



# Exploring The Network Analysis of Non-Tariff Measures and Sustainable Development Goals. Evidence From Vietnam's Non-Tariff Measures in Response with Covid-19

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## Abstract

The spread of Covid-19 has raised questions about the progress toward sustainable development goals. Many nations have seen a fast surge in non-tariff measures used to safeguard public health during the epidemic. Non-tariff measures, as the role of trade policy instruments, can reflect the policy-making process or policy response of the government related to the progress in sustainable development goals (SDGs) achievements. Whether the policy intervention by non-tariff measures can address multiple goals or the progress toward achieving the SDGs at the national level. The paper investigates the linkage between non-tariff measures and sustainable development goals, the direct targets, by using network analysis. The paper uses network analysis to depict the comprehensive connection among NTMs and SDGs and identify key nodes in the matrix. Vietnam is a significant example of how to overcome the pandemic and obtain economic growth with the high coverage of NTM matching the SDGs. From the evidence of the network of NTMs-SDGs in Vietnam, it proposes that the government should adjust the policy toward sustainability by implementing coordinated and more harmonized regulations to balance the costs and benefits, short-term and long-term goals, growth rates, and sustainability instead of eliminating the number of NTMs.

**Keywords:** Non-tariff measures, Sustainable Development Goals, Covid-19

**JEL Classifications:** F13.

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## 1. Introduction

Non-tariff measures, as the role of trade policy instruments, can reflect the policy-making process or policy response of the government in relation to the progress in sustainable development goals (SDGs) achievements. The 2030 Agenda for Sustainable Development represents the high commitment of governments toward sustainability at the global level. The SDGs are a system of interacting components rather than just a collection of goals, targets, and indicators (Pradhan, 2019). The integrated nature of the goals increases the complexity of policymaking and implies the implementation of the goals. Progress or lack of progress with one goal will affect other goals, some positively and others negatively, creating synergies and trade-offs (Nilsson and Weiz, 2019). Whether the policy intervention by non-tariff measures can address multiple goals or the progress toward achieving the SDGs at the national level. To answer the question, the paper aims to demonstrate the system mapping among non-tariff measures, sustainable development goals (SDGs), and targets at the national level. Understanding the linkages between non-tariff measures and SDGs can help identify nodes to entangle or intervene to boost the progress of countries in achieving the SDGs.

The Covid-19 pandemic had catastrophic impacts on human lives and efforts to realize sustainable development goals (United Nations, 2022). Many nations have seen a fast surge in non-tariff measures used to safeguard public health during the Covid-19 epidemic. According to the UNCTAD database, as of August 2021, countries have applied 323 temporary non-tariff measures to deal with Covid-19. The types of non-tariff measures applied have two-way effects: trade facilitation (119 measures) and trade restriction (204 measures). In Vietnam, the Covid-19 pandemic has created both chances and difficulties. Significant adverse effects included a disruption of domestic production, a shortage of some necessities, a rise in the demand for medical supplies and items for the prevention and control of epidemics, congestion at the border, and extended customs clearance processes for imports to reinforce strict quarantine measures. The recession appeared inevitable, but it happened in the short run. Vietnam is a country with a proactive response and rapid economic recovery after the pandemic, with a breakthrough growth rate of 8.02% by 2022, forecasted at 6.2% in 2023 (Vietnam's Upbeat Economic Outlook Outlier in Region, 2022). The pandemic disrupted the relocation phase in ASEAN economies; Vietnam and Malaysia became the major beneficiaries of new investment adjustments from China, mitigating overall negative impacts (Menon, 2020). When trade restrictions or protective measures were eased, the quick expansion of imports and exports contributed to Vietnam's economic recovery. Vietnam has emerged as a great example of responding to the crisis and using it to alter policy to achieve long-term goals. This study aims to explore the preliminary linkage between non-tariff measures and sustainable development goals using as network analytical approach and evidence from Vietnam's trade policy in response to Covid-19. Understanding the network system is critical for suggesting the node of trade policy intervention through non-tariff measures to advance SDG attainment at the national level. The paper has been structured into 7 parts: 1) Introduction; 2) Literature review; 3) Methodology; 4) Overview of Covid-19 temporary NTM measures imposed by Vietnam; 5) Exploring the linkage between Covid-19 responsive non-tariff measures and sustainable development goals in Vietnam; 6) The potential effects of the linkage on the progress of SDG achievements; 7) Discussion.

## 2. Literature Review

Previous studies on SDGs have been classified into two approaches. The first approach aims to measure progress toward sustainable goals, while the other approach evaluates the impact of the goals on decision-making (Pradhan et al., 2022). The first approach to monitoring the progress of SDGs achievement across countries is through various indicators and indices from open databases conducted by the United Nations, or World Bank, and Voluntary National Reviews that provide local and national government commitment to SDGs. The material supports the understanding of bottom-up processes based on the participation of stakeholders and insight into policy development. Several studies demonstrate the interaction among goals and targets at global, local, and national levels based on descriptive statistics (Pradhan et al., 2017; Shaker, 2018; Evenett et al., 2021). Besides, economic models have also been applied to investigate the progress toward goals (Allen et al., 2016; Bennich et al., 2020) or the strategies to achieve multiple goals and potential future changes (Van Soest et al., 2019). The models are often used for assessing the synergies and trade-off effects of specific policy measures or socio-economic factors on different SDGs. The gap in these studies is an integrated assessment model that covers three sustainable dimensions, namely social, environmental, and economic. Secondly, from the perspective of evaluating the goals' influence on decision-making, this approach is widely used in three methodologies, including qualitative case studies, network analysis, and discourse analysis. Among these methods, network analysis has the strength of identifying interactions and providing insight into how goals and targets and a vast number of factors or actors can coordinate and interact with each other. It has been conceptualized, visualized, and analyzed systematically. Most papers used network analysis to study goal interlinkages, or the governance network related to SDGs (Breuer et al., 2019; Bogers et al., 2021; Vijge et al., 2020). Thus, SDGs have been assessed under two microscopes in terms of their influence on policymaking and the progress towards achieving the goals. Although the interlinkages between the SDGs and the synergies and trade-offs have been explicitly recognized, it lacks comprehensive system mapping between trade measures, SDGs, and targets to cover all dimensions of environmental, social, and economic. The aim of the paper has been approached by the combination of methods to gain insight into how the network has influenced achieving sustainable development goals by intervening in the nodes of policy instruments.

Non-tariff measures, as crucial policy instruments, can directly and indirectly contribute to achieving long-term inclusive growth goals. The linkage between non-tariff measures and sustainability has been highlighted in recent studies (Lee & Prabhakar, 2021; Enikeeva, 2020; Zainuddin et al., 2020; Ahn & Steinbach, 2022). Referring to UNCTAD (2013), the research examines the economic and policy issues related to non-tariff measures and their impact on trade, particularly for developing countries. It shows the challenges and potential implications faced by developing countries in achieving sustainable development goals. However, it did not mention straightforwardly how these measures and the SDGs connect. The working paper of Kravchenko et al. (2019) explored a global concordance matrix between non-tariff measures and SDGs. The methodology links measures imposed on certain product groups to relevant goals and direct targets, as well as indirect targets based on the official document notified by governments or the implied objectives of those measures. The paper contributes to the methodology for scholars to investigate the matrix of NTM and SDGs but lacks the viewpoint of

policymakers. On the other hand, the linkage between non-tariff measures and SDGs can be evaluated by considering the impact of NTMs on trade and their implications for economic growth, poverty reduction, and environmental sustainability. The remarkable paper of Zainuddin, et al. (2020) provided new perspectives on the varying impacts of SDG-related NTMs on trade performance at the sectoral level. The paper implied that non-tariff measures address sustainable production through the development of the NTM-SDG concordance matrix conducted by Kravchenko et al. (2019). The paper identified a linkage between a type of NTM and specific SDGs one by one in designing trade policy instruments. By using the coverage ratios for NTM related to SDGs as the determinant in the gravity model to assess the effects on trade flow at the sectoral level. The results show NTM related to SDG 3 (good health and well-being) and SDG 12 (responsible production and consumption) have a positive impact on trade, but the effects vary in certain sectors. However, the linkages are complex due to the multiple connections among NTMs and sustainable goals or specific targets, as well as the integrated nature of these goals. The achievement of SDGs must consider the interaction among them (Nilsson et al., 2022). The limitation of the paper is not to draw a comprehensive network between NTM and SDGs. Besides, whether policymakers release new trade policy instruments proactively towards long-term SDG achievements or not.

The unprecedented phenomenon of the Covid-19 pandemic has raised concern about disrupting the path toward a sustainable goal. The remarkable study of Pradhan et al. (2021) shows how many Sustainable Development Goals were negatively affected, even though it might have also given a narrow window of opportunity for sustainable transformation. The paper determines key five factors affecting negatively sustainability, including lockdowns, underemployment and unemployment, the closure of institutions and facilities, diluted focus and funds for non-Covid-19-related issues, and the anticipated reduction in support from development partners. Progress in achieving sustainable development depends on government planning and action, socio-economic recovery, information, and communication technologies (ICT) and the digital economy, 'brain gain' or emigration, and the local authorities. From the perspective of policy response, Evenett et al. (2021) collected high-frequency data on policy activism in response to the Covid-19 pandemic to conduct a descriptive analysis of the effects and effectiveness of these policy interventions. Understanding the diversity in trade policy responses during the unprecedented crisis across countries and sectors shows the inferences for international cooperation and rulemaking toward long-run goals. Over the period of the Covid-19 pandemic, the visible and invisible objectives of non-tariff measures in responding to global disease have risen dramatically. Most countries have been notified to impose Covid-19-responsive non-tariff measures with many commercial objectives, such as quantitative restrictions on imports and export restrictions to ensure domestic supply of goods, and other non-commercial objectives, such as ensuring food safety, environmental protection, national security, and enhancing the regulatory framework. While the majority of NTMs have a legitimate purpose, some are intended to be protectionist and have trade-restrictive effects in the name of emergency response measures in the case of an epidemic. Such adoption may further prolong the approach to sustainable development goals. Thus, previous studies have explored the mixed effects between Covid-19-responsive NTM and the sustainability measured by the 17 SDGs of the United Nations.

The paper has three distinct contributions to the literature on non-tariff measures and sustainable development goals. First, the paper explores the comprehensive linkage between NTM and SDGs, specific targets which stand on three crucial pillars: economic, environmental, and social, by visualizing the system mapping of the network. Second,

the network mapping of NTM-SDGs-Targets-Pillars suggests the nodes of policy intervention in which NTM can affect multiple goals and targets directly or indirectly for sustainable development at the national level. Third, the paper answers the question of how NTM released in the period of Covid -19 affects progress toward attaining the SDGs.

### **3. Methodology**

#### ***3.1 Methodology of the linkage between Non-tariff measures (NTMs) and Sustainable Development Goals (SDGs)***

The paper uses network analysis to map the linkage between NTM and SDGs. Network analysis (NA) is a set of integrated techniques to depict relations among actors and to analyse the social structures that emerge from the recurrence of these relations (Chiesi, 2001). Actors in the matrix are demonstrated as nodes, and their connections are lines between pairs of nodes. The methodology enables us to investigate how the network system impacts behaviours and how purposeful actions affect the matrix, and vice versa. The network analysis is built from the database of ESCAP – UNCTAD project on mapping NTMs to SDGs for non-COVID-19 emergency measures (Kravchenko et al., 2019). The concordance matrix is constructed of information strings such as SDGs, Targets, HS codes, and NTM codes. According to ESCAP, out of 17 sustainable development goals with 169 criteria, 26 criteria are assessed as being directly and positively impacted by non-tariff measures. Other targets have indirect, non-existent, or unclear links to non-tariff measures. To determine the specific link between NTMs-SDGs objective/criteria, commodity code (HS – 4 digit/6digit), ESCAP's research has shown a number of criteria, including: i) non-tariff measures are targeted in relation to the SDGs (with relevant keywords mentioned in the measure description); ii) the link between the SDGs and the commodity code (HS) is determined to have no other objective other than those related to the SDGs. Therefore, the linkage is only determined based on the goals stated in the description or the intended (or implied) goals, as well as the actual or implicit effects (positive or negative) on the applicable or affected country, which may not be included in the Non-Tariff Measures database. Besides, the monitor approach uses indicators and indices for descriptive statistical analysis of progress toward attaining the SDGs. Indicators related to SDG performance at the national level can be used as management tools for implementation strategies and resource allocations for achieving the goals (Pradhan et al., 2021).

#### ***3.2 Database***

The data collection presented in the paper is confined to the progress toward SDG achievement at the national level. The database was extracted from SDG dashboards conducted by the World Bank. These open resources present available data on indicators to track the process of achieving the goals. Besides, the paper uses the voluntary national review to overlook the comprehensive progress toward goal achievement in Vietnam during the period. The indices about the government efforts and commitments for SDGs also contribute strong evidence about the implementation planning, institutional integration, and policy coherence for SDGs in countries. Other indicators used to monitor the nation's SDG progress were collected from: i) the Global Indicator Framework for Sustainable Development Goals of the United Nations, which defines 231 indicators that cover the multidimensional aspects of the 17 Sustainable Development Goals and their 169 targets (<https://unstats.un.org/sdgs>); ii) valuating government efforts and

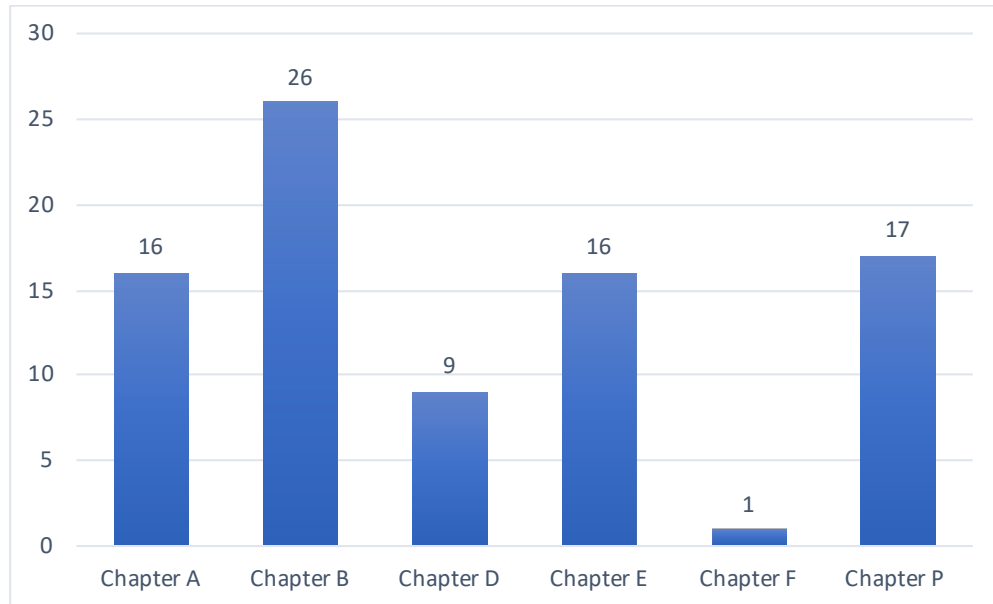
commitments to implement the SDGs and indicators retained to compute the overall score for 2023.

In terms of the non-tariff measures database, the notification of the Covid-19 Emergency Non-Tariff Measures is built on the World Trade Organization (WTO) database on non-tariff measures impact on trade in goods during the Covid-19 and the Global Trade Alert database aims to provide information on trade intervention by governments in international trade (extracted from the website: <https://www.globaltradealert.org/> and Trade map of temporary Covid-19 trade measures (extracted from <https://www.macmap.org/covid19>). The concordance matrix of NTM-HS-SDGs has been extracted from the ESCAP database. The database has coded non-tariff measures based on the International Classification of Non-tariff Measures adopted by UNCTAD and revised in 2019. A non-tariff measures database was extracted from 2020 to August 2021, corresponding to 4 phases of the pandemic in Vietnam. The total measures that were applied during the period have not been completely considered as the measures responding to Covid-19. Covid-19 temporary measures are determined by the notification from Vietnam to the WTO, extracted from WTO databases on NTM taken in the context of the Covid-19 crisis, even terminated measures, and activating measures.

#### **4. Overview of Covid-19 temporary NTM measures imposed by Vietnam**

During the pandemic, Vietnam enacted a total of 85 non-tariff measures. The most prevalent measures are SPS and TBT, which are assigned Chapters A and B based on UNCTAD's NTM classifications, respectively, 16 SPS measures and 26 TBT measures (Figure 1). The SPS measures are requirements for conformity assessment in sanitary and phytosanitary conditions by an inspection and approval procedure, certification or accreditation, origin of materials and parts, and traceability requirements. Vietnam notifies officially 5 measures responding to Covid-19, temporarily targeting medical masks, pharmaceutical products, and food stuffs, but some measures indirectly aim to prevent the virus from invading the consignments. With the spread of the pandemic, there has been a rise in non-tariff measures connected to quantity-control measures for both import and export (Chapter E) with a total of 16 measures. Following those measures in Chapters A and B, export-related measures (Chapter P) have risen dramatically with 17 measures. In the subcategory (Chapter P), Vietnam has imposed mainly export regulations referring to the technical specification of products and conformity assessment (coded by P1) and export licences, export quotas, and export prohibition (coded by P3). In the process of liberalisation, WTO has not encouraged country members to apply quantity-control measures as protective measures, except for emergency cases. Thus, the rise of prohibitive and quantity-restriction measures is necessary for the conditions of global disease in the short-run, but it is also necessary for poverty on a large scale.

Figure 1: Non-tariff Measures Imposed by Vietnam the Period of Covid-19 by Measures.



*Note: Based on Classification of NTM (UNCTAD, 2019), statistics from 1/1/2020 to 31/8/2021*  
 Source: UNCTAD, TRAINS NTMs database, Extract made on: Friday, 09 September 2022 08:31:14

In January 2020, Vietnam notified 5 temporary non-tariff measures related to export and import to respond to Covid-19 (Annex 1). According to the report of the WTO related to Covid-19 temporary non-tariff measures, the measures imposed by Vietnam have implied trade-restrictive effects, though of a legitimate purpose to ensure the supply of these goods for the prevention of the Covid-19 epidemic. Until now, Vietnam has withdrawn 3 temporary measures and is in force on 2 measures: A11 (banning the import of wild animals and wild products to reduce the risk of disease-carrying) and P7 (prohibiting the re-export of medical equipment). Vietnam is one of six countries that took measures to suspend the import of wildlife animals considered possible intermediate hosts of the virus Covid-19. The measure coded A11 has also followed the commitment in the Montreal Protocol relating to no international trade in endangered species.

Referring to export-related measures, P33 and P32 can have two-way effects, such as trade facilitation and trade restriction. The grant of an export license is at the discretion of government authorities, and the export quota does not have a commercial objective. Some countries used both quotas and licensing for exports as intermediary measures over the course of lifting the total ban on exports. In Vietnam, measures coded P33, P32, and P31 were applied in the different product categories, bringing trade-restricting effects on the volume of global trade with essential goods, even when the objectives are ensuring adequate domestic supplies of essential goods such as medical and food.

## **5. Exploring the linkage of NTM-SDGs-Targets in Vietnam**

### **5.1 Sanitary and Phytosanitary measure (SPS)**

With its legitimate purpose, SPS has a priority to impose in the emergency of global diseases. Over the period of Covid-19, SPS measures primarily targeted agricultural products, including i) breeding stock; ii) animal feeds; iii) varieties of plants; and iv) vegetables, grains, and oilseeds. These groups are intermediate products for livestock and agricultural-processed production in Vietnam. A total of 17 SPS measures issued are related to 3 Sustainable Development Goals, consisting of:

- SDG 2: “End hunger, achieve food security and improved nutrition, and promote sustainable agriculture”: 12 out of 17 SPS measures have a direct linkage to target 2.4, which refers to ensuring a sustainable food production system and implementing resilient agricultural practices.

- SDG3: “Good health and well-being”: 5 out of 17 measures applied to achieve target 3.4 to reduce mortality from non-communicable diseases through prevention and treatment and to improve mental health and well-being.

- SDG 15: “Protect and develop land resources”: SPS measures directly aim to target 15.7 and 15.8 to end poaching and trafficking of protected species of flora and fauna and address both demand and supply of illegal wildlife products, prevent the introduction, reduce the impact of invasive alien species on land and water ecosystems, and eradicate the priority species.

During the conditions of the pandemic, the Vietnamese government published a decree revising the Animal Husbandry Law. The decree released the label requirements for animal feed groups (HS1213, 1214), scraps, and wastes from the food industry (HS23). The Ministry of Agriculture and Rural Development closely monitored policy execution. SPS measures have been classified into two groups. First, the label requirement has been imposed on importers to provide adequate ingredients, instructions, and information about exporters by Vietnamese. The regulations aim to monitor the livestock industry rigorously and avoid low-quality animal feed influencing the products. These regulations, A14 and A31, are classified as simple measures that foreign importers can adapt to with low variable costs. Thus, it is not a challenge for importers to comply with these simple measures, which may improve information transparency and have a substantial influence on domestic manufacturers in the industry. Second, the measures related to state quality inspection (A83, A84) and traceability requirements (A851, A859) or conformity requirements (A89) are more complex, which can increase the variable cost for satisfying administrative processes and agricultural practices. For example, the state inspection of the quality of imported plant varieties (A83) was conducted by assessing the certification of imported variety batches by a conformity certification organization appointed by the Department of Crop Production. In general, the increase in SPS has contributed directly to achieving SDGs 2 and 3 of improving food, nutrition, and public health and maintaining sustainable agriculture. These goals stand on the two pillars of “environmental” and “social.”

### **5.2 Technical barriers to trade (TBT)**

In 2020, Vietnam added 26 technical barriers to trade (TBT) for 12 product categories divided into 3 groups: i) intermediate goods, serving in agriculture (animal feed, fertilizers, chemicals); ii) pharmaceuticals and medical ingredients; iii) industrial



products (automobiles, motorcycles, and motor vehicles). TBT measures imposed by Vietnam have a linkage with 3 crucial sustainable development goals:

- SDG 12: “Responsible consumption and production”: 15 out of 26 TBT measures in Vietnam meet goal 12, directly target 12.4 for rational environmental management of chemicals and waste types; target 12.5 aims to reduce waste generation through prevention, reduction, recycling, and reuse; target 12.6 is to encourage businesses and multinationals to adopt sustainable practices and integrate sustainability information into their reporting processes. The technical measures related to SDG 12 are the groups B22 (“restricted use of certain substances”), B31 (“labelling requirement”), B49 (“production and post-production requirement”), B7 (“product quality, safety or performance requirement”), B84 (“inspection requirement”), and B89 (“conformity assessment”).

- SDG 3: “Good health and well-being”: 6 out of 26 TBT measures intentionally respond to the infection of the Covid-19 epidemic and reduce the mortality rate from non-communicable diseases (described on target 3.4). The target products of these measures are pharmaceuticals and medical ingredients and automobiles to reduce emissions and ensure the living environment of the community.

- SDG 15: “The protection and sustainable development of land resources”: requirements on the origin of materials and parts and traceability requirements for wood products contribute to achieving the goal of sustainable development of land resources (target 15.7 prevent the destruction of land resource ecosystems).

Technical measures have been associated primarily with SDG12 and SDG3, referring directly to economic and social issues. B89 and B84 are the most linkage measures with sustainable goals and targets on the system mapping, as well as the most affecting measures on a variety of products. Vietnam has prioritized the group of technical requirements related to production with higher social responsibility (B4, B7, B8) over simple requirements related to labelling, packaging, and marking (B3).

On one side, the energy labelling requirement related to B3, which targets automobile products, can monitor production following, higher safety and environmental standards. On the other hand, the increase in product quality control, safety requirements, or additional inspection and conformity assessment (B4, B7, B8) are considered obstacles to essential products for agricultural and livestock production (such as fertilizers, animal feeds, and pharmaceutical products). These obstacles may lead to higher trade costs by lengthening the approval and clearance process, then pushing the price of essential goods in the market, reducing the availability to access these products, and taking a negative effect on good health and well-being (goal 3). According to SDG performance, SDG12 has improved moderately, while SDG3 is in the group of major challenges that remain.

### ***5.3 Export-related measure (P)***

Export-related measures have recorded the most adjustments between the two periods before and after the Covid-19 pandemic. The number of export prohibitions (P31), export quotas (P32), and export licensing (P33) has increased rapidly to 7 out of 17 measures in Chapter P. The measures target two critical sectors during the Covid 19 pandemic: medical goods and medicines and agricultural products, aiming to have a trade-restricting effect.

In terms of medical goods, types of measures include production and post-production requirements (P13), certification requirements (P163), and conformity assessment requirements (P169). Some of these measures tend to regulate more strictly than in the period before the pandemic. For example, P13 and P19 are both the new regulations for HCFCs, which are chemical compounds that damage the ozone layer and

the environment. This reflects the commitment of Vietnam to the Montreal Protocol on Substances that Deplete the Ozone Layer. Measures in Chapter P have been imposed differently by countries or partner groups, such as the certification requirement (P163) and conformity assessment (P169) imposed on timber and rice exports to the European Union. More requirements will be more challenging for Vietnamese exporters. In this case, these regulations come from the requirement of two sides to ensure quality control.

The linkage between NTM-SDG-Target-Pillar reflects that P13 and P19 are the most affecting measures on SDG12 and SDG3 and targets among the export-related measures (Chapter P). Matching the export-related measures with the sustainable development goals has recorded some facts: the most predominant objective of these measures is responsible production and consumption (Goal 12) to achieve sustainable management and efficient use of natural resources.

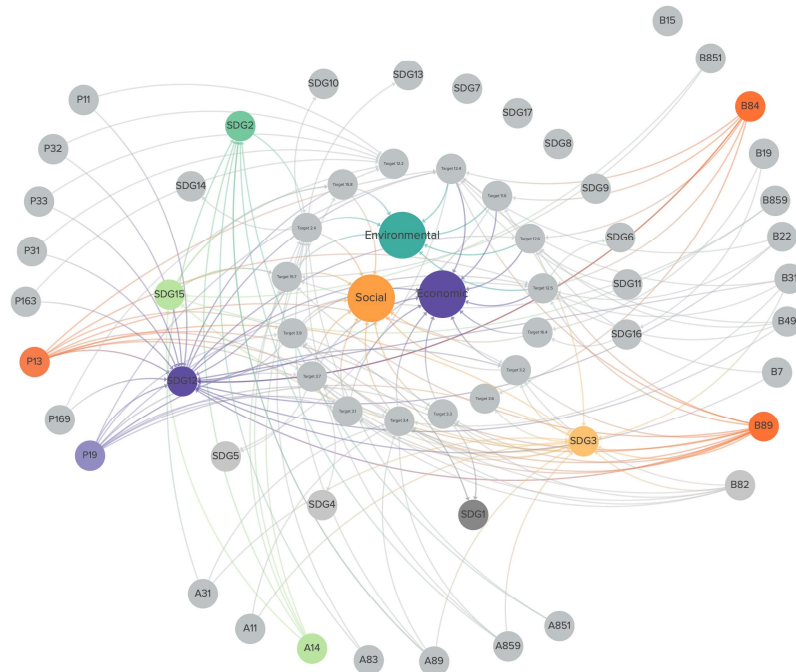
#### ***5.4 Other non-tariff measures***

Chapter E contains measures related to non-automatic import-licensing procedures, quotas, and quantity control measures. These measures were frequently used by the Vietnamese government before the period with the aim of protecting domestic supply (birds' eggs and salts) or licensing for non-economic or environmental reasons (timber, ozone layer-depleting substances). Other safeguards measures, such as anti-dumping (D12), are applied according to the results of anti-dumping case between Vietnam and other partners (China, Indonesia, Malaysia, Thailand, and South Korea). However, these measures do not clearly reflect sustainable development goals in the long term.

#### ***5.5 The network analysis of NTM-SDGs-Targets and Pillars in Vietnam***

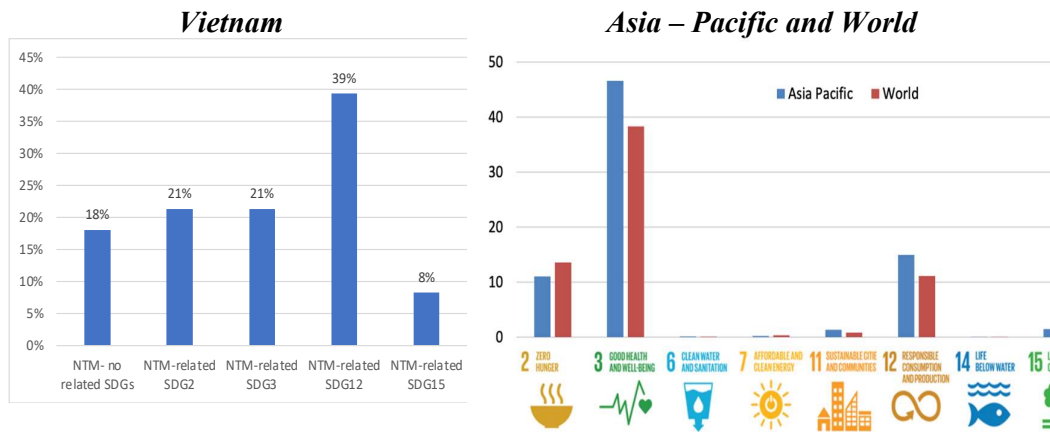
The system mapping of the NTM-SDGs-Targets and Pillars in Vietnam reflects the complexity and interdependence of the policy measures and sustainable goals (Figure 2). It also depicts how one measure can address individual or multiple goals and which crucial pillars are the most prioritized in Vietnam's trade policy. Vietnam has a high share of NTM directly related to SDGs (82%), compared with the average of Asia – the Pacific region (42,5%) (Kravchenko et al., 2019). The high share of NTM in Vietnam has directly addressed SDGs 2,3 and 12, respectively in the Asia-Pacific region. NTM-related SDG12 is the most prominent measure in Vietnam, accounting for 39%, while the majority of NTM in Asia- Pacific addresses SDG3, due to the highest share of SPS measures in the region (Figure 3).

Figure 2: System Mapping NTM – SDGs – Targets - Pillars in Vietnam



Source: Author calculations based on the concordance matrix of NTM-SDG-target (Kravchenko et al., 2019) <https://embed.kumu.io/1190361ff8e5a058519afdcfd3f175d3>

Figure 3: Share of NTM Related Directly to SDG in Vietnam



Source: Authors' calculations based on UNCTAD trains database

Source: Kravchenko et al., 2019

## **6. The potential effects of the linkage on the progress of SDG achievements**

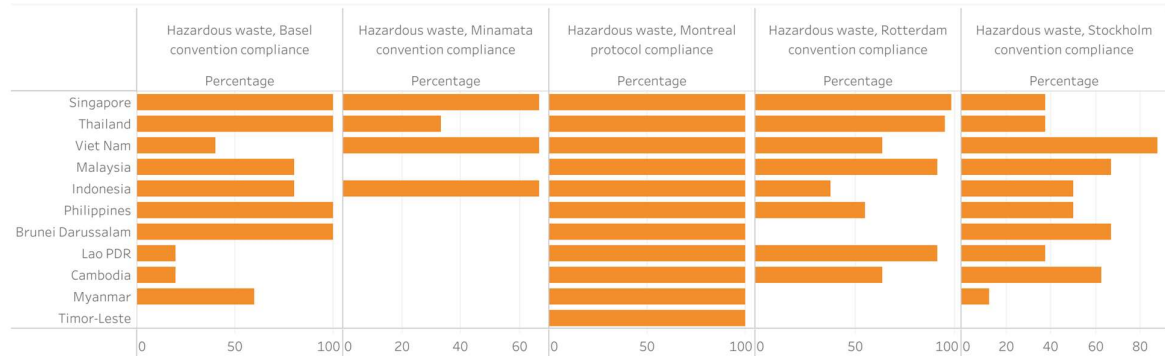
### ***6.1 Goal 12 – Responsible consumption and production***

SDG12 has a solid direct environmental linkage through targets 12.4 and 12.5 on managing hazardous and non-hazardous chemicals and wastes. The system mapping shows the nodes to address SDG12 are quality-control measures (B84, B89) and export-production requirements (P13, P19) on two crucial products: chemicals and fertilizers, motor vehicles, and automobiles. These measures associated with SDG 12 are more stringent than other simple regulations. It requires higher level of authority in the appraisal process. For example, automobiles are subject to the quality-control requirement (B84) and the disclosure of information on fuel consumption (B89) in every shipment according to the criteria specified in IATF 16949 “Quality Management System Requirements for Automotive Production and Relevant Services Parts Organizations,” under the authority of the Vietnam Register of the Ministry of Transport. The Vietnam regulations require high harmonisation and flexibility with the types of self-certification. In particular, the number of conformity-assessment requirements (B89) in Vietnam has increased significantly. It reflects that Vietnam’s trade policy has emphasised the issue of regulatory convergence to fully integrate into international trade. Regulatory convergence refers to the harmonization of regulations and standards, the simplification of customary procedures, and the increase of mutual recognition. It contributes to reducing trade costs in exports and imports.

The achievement of SDG12 has come from a set of policy interventions. First, Vietnam has obliged strongly with international environmental commitments as the role of the responsible member state (such as the Basel Conventions, Minamata Convention, Montreal Protocol, Rotterdam Convention, and Stockholm Convention). Vietnam has made great efforts to realise its commitment through specific trade policy instruments (ex: B84, B89, B49, and B7), compared with other members of the region (Figure 4). Second, Vietnam has attracted more inward FDI in industries related to the environment, such as renewable energy production. From 2019 to 2022, Vietnam ranked 5th among the top destinations that attracted the largest inward FDI in green power technologies. The remarkable FDI project belongs to AES’ corporation of the USA to build a wind farm in Vietnam, aiming to double the nation’s present 4000 MW wind generation capacity. Third, Covid-19 is an alarm about global environmental issues and the opportunity for developing countries to regulate enterprises to adapt to socially responsible practices in production processes and methods (demonstrated in Target 12.6). There are 4 non-tariff measures (B84, B89, B49, and B7) which have direct linkage with Target 12.6 in the import products (gas, steel, automobiles, fertilizers, and mal feed). According to SDG 12 indicators, the number of companies publishing sustainability reports has increased significantly from 2019 to 2021 in Vietnam (SDG Gateway, 2023). Maintaining the regulations may positively affect Vietnam’s position in the global supply chain. Consequently, SDG12 has moderately changed among Vietnam’s 17 SDG performances. The good performances are intensively based on the criteria of domestic material consumption, material footprint, and renewable electricity capacity (Table 1). Yet, Vietnam needs more efforts to accelerate environmental-related goal implementation on SDG12 (VNR Vietnam, 2023). The combination of Vietnam’s policy interventions toward SDG12 reflects the role of the responsible member state in global

issues and, conversely, the beneficial member in the transition process from fossil fuels towards low-carbon technologies. SDG12 can be the top priority in Vietnam’s trade policy to attain improvement in the two crucial pillars: environmental and economic.

Figure 4: International Agreements on Hazardous Waste (Target 12.4.1) in ASEAN economies



Source: SDG Gateway Asia-Pacific (<https://data.unescap.org/data-analysis/country-comparison>)

Table 1: The Performance of Criteria Related to SDG12

Criteria of material consumption	2015	2019	Status
Domestic material consumption intensity (Kg per USD (2015)/GDP)	6.1	3.5	Performer
Domestic material consumption, total (tons per capita)	12.7	9.1	Performer
Material footprint, total (Kg per 1 USD (2018)/GDP)	4.8	3.3	Performer
Material footprint, total (Tons per capita)	10.0	8.5	Performer
Criteria of renewable electricity capacity	2015	2020	Status
Renewable electricity capacity, bioenergy (Watts per capita)	1.7	3.8	Performer
Renewable electricity capacity, hydropower (Watts per capita)	172.5	221.4	Performer
Renewable electricity capacity, Solar (kWh per capita)	0.1	170.9	Performer
Renewable electricity capacity, wind (Watts per capita)	0	42,3	Performer
Renewable electricity capacity, total (kWh per capita)	175,8	438,4	Performer

Source: SDG Gateway Asia-Pacific (<https://data.unescap.org/data-analysis/country-comparison>)

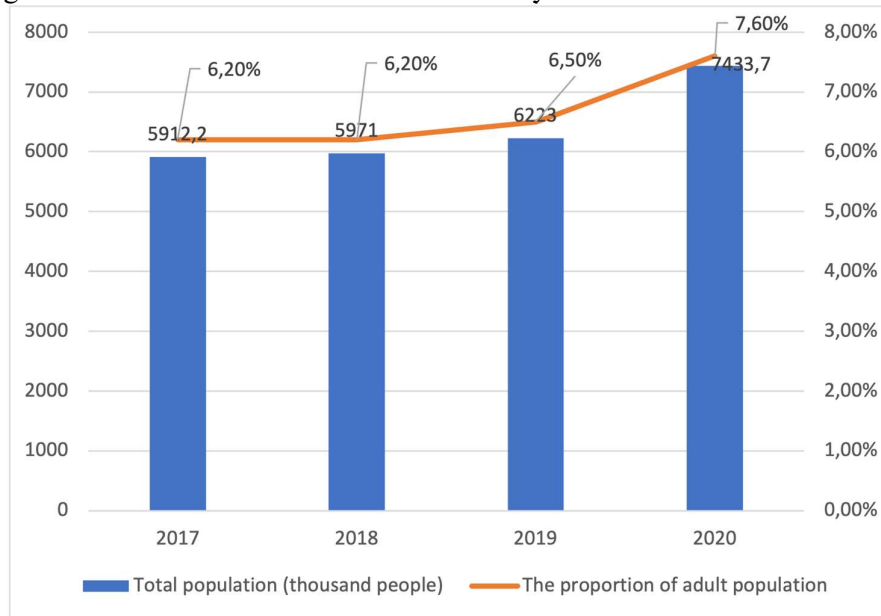
### 6.2 SDG 2 “Zero hunger” and SDG3 “Good health and well-being”

NTMs released by Vietnam in the period have positive effects on ensuring national food security and the shortage of domestic supply for overcoming the Covid-19 pandemic. NTMs regulate certain essential products to eliminate risks arising from additives, contaminants, and disease causing organisms. NTMs also shield agricultural and livestock production from pests and invasive species. In the long term, over half of the NTM imposed during the period has directly addressed with the sustainability of food security and public health. Most SPS and TBT measures have contributed to solving the goals of zero hunger, food security, and sustainable agriculture (SDG 2), as well as the prevention and treatment of non-communicable diseases to improve mental health and well-being (SDG3). The main objectives address Target 2.4, ‘Sustainable food production and resilient agricultural practices’ through A14, A83, A89, A859, A851, and Target 3.4, ‘Reduce mortality from non-communicable diseases and promote mental

health’ through a variety of measures in Chapter A (A11, A31, A89, and A859), Chapter B (B82, B89, and B31), and Chapter P (P13, P19).

The main obstacle in Vietnam is preventing food insecurity in the domestic agricultural market. The track on attaining SDG2 has remained challenging, witnessed by the increase in the total population suffering from moderate and severe food insecurity from 5,912.2 thousand people (6.2%) in 2017 to 7,433.7 thousand people (7.6%) in 2020 (Figure 5). According to the Global Food Security Index (GFSI), Vietnam ranks 46th out of 113 countries in 2022, where it performed best in the pillar of affordability and weakly in the pillar of sustainability and adaptation. From the perspective of affordability, it means providing sufficient supply at relatively consistent prices, while the food security environment remains highly vulnerable to risks associated with climate change. Thus, political commitment or policy intervention should deploy early-warning measures and measures toward the pillar of the environment. On the system mapping NTM, SDG, Target, Pillar, A14 has linkage with SDG 2,15, and Target 2.4, 15.7, and 15.8 that strongly interact with the pillar of environment, so it is considered an effective measure (Annex 2).

Figure 5: Moderate and Severe Food Insecurity in Vietnam from 2017 to 2020



Source: Author’s calculation (2023) based on statistics of United Nations, <https://unstats.un.org/sdgs/dataportal/countryprofiles/VNM#goal-2>

The measures related to Target 3.4 on essential products (agricultural products and pharmaceutical products) apparently demonstrate the public policy priorities in the Covid-19 period to prevent the spreading of global diseases. They are predominantly trade-restricting measures (as import prohibition, traceability requirement, quality requirement, or labelling requirement) to high-frequently import control with certain products which have a high risk for the occurrence of non-communicable diseases, such as plan varieties, as well as reducing exposure to harmful substances.

From the export measures (Chapter P), export quotas and export requirements had both direct effects on ensuring domestic food security and indirect effects on the increase in the world rice price market from April to June 2020. The noteworthy trade-policy activism in Vietnam was the rice export quota of 400,000 tons from 23<sup>rd</sup> March 2020 to

30<sup>th</sup> May 2020. With the wave of rice export restrictions from top rice exporters (India, Vietnam, Pakistan, Cambodia, and Myanmar) (Table 2), the world rice price surged by 22,23% (from 14.014 USD/cwt on March 2020 to 17.155 USD/cwt on April 2020 and 17.215 USD/cwt in May 2020)<sup>1</sup>. The price dropped to 11.557 USD/cwt after the termination of these measures (Figure 3). The imposed export restrictions contributed to price surges in the world rice market (Giordani et al., 2016; Martin & Anderson, 2012). The negative effects of export restrictions postponed the achievement of the sustainable goals related to hunger and poverty reduction in the world (SDG2).

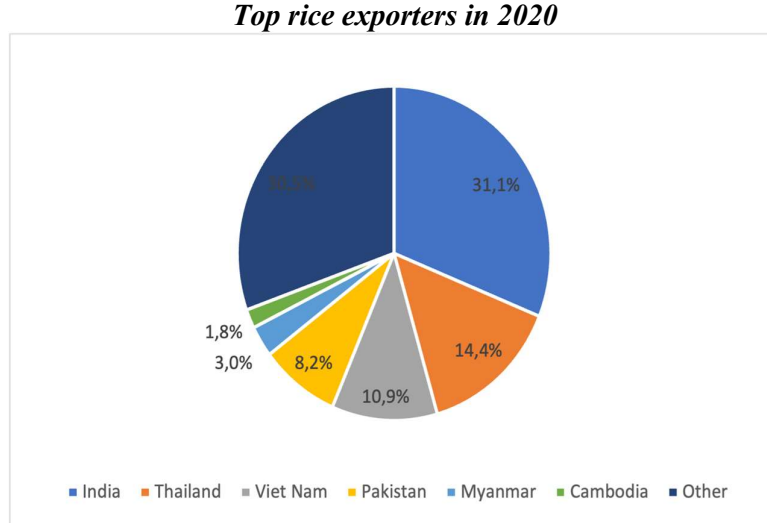
Table 2: Covid 19 - Temporary Rice Export Restrictions by Economy

Countries	Type of measures	Affected products	Effect on trade	Status of measures	Start date	End date
Vietnam	Export quota	Rice	Restricting	Terminated	23/3/2020	30/5/2020
India	Licensing or permit requirements to export	Rice	Restricting	Active	03/04/2020	Unknown
Pakistan	Export prohibition	Food products (all edible items)	Restricting	Terminated	28/04/2020	11/05/2020
Cambodia	Export prohibition	Rice	Restricting	Terminated	05/04/2020	02/05/2020
Myanmar	Export prohibition	Rice	Restricting	Terminated	03/04/2020	01/05/2020
Philippines	Export prohibition	Rice	Restricting	Active	27/3/2020	Unknown
Eurasian Economic Union	Export prohibition	onions, garlic, turnips, rye, rice	Restricting	Terminated	31/3/2020	30/6/2020

Source: ITC (2022) <https://www.macmap.org/covid19>

<sup>1</sup> Retrieved from <https://tradingeconomics.com/commodity/rice>

Figure 6: The Effects of Top Rice Exporter’s Quota on the World Rice Price during the Covid-19



**The world rice price from 4/2020**



Source: Author calculations based on the database of Trademap (extracted from <https://www.trademap.org/> and <http://tradingeconomics.com>)

Referring to the trade effects, Vietnam Covid-19 temporary NTMs applied to agricultural products contributed to trade surpluses and positive economic growth in 2020 and 2021. The remarkable trend regards trade creation in the group of agricultural products (Table 3). In 2021, Vietnam recorded a higher export growth rate in some large markets in member states of FTAs (such as CPTPP, EVFTA, and VN-EAEU FTA), and while relying less on the Chinese market. One of the reasons stems from China’s strict restrictions and licensing for Vietnamese exporters. For example, with the Zero-Covid policy, China has implemented 5 temporary measures, including an import ban on poultry meat, fish, and seafood, and a restriction on imports for SPS reasons. China has some inspection procedures related to Covid-19, resulting in the delay and long queue of trucks at the border between Vietnam-China. The phenomenon implied higher costs and risks for Vietnamese exporters, leading to the shift from China to the EU market and Australia.



Table 3: Vietnam’s Fruits and Plants Export Growth by Markets in 2020 - 2021

Unit: Thousand USD

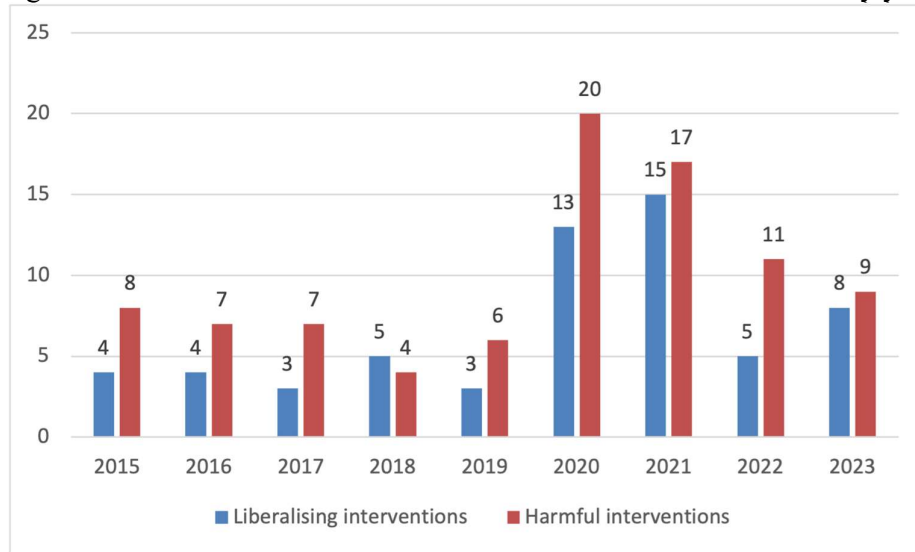
Market	2020	2021	The growth rate
<b>Total</b>	<b>3,269,245,926</b>	<b>3,551,161,777</b>	
China	1,839,855,024	1,907,456,664	3.7
USA	168,824,664	222,902,359	<b>32.0</b>
Japan	127,668,223	153,216,794	<b>20.0</b>
Korea	142,976,649	157,413,627	<b>10.1</b>
Thailand	157,156,882	147,283,243	-6.3
Taiwan	94,474,250	126,719,707	34.1
Australia	64,334,836	82,447,908	<b>28.2</b>
U.A.E	42,132,613	47,451,937	12.6
Hongkong	59,428,252	79,002,430	32.9
Singapore	35,593,975	38,002,674	6.8
Malaysia	37,018,970	40,625,152	9.7
Canada	29,715,737	34,970,210	17.7
UK	11,597,093	19,354,772	<b>66.9</b>
Russia	54,403,065	76,569,328	<b>40.7</b>
Switzerland	5,089,385	4,012,237	-21.2
Ukraine	1,396,205	4,959,189	<b>255.2</b>
Norway	2,686,844	2,791,260	3.9
EU	146,419,788	150,733,492	2.9

Source: Vietnam annual export and import report (2021)

Furthermore, NTMs are more than trade-policy instruments; they are trade-policy activism in the inclusion of sustainable development policies. NTM related to SDGs affects progress towards SDG achievement via liberalising or harmful interventions on trade flows. According to the data and methodology of GTA (2022), policy instruments may consist of single or multiple interventions with the aspect of liberalising or worsening the foreign and domestic markets. Figure 7 depicts the number of government interventions implemented by year. Most state acts have accounted for harmful interventions, especially during Covid-19 (from 2020 to 2021).

Hence, Covid-19 temporary NTMs related to SDG2 and 3 can primarily have direct positive impacts on food security and restrictions on non-communicable diseases in the short run. These policies also have both positive effects as trade creation and negative sides as the fluctuation in world market prices of certain comparative advantage commodities, for example, rice, fruits, and plant varieties.

Figure 7: Number of Vietnamese Government Interventions Released by year



Source: Global Trade Alert Database (<https://www.globaltradealert.org/country/228>)

## 7. Discussion

The system mapping shows the preliminary association between NTM and sustainable goals on the multidimensional side (liberalising and harmful interventions, direct and indirect). Again, the mapping determines the crucial role of NTM in the progress of SDG achievements at the national level. From the mapping, some insights have been gained as below:

Firstly, some prominent non-tariff measures can address multiple SDGs. For instance, conformity assessment (B89) has linkage with three crucial SDGs 3,12,15; authorisation requirement (A14) is associated with SDGs 2,15; technical export measures (P13 and P19) are associated with SDGs 3,12. Remarkably, B89 also affects the most commodity groups. Thus, it is the most crucial node in system mapping. Conformity regulations depict the high concerns of governments about harmonizing national regulations and standards with international regulations and standards. It is essential for trade facilitation and to help domestic exporters adapt to the world market and take advantage of FTAs.

Secondly, the linkage of NTM-SDGs-Targets-Pillars indicates the different priorities of the Vietnamese government on environmental-related goals (SDG12) and social-related goals (SDG2 and 3). While trade measures associated with SDG2 and 3 have short-term objectives in the conditions of Covid19, NTMs related to SDG12 have long-term objectives and expect to affect international movements (such as investment and low-carbon technology). These COVID-19-related-NTMs are distinct from the more traditional NTMs. They were imposed temporarily in response to the public health crisis and fears about supply chain bottlenecks, targeting various agricultural and food products (Ker & Cardwell, 2021).

Thirdly, the limitation of the system mapping does not quantify the degree or direction of trade effects by NTM-linkage with SDGs. Yet, from the variety of descriptive statistics, some significant effects can be shown, such as the drop in the world rice price due to the export quota of rice released by Vietnam and other top rice exporters. Covid19 responsive NTM also contributes to the trade creation from the high-dependent partners

(China) to the other members of deep trade agreements (CPTPP, EVFTA, and FTA Vietnam-Eurasian).

Lastly, although the system mapping depicts the linkage between NTMs and SDGs, it is not determined whether non-tariff measures relate to SDGs imposed by the initial intention of the government in policy-making or not. According to SDG reports, Vietnam has ranked 55th out of a total of 163 countries, but the government's commitments and efforts for the SDGs are the lowest, ranging from 0 to 40 (based on the SDG index scores). SDG 2,3,12, and 15 have remained challenges and are on track or moderately improving. Only SDG 12 achieved 9 out of 10 targets. These areas also need more concern to obtain significant improvement in the next period.

With the proliferation of NTMs, the system mapping of NTMs-SDGs may suggest further research to quantify the degree or direction effects on trade flows in the progress towards SDGs. The government should be concerned about balancing the short-term goals with the long-term objectives to ensure the sustainability of development. Coordinated and more harmonized regulations should be mentioned as the solution to balance the costs and benefits, short-term and long-term goals, growth rate, and sustainability, instead of eliminating the number of NTMs. Vietnam is a significant example of how to overcome the pandemic and obtain economic growth with the high coverage of NTM matching the SDGs. In the post-pandemic period, Vietnam should prioritise streamlining and mutually recognising regulations and standards in the area, especially ASEAN and East Asia, as well as FTA partners, to take advantage of these agreements. Meanwhile, boosting the improvement of the single window and the implementation of trade facilitation by applying digital procedures and higher mutual recognition have contributed to more transparency in trade. Policymaking should be an inside-out transformation instead of an external force (Mai &Ngoc ,2019). The crisis of Covid 19 has been an awakening of the importance of policy toward sustainability and the coordination among countries to solve global issues.

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