Non-Tariff Measures (NTM) and Their Significance in Agricultural Trade of India and European Union

M. B. Niranjan[1*], K. M. Shivakumar[1], M. Prahadeeswaran[1] and A. Rohini[2]

[1]*Department of Agricultural Economics, TNAU, Coimbatore, India.*
[2]*Department of Agricultural and Rural Management, TNAU, Coimbatore, India.*

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: The research study aims to study the decadal growth in agricultural trade of top five agricultural commodities between India and the European Union and also the quantification of Non-Tariff Measures (NTM) of select agricultural commodities to give trade policy suggestions to the concerned commodity sectors

Study Design and Methodology: A decadal growth in top five agricultural commodities were studied for 28 European Union Countries (EU-28) and India using Compounded Annual Growth Rate and NTM of three subsections of WTO were quantified using inventory-based approaches; coverage ratio and frequency index.

Results and Conclusion: In terms of quantity exported, positive annual growth rate of 0.24, 0.48 and 0.76 per cent in marine products, coffee and castor oil is noticed. A negative growth of 0.67 and 2.6 per cent in spices and tobacco unmanufactured is witnessed during the study period. Export value recorded the positive annual growth rate of 2.96, per cent in marine products and spices and a negative growth of 1.7,0.16 and 2.8 per cent in coffee, castor oil and tobacco unmanufactured respectively. Export value per unit showed annual positive growth of 2.7,2.2 and 0.94 per cent in marine products, coffee and spices and negative growth of 0.91 and 0.22 per cent

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Corresponding author: E-mail: niranjbalu1997@gmail.com;

in castor oil and tobacco unmanufactured respectively. Both Sanitary and Phyto Sanitary (SPS) and Technical Barriers to Trade (TBT) Measures had a greater impact in the agricultural export form India to EU-28 during 2010-11 to 2019-20.

1. INTRODUCTION

Post economic reforms of 1991 India's export potential has increased multifold and the Indian economy is one amongst fastest growing large economies in the 21st Century. Along with many other growing economies India's export market has been booming which contributes towards considerable economic development and growth. European Union is the third largest trading partner of India after China and USA and there has been a significant growth in trade value over the past two decades. After the initiation of World Trade Organization (WTO) there has been a significant reduction in the tariff rates however Non-Tariff Measures (NTM) has gained popularity and has been used as a protectionist policy by many countries over the past two decades. Non-Tariff Measures (NTM) refers to a wide range of government activities that have an impact on trade and commerce. According to UNCTAD there are several types of Non-Tariff Barriers (NTB) which might be blatantly protectionist, at the expense of other nations' merchants, or they can be non-protectionist, yet nevertheless hinder some commerce. Hence, the problem focus in this study would be the impact of NTMs in agricultural products under Sections I, II and IV over the years from 2011-2020 which would give a brief idea about these measures which have gained importance in recent years.

India stands in the 14th position in terms of agricultural import to European Union with a share of 1.9 per cent of its agriculture food export basket and it stands 44th with a share of 0.3 per cent of EU's agricultural export as of 2020. India is home to more than 6,000 European firms that directly and indirectly employ more than a half-million people. Goods trade between the EU and India grew by 12.5 per cent in the previous decade, according to the World Trade Organization. In 2020, the EU-India trade in services was worth € 32.7 billion [1]. SPS and TBT measures are studied since these measures are found to be very prevalent in agricultural sector. The quantification of these measures is a must in order to capture the effects of NTMs in trade hinderance, since post WTO creation, the tariffs have almost been reduced to major extent but still developing countries face stringent regulations in exporting their commodities.

Being a major exporter and importer of agricultural goods from EU, it requires a proper scientific study for devising strategies to overcome these barriers and facilitating robust trade between India and EU. Quotas, health and environmental restrictions as well as licensing requirements and required product inspections are all examples of NTBs. Non-Tariff Measures classification of import measures as per Multi-Agency Support Team (MAST) group of UNCTAD TRAINS (2012) is illustrated in Appendix. The food standards, in particular, assist to safeguard consumers and the environment. Moving to the 60th year of partnership in trade, Appendix shows the 50-year chronicle between India and EU.

2. LITERATURE REVIEW

Baldwin [2] defined Non-Tariff Measures as any governmental or private policy that causes globally traded products and services, or resources dedicated to their creation, to be allocated in a way that reduces potential real-world revenue.

Lincoln and Naumann [3] defined Non-Tariff Measures as the trade obstacles that do not comprehend with tariffs. He further described Non-Tariff Measures as restrictions that can hinder small enterprises' worldwide endeavours, making international business a high-risk activity.

The Multi Agency Support Team (MAST) [4] stood a neutral ground on defining Non-Tariff Measures. According to MAST, other than regular customs duties, NTMs are policy actions that have the ability to affect international trade in products by affecting volumes exchanged, prices, or both.

Pal [5] on his research study on export of marine products from India to global arena from 1970-1989, using compounded annual growth rate as an analytical tool found out that there was a

significant growth of 12.26 per cent export growth annually.

Sujatha et al., [6] on reporting export growth of mangoes reported a positive growth rate of 7.92 per cent and 12.26 per cent at current prices and export value after the formation of WTO. There was also a positive growth rate when it was estimated at constant price levels.

Adhikari et al., [7] on estimation of basmati rice exports from India globally found that both the quantity exported and export earnings increased significantly to the rate of 7.55 per cent and 15.87 per cent respectively.

Rindayati et al., [8] analysed the coverage ratio and frequency index of tuna exports of Indonesia to its major trade partners and reported SPS measures coverage ratio of 100 per cent in Japan, USA and Thailand.

3. METHODOLOGY

The proposed study is based on the secondary data obtained from various sources such as WTO database, UNCTAD TRAINS database and official databases from European Union such as COMEXT-EUROSTAT and Indian government's APEDA database. Time series data for a decade 2010-2011 to 2019-20 was collected and analysed. The tools used in the present study are discussed below

3.1 Compound Annual Growth Rate

In order to analyze the propensity of the variables to increase, decrease or remain stagnant over a period of time the compound annual growth rate is calculated. In the present study the exponential growth rate was used to find the compound annual growth rate of top five agricultural commodities exported to European Union.

$$Y = ab^t e \text{ --------------------------------- [1]}$$

where,

Y= quantity exported (Metric tonnes) or Value realized ($ Million)
a= intercept
b= regression coefficient
t= time
e= error term

Taking log on both the sides give the compound annual growth rate as,

$$\log Y = \log a + t \log b \text{ ----------------------[2]}$$

Compound annual growth rate in percentage is obtained by,

$$CAGR = \{Exp (b) - 1\}100 \text{ --------------------[3]}$$

where, b is the regression coefficient

3.2 Frequency Index

It generally indicates the share of Non-Tariff Measures affected by one or more NTMs. Formally, the frequency index of NTMs imposed by country j is given as below.

$$Fj = \frac{\sum DiMi}{\sum Mi} * 100 \text{ ----------------------------[4]}$$

Where, Di denotes the existence of one or more NTMs on product i and M_i denotes the presence of imports of product i. D_i takes the value 0 if there is no prevalence of NTMs and takes value 1 if there is presence of one or more NTMs. It is the mostly used method though it suffers from several limitations like it accounts not for the stringency but only the presence or absence of NTMs and secondly it doesn't reflect the impact of NTMs in pricing and global trade.

3.3 Coverage Ratio

The coverage ratio measures the percentage of total imports that are impacted by one or more NTMs. Coverage Ratio of NTMs in Country j may be expressed as follows

$$CRj = \frac{\sum DiVi}{\sum Vi} * 100 \text{ ---------------------------- [5]}$$

Where Di denotes the existence of one or more NTMs on product i and D_i takes the value 0 if there is no prevalence of NTMs and takes value 1 if there is presence of one or more NTMs V_i denotes the value of import affected due to NTMs. The limitations generally seen in this are sometimes the ratio may be downward biased and it suffers from endogeneity if NTMs are subjected to import restrictions.
However, both these methods are widely used as inventory-based approaches in the quantification of NTMs.

4. RESULTS AND DISCUSSION

The share of Indian agricultural export to EU-27 (European Union excluding United Kingdom) as illustrated in the Fig. 1 shows that the beverages

including coffee and tea export shares a considerable eleven per cent in the export basket of India. As per the WTO definition on "Agri food products", the Harmonized System (HS) classification of the products under chapter 1 to 24 excluding marine products and chapters 33, 35, 38, 41, 43, 51 and 53 are considered in the Fig. 1.

The growth rate of the quantities, export value and per unit value of export of commodity for the top five commodities exported to the 28 countries of EU are illustrated in the Table 1. It can be understood from the Table 1 that out of the top five products which contributes significantly in India's export basket of agricultural commodities to EU-28, the marine products, coffee and castor oil showed an annual positive growth rate marginally over the last decade 2010-11 to 2019-2020 with 0.24,0.28 and 0.76 per cent respectively. But a negative annual growth rate with 0.67and 2.6 per cent was recorded for the spices and tobacco unmanufactured.

Export earnings at current prices when considered there was a positive annual growth rate of 2.96 and 0.27 per cent for marine products and spices. Coffee, castor oil and tobacco unmanufactured showed a negative

export earning annually at 1.7, 0.16 and 2.8 per cent respectively.

Per unit value of exports saw a declining annual growth rate for castor oil and tobacco whereas marine products, coffee and spices showed a positive growth of 2.7, 2.2 and 0.94 per cent respectively.

India had a tremendous growth in agricultural exports post globalization however, recent trends over the past decade is of concern. Though there was a net positive trade balance for India as of 2020 when overall goods are taken into consideration but agricultural growth tends to marginally rise only in certain products and not the overall trade basket.

Despite having some of the lowest tariff rates in the world, the EU is regarded for being one of the most active initiators of non-tariff measures in global trade. The data shown below in the Table 2 and 3 backs up the previous assertion, particularly when it comes to the trade between India and the EU. We have to keep in mind that India's average tariff rate is substantially higher than the EU's for practically all commodities. Summary of the tariff rates of India and EU are shown in the Table 2 and Table 3 respectively.
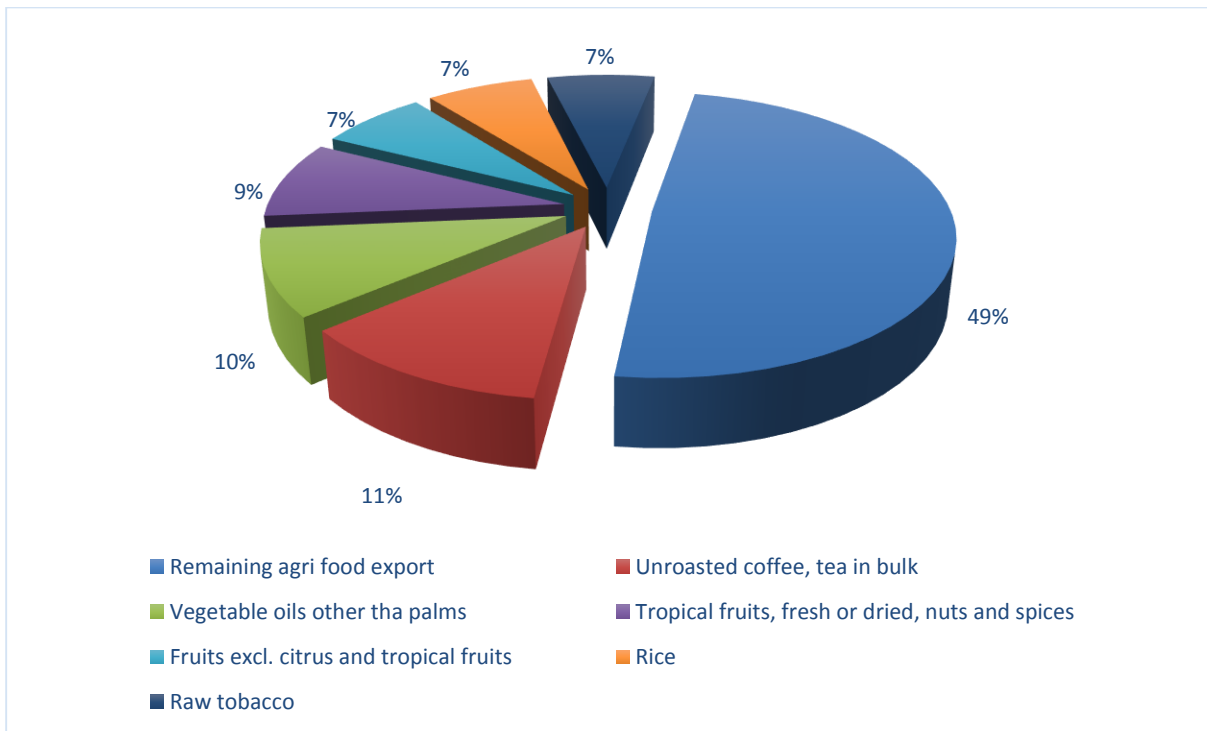

Fig. 1. Indian share of agricultural exports to EU-27 in 2020
Source: Author's calculation based on the COMEXT-EUROSTAT

Table 1. CAGR of top 5 agricultural commodities from India to EU during 2010-11 to 2019-20

Sl. No	Commodity	Description	Initial year observation	End Year observation	CAGR (%)	R^2 Value
1	Marine products	Quantity (MT)	173882.43	163386.54	0.24	0.01 [NS]
		Value (Million $)	708.58	862.53	2.96	0.28**
		Per unit value ($ Million/MT)	0.004075	0.005279	2.7	0.46 [NS]
2	Coffee	Quantity (MT)	160533.87	158805.95	0.48	0.25 [NS]
		Value (Million $)	402.28	367.59	-1.7	0.25**
		Per unit value ($ Million/MT)	0.002506	0.002315	2.2	0.43 [NS]
3	Spices	Quantity (MT)	71700.41	73579.74	-0.67	0.07 [NS]
		Value (Million $)	313.25	362.67	0.27	0.01 [NS]
		Per unit value ($ Million/MT)	0.004369	0.004929	0.94	0.07 [NS]
4	Castor oil	Quantity (MT)	183851.45	190864.86	0.76	0.13 [NS]
		Value (Million $)	256.74	288.67	-0.16	0.01 [NS]
		Per unit value ($ Million/MT)	0.001396	0.001512	-0.91	0.04[NS]
5	Tobacco unmanufactured	Quantity (MT)	84056.17	70324.34	-2.6	0.49**
		Value (Million $)	295.85	232.94	-2.8	0.43**
		Per unit value ($ Million/MT)	0.00352	0.003312	-0.22	0.03*

Source: Author's calculation based on APEDA

On comparison of Tables 2 and 3, tariff rates for agricultural products are 113.1 per cent and 6.7 per cent for India and EU respectively. The tariff rates for non-agricultural products stands at 36.0 and 3.9 per cent respectively. Though the tariff rates are high in India when compared to EU it should be noted that the Indian commodities face less tariffs in other export markets such as United States of America, United Arab Emirates when compared to EU.

Table 4 shows the clear picture of SPS measures dominating the agriculture and allied sectors as indicated in the Sections I, II and IV to the level of 70 per cent whereas the TBT are concentrated more on other traded goods. Tariff rate quotas, and special safeguard measures export subsidies are concentrated on a whole towards the trade in agriculture goods. Based on the WTO Harmonized System (HS) classification codes agricultural products in majority fall under

Table 2. Tariff rate summary of India, 2020

Summary	Total	Agri products	Non - Agri products
Simple average final bound (%)	50.8	113.1	36.0
Simple average MFN applied (%)	15.0	34.0	11.9
Trade weighted average (%)	7	32.5	5.8

Source: World Tariff Profiles 2021, WTO publication [9]

Table 3. Tariff rate summary of EU, 2020

Summary	Total	Agri products	Non - Agri products
Simple average final bound (%)	4.9	6.7	3.9
Simple average MFN applied (%)	5.1	7.2	4.1
Trade weighted average (%)	2.9	8.3	2.6

Source: World Tariff Profiles 2021, WTO publication

2-digit HS classification HS 01 to HS-24. The data was further disintegrated into 4-digit HS classification and descriptive statistics were used Table 5 shows the descriptive statistics using coverage ratio and frequency index for the computation of non-tariff measures focused on SPS and TBT measures since it forms the major portion of the measures applied especially in agricultural products.

Table 5 highlights the number of incidence of NTBs Section wise and it is found that the coverage ratio ranges from 63 percent to 100 percent in the three Sections under study. Coverage ratio is 100 percent in case of live animals and its products for both SPS and TBT measures which shows that each and every product traded under the Section 1 has been affected by at least one NTM. Prepared foodstuff; beverages, spirits, vinegar; tobacco has a frequency index of 100 which again infers that all the 44 commodities traded under Section II faces at least one TBT measure and 42 commodities faces at least one SPS measure. The wide range of coverage ratio of SPS is due to the fact that the SPS measure do not hinder the trade of tobacco and tobacco substitutes and instead TBT measures are imposed. Since the value of HS code 24 traded is nearly 178 million USD there seems to be less impact in terms of coverage ratio.

Coverage ratio greater than frequency index indicates that the sector is impacted more due to NTM. Live animals and products in Section I has a coverage ratio more than frequency index in both SPS and TBT and hence higher the impact. The vegetables in Section II been affected more due to SPS than the TBT measures. In Section IV, Prepared foodstuff; beverages, spirits, vinegar; tobacco has high impact in India's export due to the presence of TBT and the SPS aids in further reduction in the quantum exported. Accordingly, the SPS measures on a whole affects the export of Indian agricultural products to EU under these Sections than TBT.

Overall the TBT measures affects the commodities under 3 Sections than the SPS measures. With the coverage ratio of 97.70 and 90.44 for TBT and SPS respectively proves that UE-28 concentrates more on TBT measures. The frequency index with 95.68 and 99.28 for SPS and TBT measures respectively confirms the same. Out of 2.62 billion USD value traded, 2.56 billion USD value trade were subjected to NTM either due to SPS or TBT measures.

Various literature studies have shown that dairy export from India is affected due to the absence of mechanical milking. On the grounds of lack of transparency, the spices export is affected. Maximum Residual Limits (MRL) imposed at a more stringent levels than FAO specification has in turn affected the export quantum of rice and beverages such as coffee and tea. For an example, the maximum pesticide levels specified by the US were followed by Indian exporters; however, certain EU countries enforce tighter limitations of only 0.01 mg of tetrafidon and 2 mg of ethion per kilogram. Because of the presence of rinderpest, meat imports from India have been restricted in the EU. Groundnut and its oil import has been severely affected due to the presence of aflatoxin. Although the NTMs may be confined in the sense that they do not affect prices of other related products, their negative effects on exports are substantial. NTMs connected to SPS, for example, might effectively reduce exports to nil or very low levels in the food and seafood industries. This demonstrates that SPS procedures can and have resulted in complete consignment rejection in the past.

Table 4. NTMs imposed by EU on all imported products of India against agricultural imports under Section I, II & IV as on 30/06/2021

NTM	Overall Number of measures	Measures under Section I, II and IV
Sanitary and Phytosanitary measures (SPS)	868	609
Technical barriers to trade (TBT)	1379	86
Special safeguards (SSG)	71	71
Quantitative restrictions (QR)	10	2
Tariff Rate Quotas (TRQ)	87	86
Export Subsidies (XS)	20	20

Source: Integrated Trade Intelligence portal, WTO [10]

Table 5. Section wise classification of coverage ratio and frequency index for SPS and TBT

HS Codes	Section & Product Description	Measures	NTM affected Product count	Total traded product count	NTM affected trade value (Million USD $)	Total trade value (Million USD $)	Coverage Ratio	Frequency Index
HS 01 -05	**I** Live animals and products	SPS	22	23	506.75	506.75	100.00	95.65
		TBT	23	23	506.75	506.75	100.00	100.00
HS 06-14	**II** Vegetable products	SPS	69	72	1541.84	1603.92	96.13	95.83
		TBT	71	72	1553.75	1603.92	96.87	98.61
HS 06-24	**IV** Prepared foodstuff; beverages, spirits, vinegar; tobacco	SPS	42	44	320.81	509.26	63.00	95.45
		TBT	44	44	499.24	509.26	98.03	100.00
	Sections (I+II+IV) Total	SPS	133	139	2369.40	2619.95	90.44	95.68
		TBT	138	139	2559.75	2619.95	97.70	99.28

Source: UNCOMTRADE, UNCTAD TRAINS (2021) Database (Author's calculation)

5. CONCLUSION

The fact that NTMs are the most significant impediment to Indian exports is universally acknowledged, however a deeper understanding may differ between exporters. The government also recognizes the annual loss of marketplaces and export value that NTMs cause the country. On a long-term basis, however, to cope with this developing catastrophe, a deliberate and coherent response including all stakeholders, informed by adequate scientific understanding of the measures in question, utilizing existing institutional structures or creating new such arrangements is essential. NTM has acquired favour as a protectionist strategy in many nations, however it should only be used between competitive countries. NTM protectionist measures should have no impact on trade between non-competing countries.

India being one among the top exporters of agricultural products to EU, in order to protect itself from NTMs, India will have to take proactive measures. This necessitates increased attention and action on the part of the Indian government in order to continually lower the level of non-tariff measures and finalize the proposed FTA with the EU on favorable terms in near time. With special focus on SPS and TBT measures in tea, coffee, spices and marine products there would considerably increase India's export to EU. The quality and standard bar of Indian products shall be raised with the cooperation among the stakeholders involved.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Classification of Non-Tariff Measures related to import measures

TECHNICAL MEASURES	A	Sanitary and Phytosanitary measures (SPS)
	B	Technical Barriers to trade (TBT)
	C	Pre-Shipment Inspection
NON-TECHNICAL MEASURES	D	Contingent Trade Protective measures
	E	Non-automatic licensing, quotas, prohibitions and quantity-controlled measures other than SPS and TBT
	F	Price control measures including taxes and additional charges
	G	Finance measures
	H	Measures affecting competition
	I	Trade related investment measures
	J	Distribution restrictions
	K	Restrictions on post-sale services
	L	Subsidies excluding export subsidies under P7
	M	Government procurement restrictions
	N	Intellectual Property
	O	Rules of Origin

Source: UNCTAD TRAINS(2012) - The Global Database For Non-Tariff Measures Collection

India-EU Chronicle – 50 Years

1962	Euro-Indian business groups form joint forum to promote commerce.
1970	To augment operation flood here was a cooperation program on Dairy sector.
1971	Through the Generalized System of Preferences (GSP) EU supported India.
1973	An agreement between the European Union and India on commercial cooperation helping in promoting various export-oriented areas.
1981	Commercial and Economic Cooperation Agreement between India and EU.
1983	EU established presence in India through delegations.
1988	EU- India joint Commission met for the first time
1992	Euro-Indian business groups formed joint forum to promote commerce.
1993	For the support of District Primary education (DPEP) 150 million euro was granted for the Government of India initiative.
1996	200 million euro grant towards health sector.
2000	EU – India summit at Lisbon yielded a grant of 200 million euro to Sarva Siksha Abhiyan
2001	Agreement on cooperation in science and technology
2005	In order to bring the people together a joint action plan was implemented to boost trade and economic policies
2006	Partnership between EU the Indian states Rajasthan and Chattisgarh resulted in a grant of 160 million euro
2009	India-EU signed a joint declaration on Multilingualism
2011	200 million euro was given as a loan to finance renewable energy sector

Source: Delegations of EU and India (2013). The European Union and India- Fifty years of partnership. Accessed on 16 August 2021. Available: http://eeas.europa.eu/delegations/india