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Impact of TBT on Marine Products Exports from Kerala in a Benefits and Foibles Settings Based on Primary Data Inferences

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ABSTRACT

Seafood trade is a major item in the global trade of all products. The GATT has been replaced with the WTO for minimizing trade restrictions, but the irony is that in the ambit of WTO newer trade rules have been introduced in the form of TBT and other quality standards. Though it is possible for the Codex committee to introduce new guidelines and rules connected with trade. But the developed countries might change these stipulation as per their self-interest. The study is based on primary data collected from 30 processing-cum-export firms in the three districts of Kerala by using appropriate statistical techniques to endorse the benefits and foibles of the study. The EU approval has helped the firms to minimize rejections citing the implementation of the TBT standards by the importers. There were several factors that had led to these changes, apart from simple demand-supply dynamics and competitiveness. The impact of TBT on seafood exports of Kerala pointed towards strongness of its influence, particularly generating market diversification as its primary consequence of TBT stipulations. Market diversification, though is seemed a temporary solution, value addition and high unit value realisation are inevitable coping up mechanisms with a view to reducing the present high TBT impact index.

Keywords: Seafood trade, market concentration, compliance, quality standards, Technical Barriers to trade, WTO

Introduction

The seafood trade has been at an increasing trend. There are several reasons for this, nutritional value, health aspects and an income spurt in most of the emerging economies like China and Gulf countries. Another impetus fuelled for this continuum is the liberalisation in global seafood

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trade anticipated with the formation of the WTO *inter alia* technological innovations. Thereafter there seemed to be a big tussle between the participants in seafood trade, the exporters and the importers, though GATT was replaced with WTO for the smooth flow of trade. In India, Kerala is a prominent partner and hence the flow of trade was very favourable to flourish. Kerala has also benefitted from this as Kerala has good potential in exportable species and a prominent marine product producer and processing state in India. Though the global concentration is in terms of fish production from aquaculture, in Kerala it is still concentrating on marine harvest sector with a little prominence even for inland fish production. Post WTO period also witnessed big transformation in the fishery trade with more stringent restrictions, regulations and quality assurance practices mostly imposed by the importers of seafood. These include TBT measures, and SPS standards which have differently been treated by different importers in the EU, Japan and the US and this is stipulated mostly for the export item of Kerala the shrimp. Though TBT affected every seafood exporter globally, its repercussion in India and Kerala is also big as these measures have been detrimental to the progress of the export sector. With no option, India responded quickly and hence Kerala too responded to meet the challenges of the seafood sector conundrum. Initially the state faced some rejections of the consignment of the EU and the US, but soon the processing industry sets its standards, though with a high cost, with the government of India, Marine Products Export Development Authority (MPEDA) and Export Inspection Agency. The challenges faced by the seafood exporters and processors in the state in the background of importers challenges of TBT stipulations and the wherewithal of its addressing mechanisms are indeed significantly related.

The wide use of TBT is for a variety of reasons. First, TBT is legitimate. World Trade Organization (WTO) authorises its members to take measures like TBT/SPS Agreements to protect human health, animal and plant health, provided that the enforced measures are not disguised protectionism. Second, the increasing income of an importing country and consumer preference may result in a higher demand for product quality, safety, and environment protection. Third, as trade liberalization becomes more complex, it has become more difficult to use traditional trade protectionist measures to protect domestic industries. Thus, TBT has been used (or misused) to substitute for tariffs and other non-tariff barriers to trade. Unlike tariffs and other non-tariff barriers (NTBs), TBT can promote trade or restrict trade. On one hand, TBT promotes trade by providing consumers of importing countries with confidence on the quality, safety, and other health related concerns of the imported seafood products. On the other hand, governments of importing countries can use TBT to restrict imports even if the imported products are safe and met the standard imposed.

Facing potential examination harassment under TBT, importers and exporters are discouraged to carry out their trade. There are cases of rejection of seafood exports from Kerala for not

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following technical standards prescribed by export markets and these stipulations create trade distortion in the sector. Several pro-active measures are needed to overcome the impediments with quick responses from the exporters and government for addressing the quality issues and stipulations of TBT by the importers of seafood. In this scenario one immediate and possible option is, the exporters have to search for markets that have low level of technical stipulations, which in turn results in market diversifications other than the traditional market for export. This kind of diversion is not taking place with the sole action of one exporter, others are also following similar strategies. Here lies the importance of the problem, as Kerala has several processors and exporters in seafood and the earning from seafood is considerable while evaluating the total export earnings of the state. It is also needed to identify that Kerala's fish economy is different from other maritime states of India in terms of modernisation in the form of mechanisation and technological up-gradations and focussing mainly on the exportable verities of species. Hence, any changes in the quality stipulations through the WTO regime, like TBT makes big challenges in Kerala seafood sector from the beginning to the end of the nodes of the supply chain. Juxtaposing this to the realities of the seafood exporting firms so as to juggle with the fortunes of the exporters and their perceptions regarding TBT. Here lies the importance of the research problem.

Theoretical framework and literature

International trade theory gives an important caveat to the free and unhindered trade in seafood sector as the global economy participates in this in one way or another. Hence, the classical and neo-classical trade theories of Ricardo (1817) or Hecksher–Ohlin (Hecksher, 1919; Ohlin, 1933) are well camouflaged as in other commodities to the seafood trade as well. Maskus and Wilson (2000) highlight the issues of technical barriers to trade (TBT) and it is a common concern to most of the developing countries who are participating in fishery trade. Imposition of TBT leads to additional cost to the exporters with no additional revenue generation. Debroy (2005) is of the vies that TBT stipulations generate negative trends in the initial stage of its introduction, but it seems that India is slowly making steps to address those stipulations. Adhering to any multilateral agreement and the reaction happening in the economy is highly correlated to the pace of domestic reforms. It is substantiated that the domestic standards change in a better pace than earlier and hence complaining to TBT is not a serious issue for the marine product export sector of India and Kerala. Emran et. al. (2015) explain the economic and social costs of the rejection or that of detention of shrimp consignments under the stipulation by the shrimp exporters to the US and EU that stipulations are part of the WTO rules, there is no another go, but to comply with these standards of the US and EU. With this new compliance regime, the exporting firms are facing many obstacles, trade restrictions, losing the competitive power and thereby the overall quantity stagnation of shrimp exports. Bostock et al., (2004) analyse various

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issues of TBT measures of fish trade of different levels of stakeholder groups in a group of developing economies of India, Bangladesh, Viet Nam, Uganda and Guinea identify that impact is almost identical in these economies with respect to employment, export and cost for meeting the quality compliance and this led to large-scale unemployment to the female fish pre-processing workers. State-wise in India, Kerala has faced the brunt of the problem as the trawling industry is primarily connected to shrimp meant for export. Similar is the pathetic story of Viet Nam as it results in huge employment and income loss to the small-scale workers and processors.

Materials and Methods

The study amasses primary data collected from 30 seafood export processing units in Kerala from three districts of Ernakulam, Kollam and Alappuzha. As per MPEDA, Kerala has 123 manufacturer-cum-exporters. In this, the majority of the units are the EU approved. Sample constitute 30 EU approved seafood export processing units from Kerala. This is because the fact that once it is EU approved means that it has the best technical know-how to face the competition in the sector. As per concentration of processing units, and in this respect the spread of the units is 42 in Ernakulam, 11 in Kollam and 47 in Alappuzha districts. From this, proportionate random sampling is used to accrue primary data. Based on this, 13 units are surveyed from Ernakulam, 3 from Kollam and 14 from Alappuzha. Statistical tools and econometric modelling techniques like regression, Factor Analysis, Ranking, Indexing etc. are made use of to analyse the data for an empirical rigour.

Results and discussions

Profile of Units

District-wise composition of sample units is shown in Table 1. Majority of sample firm's surveyed are from Alappuzha (14 units), which forms 46.7 percent of the total sample. Though Alleppey is not a mechanized fishing hub, most of the fish processing centers are located in the periphery of Alleppey adjacent to the Ernakulam District. There might be several cooperant factors for the seafood processing sectors like availability of pre-processing women skilled labors, land availability, easy movement of containers to the port.

The majority of seafood export units in the state are EU approved. The approval in this regard is given by the Export Inspection Council (EIC) of India. Units eligible to export to EU countries are categorized as EU approved units. As EU region countries have the most stringent regulations. The EU approval is considered as the highest standard among the fishery quality standard stipulations coming under TBT. It is evident from the sample that all the firms

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surveyed are EU approved and belonging to the private sector. They mainly export frozen seafood.

Table 1 Profile of Units

	Frequency	Percent
(a) District of the Sample Units		
Ernakulam	13	43.3
Alappuzha	14	46.7
Kollam	3	10
Total	30	100
(b) Source of Fish		
Marine	22	73.3
Aquaculture	1	3.3
Both	7	23.3
Total	30	100
Source: Survey data		

Marine fish is the major species exported by these units and it is the first major source for 73.3 percent of the units. About 23.3 percent of the units rely on both marine and aquaculture and riverine sources for their export needs. Field inferences and discussions with the representatives of the exporters show that the main source of fish for their export needs is marine. This is similar to the inference obtained from secondary sources that the large-scale aquaculture in Kerala is in a progressing stage.

Figure 1 shows the priority of markets in terms of trade quantity and value of seafood by the export's firms from Kerala. Based on quantity, EU is the major market for 70 percent of the exporters. About 13.3 percent considers SEA as the major market. For 10 percent of the exporters, the priority market is US and 6.7 percent consider China as a major importing market. The results are similar with minor difference in terms of value. The US and EU still remain as the second priority markets in value and quantity terms for majority of the exporters. Around 17.4 and 14.3 percentages consider China as the second major importer in quantity and value terms. More than 60 percent have given their third priority for China.

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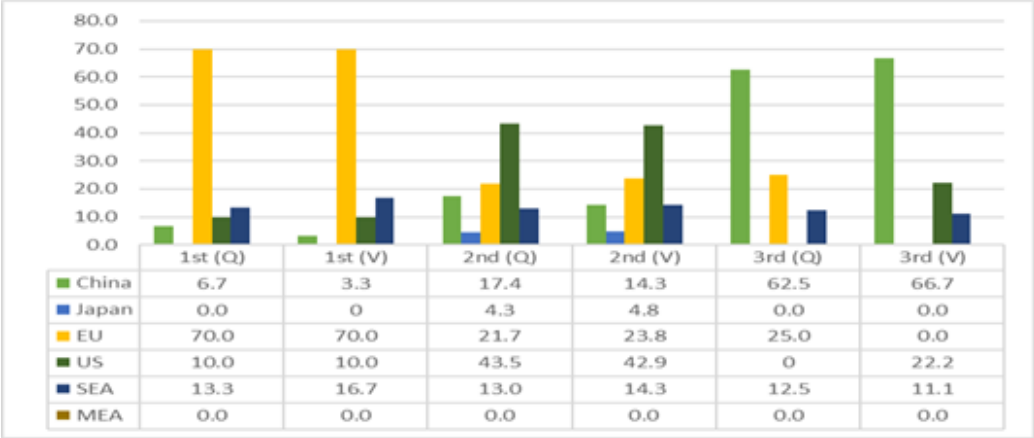
Figure 1 Market priority in terms of quantity and value

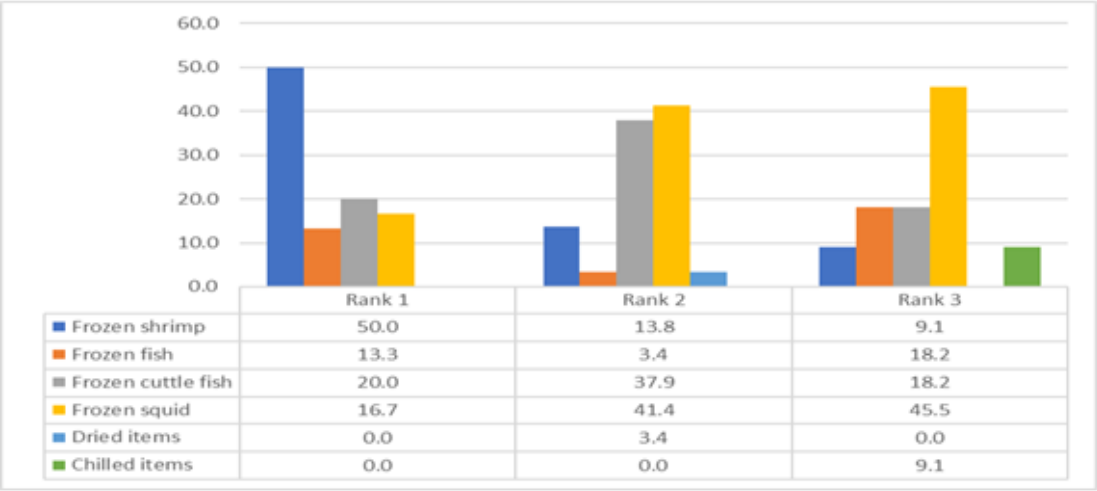


	1st (Q)	1st (V)	2nd (Q)	2nd (V)	3rd (Q)	3rd (V)
China	6.7	3.3	17.4	14.3	62.5	66.7
Japan	0.0	0	4.3	4.8	0.0	0.0
EU	70.0	70.0	21.7	23.8	25.0	0.0
US	10.0	10.0	43.5	42.9	0	22.2
SEA	13.3	16.7	13.0	14.3	12.5	11.1
MEA	0.0	0.0	0.0	0.0	0.0	0.0

Source: Survey data

The major species exported as per the data is frozen shrimp. Following this, Frozen squid and cuttlefish are the second major species. The third priority of exports chosen by majority of exporters is frozen squid. Figure 2 depicts the results.

Figure 2 Major species traded



	Rank 1	Rank 2	Rank 3
Frozen shrimp	50.0	13.8	9.1
Frozen fish	13.3	3.4	18.2
Frozen cuttle fish	20.0	37.9	18.2
Frozen squid	16.7	41.4	45.5
Dried items	0.0	3.4	0.0
Chilled items	0.0	0.0	9.1

Source: Survey data

Change in market priority

A further comparison of changes in present market priority with the initial phase is done to evaluate whether newer trade partners have emerged for the seafood exporters in Kerala. The

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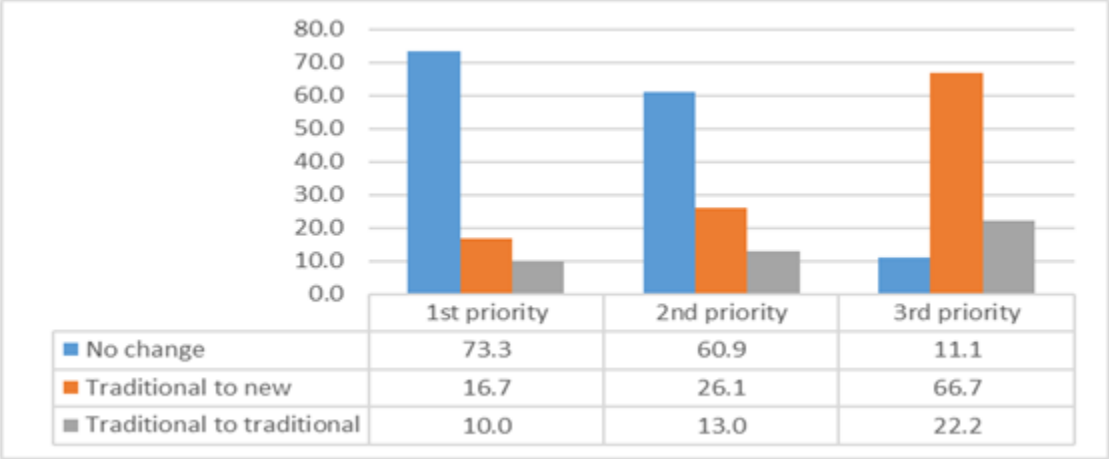
responding firms were asked to record their perception about whether there has been any change in their 1st, 2nd and 3rd major trade partners over a period of time since 1995. The changes in first three major markets are depicted in Figure 3. It is evident that changes have happened in the markets traded by the seafood export firms with the imposing of stringent quality control measures and TBTs and NTBs by the traditional markets. However, traditional markets like the EU still remain as the priority markets to the export units and this is the result of the quality standard improvements done in their firms and hence is helping them to comply with the standards of the importing countries. So, for 73.3 percent of the units surveyed, there is no change in the market priority as they are sticking on to their traditional strongholds. Better facilities mean that the rejection changes are comparatively low. However, 16.7 percent have identified newer markets as their prime trade partner, even though they also trade with their traditional partners. For 10 percent of the firms have shifted their focus from one traditional market to another as their major trade partner. Here, a classic example cited could be that of US with stringent quality standards like the TBT is making it difficult for the export processing units from Kerala to trade with these partners. Since the setting up of EU approved facilities, they have shifted their focus to these markets as a major trade partner, 26.1 percent have shifted from traditional to major market as their second major trade partner. About 13 percent have moved from one traditional market to another. As the third priority, new markets have emerged for 66.7 percent of the firms. Traditional-traditional shift is seen among 22.2 percent of the firms. The firms perceive that TBT stipulations became a major reason for changes in market structure. Stringent regulations in some markets and liberal trade rules in others have brought in these changes.

Figure 3 Changes in market priority



	1st priority	2nd priority	3rd priority
No change	73.3	60.9	11.1
Traditional to new	16.7	26.1	66.7
Traditional to traditional	10.0	13.0	22.2

Source: Survey data

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The market priority during the initial and present phase clearly shows a change in market concentration. Change in priority markets is the off-shoot of the stringent barriers imposed by some importers resulting in changes in markets. The EU approval has helped the firms to minimize rejections citing the implementation of the quality standards by the importers. But they have explored newer markets like South East Asia and China. Importance of Japan has also come down. Despite all this, the EU and US remain as major markets. There are several factors that have led to these changes, apart from simple demand-supply dynamics and competitiveness. The higher compliance cost definitely has an impact on the price and competitiveness. Stringent barriers in some markets makes it difficult for the exporters to trade with the partners to these markets. Here, it is pertinent to mention that non-tariff barriers like the TBT becomes one of the major impediments of trade. The TBT has impacted the firms and frequent changes in stipulations by these markets make it difficult for them to comply with the standards. So, some firms explore newer markets while keeping trade relations with traditional partners intact. Dynamics of competitors with the trade partners also works in favor/against the trade relations of seafood exporters from Kerala.

Impact of trade barriers faced by the exporters

A detailed indication about the trade barriers imposed by various markets is given in Table 2. It is evident that out of 24 Technical barriers cited, EU imposes the highest number of technical barriers i.e., 16. The US has 15 barriers in force. SEA has the lowest number of TBTs i.e., 10 and the second lowest is China with 13. A market-wise composite index for barrier to trade viz. Trade Barrier Index (TBI) is worked out from the inferences obtained from the exporters to identify which market has the highest number of technical barriers imposed. It is evident that the EU markets have the highest barrier score of 66.7. US comes second with 62.5 percent score. Japanese markets have generated a TBI score of 58.3. SEA and China have the lowest TBI scores. In fact, SEA has a TBI score of less than 50 i.e., 41.7. The results clearly point towards reasons for a shift in market share from traditional market to newer markets due to lesser technical trade barriers in these markets for exporters from India.

Table 2 TBI for various markets

Name	US	EU	Japan	China	SEA
TBI	62.5	66.7	58.3	54.2	41.7

Source: Field survey inferences

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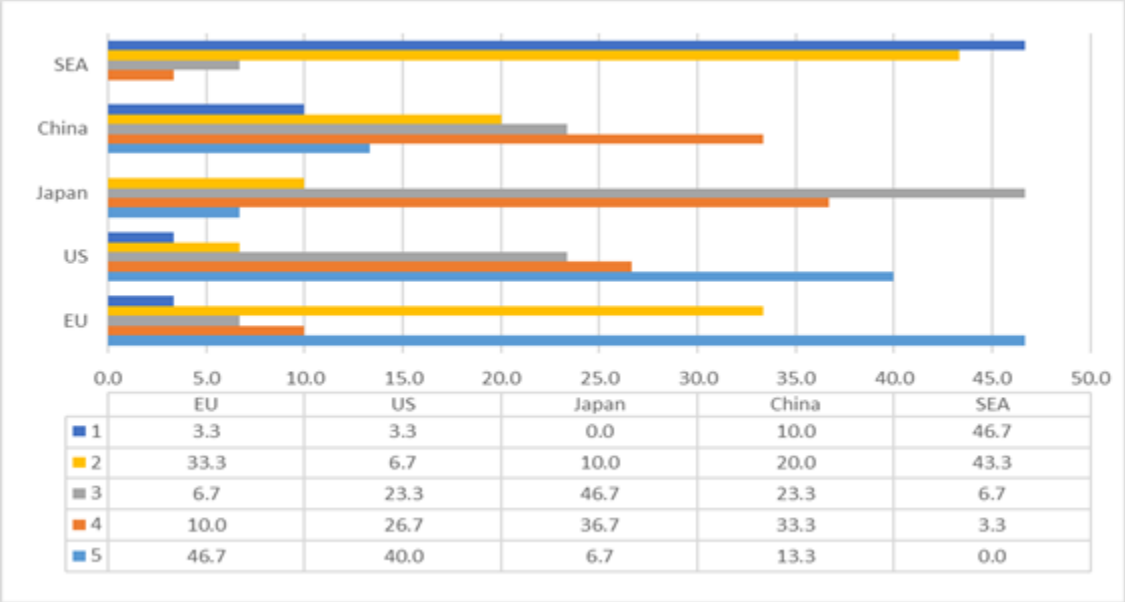
Figure 4 Severity of TBT stipulations



	EU	US	Japan	China	SEA
1	3.3	3.3	0.0	10.0	46.7
2	33.3	6.7	10.0	20.0	43.3
3	6.7	23.3	46.7	23.3	6.7
4	10.0	26.7	36.7	33.3	3.3
5	46.7	40.0	6.7	13.3	0.0

Source: Survey data

Even though the firms trade with EU and US, the barriers to trade imposed by these importers are stringent. With regard to severity of standards for trade barriers for the markets, the representatives of the units surveyed were asked to record their perception in a scale of 1 to 5 with 1 indicating lower severity and 5 the highest. This response is recorded for all the seafood export firms surveyed irrespective of their present trade relations. In this regard, their responses are based on their past experience or perception/knowledge on the TBT and other NTB stipulations imposed by the importers of their seafood. Figure 4 depicts results of the same. Severity of the stipulations in EU is ranked as the highest as it is suggested by 46.7 percent of the exporters. About 10 percent perceive those stipulations of EU markets have a severity score of 4. 33 percent have recorded a market severity of 2 for EU markets. Majority of exporters have given a score of either 5 or 4 for the severity of stipulations to US markets (66.7 percent). For Japan, severity ranges between 4 and 3. For China, 13.3 percent of exporters have perceived that the severity of stipulations is very high. Majority have recorded severity of TBT stipulations in Chinese markets between 3-4. The severity of stipulations in SEA markets is very less as 90 percent have a score between 1 and 2.

While evaluating the average score, one can infer that the severity is the highest for the US markets i.e., 3.93, whereas for EU it is comparatively lower at 3.63. SEA has recorded the lowest

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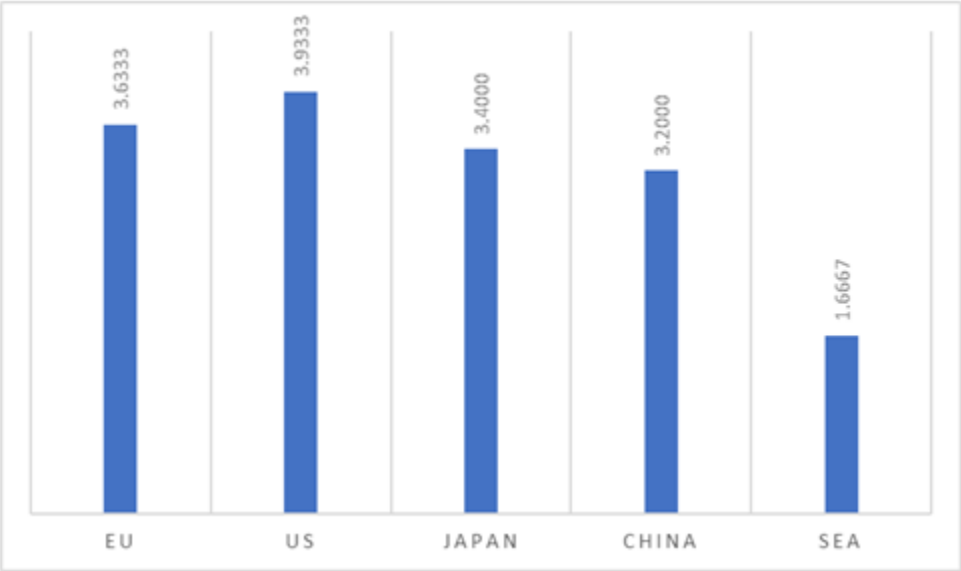
mean severity in terms of TBT stipulations as the score obtained is 1.67. For Japan and China, mean scores obtained are 3.4 and 3.2, respectively. Figure 5 depicts the results of the same.

Figure 5 Market-wise mean score of Severity of TBT



Source: Survey data

The major impact of trade barriers is reduction in trade and the possibility of rejection of exported consignment by the importers. This causes huge losses to the export units. Another issue is the high demurrage cost paid at the destination ports owing to the delay caused in testing the consignment at the ports. One of the ways the export processing units can counter rejections of their consignments is by implementing quality standards which will ensure that the seafood exported fulfils the quality criteria set by the importing markets and hence the probability of rejections of the consignments is less. It has been already identified that most of the firms are EU approved and have also implemented strict quality standards to adhere to the stipulations cited by the major import markets. Despite this, there have been occurrence of rejection of consignments in some cases. Most of the firms started implementing EU and other standards during the earlier phase of WTO period.

Benefits and foibles of TBT on fisheries trade

The TBT stipulations have made the existence of the firms difficult, compliance with these stipulations have helped the firms to get an edge over the non-complaint competitors from within and outside the country. However, the benefits and intensity of these have varied based on firms. To capture this, the perception of units with regard to the statements on major benefits and

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drawbacks of the TBT stipulations have been recorded on a five-point scale of strongly agree, agree, neutral, disagree and strongly disagree.

The major benefits of adherence to TBT stipulations are discussed in Figure 6. They are basic arguments in the case of exporters who have perceived adherence of stipulations imposed during the post-WTO period. In this, 43.3 percent of the units have agreed and 13.3 percent of the units strongly agree to the statement that there has been an improvement in their turnover. About 20 percent have neutral opinion and they feel that the TBT adherence has not led to any change in the turnover of their unit as 23.3 percent disagree (13.3 percent) or strongly disagree (10.0 percent) to this statement. The adherence to stipulations often requires setting up of better facilities, following quality standards, certification etc. as 60 percent of the units surveyed have made improvements in this regard as they strongly agree (20 percent) or agree (40 percent) to this statement. However, 26.7 percent are neutral in this regard and 13.3 percent disagree to this statement. None of the respondents has expressed strong disagreement to the statement that technology and standards have improved owing to the need to adhere to the stipulations. Implementing the quality standards incur cost, the revenue of the firms also increases after this and it may not always reflect as profit of the companies. Perception of 66.7 percent of the units are neutral in this regard. Despite the fact that only 23.3 percent agree or strongly agree that there has been an improvement in profits, those who disagree or strongly disagree to this statement are 10.0 percent.

Higher wastages due to rejections is also an issue as 43.3 percent disagree that the instances of wastages have come down. Post-harvest loss and loss during the processing stage are still a major issue in the seafood export processing sector. About 33.3 percent are agreeing to the statement that there are less wastages and 23.3 percent have neutral opinion. Yet another benefit perceived is identification of newer markets and 50 percent agree and 16.7 percent strongly agree to this. Value added fishery products are in high demand in developed countries and the fact that the processing and packing needs sophisticated machinery so as to make it foolproof. Such products also yield high price. Some players like Vietnam, China etc. import seafood from India and reexport as value added fishery products to the developed markets where these are fetching high demanded. Value addition or need for the same has been one of the major outcomes. In this 63.3 percent of the exporters are in agreement with the statement that the demand for value added products are on an increase. About 26.7 percent are neutral in this regard and some disagree. It has been identified during the firm's survey that the value addition in the seafood export industry of Kerala has been at a developing stage. Despite this, exporters acknowledge the need for the same to compete in the market especially after the Covid-19 outbreak. The percentage of value-added products in total seafood export basket in India was 6-7 percent till

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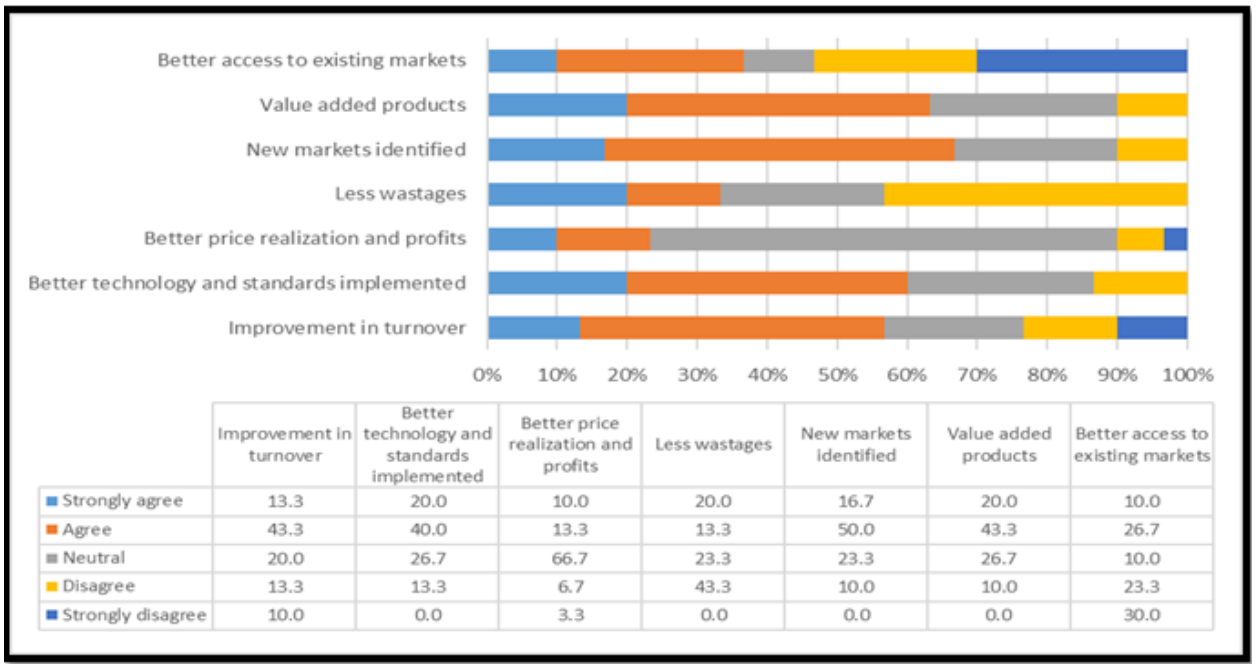
the outbreak of Covid-19 pandemic, which has increased to 10 percent during 2021[1]. This has brought in more challenges to seafood exporters as they have to pack in smaller packages rather than bulk packing. This calls for skilled workforce and good equipment incurring huge investments. With regard to access to traditional markets, the responses are mixed. Only 10 percent strongly agree to this statement, whereas those who strongly disagree are 30 percent, 26.7 percent agree and 23.3 percent disagree to this statement.

Figure 6 Benefits of TBT



	Improvement in turnover	Better technology and standards implemented	Better price realization and profits	Less wastages	New markets identified	Value added products	Better access to existing markets
Strongly agree	13.3	20.0	10.0	20.0	16.7	20.0	10.0
Agree	43.3	40.0	13.3	13.3	50.0	43.3	26.7
Neutral	20.0	26.7	66.7	23.3	23.3	26.7	10.0
Disagree	13.3	13.3	6.7	43.3	10.0	10.0	23.3
Strongly disagree	10.0	0.0	3.3	0.0	0.0	0.0	30.0

Source: Survey data

Foibles connected with the TBT and other barriers imposed during the post-WTO regime are displayed and discussed in Figure 7. Issue of financial loss has been cited by 80 percent of the firms, 10 percent are neutral and 10 percent disagree that there is financial loss due to rejection issues. As 60 percent strongly agree or agree that the processing and export cost have gone up due to TBT issues, 23.3 percent are neutral and 16.7 percent have shown their disagreement. Increased competition from other global players is yet another issue cited by 66.7 percent of the firms as a negative effect of TBT which is 46.7 percent strongly agree and 30 percent agree to the statement that regulations on standards and seafood safety are very stringent. Only 3.3 percent each of the firms disagree or strongly disagree to this, 50 percent feel that additional

[1] https://www.moneycontrol.com/news/business/economy/rising-demand-for-convenience-food-boosts-value-addition-in-indian-seafood-exports-7785621.html

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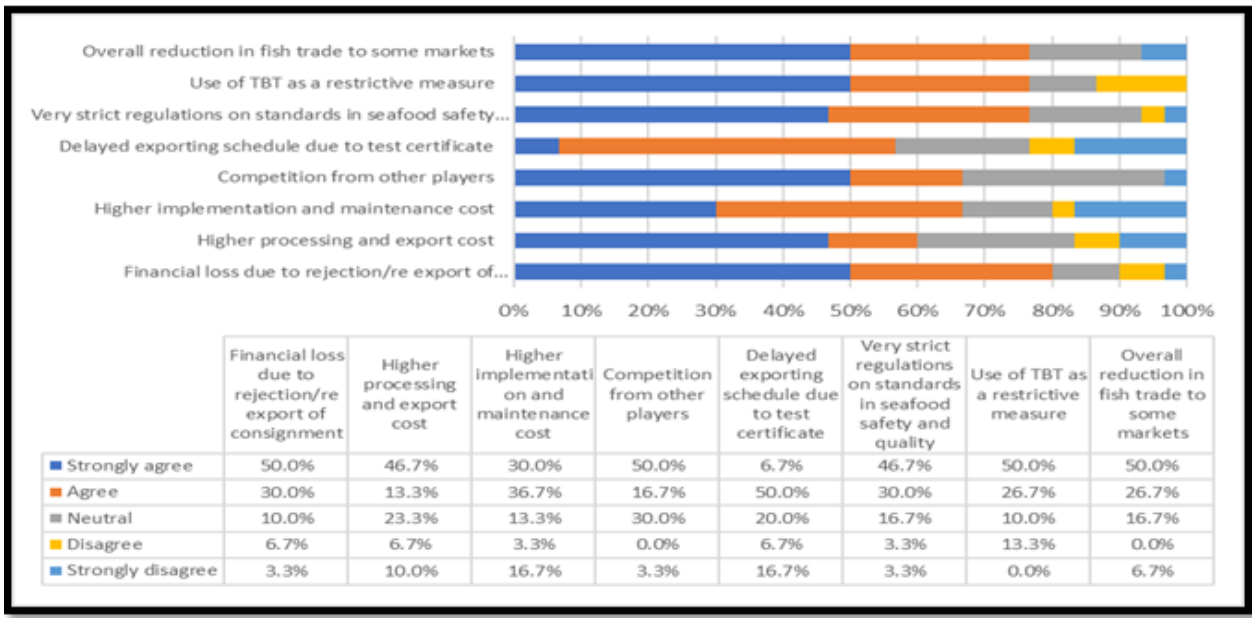
testing and certification is a cumbersome process and hence leads to delay in export schedule. About 6.7 percent strongly agree and 20 percent are neutral, 23.4 percent have disagreement to the statement. Yet another issue where majority (76.7 percent) of the exporters agree or strongly agree is the use of TBT as a restrictive measure by the importing nation. In fact, 50 percent of the firms strongly agree to the statement, 10 percent are neutral and 13.3 percent disagree. The exporters also feel that there is a reduction in trade with the partner country which imposes trade barriers as 50 percent strongly agree and 26.7 percent agree to this.

Figure 7 Drawbacks of TBT



	Financial loss due to rejection/re export of consignment	Higher processing and export cost	Higher implementation and maintenance cost	Competition from other players	Delayed exporting schedule due to test certificate	Very strict regulations on standards in seafood safety and quality	Use of TBT as a restrictive measure	Overall reduction in fish trade to some markets
Strongly agree	50.0%	46.7%	30.0%	50.0%	6.7%	46.7%	50.0%	50.0%
Agree	30.0%	13.3%	36.7%	16.7%	50.0%	30.0%	26.7%	26.7%
Neutral	10.0%	23.3%	13.3%	30.0%	20.0%	16.7%	10.0%	16.7%
Disagree	6.7%	6.7%	3.3%	0.0%	6.7%	3.3%	13.3%	0.0%
Strongly disagree	3.3%	10.0%	16.7%	3.3%	16.7%	3.3%	0.0%	6.7%

Source: Survey data

An Index for Benefits and Drawbacks of TBT on seafood exports is developed for 7 benefits and 8 drawbacks by categorising these into Very high, High, Moderate, Low and Very low and presented in Figure 8. The firms perceive benefits from TBT at medium level (60 percent) and 33.3 percent perceive the benefits as high. Those perceiving benefits at low or very high levels are 3.3 percent each. With regard to index of drawbacks from TBT, the majority also perceive the drawbacks to be high or very high levels. In this, 30 percent feel that there are very high drawbacks to exports due to TBT, whereas those perceiving that the drawbacks from TBT at a high level are 43.3 percent. Overall, the TBT is both beneficial and harmful to the seafood exporters as per the perception of the export units. Though getting the EU approval is an advantage to these units, frequent changes in stipulations, increasing costs, competition etc. work as restrictions to trade.

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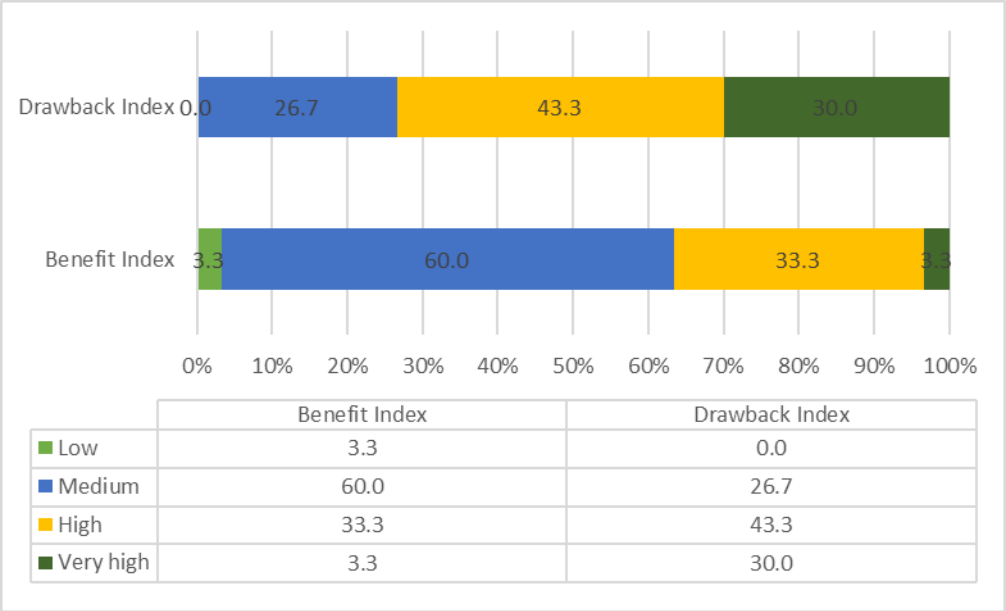
Figure 8 Index of Benefits and Drawbacks of TBT

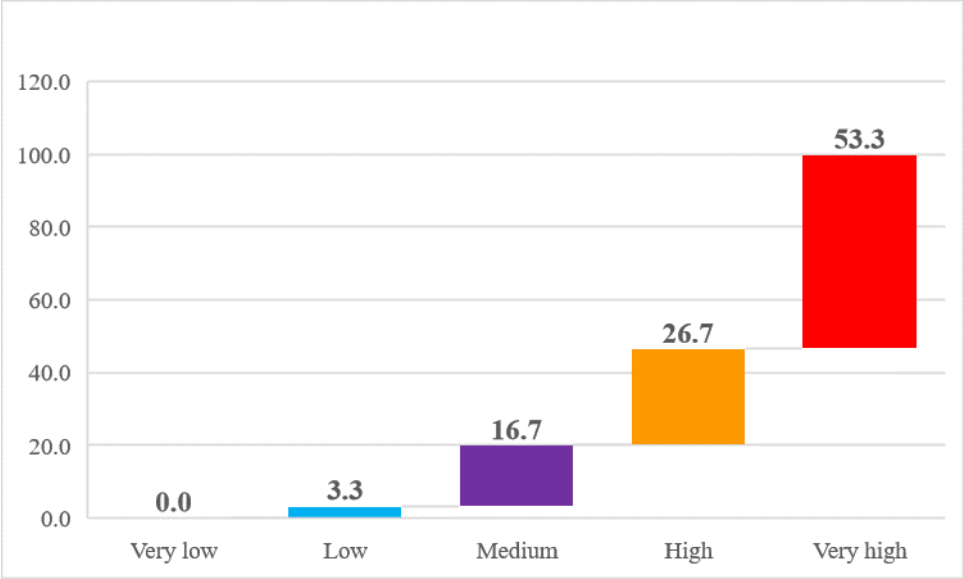


	Benefit Index	Drawback Index
Low	3.3	0.0
Medium	60.0	26.7
High	33.3	43.3
Very high	3.3	30.0

Source: Survey data

Overall impact of TBT on trade

Figure 9 TBT Impact Index



Source: Survey data

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The overall impact of TBT on trade after discounting the advantages is recorded on a scale from 1 to 10 with 1 being the lowest impact and 10 the highest. The exporters have given the score ranging from 4 to 8 to record the negative effect of TBT on fisheries trade. None of the exporters has recorded the impact below 4. The scores recorded by the respondents are further recategorized into a five-point scale of low, medium-low, medium, medium-high and high and an Impact Index of TBT is also developed. Figure 9 describes the results. Majority i.e., 53.3 percent feel that very high influence is there on seafood trade due to TBT stipulations. As 26.7 percent have recorded the negative impact as high. Only 20 percent feel that TBTs negative impact on trade is at a moderate or low level. It is evident that exporters perceive negative impacts of TBT on marine products exports from Kerala at very high levels.

Binary Logistic Regression (BLR) is used to evaluate the major outcomes of TBT on trade. Variables used are TBT impact, market diversification, instability in exports and use of TBT as a restrictive practice. Regression equation is:

TBT impact = C + a Market diversification + b Instability in exports + c TBT used as restrictive measure.

Results as per the classification shows instability of 80 percent initially, the final model predicts 86.7 percent of the total variance as per Table 3 (a). The model is significant as per Table 3 (b) and Table 3 (c). R square values are 0.309 and 0.489, respectively which are shown in Table 3 (d). The results of Hosmer and Lemeshow Test, the goodness of fit test is insignificant as per Table 3 (e). The results in Table 4 show that the variables relating to market diversification and instability are statistically significant. Restrictive nature of TBT is insignificant. Hence, the impact of TBT is visible in the results as market diversification and instability in exports to different markets are major issues connected to the TBT.

Table 3 Regression results

(a) Classification Table[a,b]							
		Step 0[a, b]			Step 1[b]		
Observed		Predicted			Predicted		
		TBT Impact		Percentage Correct	TBT Impact		Percentage Correct
		No	Yes		No	Yes	
TBT Impact	No	0	6	0	3	3	50
	Yes	0	24	100	1	23	95.8
Overall Percentage				80			86.7
(b) Variables in the Equation							
		B	S.E.	Wald	df	Sig.	Exp(B)

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Step 0	Constant	1.386	0.456	9.225	1	0.002	4	
(c) Omnibus Tests of Model Coefficients					*(d) Model Summary*			
		Chi-square	df	Sig.	Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
Step 1	Step	11.091	3	0.011	1	18.933[c]	0.309	0.489
	Block	11.091	3	0.011	(e) Hosmer and Lemeshow Test			
	Model	11.091	3	0.011	Step	Chi-square	df	Sig.
					1	0.548	4	0.969

a. Constant is included in the model.; b. The cut value is .500; c. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Table 4 Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	Market diversification	2.855	1.383	4.260	1	.039	17.366
	Instability in exports	2.629	1.462	3.233	1	.072	13.858
	TBT used as restrictive measure	.963	1.363	.499	1	.480	2.619
	Constant	-1.935	1.497	1.671	1	.196	.144

a. Variable(s) entered on step 1: Market diversification, Instability in exports, TBT used as restrictive measure.

Conclusion

The market priority during the initial and present phase clearly showed a change in market concentration. The EU approval has helped the firms to minimize rejections citing the implementation of the TBT standards by the importers. There were several factors that had led to these changes, apart from simple demand-supply dynamics and competitiveness. The higher TBT compliance cost definitely has an impact on the price and competitiveness. Stringent barriers in some markets made it difficult for the exporters to trade with the partners to these markets. Here, it could be pertinent to mention that non-tariff barriers like the TBT became one of the major impediments of trade. The TBT has impacted the firms and frequent changes in stipulations by these markets made it difficult for them to comply with the standards. So, some firms explored newer markets while keeping trade relations with traditional partners intact.

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Dynamics of competitors with the trade partners also worked in favor/against the trade relations of seafood exporters from Kerala.

The impact of TBT on seafood exports of Kerala pointed towards strongness of its influence, particularly generating market diversification as its primary consequence as TBT stipulations in the beginning is found untenable for the exporters to continue their export and hence institutional support is increasingly warranted to continue export and this gives the major outline of the paper. Though the TBT on seafood trade has some positives like market diversification, upgradation, the negatives seem to be much higher than the positives which were marked well in Kerala's seafood trade with high cost of compliance and instability in exports in some markets. The perception of the exporters in the case of primary data pointed towards instability as a major outcome. The exporters in Kerala, so far have been in a better position to overcome the TBT challenges, but the issue is that when one issue is solved new issues are emerging in the system and hence the TBT issue is perennial in nature. Market diversification, though is seemed a temporary solution, value addition and high unit value realisation are inevitable coping up mechanisms with a view to reducing the present high TBT impact index.

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