

Inventa: Journal of Science, Technology, and Innovation
Vol 2 No 2 December 2026, Hal 26-36
ISSN: 3123-3147 (Print) ISSN: 3123-3155 (Electronic)
Open Access: https://scriptaintelektual.com/inventa

Analysis of Technical Barriers to Trade (TBT) Affecting *Indonesian Viscose* Staple Fibre Exports to India Using a *Fishbone Diagram*

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Article Info :
Received:
04-10-2026
Revised:
08-11-2026
Accepted:
16-11-2026

Abstract

Indonesia's Viscose Staple Fibre *(VSF) exports to India face significant technical barriers following the implementation of the* Quality Control Order *(QCO) in September 2022. This study analyzes the root causes of these barriers using a* Fishbone Diagram *covering Material, Method, Machine, Man, and Environment dimensions. Data were obtained through observation, document review, interviews, and discussions at the Directorate of SPSPK, National Standardization Agency of Indonesia, during July–November 2025. The findings show that differences between SNI 6108:2017 and IS 17266:2019, the complexity of Bureau of Indian Standards certification, limited recognition of Indonesian testing laboratories, insufficient exporter understanding of Indian technical regulations, and the absence of a* Mutual Recognition Arrangement *between KAN and BIS are the main barriers. These conditions were associated with a decline in export value from USD 110.634 thousand in 2022 to USD 14.035 thousand in 2024. Mitigation efforts included TBT-WTO forums, Specific Trade Concerns, bilateral coordination, and Komnas HTP. BIS certification obtained in July 2025 created opportunities for restoring market access and strengthening future VSF exports. Further harmonization of standards and technical cooperation remain essential for sustainable recovery.*

Keywords: *Viscose Staple Fibre*, *Technical Barriers to Trade*, *Quality Control Order*, *Bureau of Indian Standards*, *Fishbone Diagrm.*

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INTRODUCTION

The textile and textile products (TPT) industry is one of the manufacturing sectors that contributes to Indonesia's export activities and occupies an important position in the national trade structure. According to data from the Ministry of Industry of the Republic of Indonesia (2023), the TPT sector accounted for approximately 6.3% of the total value of national non-oil and gas exports, making it one of the important pillars of Indonesia's export structure. One product with export potential in this sector is *Viscose Staple Fibre* (VSF), a man-made fibre derived from natural cellulose that is processed into short fibres as raw material for fabrics and yarns (Asia Pacific Rayon, 2022). VSF is soft, hygroscopic, biodegradable, and more environmentally friendly than petrochemical-based synthetic fibres, giving it strategic value in textile product trade.

India is one of the most important export destinations for Indonesian *Viscose Staple Fibre* because of the substantial demand for raw materials in its textile industry. According to the Ministry of Textiles, Government of India (2022), India has the second-largest textile industry in the world, with a very high level of fibre consumption. However, since September 2022, Indonesian VSF exports to India have faced significant technical barriers to trade following the Indian government's implementation of a *Quality Control Order* (QCO) on the product. This policy requires imported VSF products to comply with IS 17266:2019 and obtain *Bureau of Indian Standards* (BIS) certification before they can be marketed in India (World Trade Organization, 2022).

Technical Barriers to Trade (TBT) are a form of non-tariff barrier arising from the application of technical regulations, quality standards, and certification procedures in international trade. Haykel and Lie (2025) show that non-tariff barriers, including TBT, can affect the export competitiveness of Indonesian products, particularly in sectors dependent on compliance with product standards and certification. Elisabeth and Verico (2022) also found that TBT have a significant negative effect on

Indonesia's manufacturing export performance, primarily because of the costs of complying with the destination country's technical regulations. Consistent with these findings, Pasaribu and Nasution (2024) show that barriers in international trade have a tangible effect on Indonesia's export performance and economic growth.

The impact of India's QCO on Indonesian VSF trade can be seen in changes in export value after the policy took effect on 20 September 2022. According to International Trade Centre (2025) data, Indonesian VSF exports to India under HS 550410 had previously increased from USD 25.421 thousand in 2020 to a peak of USD 110.634 thousand in 2022. Following implementation of the policy, export value fell sharply to USD 20.869 thousand in 2023 and declined again to USD 14.035 thousand in 2024. These changes indicate a very steep decline in the value of Indonesian VSF exports to India following the introduction of new technical and certification requirements under the QCO.

The problems affecting Indonesian VSF exports to India relate not only to the implementation of the QCO but also to differences in technical standards between the two countries. In Indonesia, VSF quality standards are regulated by SNI 6108:2017, which covers parameters such as fibre *length,* fineness (denier), tenacity, moisture content, oil content, and pH (Badan Standardisasi Nasional, 2025). Meanwhile, India applies IS 17266:2019, which has a different scope and parameters, including more detailed provisions on sampling, *quality* tolerances, physical defect control, and packaging and labelling. The differences between SNI 6108:2017 and IS 17266:2019 create a need for Indonesian products to be adjusted before they can meet India's market access requirements. Apart from differences in standards, the BIS certification mechanism is an important component of the technical barriers faced by Indonesian VSF exporters. *Under the Foreign Manufacturers Certification* Scheme (FMCS), overseas manufacturers are required to undergo testing at BIS-accredited laboratories and receive factory audits by BIS teams in their countries of origin (Bureau of Indian Standards, 2024). These conditions are further complicated by the fact that BIS certificates are valid for one year, whereas SNI certification in Indonesia is *valid for* four years with annual surveillance under a certification system involving product certification bodies accredited by KAN.

Furthermore, *the absence of a Mutual* Recognition Arrangement (MRA) between KAN and BIS in the VSF sector means that the SNI certifications already held by Indonesian manufacturers are not automatically recognized in India (ASEAN Secretariat, 2021). These technical barriers have attracted attention within international trade mechanisms because of their direct impact on market access for Indonesian VSF products. India's QCO on VSF products *was subsequently* raised as a Specific Trade Concern (STC) before the WTO TBT Committee by Indonesia and several other affected countries (World Trade Organization, 2023). The Indonesian government, through BSN, Komnas HTP, the Ministry of Trade, the Ministry of Foreign Affairs, KAN, and the Permanent Mission of the Republic *of* Indonesia in Geneva, undertook various technical diplomacy measures, including submitting enquiries, discussions in the WTO TBT STC forum, bilateral meetings, and interministerial and interagency coordination. These efforts show that resolving barriers to VSF exports requires an approach encompassing not only compliance with product standards but also recognition of conformity assessment results and coordination of trade policies between countries.

Several previous studies have examined the effects of TBT and non-tariff barriers on Indonesian trade, including their influence on competitiveness, manufacturing exports, and economic growth (Elisabeth & Verico, 2022; Haykel & Lie, 2025; Pasaribu & Nasution, 2024). Nevertheless, studies specifically analysing *the root causes* of technical barriers to Indonesian Viscose Staple *Fibre exports to* India using a Fishbone *Diagram remain very* limited. A Fishbone Diagram allows the factors causing barriers to be mapped systematically across *five dimensions, namely Material, Method, Machine,* Man, and Environment, so that the interrelationships among problems can be analysed in a structured manner. Based on this gap, the present study aims to analyse the root causes of TBT affecting Indonesian VSF exports to *India through a* Fishbone Diagram, considering differences in standards, certification mechanisms, testing facilities, human resource capacity, and the trade policy environment.

RESEARCH METHODS

This study was conducted at the Directorate of Standards Implementation Systems and Conformity Assessment (SPSPK), National Standardization Agency of Indonesia (BSN), Jakarta,

from 14 July to 14 November 2025. The study used a descriptive-analytical approach to identify and analyse technical barriers to trade affecting Indonesian *Viscose Staple Fibre* (VSF) exports to India. Research data were obtained through direct observation, interviews and discussions with relevant parties within BSN and industry stakeholders, and document studies of WTO TBT notifications, India's *Quality Control Order* (QCO) regulations, historical VSF export data, and relevant standards and certification documents. Data collection and analysis involved triangulation of primary and secondary data to ensure consistency of information concerning the chronology of barriers, regulatory changes, technical requirements, and their effects on Indonesian VSF export market access in India.

The analysis was conducted in five main steps: identification of technical barriers to trade, standards *gap* analysis, comparison of certification processes, root cause analysis using a *Fishbone Diagram,* and evaluation of barrier mitigation *efforts. The* gap analysis compared SNI 6108:2017 and IS 17266:2019 in terms of product scope, quality parameters, testing methods, tolerances, and packaging and labelling provisions, while the certification comparison examined the Indian BIS and Indonesian SNI mechanisms based on BIS (2024) documents and BSN Regulation Number 4 of 2020. Next, the root causes of export barriers were mapped using a Fishbone *Diagram across* five dimensions: Material/Standards, Method/Procedures, *Machine/Facilities,* Man/Human Resources, *and Environment/Policy.* The final step evaluated the technical diplomacy measures undertaken by BSN, Komnas HTP, and relevant stakeholders through the submission of enquiries to BIS, *the* submission of Specific *Trade Concerns (STCs)* in the WTO TBT forum, Indonesia–India bilateral meetings, and interministerial and interagency coordination.

RESULTS AND DISCUSSION

Identification and Impact of Technical Barriers to Trade on Indonesian *Viscose Staple Fibre* Exports to India

The textile and textile products (TPT) industry occupies an important position in Indonesia's trade structure because it is one of the manufacturing sectors contributing to national export activities. The TPT sector accounts for approximately 6.3% of the total value of national non-oil and gas exports, demonstrating its role as one of Indonesia's export pillars (Kementerian Perindustrian Republik Indonesia, 2023). One commodity with potential in this sector's trade is *Viscose Staple Fibre* (VSF), a regenerated textile fibre made from natural cellulose and used as a raw material for fabrics and yarns. VSF's soft, hygroscopic, biodegradable, and naturally decomposable characteristics also add value to the product as the textile industry increasingly considers sustainability (Asia Pacific Rayon, 2022).

India is an important destination for Indonesian VSF exports because it has the world's second-largest textile industry, with very high fibre consumption (Ministry of Textiles, Government of India, 2022). These market conditions essentially offer Indonesia substantial opportunities to supply raw materials to India's textile industry. Textile trade relations also show that export opportunities are determined not only by the production capacity of exporting countries but also by the trade policies and technical requirements imposed by destination countries (Ardi & Arsalan, 2024; Maharani, 2025). In the context of Indonesia's trade with India, these opportunities subsequently faced challenges following the introduction of technical regulations on VSF products entering the Indian market.

A major change in market access occurred when India implemented the *Quality Control Order* (QCO) for VSF products in September 2022. Notification G/TBT/N/IND/234 issued by India requires all imported VSF products to comply with IS 17266:2019 and obtain *Bureau of Indian Standards* (BIS) certification before being marketed in India (World Trade Organization, 2022). The research manuscript states that the QCO took effect on 20 September 2022 and required Indonesian VSF exporters to complete BIS certification through product testing and factory audits. The introduction of these requirements marked a shift in the trading environment from relatively open market access to a market with stricter technical and conformity assessment requirements.

This policy change coincided with a very sharp change in the performance of Indonesian VSF exports to India. According to *Trade Map* data, Indonesia's export value to India for HS 550410 increased from USD 25.421 thousand in 2020 to a peak of USD 110.634 thousand in 2022 (International Trade Centre, 2025). After the implementation of the QCO, export value fell to USD 20.869 thousand in 2023 and declined again to USD 14.035 thousand in 2024. These data constitute

the principal empirical basis used in the study to identify the relationship between the emergence of India's technical requirements and weakening market access for Indonesian VSF.

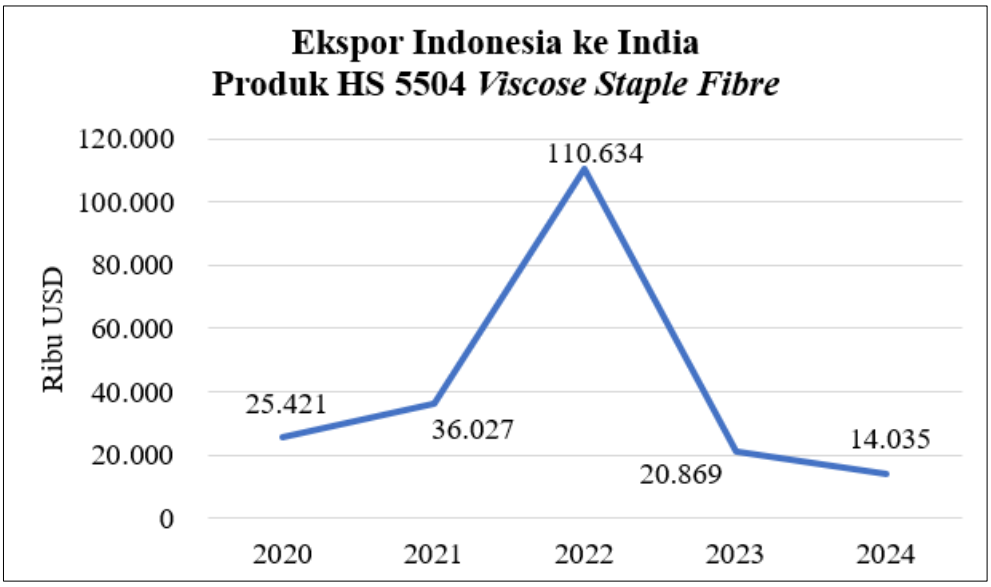


Figure 1. Graph of Indonesian Exports to India

The decline in export value after 2022 indicates that the destination country's technical policies can be a highly important factor in determining the sustainability of a product's market access. In this study, the decline from USD 110.634 thousand in 2022 to USD 14.035 thousand in 2024 is stated to be equivalent to an 87.3% decrease, without changing the figures given in the original manuscript. This finding is consistent with Elisabeth and Verico (2022), who show that TBT implementation can negatively affect Indonesia's manufacturing export performance, particularly for products highly dependent on compliance with standards and certification. Thus, technical barriers concern not only product quality specifications but can also create compliance costs and administrative complexity that affect exporters' ability to maintain access to destination markets.

Table 1. Development of the Value of Indonesian *Viscose Staple Fibre* Exports to India

Year	Export Value (USD thousand)	Condition in the Study
2020	25.421	Initial export value in the data period shown
2022	110.634	Export value reached its peak
2023	20.869	Export value declined after QCO implementation
2024	14.035	Export value declined again

Source: International Trade Centre (2025),

The data in Table 1 show that Indonesian VSF exports to India changed markedly before and after the introduction of the QCO. The export value of USD 110.634 thousand reached in 2022 could not be maintained in the following two years, falling to USD 20.869 thousand in 2023 and USD 14.035 thousand in 2024. This pattern is directly associated in the study with India's implementation of the QCO in September 2022, which tightened technical and certification requirements for imported VSF products. This finding reinforces Haykel and Lie's (2025) view that non-tariff barriers can affect the competitiveness of Indonesian products when exporters face additional standards, certification, and administrative requirements in destination markets.

The identification results show that the barriers faced by Indonesian VSF exporters do not arise from a single factor but encompass at least three major, interrelated aspects. The first is mandatory BIS certification, which requires Indonesian manufacturers to undergo laboratory testing and factory audits, while the second is the difference in technical standards between SNI 6108:2017 and IS

17266:2019. The third is the absence of a *Mutual Recognition Arrangement* (MRA) between KAN and BIS, meaning that certification and conformity assessment results obtained in Indonesia are not automatically recognized by India. These three barriers show that TBT affecting VSF exports simultaneously involve standards, certification procedures, and recognition of conformity assessment results.

These findings are consistent with the nature of TBT as trade barriers arising from technical regulations, standards, and conformity assessment procedures rather than from the direct imposition of tariffs. Sukananda (2019) explains that product standardization arrangements should be situated within the framework of the *Technical Barriers to Trade Agreement* so that the application of standards does not develop into unnecessary trade barriers, while Hidayatullah (2021) highlights the importance of considering the relationship between domestic technical regulations and TBT provisions in international trade. In the Indonesian empirical context, Elisabeth and Verico (2022) emphasize that discrepancies between Indonesian standards and destination-country requirements contribute to higher compliance costs for exporters. Therefore, the case of Indonesian VSF exports to India can be understood as a concrete manifestation of how destination-country technical regulations interact with the exporting country's standardization and certification systems and industrial compliance capacity.

The technical barriers that have arisen must also be understood within the broader context of the international trade challenges facing Indonesian industry. International markets provide substantial expansion opportunities for domestic products, but differences in destination-country trade policies and standards can threaten export continuity when industry participants are unable to adapt quickly (Azizah, 2026). A study of Indonesian furniture trade with India also shows that bilateral trade dynamics must be analysed by considering both opportunities and barriers emerging from the trading environment of partner countries (Banjarnahor, 2026), while Maharani (2025) emphasizes that opportunities and threats simultaneously influence international textile product trade. These conditions demonstrate that the VSF case is not merely a matter of trade transactions but also concerns the industry's ability to adapt to changing market access requirements.

From a macroeconomic perspective, disruptions to exports are relevant because international trade is linked to national economic performance and growth. Pasaribu and Nasution (2024) show that international trade influences Indonesia's economic growth, so barriers that reduce the ability of domestic products to enter foreign markets warrant policy attention. In the VSF case, the decline in exports following the implementation of the QCO indicates that technical regulations can have tangible consequences when they affect products that previously had high trade values in destination markets. Therefore, resolving technical barriers cannot be achieved solely through individual company responses but requires support through standardization, trade facilitation, technical diplomacy, and coordination between government and industry participants.

Overall, the identification results show that India's implementation of the QCO was a turning point in Indonesian VSF market access because it required imported products to comply with IS 17266:2019 and obtain BIS certification. This regulatory change coincided with a decline in export value from USD 110.634 thousand in 2022 to USD 20.869 thousand in 2023 and USD 14.035 thousand in 2024, with the study recording an 87.3% decline between 2022 and 2024 (International Trade Centre, 2025). The identified barriers include mandatory BIS certification, differences between SNI 6108:2017 and IS 17266:2019, and the absence of an MRA between KAN and BIS, making market access problems both technical and institutional. These results provide the basis for the subsequent analysis to examine in greater depth the gaps between standards and certification mechanisms underlying barriers to Indonesian VSF exports to India.

Gap Analysis of SNI 6108:2017 and IS 17266:2019 Standards

The study findings show that one of the main sources of technical barriers to trade affecting Indonesian *Viscose Staple Fibre* (VSF) exports to India is the difference between the standards applied by the two countries. Indonesia uses SNI 6108:2017 Textiles–Viscose Staple Fibre as a reference for VSF product quality standards, while India applies IS 17266:2019 *Textiles–Viscose Staple Fibres–Specification* as a requirement for products entering its market. The difference between these standards became increasingly important after India implemented the *Quality Control Order* (QCO), requiring imported VSF products to comply with IS 17266:2019 and obtain *Bureau of Indian*

Standards (BIS) certification (World Trade Organization, 2022). Consequently, the conformity of Indonesian VSF characteristics with India's technical requirements became a major factor in determining continued access to the export market.

Based on the *gap analysis*, the first difference between the two standards was found in the scope of products covered. SNI 6108:2017 applies to quality requirements for *viscose* fibres intended for yarns and may be used for viscose rayon staple fibres with fibre lengths of 25 mm to 100 mm and fineness of 1 denier to 3 denier (Badan Standardisasi Nasional, 2025). By contrast, IS 17266:2019 establishes requirements for all types of pure viscose staple fibres (VSF), including modal and *lyocell*, for various end uses. This difference in coverage shows that the Indian standard has a broader product scope than the standard in force in Indonesia.

This difference in scope has implications for the compliance process for Indonesian VSF products intended for sale in India. SNI 6108:2017 specifically regulates viscose fibres for yarn production, whereas IS 17266:2019 is not limited to this application and covers various end uses. IS 17266:2019 also includes modal and *lyocell* among the fibre types covered by the standard, while these types are not listed within the scope of the SNI analysed in the study. Therefore, the difference in scope is an important aspect of standards misalignment that must be considered when harmonizing Indonesian VSF product standards with Indian requirements.

In addition to differences in scope, the study identified differences in the level of detail of the quality parameters contained in the two standards. IS 17266:2019 is described as providing more detailed provisions on *sampling* methods, quality tolerances, physical defect control, and packaging and labelling. The Indian standard also contains additional Eco-Mark provisions for environmentally friendly products that are not included in SNI 6108:2017. These findings indicate that exporters cannot rely solely on SNI compliance, since products entering India must also be adjusted to meet the additional parameters and provisions imposed by the Indian standard.

These technical differences are relevant under the *Technical Barriers to Trade* framework because standards and conformity assessment procedures can affect a product's ability to enter destination markets. Elisabeth and Verico (2022) show that discrepancies between Indonesian National Standards and destination-country standards are among the sources of compliance costs facing Indonesia's manufacturing sector. Sukananda (2019) also positions product standardization as an important part of implementing the *Technical Barriers to Trade Agreement*, so the design and application of standards must consider their implications for trade. In the VSF case, the differences between SNI 6108:2017 and IS 17266:2019 demonstrate concretely how misaligned standards can develop into additional requirements for Indonesian exporters.

Table 1. *Gap Analysis* of Standards in the Export Destination Country

Standard	No.	Evaluated Quality Requirements and Quality Requirement Clause Numbers
SNI 6108:2017	1	Scope
SNI 6108:2017	1.1	This standard applies to the quality requirements for viscose fibres intended for yarns.
SNI 6108:2017	1.2	This standard may be used for viscose rayon staple fibres with fibre lengths from 25 mm to 100 mm and fineness from 1 denier to 3 denier.
IS 17266:2019	1	Scope: This standard specifies requirements for all types of pure viscose staple fibres (VSF), including modal and *lyocell*, for various end uses.

Source: Research data based on a comparison of SNI 6108:2017 and IS 17266:2019.

The data in Table 1 show that differences between the two standards already emerge in defining product scope. In SNI 6108:2017, Clause 1.1 explicitly states that the standard applies to quality requirements for *viscose* fibres intended for yarns, while Clause 1.2 limits its application to viscose rayon staple fibres with fibre lengths of 25 mm to 100 mm and fineness of 1 denier to 3 denier. In IS 17266:2019, the scope covers all types of pure viscose staple fibres, including modal and *lyocell*, for

various end uses. These differences provide the empirical basis for the study's statement that the Indian standard covers a broader range of products than SNI 6108:2017.

This misalignment between standards does not in itself indicate a difference in product quality but shows that the criteria used to assess product conformity are not entirely the same. In international trade, differences in requirements concerning scope, *sampling* methods, quality tolerances, defect control, packaging, and labelling can increase the number of adjustments necessary before a product can be declared compliant with destination-country standards. Haykel and Lie (2025) explain that non-tariff barriers arising from technical requirements, quality standards, and certification can increase the complexity of export processes. Thus, the VSF case shows that differences between national and destination-country standards can create a compliance burden even when a product meets the standardization requirements of its country of origin.

The difference between standards becomes even more significant because India not only designates IS 17266:2019 as the reference standard but also links compliance with mandatory BIS certification under the QCO. Implementation of the QCO requires all imported VSF products to comply with IS 17266:2019 and hold BIS certification, making these requirements directly relevant to product access to the Indian market (World Trade Organization, 2022). Hidayatullah (2021) identifies technical regulation issues as an important aspect of the relationship between domestic policies and TBT provisions in international trade. These conditions show that the differences between SNI and IS are not merely documentary but relate directly to regulatory requirements that Indonesian exporters must meet before their products can be marketed in India.

The *gap analysis* findings further demonstrate the need to adjust SNI to reduce differences from the standards applied in destination markets. The study recommends broadening the scope of SNI, adding product defect criteria, clarifying *sampling* procedures, and aligning quality tolerances with international standards. BSN together with Komnas HTP also recommended revising SNI to include modal and *lyocell* fibres and tightening quality parameters to align with Indian standards. These recommendations derive directly from the comparison of SNI 6108:2017 and IS 17266:2019 and do not change the parameters or conclusions of the *gap analysis* contained in the original study.

Standards harmonization is important because misaligned standards not only affect technical product requirements but can also be linked to the effectiveness of mutual recognition of conformity assessment results between countries. ASEAN Secretariat (2021) notes that the implementation of *Mutual Recognition Arrangement*s (MRAs) in the textile sector remains very limited compared with other sectors, while this study identifies the absence of an MRA between KAN and BIS in the VSF sector as a structural barrier. Without adequate recognition, meeting Indonesian national standards does not automatically remove manufacturers' obligations to complete the procedures specified by destination countries. Therefore, harmonization of standard parameters and strengthening mechanisms for recognizing conformity assessments are two interrelated aspects of reducing technical barriers to Indonesian VSF exports.

Overall, the *gap analysis* shows that SNI 6108:2017 and IS 17266:2019 differ in both scope and the level of detail of their technical requirements. SNI 6108:2017 applies to quality requirements for *viscose* fibres intended for yarns, with fibre lengths of 25 mm to 100 mm and fineness of 1 denier to 3 denier, whereas IS 17266:2019 covers all types of pure viscose staple fibres, including modal and *lyocell*, for various end uses. IS 17266:2019 also provides more detailed provisions on *sampling* methods, quality tolerances, physical defect control, packaging and labelling, and includes additional Eco-Mark provisions not found in SNI. Based on these findings, revision and harmonization of SNI are recommended to narrow the standards gap and improve the readiness of Indonesian VSF products to meet the Indian market's technical requirements.

Analysis of Certification Processes, Root Causes, and Measures to Address TBT Barriers

The research findings show that, in addition to differences in standards, certification mechanisms constitute an important component of the technical barriers to Indonesian *Viscose Staple Fibre* (VSF) exports to India. Based on *Bureau of Indian Standards* (2024) documents and National Standardization Agency Regulation Number 4 of 2020, there are significant differences between India's BIS certification mechanism and Indonesia's SNI certification. India's BIS system is implemented through a stricter and more centralized mechanism, whereas Indonesia's SNI system involves Product Certification Bodies (LSPro) accredited by KAN. These differences mean that

Indonesian manufacturers seeking to enter the Indian market must adapt to the BIS certification system even when they have complied with national certification mechanisms (Badan Standardisasi Nasional, 2020; Bureau of Indian Standards, 2024).

At the initial certification stage, India's BIS uses the BIS *online portal* for registration, while Indonesia's SNI system requires applications to LSPro. The next stage under the BIS system is a document completeness check, whereas under the SNI system the certification scheme is determined. These differences show that the two countries have distinct administrative pathways for ensuring product conformity before proceeding to subsequent testing and evaluation stages. In international trade, the administrative complexity of certification matters because non-tariff barriers can arise from the technical and procedural requirements that manufacturers must satisfy before their products are granted market access (Haykel & Lie, 2025).

At the product testing stage, India's BIS system requires BIS laboratory testing in India, whereas Indonesia's SNI system specifies product testing and factory audits. The subsequent BIS factory audit stage involves examining the quality system at the production site, while the SNI system involves assessment of the results by LSPro. These requirements are important for Indonesian VSF exporters because the study also identified limitations involving Indonesian testing laboratories that are not yet recognized by BIS. This situation represents one aspect of the technical barriers because exporters must comply with the conformity assessment requirements prescribed by the destination country under the BIS mechanism (Bureau of Indian Standards, 2024).

A particularly clear difference was also found in the validity periods of certificates issued under the two systems. India's BIS certificates are valid for 1 year, whereas Indonesia's SNI certificates are valid for 4 years with annual *surveillance*. The original study considers this difference in validity periods to impose a substantially higher cost burden on Indonesian exporters when adapting to the Indian system. This condition supports the finding of Elisabeth and Verico (2022) that compliance costs associated with destination-country technical regulations are one factor that can affect Indonesia's manufacturing export performance.

These certification issues are further complicated by the absence of a *Mutual Recognition Arrangement* (MRA) between KAN and BIS for the VSF sector. The absence of an MRA means that certification and conformity assessment results obtained by manufacturers in Indonesia are not automatically recognized under India's BIS mechanism. ASEAN Secretariat (2021) notes that the implementation of MRAs in the textile sector remains very limited compared with several other sectors, so recognition of conformity assessment results remains a trade challenge. In this study, this situation is identified as a structural barrier and subsequently placed under the *Environment/Policy* dimension in the root cause analysis using a *Fishbone Diagram*.

Table 2. Comparison of Indian BIS and Indonesian SNI Certification Processes

No.	Stages	BIS India	SNI Indonesia
1	Registration	*BIS* online portal	Application to LSPro
2	Document Verification	Document completeness check	Determination of certification scheme
3	Product Testing	BIS laboratory testing in India	Product testing & factory audit
4	Factory Audit	Quality system inspection at the production site	Assessment of results by LSPro
5	Certificate Issuance	Valid for 1 year	Valid for 4 years + annual *surveillance*

Source: Bureau of Indian Standards (2024) and BSN Regulation Number 4 of 2020.

The results of this certification comparison were then used alongside observations and documentary studies to map the root causes of VSF export barriers using a *Fishbone Diagram*. The study groups the causal factors into five dimensions: *Material/Standards*, *Method/Procedures*, *Machine/Facilities*, *Man/Human Resources*, and *Environment/Policy*. The use of these five

dimensions demonstrates that the TBT barriers facing Indonesian VSF do not constitute a single regulatory problem but rather a combination of technical, procedural, facilities-related, business capacity, and policy environment factors. This approach enables the relationships among standards misalignment, BIS certification, testing facilities, exporter preparedness, and QCO policy to be analysed as an interconnected chain of causes.

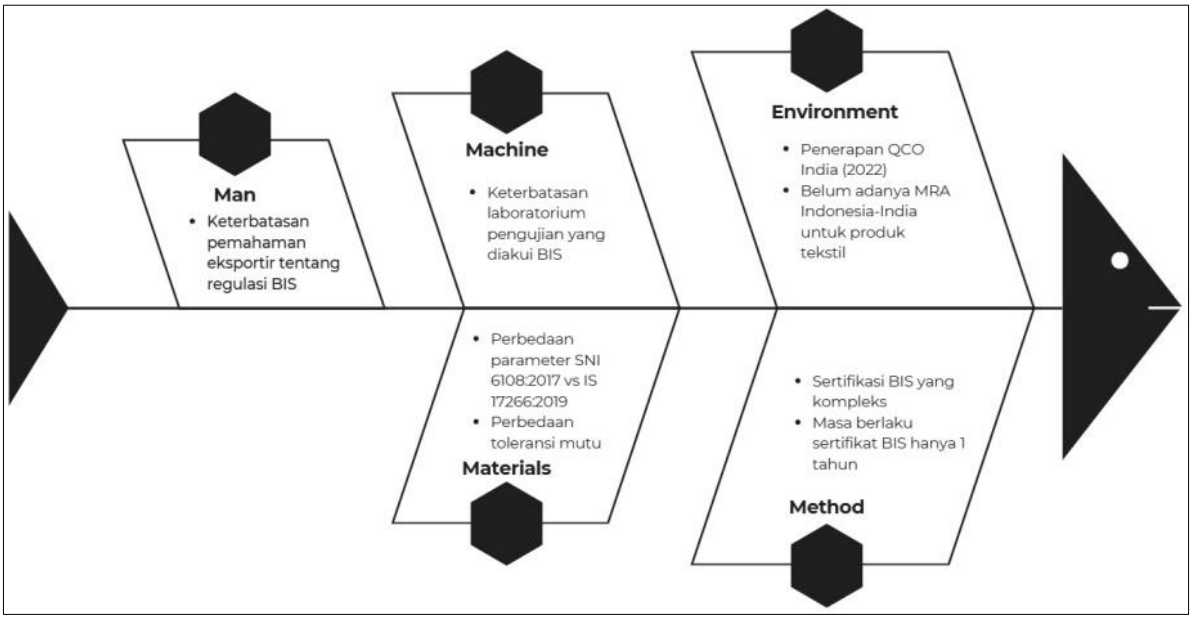


Figure 2. ***Fishbone Diagram***

In the *Material/Standards* dimension, the root barrier lies in differences in scope and technical parameters between SNI 6108:2017 and IS 17266:2019, while the *Method/Procedures* dimension concerns the complexity of the BIS certification process and the certificate validity period of only 1 year. These two dimensions demonstrate the direct relationship between product requirements and the administrative procedures exporters must complete to comply with Indian market requirements. In the *Machine/Facilities* dimension, limitations in Indonesian testing laboratories that have not yet been recognized by BIS require exporters to send samples to India. These findings show that standards harmonization alone is insufficient unless accompanied by conformity assessment mechanisms and testing facilities recognized by the destination country (Badan Standardisasi Nasional, 2025; Bureau of Indian Standards, 2024).

In the *Man/Human Resources* dimension, the study identifies business operators' limited understanding of Indian technical regulations as a factor weakening the preparedness of domestic industry, while in the *Environment/Policy* dimension, barriers arise from the 2022 QCO implementation and the absence of an MRA between KAN and BIS. The combination of these five dimensions is considered to create interrelated barriers to Indonesian VSF market access in India. The impact is apparent in the decline in VSF export value from USD 110.634 thousand in 2022 to USD 14.035 thousand in 2024, without changing the data provided in the original study (International Trade Centre, 2025). Therefore, the *Fishbone Diagram* results indicate the need for an integrated approach involving standards harmonization, accelerated MRA arrangements, improved exporter capacity, and sustained technical diplomacy in the WTO TBT forum.

Efforts to address these barriers have been pursued through various technical diplomacy channels since VSF export problems emerged in 2022. Through the Indonesia TBT WTO *Enquiry Point*, BSN sent an official *enquiry* on 31 January 2023 to relevant parties in India requesting clarification of the QCO timetable, the transition period considered too short, and mechanisms for recognizing test results from KAN-accredited laboratories. The QCO issue was subsequently raised as a *Specific Trade Concern* (STC) at WTO TBT Committee meetings in 2023 and 2024, while the Indonesian government also held bilateral meetings with India to promote a more reasonable transition period and technical cooperation between KAN and BIS (World Trade Organization, 2023).

The Komnas HTP meeting on 21 October 2025 then discussed Indonesia's strategy for addressing STCs, including QCO issues involving VSF, wood, tyres, and medical textiles, with coordination involving BSN, APSyFI, the Ministry of Trade, the Ministry of Foreign Affairs, KAN, and the Permanent Mission of the Republic of Indonesia in Geneva (Tim Notifikasi TBT BSN, 2025).

These efforts to address the barriers led to an important development when Indonesian VSF products successfully obtained BIS certification in July 2025, valid until July 2026. The original study states that some companies, such as *Asia Pacific Rayon* (APR), had successfully obtained certificates, while *South Pacific Viscose* (SPV) was still undergoing verification. This certification achievement opened opportunities to restore Indonesian VSF exports to India following the sharp decline after the 2022 QCO and demonstrated the importance of combining industry compliance with government technical diplomacy. Thus, the analysis shows that resolving barriers to VSF exports requires harmonizing SNI 6108:2017 with IS 17266:2019, exploring an MRA between KAN and BIS, improving exporter capacity, and maintaining sustained technical diplomacy through the WTO TBT forum.

CONCLUSION

This study shows that technical barriers to trade affecting Indonesian *Viscose Staple Fibre* (VSF) exports to India are multidimensional and arise from five main factors in the *Fishbone Diagram*: *Material/Standards*, *Method/Procedures*, *Machine/Facilities*, *Man/Human Resources*, and *Environment/Policy*. These barriers include differences in scope and technical parameters between SNI 6108:2017 and IS 17266:2019, the complexity of BIS certification procedures, the BIS certificate validity period of only 1 year, the limited number of Indonesian testing laboratories recognized by BIS, business operators' insufficient understanding of Indian technical regulations, and the absence of a *Mutual Recognition Arrangement* (MRA) between KAN and BIS. The implementation of the *Quality Control Order* (QCO) in September 2022 coincided with a decline in the value of Indonesian VSF exports to India from USD 110.634 thousand in 2022 to USD 14.035 thousand in 2024, a decrease of 87.3%. These findings show that differences in standards and conformity assessment mechanisms can constitute genuine barriers to Indonesian products' market access.

Efforts to resolve these barriers have been pursued through technical diplomacy and interagency coordination involving BSN, APSyFI, the Ministry of Trade, the Ministry of Foreign Affairs, KAN, the Permanent Mission of the Republic of Indonesia in Geneva, and Komnas HTP. These measures included submitting an *enquiry* on 31 January 2023, raising the QCO issue as a *Specific Trade Concern* (STC) at WTO TBT Committee meetings in 2023 and 2024, Indonesia–India bilateral meetings, and discussions through Komnas HTP on 21 October 2025. Indonesian VSF products eventually obtained BIS certification in July 2025, valid until July 2026, with *Asia Pacific Rayon* (APR) having obtained certification while *South Pacific Viscose* (SPV) was still undergoing verification. Going forward, accelerated harmonization of SNI 6108:2017 with IS 17266:2019, exploration of an MRA between KAN and BIS, stronger exporter capacity to understand Indian technical regulations, and sustained technical diplomacy through the WTO TBT forum are needed to restore Indonesian VSF market access in India.

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