Europe and North America. Study concluded, India has a comparative advantage in pulses, oilseeds and wheat and terms of trade of India's cereals (except rice, maize), pulses (except pigeon pea, peas), cotton and jute which were found to be increased. The poor treatment towards the agriculture sector by the governments and World Bank Funding was observed. India's import basket majorly consists of oilseeds and rice is the major exported product. Present study adds to the research directed at the impacts of domestic support and measures policies for WTO negotiations.

Keywords

Trading Signals, Agriculture, WTO, Stakeholders, Decision Making, World

1. Introduction

Imperialism and protectionism lead to two world wars. WTO Trade liberalization empowered USA and other influential countries. Globally, countries trade policies are converging for development. During WTO regime markets are liberalized. However, the dynamics of world trade have been changing with the growing protectionism (Brexit and changing US policies). Globally, any country policy makers; Ministry of Finance, Ministry of Commerce need to understand the intricacies involved in designing trade policy on global trade signals and operating systems, international political economy, rules and regulations imposed by inter-governmental and international organizations such as WTO, World Bank and IMF etc. Any decision making and policy framing requires understanding of the present and the past trends in the respective fields.

Giri *et al.* [1] concluded that the eruptive international market can get transmitted to the domestic economy which can in turn affect the prices of food grains and public distribution of the food to the poor. The major agricultural foods such as cereals, meat, sugar, milk, butter, cheese and the commercial crops like tobacco products and cotton of developing countries face highest tariff rates. Magesa et al. [2] observed that farmers bargaining power for a better price to the produce is hindered due to lack of market information, which in turn results in the injection of market intermediaries. These middlemen or intermediaries are placed at an advantage about marketing information. Other studies by Shepherd [3] supported this concept by stipulating that correct and current information about the market must be known to public for an efficient market to operate. A study by Dastagiri [4] concluded that the market information parameters such as export policies provided an easy export environment by simplifying the procedures for trade facilitation and the export prices and balance of agricultural trade are positively affecting on potato, onion quantity of exports. World Bank report [5] did emphasize the fact that the majority population of developing countries live in rural areas and make their livelihood mainly from farming crops. The report also concluded that low levels of information and communication infrastructure in the poor access to the updated information on prevailing prices in urban market centers. India keeps huge stocks than elsewhere in South Asia, to meet the food security needs of large population in the country and total cereal demand. Also a spike in import demand could result in considerable increases in world market prices, Ninno et al. [6]. In South Asian region, the effects of international price shocks on domestic markets were in part determined with the domestic trade policies and government market interventions. The dependence on international markets may not guarantee price stability is clearly reminded by these price shocks, governments need to appropriately react and take up policies accordingly, Dorosh *et al.* [7].

Sachdev [8] discusses about comparative advantage in agricultural and how India being a low income agricultural economy benefits from it in agricultural products and labor-intensive manufactures. The study concludes that the external sector performance can be improved with an increase in the share of agricultural exports in total exports. Mathur [9] discusses the coherence between India's foreign trade policy and rules and regulations of WTO and reflects that the new EXIM policy 2002-07, manages to introduce an export environment which is free of restrictions and controls.

Chand [10] suggests that strengths in Indian agriculture must be used to compete in the global trade and low level of international prices have a direct impact on the Indian agricultural trade. Ahmed and Alam [11] scrutinized the problems and prospects of India's agricultural exports since the establishment of WTO and concluded that greater market accessibility and improved prices for their products are the two benefits that Indian farmers were expected to receive.

The market information on a day-to-day basis is when captured and analyzed to provide inputs in accessing the existing opportunities in a market, to penetrate with new ideas and to develop the metrics for market development is Marketing Intelligence (MI) [12]. Market analysis content helps you discover profitable opportunities first, including in emerging markets and new instruments filtered to your precise needs, and integrated in a single, intuitive and easy-to-use desktop and mobile solution [13].

Commodity prices and market export signals at a common level are affected by demand and supply factors. Nobel Laureate Michael Spence [14], [15] attempted to record market structure information to understand the mechanisms in a market to adapt and the outcomes of informational gaps with regard to market performance. Dastagiri and Vajrala [16] reported that, since 2000 among WTO member countries, Russia, India, China and New Zealand have given more domestic support and Mexico, Chile, USA, Japan and OECD countries have given decreasing support to agricultural sector.

India emerged as a major agricultural exporter during 2003-2013 with the value of exports \$5 billion in 2003 to a record of more than \$39 billion in 2013. India trails only the United States in Cotton Exports. Also in 2013, India became the world's seventh-largest exporter of agricultural products, surpassing Australia. India emerged as a top bovine meat exporter. India is a very important player on the global agricultural market, especially for rice, cotton, sugar, and beef (buffalo). A diverse range of products such as soybean meal, guar gum, corn, and wheat are exported from India. Dastagiri [17] found that there is a need that the developing countries must follow strategic action to meet the future demands (2025) of the wheat, maize, soybean, pig meat, poultry meat, sheep meat, beef and veal.

UNCTAD [18] findings show that India's exports to world are very receptive

to income changes. A decline of 1% in GDP growth of world will reflect 1.88% decline in India's growth of exports to world. Singh and S. K. Singla [19] observed that from 1992 to 2006 India has been unable to diversify its exports and its destinations. India exports experienced instability predominantly in the developing countries. Bhatt [20] observed that the export promotion policies in 1960s-1970s were introduced in the form of compensatory support (CCS), duty drawbacks (DDS) and market development assistance (MDA), among others.

The dynamism of the international markets is not being captured enough by the research community. It is of utmost importance to prioritize sector/crop/domain for the exports or imports or opportunity cost of profitability and selection of commodities in the international markets by the researchers. Research is not being promptly responsive to the international markets hence researchers need to do prioritization for sector/crop/domain for their exports or imports or opportunity cost of profitability and selection of commodities in the international markets.

The relative prices and income of the importing countries are found to be relatively elastic for India's export demand. This study analyses market signals of world's exports and the prices of India's major agricultural commodities and the identification of their destinations. The study tracks information on demand, policy changes, tariffs, safety and standards of exports for major Indian crops. Decade wise growth rates, trends and elasticity's are estimated for cereals, pulses, oilseeds and fiber crops (1990-2016). The present study also tracked on international policies and reasons effecting on market and price signals of India's agricultural trade. The effects of global political economy of agriculture in common and continents and country-wise in particular from 37 to 170 major countries of 6 continents policies are analyzed. The meta-analysis, growth rates and agricultural orientation index were estimated. The specific objectives of the study are:

Objectives

- 1) To identify, estimate and analyze international trading signals for India's agricultural commodities.
- 2) To track information on domestic supports, tariffs and non-tariffs, demand, policy changes, safety and standards of exports for Indian agricultural commodities.
- 3) To trace out the usefulness of international trading signals for multi-stake holders in decision making.
- 4) To suggest strategies and policy interventions to governments and international institutions to deal with the world trading problems.

2. Data and Methodology

Basically, the present study is based on estimation and identification of various international trading signals and to advocate their usefulness in decision making to multi-stake holders such as governments, policymakers, exporters/importers, producers, researchers, WTO, IMF and World Bank. In this context, the study

analyzed the various signals such as the, international prices, export import price elasticity's, compound annual growth rates, domestic support of major countries, continent-wise tariff, non-tariff measures imposed by WTO members, average export import prices, quantity and price growth rates, terms of trade and the agricultural orientation index (AOI) for the Indian cereals, pulses, cotton, jute and oilseeds. The study also calculated the quantity growth rates and the price elasticity's for the major destinations of the various agricultural crops. For the AOI, the developed countries of continents namely, European Union (15 countries), North America (3 countries viz., USA, Mexico and Canada), Asia (11 countries including China), South America (4 countries), Africa (2 countries), and Australia were selected. The data and information on global economic systems such as GDP, World Bank lending sector wise, tariff and non-tariff rates, global agricultural domestic support during WTO regime were collected from FAO, World Bank, IMF, UNDES, WEF, OECD, CGIAR, WTO reports and published secondary sources and websites. The meta-analysis was done. The study period is 1990-91 to 2015-16 and the study employed the Foreign Trade Philosophy to analyze the international market signals, trends, growth rates, elasticity's, instability index, AOI, Meta-Analysis to provide the vision for future researchers.

Growth rate formulae [21]

An exponential function is fitted to the variables of interest viz., exports and prices for the period 1990-91 to 2015-16 to calculate the compound growth rate (r).

$$Y_{t} = Y_{0} \left(1 + r \right)^{t}$$
 (1)

Assuming multiplicative error term in the Equation (1), model may be linearized by logarithmic transformation

$$\ln Yt = A + Bt + \tag{2}$$

where, $A (=\ln Ao)$ and $B (=\ln (1 + r))$ are the parameters to be estimated by ordinary least square regression, t = time trend in year, $r = \exp (B) - 1$

Price elasticity of exports formulae

 $\Sigma P_e = \%$ change in quantity exports/% change in price.

The percentage change in quantity exports is % ΔQ , and the percentage change in price is % ΔP . We calculate % ΔQ as $\Delta Q/Qave$ and we calculate % ΔP as $\Delta P/Pave$.

So we calculate the price elasticity of exports as $(\Delta Q/Qave)/(\Delta P/Pave)$.

Instability index formulae

Coefficient of variation = (Standard Deviation/Mean) × 100. Terms of trade calculation

 $AOI = \frac{Average Price of Exports}{Average Price of Imports} = Px / Pm$

 \uparrow Price *M* or \downarrow Price *X* \rightarrow Deterioration ToT

 \downarrow Price *M* or \uparrow Price *X* \rightarrow Improvement ToT

Agricultural orientation index formula

 $AOI = \frac{Agriculture share of Total Outlays (central govt)}{Agriculture share of GDP}$

3. Results and Discussion

Any country in the world, either exporting or importing country, needs to look at the following international market price signals such as, world trading prices, trends, growth rates, elasticity's, market destinations, demand and supply, tariffs, export-import duties, trade barriers, comparative advantage, competitive advantage, international government organizations priorities, and global policies changes and these signals usefulness in decision making to governments, exporters and importers, producers, consumers, researchers and WTO negotiations.

3.1. Government/Policy Makers

In view of the changing world trade scenarios, the policy makers in various decision making scenarios require to understand the implications of foreign trade policies, to decide the trade barriers such as the tariff and quotas in order to protect the domestic employment, producer, consumers and infant industries and to cater to the WTO negotiations and dispute settlements.

1) To design the foreign trade policy

Trade price elasticity's are important signals for the policy makers to layout the future trade for exporters and importers, who based on these signals increase or decrease their trade. As the elasticity's indicate the exports or imports sensitivity to changes in price, it helps to find out which commodities have more demand in international markets. The export and import price elasticity's for India's various agricultural crops during the period 1990-91 to 2015-16 are given in **Table 1**. It can be clearly observed that the export import price elasticity's of all the crops shown are positive except the wheat export price elasticity (-0.3%) and import price elasticity of soybean (-0.45%). Among cereals, pulses, oilseeds and fiber crops, rice (1.24%), peas (2.36%), mustard (0.97%) and cotton (0.75%) has high export elasticity's respectively. It shows that, the more elastic crops are more demand in the international market and more competitiveness.

The study suggests that imports from inelastic countries should be exempted from any ban (without any quantity restriction) which would help in increasing trade and in good relationships with the world trade countries.

3.2. Useful to WTO and Other International Trade Organizations

1) Global agricultural supports

WTO deals with the rules of trade among the nations. The world market prices are greatly impacted by the global agricultural supports. In establishing the trade rules and to oversee the execution of the trade agreements among the countries, understanding of global agricultural supports and the factors affecting it are necessary. The compound annual growth rates of global agricultural supports (2000-2016) are presented in **Table 2**. During 2000-2016, the highest and positive growth rates in agricultural support were observed in Russia (22.68%) followed by India (20.19%), China (19.93%), New Zealand (12.34%), Philippines (6.41%), Costa Rica (6.36%) and Brazil (6.01%). During the same period, the negative growth rates in agricultural support were observed in Mexico (-3.44%), Chile (-2.59%), the USA (-2.47%), Japan (-1.52%) and OECD (-0.37%) members. The study found that during the period 2000 to 2016, Russia, India, China and New Zealand have given more domestic support to agricultural sector than compared to other WTO member countries. It indicates that these countries are protecting agriculture and are trying to make their products more competitive in international markets. The study suggests that India can find out more opportunities for trade in these countries.

2) In deciding tariffs and quotas

In GATT 1947, in the context of market access, domestic and export subsidies, various fields of study in agriculture have been quite flexible compared to general disciplines. Evidence of one such flexibility is that, non-tariff measures such as import quotas and subsidies were allowed. Continental-wise non-tariff measures imposed by WTO member countries are presented in **Table 3**. It could be observed that the Technical Barriers to Trade (21,925) is the most prominent non-tariff measure imposed in the world followed by Sanitary and Phytosanitary (15,670), Anti-dumping (2084), Tariff-rate quotas (1274) and Quantitative Restrictions (1108). Out of the world total Technical Barriers to Trade [TBT] measures, highest number of TBT were levied by Asia (22.88%) followed by Europe (18.62%) and Middle East (17.99%). Out of the total Sanitary and Phytosanitary and Anti-dumping measure, highest number of SPS and ADP were imposed by Asia (30.71% and 37.86% respectively) followed by North America (27.50% and 23.03% respectively), South and Central America (24.64% and 17.85% respectively) and Europe (8.49% and 15.64% respectively).

The study found that the Technical Barriers to Trade (TBT), Sanitary and Phytosanitary (SPS) and Anti-dumping (ADP) are the most noticeable non-tariff measures. The study also observed that the excessive non-tariff measures were imposed by Asia followed by Europe and North America.

3) Comparative advantage

Comparative advantage not only helps in policy making but also provides economic rationale for the proponents of agricultural trade liberalization. The world trading prices and comparative advantages of various agricultural crop categories such as cereals, fiber crops, pulses and oilseeds are presented in **Table 4**, **Table 5**, **Table 6** and **Table 7**. The results of the cereals (**Table 4**) indicate that, both exports and imports prices of wheat were found to be highest, followed by rice, during the period of 1990-91 to 2015-16. It also shows that import prices of rice and maize were more than export prices, where as in wheat a reverse trend was observed. The period 1990-91 to 2015-16 witnessed, the export

		Export import price elasticity's				
Crop	Variable	1990-91 to 2000-01	2001-02 to 2015-16	1990-91 to 2015-16		
Rice	Export	1.84	0.48	1.24		
	Import	0.97	1.92	1.03		
Wheat	Export	1.48	-0.58	-0.3		
	Import	0.98	0.67	0.93		
Maize	Export	1.4	0.68	0.93		
	Import	1.26	0.67	0.57		
Total Cereals	Export	1.69	0.26	0.91		
	Import	0.82	0.56	1.03		
Cotton	Export	1.06	0.75	0.75		
	Import	1.47	4.47	1.06		
Jute	Export	-0.4	0.13	0.71		
	Import	1.66	-0.05	0.39		
Groundnut	Export	0.7	0.35	0.31		
	Import	0.72	0	1		
Soyabean	Export	1.38	1.78	0.42		
	Import	1	3.83	-0.45		
Niger Seeds	Export	1.17	-0.41	0.25		
	Import	0	0	0.67		
Mustard	Export	1.45	0.43	0.97		
	Import	0	2.93	0		
Safflower	Export	0	0.57	0.72		
	Import	0	0	0		
Sesamum	Export	1.42	0.17	0.58		
	Import	0.7	0	0.54		
Sunflower	Export	-0.09	0.7	0.09		
	Import	0	0	0		
Pigeon Pea	Export	1.71	-0.98	0.35		
	Import	1.22	0.08	0.31		
Gram	Export	-2.33	0.37	0.69		
	Import	0.91	0.36	0.53		
Lentil	Export	1.61	1.21	0.55		
	Import	0.83	0.4	0.47		
Peas	Export	3.85	0.55	2.36		
	Import	1.18	0.5	0.25		

Table 1. Export import price elasticity's for various agricultural crops.

Source: Commodities, CMIE.

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	CAGI	R of Agricultural Domestic	Support
Country	2000-01 (Million US\$)	2015-16 (Million US\$)	Growth Rates (%)
Australia	780.04	890.22	0.78 √
Canada	4335.38	4777.19	0.57
Iceland	153.46	222.31	2.20
Japan	54087.76	41666.36	-1.52 √
Korea	19259.32	20039.27	0.23 √
Mexico	7604.62	4194.50	-3.44
New Zealand	19.71	142.44	12.34
Norway	2153.01	3128.36	2.22
Switzerland	5481.17	7288.12	1.69
Turkey	9035.91	17182.47	3.85
USA	50,880.50	33277.27	-2.47 √
Chile	562.30	359.97	-2.59 √
Israel	786.23	1361.04	3.28
OECD Member	242964.29	228052.50	-0.37 √
Brazil	2727.57	7362.29	6.01
China	9653.51	212182.44	19.93 √
Colombia	2342.36	3297.08	2.03
India	1711.17	35969.08	20.97 √
Russia	369.39	11927.50	22.68 √
EU (28 countries)	87824.86	99735.09	0.75 √
Costa Rica	187.63	535.52	6.36
Phillipines	2178.84	6263.92	6.41

Table 2. CAGR of agricultural domestic support of major countries (2000-01 to 2015-16).

Source: OECD Data.

Table 3. Continent-wise non-tariff measures imposed by WTO member countries.

Non-Tariff Variable	Africa	Asia	Europe	Least Developed Countries	Middle East	North America	South and Central America	Grand Total
Sanitary and Phytosanitary [SPS]	348 (2.22)	4813 (30.71)	1330 (8.49)	141 (0.90)	700 (4.47)	4310 (27.50)	3861 (24.64)	15670 (100.0)
Technical Barriers	1920	5017	4082	896	3945	2616	3909	21925
to Trade [TBT]	(8.76)	(22.88)	(18.62)	(4.09)	(17.99)	(11.93)	(17.83)	(100.0)
Anti-Dumping	75	789	326	0	4	480	372	2084
[ADP]	(3.60)	(37.86)	(15.64)	(0.0)	(0.19)	(23.03)	(17.85)	(100.0)
Countervailing	8	28	25	0	0	160	9	232
[CV]	(3.45)	(12.07)	(10.78)	(0.0)	(0.0)	(68.97)	(3.88)	(100.0)

Continued

Safeguards [SG]	12	23	3	1	9	0	6	61
	(19.67)	(37.70)	(4.92)	(1.64)	(14.75)	(0.0)	(9.84)	(100.0)
Special Safeguards	0	123	269	0	0	173	68	633
[SSG]	(0.0)	(19.43)	(42.50)	(0.0)	(0.0)	(27.33)	(10.74)	(100.0)
Quantitative	35	806	63	32	0	57	69	1108
Restrictions [QR]	(3.16)	(72.74)	(5.69)	(2.89)	(0.0)	(5.14)	(6.23)	(100.0)
Tariff-Rate	82	179	681	0	12	84	228	1274
Quotas [TRQ]	(6.44)	(14.05)	(53.45)	(0.0)	(0.94)	(6.59)	(17.90)	(100.0)
Export Subsidies	62	8	214	0	6	29	110	429
[XS]	(14.45)	(1.86)	(49.88)	(0.0)	(1.40)	(6.76)	(25.64)	(100.0)

Note: Figures in parenthesis indicates percentage share to grand total. Source: World Trade Organization, 2017, accessed on 25th July 2017.

Crop	Variables		1990-91 to 2000-01	2001-02 to 2015-16	1990-91 to 2015-16
	Average Export Import Price	Export	0.40	0.57	0.50
	US\$/Kg	Import	0.20	0.82	0.56
	Quantity Growth	Export	18.49 (116.55)	10.96 (171.0)	15.69 (123.14)
Rice	Rate (%)	Import	-13.62 (80.21)	20.47 (94.69)	-14.82 (47.71)
	Price Growth	Export	-4.35 (355.57)	4.16 (198.37)	-0.80 (204.11)
	Rate (%)	Import	-1.0 (139.93)	0.0 (158.27)	3.85 (110.71)
	Terms of Trade (%)		2.0	0.70	0.89
	Average Export	Export	1.28	2.29	1.90
	US\$/Kg	Import	1.72	1.96	1.86
	Quantity Growth	Export	14.69 (77.55)	-16.13 (87.08)	-3.05 (69.15)
Wheat	Rate (%)	Import	-22.11 (95.29)	63.48 (48.95)	18.0 (53.69)
	Price Growth	Export	2.35 (178.46)	5.61 (182.54)	4.11 (162.08)
	Rate (%)	Import	-3.27 (197.60)	2.52 (129.76)	0.28 (146.29)
	Terms of Trade (%)		0.74	1.17	1.02
Maize	Average Export	Export	0.25	0.21	0.23
Iviai2¢	US\$/Kg	Import	0.06	0.51	0.51

Table 4. World trading prices and comparative advantage—cereals.

Continued					
	Quantity Growth	Export	74.85 (77.22)	16.93 (139.62)	36.14 (80.27)
	Rate (%)	Import	106.38 (52.83)	28.45 (39.05)	45.82 (43.28)
	Price Growth	Export	-3.30 (114.81)	2.54 (473.05)	0.32 (160.77)
	Rate (%)	Import	-2.04 (86.48)	2.70 (184.93)	2.21 (103.07)
	Terms of Trade (%)		4.17	0.41	0.45
	Average Export Import Price US\$/Kg Quantity Growth Rate (%)	Export	0.33	0.40	0.37
		Import	0.22	0.33	0.29
		Export	9.43 (172.36)	3.81 (139.62)	8.22 (95.70)
Total Cereals		Import	-8.70 (91.33)	37.40 (38.89)	6.83 (50.45)
	Price Growth	Export	-3.73 (530.86)	6.74 (265.62)	0.34 (299.96)
	Rate (%)	Import	-4.21 (266.78)	3.88 (249.01)	-0.10 (228.96)
	Terms of Trade (%)		1.50	1.21	1.28

Source: Commodities, CMIE.

price of pulses (Table 5) namely, pigeon pea, gram, lentil and peas were more than import prices. While during the same period, oilseeds export prices (Table 6) namely, groundnut, soybean, Niger seed, safflower, sesamum and sunflower were more than the import prices except mustard. Cotton (Table 7) export as well as import prices were more than jute export import prices, indicating India has a comparative advantage in pulses, oilseeds and wheat.

From 2001-02 to 2015-16, similar trend was observed in all cereals, pulses, oilseeds and fiber crops as mentioned above, except soybean crop where the study noted that import price is more than the export price. Also, during 1990-91 to 2000-01, the export price of rice, maize, total cereals, pigeon pea, lentil, peas, groundnut, Niger seed, mustard, safflower, sesamum and sunflower found to be more than import price and the import price of wheat, gram and soybean were more than the export price. Export as well as import price of cotton was more than jute.

With regard to the terms of trade of India with world countries during 1990-91 to 2015-16, it was found to be improved for all cereals, pulses, cotton and jute except rice, maize, pigeon pea, peas.

The study found that among the world trading prices of the cereals, pulses,

oilseeds and fiber crops, average exports price of wheat, all the pulses and all the oilseeds except mustard found to be more than other crops imports price indicating India's comparative advantage in these crops. The study also found that the terms of trade of India's cereals (except rice, maize), pulses (except pigeon pea, peas), cotton and jute were found to be increased.

Crop	Variables		1990-91 to 2000-01	2001-02 to 2015-16	1990-91 to 2015-16
	Average Export	Export	0.68	0.87	0.79
	US\$/Kg	Import	0.35	0.56	0.47
	Quantity Growth	Export	17.36 (-251.9)	-5.28 (-77.01)	4.53 (-85.08)
Pigeon Pea	Rate (%)	Import	7 (-136.7)	1.8 (-352.93)	12.71 (-140.88)
	Price Growth	Export	-3.76 (672.32)	8.79 (-65.74)	3.25 (-192.71)
	Rate (%)	Import	-0.92 (-553.63)	9.34 (-232.07)	4.5 (-221.69)
	Terms of Trade (%)		1.94	1.55	1.68
	Average Export	Export	0.37	0.79	0.62
	US\$/Kg	Import	0.41	0.52	0.47
	Quantity Growth Rate (%)	Export	3.03 (-108.92)	37.79 (-121.4)	20.11 (-75.78)
Gram		Import	-8 (-111.83)	4.71 (-130.7)	7.43 (-104.79)
	Price Growth Rate (%)	Export	-4.54 (-180.55)	6.81 (-300.57)	1.44 (-193.87)
		Import	-1.49 (-233.66)	4.32 (-373.62)	2.21 (-291.04)
	Terms of Trade (%)		0.9	1.52	1.32
	Average Export	Export	0.6	0.88	0.76
	US\$/Kg	Import	0.44	0.59	0.53
	Quantity Growth	Export	38.63 (-85.12)	-13.63 (-69.25)	3.15 (-76.37)
Lentil	Rate (%)	Import	5.56 (-103.11)	19.51 (-80.34)	19.76 (-58.54)
	Price Growth	Export	-4.12 (-574.87)	5.9 (-214.72)	1.45 (-222.83)
	Rate (%)	Import	0.79 (-688.23)	5.98 (-309.35)	2.89 (-318.74)

 Table 5. World trading prices and comparative advantage—pulses.

Continued

	Terms of Trade (%)		1.36	1.49	1.43	
	Average Export Import Price US\$/Kg Ouantity Growth	Export	0.57	0.56	0.57	
		Import	0.27	0.34	0.31	
		Export	25.86 (-73.64)	14.14 (-90.54)	18.69 (-77.41)	
Peas	Rate (%)	Import	-14.63 (-118.18)	6.7 (-266.97)	4.14 (-126.45)	
	Price Growth	Export	-9.88 (-194.05)	3.58 (-232.8)	-3.19 (-218.08)	
R	Rate (%)	Import	4.99 (-444.24)	3.28 (-354.57)	4.19 (-351.28)	
	Terms of Trade (%)		2.11	1.65	1.84	

Source: Commodities, CMIE

 Table 6. World trading prices and comparative advantage—oilseeds.

Crop	Variables		1990-91 to 2000-01	2001-02 to 2015-16	1990-91 to 2015-16
	Average Export	Export	0.55	0.90	0.75
	US\$/Kg	Import	0.14	0.67	0.39
	Quantity Growth	Export	15.90 (125.12)	11.04 (161.97)	12.23 (116.91)
Groundnut	Rate (%)	Import	-5.76 (78.73)	20.41 (70.19)	2.04 (52.04)
	Price Growth	Export	2.77 (372.09)	6.9 (319.98)	4.41 (259.20)
	Rate (%)	Import	0.0 (31.62)	0.0 (79.62)	0.0 (56.04)
	Terms of Trade (%)		3.93	1.34	1.92
	Average Export Import Price	Export	0.19	0.54	0.40
	US\$/Kg	Import	0.09	0.60	0.33
	Quantity Growth	Export	63.03 (43.92)	42.57 (77.72)	27.34 (63.17)
Soyabean	Rate (%)	Import	-66.88 (38.23)	134.30 (41.84)	-1.66 (39.67)
	Price Growth Rate (%)	Export	-2.87 (67.52)	-3.76 (208.22)	3.36 (123.78)
		Import	0.0 (39.40)	-12.52 (101.02)	4.19 (58.69)

Continued					
	Terms of Trade (%)		2.11	0.90	1.21
	Average Export Import Price	Export	0.62	0.78	0.71
	US\$/Kg	Import	0.0	0.0	0.37
	Quantity Growth	Export	10.99 (236.04)	-2.98 (266.68)	1.59 (232.97)
Niger Seeds	Rate (%)	Import	0.0 (0.0)	0.0 (0.0)	20.24 (68.89)
	Price Growth	Export	-0.94 (848.08)	7.50 (288.62)	2.74 (320.0)
	Rate (%)	Import	0.0 (0.0)	0.0 (0.0)	0.0 (79.94)
	Terms of Trade (%)		0.0	0.0	1.92
	Average Export Import Price	Export	0.49	0.59	0.54
	US\$/Kg	Import	0.23	0.85	0.55
	Quantity Growth Rate (%)	Export	58.86 (61.76)	3.63 (187.86)	24.35 (99.90)
Mustard		Import	33.66 (149.87)	-5.77 (99.50)	11.05 (122.28)
	Price Growth Rate (%)	Export	-3.63 (476.88)	3.14 (556.73)	0.12 (475.79)
		Import	33.66 (104.17)	-5.77 (220.68)	11.05 (118.46)
	Terms of Trade (%)		2.13	0.69	0.98
	Average Export Import Price	Export	0.41	0.33	0.36
	US\$/Kg	Import	0.0	0.0	0.06
	Quantity Growth	Export	-1.69 (102.55)	2.24 (605.95)	11.94 (153.41)
Safflower	Rate (%)	Import	0.0 (0.0)	0.0 (0.0)	25.26 (63.65)
	Price Growth	Export	1.72 (522.03)	1.33 (122.79)	1.31 (170.42)
	Rate (%)	Import	0.0 (0.0)	0.0 (0.0)	0.0 (26.73)
	Terms of Trade (%)		0.0	0.0	6.0
	Average Export	Export	0.73	1.29	1.05
Sesamum	Import Price US\$/Kg	Import	0.29	1.03	0.71

Continued

	Quantity Growth	Export	20.83 (165.04)	2.74 (301.97)	10.79 (156.38)
	Rate (%)	Import	-10.46 (93.49)	81.45 (72.17)	21.22 (53.67)
	Price Growth	Export	-2.70 (665.95)	6.58 (250.03)	2.01 (218.10)
	Rate (%)	Import	0.0 (69.92)	0.0 (264.14)	0.37 (122.06)
	Terms of Trade (%)		2.52	1.25	1.48
	Average Export	Export	0.62	0.96	0.82
	US\$/Kg	Import	0.28	0.79	0.57
	Quantity Growth	Export	-3.87 (174.22)	9.31 (220.19)	3.51 (150.75)
Sunflower	Rate (%)	Import	-100.0 (35.25)	0.0 (66.48)	28.90 (50.85)
	Price Growth	Export	0.42 (157.68)	1.84 (373.38)	7.85 (227.66)
	Rate (%)	Import	0.0 (30.15)	0.0 (53.71)	0.0 (43.65)
	Terms of Trade (%)		2.21	1.22	1.44

Source: Commodities, CMIE.

Table 7. World trading prices and comparative advantage—cotton and jute.

Crop	Variables		1990-91 to 2000-01	2001-02 to 2015-16	1990-91 to 2015-16
	Average Export Import Price	Export	1.27	1.42	1.36
	US\$/Kg	Import	1.83	1.74	1.78
	Our at the Court	Export	-17.49	40.48	6.69 (87.76)
Cotton	Quantity Growth Rate (%)	Import	91.52 (78.68)	-3.36	32.09 (130.76)
Cotton	Price Growth Rate (%)	Export	3.25	(21122)	0.93
		Import	-3.45 (335.04)	(382.32) 2.83 (371.72)	-0.23
	Terms of Trade (%)		2.0	0.70	0.89
Iuto	Average Export	Export	0.23	0.34	0.29
Jule	US\$/Kg	Import	0.29	0.41	0.36

Continued 2.03 6.80 5.98 Export (119.65) (199.34)(116.48)Quantity Growth Rate (%) 6.94 0.45 3.28 Import (145.62)(189.55)(162.96)-10.2511.86 1.07 Export (178.74)(145.83)(146.43)Price Growth Rate (%) -2.106.55 2.47 Import (434.95)(233.21)(239.29)Terms of Trade 0.79 0.83 0.81 (%)

Source: Commodities, CMIE.

3.3. Politicians, Ministry of Finance, Economists

1) International political economy of agriculture

Understanding the international political economy and the impact of foreign trade policy making on the production and consumption of agricultural crops and its contribution to the economic growth is of prime importance for politicians and ministry of finance. International politics and international economics together compose the international political economy. Agriculture has not been paid enough attention required in the constantly changing or developing political scenarios. The incentives and strategies of politicians, economists, agency officials, and environmental advocates play an important role in the field of agriculture. How this web of interactions effects agricultural and food policies, farmers, consumers, welfare and economic growth, is of great relevance in the dynamical trade scenarios. Continent-wise nominal GDP sector composition (in percentage and in millions of dollars) and Agriculture Orientation Index continent-wise for the year 2015 are presented in Table 8. The AOI indicates, those the countries which have more than 1 as AOI spends more budget for agricultural budget allocation. It was noticed that most of the country's AOI is less than 1, implying, globally agriculture is not on the priority list for the local central governments, except for South Korea and Switzerland, whose agriculture orientation index is greater than 1 (1.96 and 5.08 respectively). International institutions like World Bank have been giving low to medium preference to funding in Agriculture, Fishing and Forestry, among various sectors. This shows the poor treatment towards the agriculture sector.

2) World bank funding

World Bank lending by sector wise for the fiscal years 2011-2015 is given in **Table 9**. World Bank lending has been the highest to public administration, law and justice sector in all the years and the least to information and communications. Agriculture, Fishing and Forestry has been given low to medium preference among various sectors by the major lending institutions of the world. Political economy of international financial institutions displays high priority to public administration, law and justice sectors and a poor treatment towards the agriculture.

No.	Country/Economy	Nominal GDP (in Mn \$)	Agri. Share in GDP (%)	Total Outlays 2015 (Central Government) (in Mn \$)	Agriculture Orientation Index
-	World	75,212,696	5.90		
	Africa				
1	Nigeria	415,080	17.80		
2	South Africa	341,216	2.50	60254.34	0.68845
	Asia				
1	China	11,218,281	6.90	410151.69	0.31944
2	Japan	4,730,300	1.20	760577.81	
3	India	2,250,990	17.40		0.000769 √
4	Indonesia	940,953	14.30	134821.07	
5	United Arab	416,444	0.70	17506.14	0.05023
6	Iran	412,340	11.20		
7	Saudi Arabia	657,785	2.00		
8	South Korea	1,404,380	2.70	297256.6	1.96439 √
9	Thailand	390,592	13.30	75187.49	0.83418
10	Taiwan	519,149	1.30		
11	Turkey	755,716	8.90	277290.12	0.39941
	Australasian				
1	Australia	1,256,640	4.0	326570.64	0.23684
	Europe				
1	Germany	3,494,900	0.8	425433.58	
2	Netherlands	769,930	2.8	310458.85	0.22548
3	Russia	1,267,750	3.90	451002.73	0.17643
4	Switzerland	662,483	1.30	117416.31	5.08178 √
5	Spain	1,252,160	3.30	418114.85	0.08045
6	Italy	1,852,500	2.00	537402.74	0.16724
7	Sweden	517,440	1.80	147381.2	0.38457
8	Belgium	470,179	0.70	125407.29	0.00004
9	Poland	467,350	3.40	188586.55	0.38103
10	United Kingdom	2,649,890	0.70	1124398.57	0.45754
11	France	2,488,280	1.90	1115984.03	0.2045
12	Austria	387,299	1.50	177453.82	
13	Norway	376,268	2.70	150895.81	0.93762
14	Denmark	347,196	4.50	124401.99	0.39976

Table 8. Continent-wise Nominal GDP sector composition (in percentage and in millions of dollars) and agriculture orientation index continent-wise for the year 2015.

Continu	ied				
15	Greece	246,397	3.30	105728.45	0.11949
	North America				
1	United States	17,946,996	1.12	2405200	
2	Canada	1,532,340	1.80		
3	Mexico	1,063,610	3.70		
	South America				
1	Colombia	400,117	8.90	66126.09	
2	Argentina	541,784	10.00	165216.11	0.09439
3	Venezula	209,226	4.70		
4	Brazil	1,769,600	5.40	496545.66	0.14801

Sources: The World Bank Agri. Share. % GDP Share of different sectors—"The World Fact Book—Central Intelligence Agency". Central Intelligence Agency. September 2017. Total Outlays, Agriculture Orientation Index_FAO STAT.

Table 9. World Bank lending sector wise: fiscal 2011-15 (Millions of dollars).

SECTOR	FY11	FY12	FY13	FY14	FY15
Agriculture, Fishing and Forestry	2128	3134	2112	3059	3027
Education	1733	2959	2731	3457	3534
Energy and Mining	5807	5000	3280	6689	4510
Finance	897	1764	2055	1984	4054
Health and Other Social Services	6707	4190	4363	3353	6647
Industry and Trade	2167	1352	1432	1807	2311
Information and Commucations	640	158	228	381	322
Public Administration, Law and Justice	9673	8728	7991	8837	8180
Transporation	8683	4445	5135	6946	5151
Water, Sanitation and Flood Protection	4617	3605	2220	4332	4760
Sector Total	43,006	35,335	31,547	40,843	42,495
Of which IBRD	26,737	20,582	15,249	18,604	23,528
Of which IDA	16,269	14,753	16,298	22,239	18,966

Source: Annual Report, World Bank, 2015.

3.4. Exporters/Importers/Farmers

These are the signals useful to exporters, importers and farmers. Major destinations for various agricultural crops based on quantity from 1990-2016 are given in **Table 10**.

1) Identification of markets

The study noticed that India's major exports destinations for cereals, pulses, cotton, jute, groundnut, soybean Niger seeds, sesamum, and sunflower are Bangladesh, Sri Lanka, China, Nepal, Indonesia, the USA, South Korea and Philippines respectively and imports destinations are Australia, Canada, the USA, Bangladesh, Germany, the USA, Nigeria and Ukraine for cereals, pulses, cotton, jute, groundnut, soybean, sesamum, and sunflower respectively.

- India witnessed the comparative advantage in exports of cereals, pulses and cotton to Bangladesh, Saudi Arabia and Vietnam respectively.
- The study found that the major India's exports destinations for cereals, pulses, cotton, jute, groundnut, soybean, Niger seeds, sesamum, and sunflower are Bangladesh, Sri Lanka, China, Nepal, Indonesia, the USA, South Korea and Philippines respectively.
- India's major imports destinations are Australia, Canada, the USA, Bangladesh, Germany, Nigeria and Ukraine for cereals, pulses, cotton, jute, groundnut, soybean, sesamum, and sunflower respectively.

These findings have important implications which could be considered to design foreign trade policies and programs in agriculture and commerce to augment foreign earnings of trading countries. The study guides exporters and importers countries for market and price signals of commodities. Market price signals contribute to all the stakeholders right from the farmer to the consumer. However, all the back end research and the main goal of the governments is to make an ecosystem of market that facilitates easy and profitable trade. In this context, the effect of market price information on agricultural outcomes is immense. Studies world over have only contributed to the fact that market failures could be curbed to a great extent with timely access to price information between farmers and traders. Not only the informed farmers, market activity and incomes increased, but also resulted in an increased dispersion in revenues between informed and uninformed farmers, Svensson and Drott [22].

Top agricultural exports and imports products of India in terms of value for the year 2016 are tabled (Table 11). Rice is the major exported product with its value at 5316 Million US \$. India's import basket majorly consists of oilseeds and its products. Palm oil and its fractions stood the highest among the 2016 imports which valued at 5642 Million US \$. It could be observed that there is an increasing need to focus on the oilseeds research and development. The study suggests that researchers require to concentrate on increasing the oilseeds productivity despite the technological constraints.

2) Tariffs

Tariffs raise revenues besides protecting local industries from foreign competition and are viewed as a helpful policy tool. As per the WTO India tariff profile, the MFN tariffs which are the highest tariffs charged on WTO members by one another, it could be observed from **Table 12**, that among the major agricultural imports by product groups' beverages and tobacco (68.6) and coffee, tea (56.3) were the highest. Also, the bound tariff which is the maximum MFN level for a given commodity have the binding overhang of 100% to almost all the agricultural products.

The major trading partners of Indian agricultural exports and the duties faced

in 2015 are shown in **Table 13**. During the year, European Union stood at the top of bilateral imports valued at 3203 million US \$ followed by the USA, Saudi Arabia and Bangladesh.

Table 10. World Bank lending sector wise: fiscal 2011-15 (Millions of dollars).

		Quantity Growth Rate (%)			Pric	e Growth Rate	Total		
Indian Trade	Country	1990-91 to 2000-01	2001-02 to 2015-16	1990-91 to 2015-16	1990-91 to 2000-01	2001-02 to 2015-16	1990-91 to 2015-16	Quantity (Tonnes)	% Quantity to World Total
-	Bangladesh	57.08	0.92	25.05	2.45	-0.1	1.3	30,137,075	16.85
Cereals Export	Saudi Arabia	7.78	4.74	5.43	1.53	0.36	0.74	16,426,190	9.19
Cereals Import	Australia	-15.06	51.41	8.48	0	0.78	0	6,210,790	37.04
	Russia	0	0	0	0	0	0	2,882,728	17.19
	Saudi Arabia	15.82	4.33	8.71	1.56	0.35	0.74	15,624,608	14.22
Rice Export	Bangladesh	0	7.98	0	0	0.32	0	14,311,137	13.02
	Vietnam	-100	0	-100	1	0	1	178195.5	54.64
Rice Import	USA	-6.22	6.53	-16.62	0.75	0	1	76327.11	23.41
	Bangladesh	0	-19.69	0	0	-0.64	0	11184.63	33.95
Wheat Export	UAE	26.37	-10.6	-0.39	7.88	-0.57	-0.03	3180.24	9.65
Wheat Import	Australia	-19.58	60.91	15.37	0.98	0.62	0.79	38.41	1.6
	Ukraine	0	0	0	0	0	0	16.98	0.68
	Malaysia	0	0	0	0	0	0	7446129.7	23.98
Maize Export	Indonesia	13.89	6.29	14.26	0.21	9.45	1.02	5450400.5	17.55
	China	0	-100	0	0	1	0	162620.66	32.35
Maize Import	Ukraine	0	0	0	0	0	0	155665.67	30.97
	Sri Lanka	0	-3.3	0	0	-0.94	0	617307.89	14.1
Pulses Export	Pakistan	0	14.67	0	0	0.39	0	616440.87	14.08
	Canada	41.86	8.42	29.05	1.56	0.42	0.76	20,585,212	36.15
Pulses Import	Myanmar	-2.89	-1.02	5.52	1.37	-0.07	0.24	13,223,455	23.22
	China	0	83.65	0	0	0	0	7896844.4	46.26
Cotton Export	Bangladesh	0.14	61.04	24.33	0	0.74	1.09	2600166.6	15.23
Cotton	USA	0	-7.38	0	0	4.02	0	812028.49	22.98
Import	Egypt	0	-0.9	0	0	-15.35	0	345064.13	9.77
T · F ·	Nepal	0	6.95	0	0	0.12	0	396247.58	90.78
Jute Export	Pakistan	0	0	0	0	0	0	11202.23	2.57
т. т.	Bangladesh	6.93	0.04	3.28	1.66	0	0.39	1875619.2	97.63
Jute Import	Nepal	0	-100	0	0	1	0	39783.2	2.07

Source: Commodities, CMIE.

DOI: 10.4236/ajps.2018.99136

Top Exported Products	Products	Value in 2016 (Mn US \$)	Top Imported Products	Products	Value in 2016 (Mn US \$)
HS1006	Rice	5316	HS1511	Palm oil and its fractions	5642
HS0202	Meat of bovine animals, frozen	3681	HS0713	Dried leguminous vegetables	4017
H\$1701	Cane or beet sugar	1450	HS1507	Soybean oil and its fractions	3013
HS5201	Cotton, not carded or combed	1346	HS1512	Sunflower seed, or cotton oil	1316
HS0904	Pepper of the genus Piper	844	HS0801	Coconuts, Brazil nuts, cashew nuts	1209

Table 11. Agricultural products exports and imports of India.

Source: WTO.

Table 12. By product groups—tariffs and imports (2015-16).

]	Final Bo	und Du	ties	MFN	Applied D	Imports		
Product Groups	AVG	Duty free (%)	Max	Binding (%)	AVG	Duty free (%)	Max	Share (%)	Duty free (%)
Animal Products	106.1	0	150	100	31.1	0	100	0	0
Dairy Products	65	0	150	100	33.5	0	60	0	0
Fruit, Vegetables, Plants	100	0	150	100	29.4	0.5	100	2	18.5
Coffee, Tea	133.1	0	150	100	56.3	0	100	0.1	0
Cereals and Preparations	115.3	0	150	100	31.3	15.4	150	0.1	33.3
Oilseeds, Fats and Oils	169.7	0	300	100	35.1	0.9	100	3	0.2
Sugars and Confectionery	124.7	0	150	100	35.9	0	60	0.2	0
Beverages and Tobacco	120.5	0	150	100	68.6	0	150	0.2	0
Cotton	110	0	150	100	6	80	30	0.1	99.9
Other Agricutural Products	104.8	0	150	100	22.3	13.6	70	0.5	4.5
Fish and Fish Products	100.7	0	150	11.1	29.9	0.1	30	0	6.3
Minerals and Metals	38.3	0.4	55	61.3	8.2	0.1	15	34.1	0.1
Petroleum	-	-	-	0	4.2	16.7	5	18.9	94.4
Chemicals	39.6	0.1	150	89	7.9	0.4	10	10.9	2
Wood, Paper, etc.	36.4	0	40	64.2	9	4	10	2.1	2.5

Continued									
Textiles	27.1	0	70	69.9	11.7	0	90	1.4	0
Clothing	37.4	0	48	58.4	12.3	0	48	0.2	0
Leather, Footware, etc.	34.6	0	40	51.6	10.1	2.5	70	1.1	0

Source: WTO.

Table 13. Exports-major trading partners and duties faced in 2015 by India.

Major Markets for	Bilateral D imports 9 (in Mn US \$)		Diversification 95% trade in No. of		MFN AVG of traded TL		Duty-free imports	
Products		HS 2-digit	HS 6-digit	Simple	Weighted	Weighted	TL in %	Value in %
European Union	3,203	26	115	11.8	4.4	1.7	27	60.2
United States of America	2,669	23	86	4.6	1.3	0.6	72.3	81.5
Saudi Arabia	2,059	20	63	13.9	5.8	0	26.5	69.3
United Arab Emirates	1,926	20	86	5.2	2.5	0	26.4	71.2
Bangladesh	1,857	10	24	16.6	7.3	0.4	20.1	53.1

Source: WTO.

3.5. Researchers

The world food security which is influenced by some of the global key variables (beyond 2050) is presented in **Table 14**. "By 2050" food production in the developing countries would need to almost double. Hence stimulus package is necessary in agriculture. The developed countries have to focus for future demands (2025) of sugar and developing countries on wheat, maize, soybean, pig meat, poultry meat, sheep meat, beef and veal.

There is a need to formulate new strategy and global policies to meet the future demand for rice. It must be noted that in the economic development of world, livestock sector could play an important role.

The New Vision for Agriculture journey is composed of National-Regional-Global level partnerships approach and scaling it up through institutions and national programs. CGIAR and FAO should act as intelligence think tank. The countries with considerable agriculture sector thriving in their economies must fix MSP 20% higher than world average price.

Information on the current status of supports and measures forms a critical input into trade policy debates and helps demonstrate that further efforts are still worthwhile. These examined issues have a significant impact on trade negotiations on world trading rules. It adds to the existing research directed at the impacts of domestic support and measures policies. These findings have important implications which could be considered to design WTO Agreements or policies

Key Variables	2005	2050	2080	2100
Population (million)—UN 2008 revision	6592	9150	9414	9202
Population (million)—UN 2010 revision	6584	9306	9969	10125
Cereals, food (kg/capita)	158	160	161	
Meat, food (kg/capita)	38.7	49.4	55.4	
Oil crops (oil equivalent), food (kg/capita)	12.1	16.2	16.9	
Cereals, production (million tonnes)	2068	3009	3182	
Meat, production (million tonnes)	258	455	524	

Table 14. Global key variables which influence on food security (beyond 2050) [23].

Source: Alexandratos and Bruinsma (2012).

or programs to boost agricultural development and promotion of trade. A significant finding of this study is that while many trade and domestic support policies are aimed at increasing protection of agriculture. Sanitary and Phytosanitary (SPS) and Antidumping (ADP) were emerged as most noticeable non-tariff measures to protect agriculture in the world. The impacts of current support policies have a number of implications for further multilateral agreement on agricultural trade and domestic supports and measures policy reforms. There is still something to be gained from all regions in pursuing further reforms.

Institutions such as CGIAR and FAO vision must act as an intelligence think tank to acquaint and analyze global research knowledge and transfer capacity building of NARES system. Present study suggests to focus on future policies with agriculture as a global agenda and to put in global efforts.

The international trade in general and export marketing in particular is a complex phenomenon because of too many variables effect on trade. This study estimated only few indicators such as elasticity's, growth rates, market destinations and traced global supply chains. Hence, future research should focus on more trade parameters and policies influencing them.

4. Conclusions

Countries in the world either exporting or importing need to look at the following international market signals such as, world trading prices, trends, growth rates, elasticity's, market destinations, demand and supply, tariffs, export-import duties, trade barriers, comparative advantage, competitive advantage, international government organizations priorities, and global policies changes and these signals usefulness in decision making to governments, exporters and importers, producers, consumers, researchers and WTO negotiations.

Trade price elasticity's are one of the important signals for the policy makers, and are helpful for the exporters and importers to increase or decrease their trade. The export and import price elasticity's for India's various agricultural crops during the period 1990-91 to 2015-16 of all the crops shown are positive except the wheat export price elasticity (-0.3%) and import price elasticity of

soybean (-0.45%). Among cereals, pulses, oilseeds and fiber crops, rice (1.24%), peas (2.36%), mustard (0.97%) and cotton (0.75%) have high export elasticity's respectively. It shows that more elastic crops are more demand in the international market and more competitiveness. The study suggests that to increase the trade and to establish good relationships with the world trading countries, imports from inelastic countries should be exempted from any ban (without any quantity restriction).

A good understanding of global agricultural supports is crucial to institute the trade rules and to oversee the execution of the trade agreements among the countries. During 2000-2016, the highest and positive growth rates in agricultural support were observed in Russia (22.68%) followed by India (20.19%), China (19.93%), New Zealand (12.34%), Philippines (6.41%), Costa Rica (6.36%) and Brazil (6.01). During the same period, the negative growth rates in agricultural support were observed in Mexico (-3.44%), Chile (-2.59%), USA (-2.47%), Japan (-1.52%) and OECD (-0.37%) members. The study found that among the WTO member countries Russia, India, China and New Zealand have given more domestic support to agricultural sector (2000-2016), indicating that these countries are protecting agriculture to make their products competitive in international markets. Technical Barriers to Trade (TBT), Sanitary and Phytosanitary (SPS) and Anti-dumping (ADP) are the most noticeable non-tariff measures in world. The study also observed that Asia followed by Europe and North America imposed the highest non-tariff measures.

The study found that, during the period 1990-91 to 2015-16, import prices of rice and maize were more than export prices, where as in wheat a reverse trend was observed. Also, the export prices of all pulses viz., pigeon pea, gram, lentil and peas were more than import prices. Study concluded that India has a comparative advantage in pulses, oilseeds and wheat. The study also found that the terms of trade of India's cereals (except rice, maize), pulses (except pigeon pea, peas), cotton and jute were found to be increased.

The underlying concept of AOI indicates that the countries with more than 1, as AOI, will spend more budget in budget allocation towards agriculture. It was observed that most of the country's AOI is less than 1, which depicts that, globally agriculture is not on the priority list for the local central governments, except for South Korea and Switzerland, whose agriculture orientation index is greater than 1 (1.96 and 5.08 respectively). The poor treatment towards the agriculture sector is also reflected in the international institutions (like World Bank) funding pattern of low to medium preference towards Agriculture, Fishing and Forestry, among various sectors. Political economy of international financial institutions displays high priority to public administration, law and justice sectors.

It was also found that India's major exports destinations for cereals, pulses, cotton, jute, groundnut, soybean and Niger seeds, sesamum, and sunflower are Bangladesh, Sri Lanka, China, Nepal, Indonesia, the USA, South Korea and Philippines respectively and imports destinations are Australia, Canada, the

USA, Bangladesh, Germany, the USA, Nigeria and Ukraine for cereals, pulses, cotton, jute, groundnut, soybean, sesamum, and sunflower respectively. Rice is the major exported product with its value at 5316 Million US \$ and India's import basket majorly consists of oilseeds and its products.

With regard to tariffs, being one of the important policy tools, the study observed that, among the major agricultural imports by product groups' beverages and tobacco (68.6) and coffee, tea (56.3) were the highest in the WTO tariff profile. Also, the bound tariff which is the maximum MFN level for a given commodity has the binding overhang of 100% to almost all the agricultural products. In 2015, among the major trading partners for Indian agricultural exports and duties levied, European Union stood at the top of bilateral imports valued at 3203 million US \$ followed by the USA, Saudi Arabia and Bangladesh.

A critical input into trade policy debates is the world trade information on the current status of supports and measures. The study examined issues which have a significant impact on trade negotiations on world trading rules. It adds to the current research directed at impacts of domestic support and measures policies. However, the impacts of current support policies have a number of implications for further multilateral agreements on agricultural trade and domestic supports and measures policy reforms. There is still something to be gained from all regions in pursuing further reforms. The study concludes that the future research must be oriented based on the requirements of the changing world trade scenarios rather than based on the domestic parameters. Finally, the study suggests that existing research gaps must be analyzed thoroughly with regard to various world foreign trade policies, market signals and their usefulness in decision making to multi-stake holders such as governments, policymakers, exporters/importers, producers, researchers, WTO, IMF and World Bank.

Acknowledgements

I would like to thank SERB, DST, GOI for supporting the project.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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