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The evaluation of non-tariff measures and their effects on the international trade landscape and competitive positioning of Cambodia and Thailand

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Abstract: Thailand has enacted approximately 60% of the 118 Non-Tariff Measures (NTMs) categorized as Class A: Sanitary and Phytosanitary measures, which significantly impacts agricultural exports from Cambodia. In comparison, Cambodia has established only 30 NTMs, representing about 26% of the total NTMs affecting agricultural goods exported to Thailand. This disparity underscores the necessity for a bilateral meeting between the two nations to explore opportunities for reducing NTMs in agricultural trade. Concurrently, Cambodia is making strides to improve the quality of its agricultural products to enhance export potential to Thailand. If these discussions prove fruitful, the trade processes will be streamlined, leading to a substantial increase in the exchange of agricultural products between the two countries. The government should promote private sector investment aimed at elevating sanitary and phytosanitary standards to align with international benchmarks. Specifically, attracting both domestic and foreign investment to establish agricultural product processing facilities will enable the production of finished goods, thereby boosting exports and enhancing product quality. This initiative not only addresses domestic demand for agro-industrial products but also assists in identifying markets for Cambodian farmers.

Keywords: *Agricultural products, Agro-industry, Non-tariff measures, Sanitary and phytosanitary measures.*

1. Introduction

Cambodia's economy was classified into three key sectors: agriculture, industry, and services. In the last five years, between 2017 and 2021, on average 23.8 percent, 36 percent, and 40.2 percent of gross domestic product were accounted for agricultural, industrial, and service sectors, respectively. During the same period, the average real GDP growth rate was 4.3 percent. Among the three sectors, on average, the sector that generated the highest growth rate was industry (7.9%), followed by service (2.3%), while the agricultural sector created the lowest growth rate of about 0.8 percent (Asian Development Bank, 2024).

The economy of Cambodia was not dependent only on domestic consumption, but it relied on international trade as well. The total value of Cambodia's export had increased from $US11.31 billion in 2017 to $US18.36 billion in 2021 which increased by approximately 62.36 percent. The top ten importers from Cambodia were the United States of America ($US7.06 billion), Japan ($US1.14 billion), Germany ($US0.98 billion), the People's Republic of China ($US1.40 billion), the United Kingdom ($US0.71 billion), Canada ($US0.95 billion), Singapore ($US0.15 billion), Viet Nam ($US1.57 billion), Thailand ($US0.51 billion), and Belgium ($US0.43 billion). There were three countries determined to be the top importers of Cambodia, the People's Republic of China ($US9.75 billion), Singapore ($US5.12 billion), and Thailand ($US3.25 billion) (International Monetary Fund, 2024).

Thailand was considered to be one of its main trading partners in Cambodia, with a value of export of $US0.51 billion of which $US18.62 million were agricultural products. Cambodia imported agricultural products from Thailand in 2021 about $US1.40 billion of which $US238.40 million were unprocessed agricultural products and $US1.17 billion were processed agricultural products as referring to the BACI International Trade Database (International Trade Centre, 2024).

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The ASEAN Economic Community known as AEC has established in 2015 under three pillars: Political-Security Community, Economic Community, and Socio-Cultural Community. By implementing AEC Blueprint 2015 measures related to tariff reduction, trade facilitation, and ASEAN Trade in Goods Agreement (ATIGA), more goods have been freed to flow within the ASEAN region. As part of AEC 2025, ASEAN will continue to reduce or eliminate border and behind-the-border regulatory barriers that impede trade, to achieve competitiveness, efficiency, and seamless movement of goods across its borders. The three strategic goals of ATIGA are as follows: (i) further strengthening ATIGA; (ii) strengthening and streamlining the application of the Rules of Origin (ROO); and (iii) accelerating and deepening the application of trade facilitation measures. Among the vital measures, the issue surrounding the Non-Tariff Measures (NTMs) was thought to be one of the most crucial concerns to be resolved among the ASEAN Member States (AMS). Minimizing trade protection and compliance costs while dealing with NTMs is one of the AMS's key responsibilities. "Most NTMs address regulatory objectives such as environmental, health and safety, security or cultural considerations, but they can also significantly impede trade inadvertently or by design. In order to address NTMs, it is necessary to (i) accelerate efforts toward the complete elimination of nontariff barriers; (ii) implement standards and conformance measures, such as equivalence in technical regulations, standardization, alignment with international standards, and mutual recognition agreements (MRAs); and (iii) streamline processes and lower import and export license, permit, and certificate requirements" (AEC Blueprint, 2015).

Cambodia and Thailand are the member states of ASEAN which border close to each other and had huge trade flows as mentioned earlier, especially the agricultural products. The intra-ASEAN import duties of Cambodia and Thailand have been eliminated on 99.65 percent and 98.86 percent of their tariff lines, respectively, as referred to the ATIGA. Therefore, NTMs were considered the main issues to be solved by the AMS including Cambodia and Thailand. The objectives of this research are to conduct an empirical investigation the impact of NTMs imposed by the Cambodia trading partners on its exports of the agricultural products, current trend of NTMs in Cambodia and Thailand's NTMs imposed to export of Cambodia, perspectives of importers and exporters in Cambodia towards the non-tariff measures, the procedures/process involve with NTMs, and ways of implementing effective NTMs and possible collaborations on NTMs between Thailand and Cambodia through utilizing existing regional trade agreements and bilateral trade agreements.

2. Literature Review

Food hygiene and safety standards on seafood such as the Analysis and Critical Control Point System – HACCPS, Minimum Required Performance Limit (MRPL), and Basic Food Safety Law developed by the US, EU, and Japan, respectively caused Vietnamese's shrimp and fish exports to those markets decreased on average approximately 97% and 80%, respectively (Nguyen and Wilson, 2009). The volume of export of seafood products remain the same unchanged despite the free trade agreement had been signed between the EU and the US due to the non-tariff barriers such as import notification and rejections. The empirical results of this study using gravity model had further indicated that it was a trade-off between tariffs and non-tariff measures (Baylis, 2012). The standard of food safety imposed by Chinese trading countries had a huge impact on the export of vegetables and fruit. In contrast, the exports of the both products would continue to decline when Chinese government applied the same measurement on the imported fruit and vegetable from its counter parties. The bilateral trade of fruit products between China and Japan, United States of American and the EU reduced because of the imposed standards related to the limitation of pesticide residue by the three countries (Dou, et al., 2013).

Non-tariff barriers related to the import and export of agricultural products between developing and developed countries still be a critical issue to be discussed and solved. Gravity model was applied in a study about the SPS measures imposed by developed countries on the import of tea from China. The results showed that 1 ppm increase of Maximum Residual Limits of fenvalerate and endosulfan by developed countries would reduce the export of Chinese tea by 1.6% and 0.7%, respectively (Dong and Zhu, 2015). A study by Ferro et al. (2015) revealed that non-tariff measures vary, but recently the number of measurement rose dramatically especially the restriction on trading of agricultural products.

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The export of fruits of Chile decreased when stringency had increased as indicated by a research conducted by Santeramo and Lemonaca (2019) to investigate the effect of sanitary and phytosanitary and technical barriers to trade measures that incorporates a stringency perception index on the exports of fruit. To evaluate the impact of four most used NMTs, the importer-specific ad valorem equivalents, on trade in the Indian Ocean Rim Association, a gravity model using NTM count data was carried out. The empirical finding of this research showed that sanitary and phytosanitary and technical barriers to trade measures had less impact on trade in the region than import-impeding and import-promoting (Akintola, et al., 2021). This results was inconsistence with a research conducted by Ronen and Economy (2017) and Dolabella (2020) that SPS and TBT had a sizeable negative impact on trade than other non-tariff measures.

An empirical investigation conducted in Hebei Province found that green trade barriers imposed by the Chinese government had a negative impact on export volume of agricultural products, but it had a positive effect on price as well in the short-run. In the long-run, the situation reversed (Su, 2021). Using a gravity model over the period between 2001 and 2020 to investigate the effect of two most practical NTMs, sanitary and phytosanitary and technical barriers to trade on three different agricultural products, HS08, HS09, and HS10, by EU on the import of agricultural products import from Vietnam. This research found that it had a positive relationship between NTMs imposed and trade related measures (Hien and Huyen, 2022). The evaluation of the impact of non-tariff measures (NTMs) on exports between developing and developed nations involved the formulation of the Ad Valorem Equivalent (AVE) by integrating various categories of products from both importers and exporters. The findings presented in this study revealed that the differences tend to amplify alongside the AVEs, which aligns with instances of trade fraud, where traders deliberately misrepresent the countries of origin or misclassify products to circumvent border NTMs (Kee & Nicita, 2022).

In the context of political economy theory, nations that exhibit a higher degree of integration into global value chains (GVCs) tend to impose lower tariffs compared to those with lesser integration, as indicated by the domestic value added in foreign final goods. This analysis utilized panel data from over 160 countries spanning the years 1995 to 2015, focusing on tariffs and non-tariff measures (NTMs). The empirical findings derived from pooled ordinary least squares (OLS) and instrumental variable (IV) approaches suggest that a stronger integration into GVCs correlates with reduced tariffs, particularly in scenarios outside of regional trade agreements, as well as diminished NTMs, applicable both within and beyond these agreements (Raimondi et al., 2023). The gravity model was utilized to examine the influence and extent of country-specific non-tariff measures (NTMs) on global wine imports. This research aimed to clarify the impact of these NTMs, particularly those applied to wine imports, and to differentiate the global effects of such measures across various wine market segments, including sparkling, bottled, bulk, and musts. The analysis concentrated on key exporters and importers, covering trade data from 1991 to 2016. The findings indicate that country-specific NTMs generally promote wine imports, with notable variations observed among different market segments and regulatory types. Specifically, technical barriers to trade (TBT) favor bottled wine imports, while pre-shipment inspection (PSI) also enhances bottled wine imports. Furthermore, sanitary and phytosanitary measures (SPS) and export restrictions and measures (ERM) emerge as the most effective NTMs in facilitating trade, irrespective of the market segment (Santeramo, et al., 2019).

The synthesized empirical finding in this research indicated mixed results regarding the relationship between non-tariff measures such as sanitary and phytosanitary and technical barriers to trade and trade-related measures from one country to another country, but most of the studies end up with a negative relationship between NTMs and trade.

3. Research Methodology

The empirical assessment of the impact of NTMs on Cambodia exports of agricultural products to her main trading partners can be conducted by running a multiple regression model in the form of Gravity model as follow,

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$$lnExport_i = \beta_0 + \beta_1 lnGDP_i + \beta_2 Border_i + \beta_3 ln(1 + SPS_i) + \beta_4 ln(1 + TBT_i) + \beta_5 ln(1 + PSI_i) + \beta_6 ln(1 + NTB_i) + \epsilon_i$$

Where, $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are parameters to be estimated. ϵ are the residual or error terms which defined to be the unobserved variables which can impact on the value of export. Export represents the value of export of agricultural products from Cambodia to her trading partners which is denoted by i which is $i = 1, \cdots, N$. As referring to the Direction of Trade of the International Monetary Fund, in 2021, there were 41 countries that determined to be the top exporting countries of Cambodia including Austria, Bangladesh, Belgium, Brunei Darussalam, People's Republic of China, Hong Kong SAR, Denmark, Finland, France, Germany, Greece, Hungary, Indonesia, Ireland, Italy, Japan, Lao People's Democratic Republic, Malaysia, Malta, Myanmar, Netherlands, New Zealand, Norway, Philippines, Poland, Portugal, Republic of Korea, Russian Federation, Saudi Arabia, Singapore, Slovakia, Slovenia, South Africa, Spain, Sweden, Switzerland, Thailand, United Arab Emirates, United Kingdom, United States of America, and Viet Nam. The agricultural product codes are determined using the Harmonized System (HS) 2-digit codes covering from 01 to 24 which established by the World Integrated Trade Solution (WITS) (See Table 1 for more detail). From code 01 to 14 indicate the unprocessed agricultural products, while from code 15 to 24 represent the processed agricultural products.

The data on exports are collected from the UN Comtrade Database. Gross Domestic Product (GDP) of each country is extracted from the World Development Indicators of the World Bank. Border is a dummy variable where 1 indicates the country bordering close to Cambodia which are Lao People's Democratic Republic, Thailand, and Viet Nam, and 0 otherwise.

Table 1.
HS 2-digit, agricultural products.

Code	Description
01-	Animals; live
02-	Meat and edible meat offal
03-	Fish and crustaceans, molluscs and other aquatic invertebrates
04-	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included
05-	Animal originated products; not elsewhere specified or included
06-	Trees and other plants, live; bulbs, roots and the like; cut flowers and ornamental foliage
07-	Vegetables and certain roots and tubers; edible
08-	Fruit and nuts, edible; peel of citrus fruit or melons
09-	Coffee, tea, mate and spices
10-	Cereals
11-	Products of the milling industry; malt, starches, inulin, wheat gluten
12-	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit, industrial or medicinal plants; straw and fodder
13-	Lac; gums, resins and other vegetable saps and extracts
14-	Vegetable plaiting materials; vegetable products not elsewhere specified or included
15-	Animal or vegetable fats and oils and their cleavage products; prepared animal fats; animal or vegetable waxes
17-	Sugars and sugar confectionery
18-	Cocoa and cocoa preparations
19-	Preparations of cereals, flour, starch or milk; pastrycooks' products
20-	Preparations of vegetables, fruit, nuts or other parts of plants
21-	Miscellaneous edible preparations
22-	Beverages, spirits and vinegar
23-	Food industries, residues and wastes thereof; prepared animal fodder

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24-	Tobacco and manufactured tobacco substitutes

Source: World Integrated Trade Solution (WITS)

Regarding the United Nations Conference on Trade and Development (UNCTAD), NTMs are classified into two main categories, imports and exports. Imports consist of two main categories, technical measures and non-technical measures. There are three chapters, (A) Sanitary and phytosanitary (SPS), (B) Technical barriers to trade (TBT), and (C) Pre-shipment inspection and other formalities (PSI) included in technical measures, while the Non-technical measures or Non-technical barriers (NTB) which has twelve chapters, D, E, F, G, H, I, J, K, L, M, N, and O. The main objective of the regression analysis is to investigate the impact of NTMs imposed by Cambodia's trading partners on the export of the agricultural products. This research uses four main classes of NTMs, SPS, TBT, PSI, and NTB. Each of the class represents the number of NTMs imposed by imported countries, collected from the UNCTAD - Trade Analysis Information System (TRAINS). All variables are equipped with natural logarithm, ln, except the dummy variable.

The sample parameters of the regression model are estimated using Ordinary Least Square (OLS) method, but to get a robust standard error, bootstrapping technique applied. The technique starts with randomly selected with replacement of *N* observations from *N*-observation dataset. In each trail, a new resampling dataset is used to estimate sampling parameters and statistics based on OLS method. The process is repeated many times and the statistics are recalculated. The replicated statistics which established from the trails will be applied to calculate the standard error (se) based on the standard formula for the sample standard deviation below,

$$\widehat{se} = \left\{\frac{1}{k-1}\sum\left(\hat{\theta}_i - \bar{\theta}\right)^2\right\}^{1/2}$$

and

$$\bar{\theta} = \frac{1}{k}\sum_{i=1}^{k}\hat{\theta}_i$$

Where k is the number of replications, $\hat{\theta}_i$ is the statistic calculated using the ith bootstrap sample, and $\bar{\theta}$ is the average bootstrapped estimates as referring to Hall and Wilson (1991). To produce the unbiased statistic, the deviation of $\bar{\theta}$ from $\hat{\theta}$ will be subtracted from $\hat{\theta}$ (Efron, 1982). Since, the unbiased estimator would generate more mean squared error than the biased one, therefore, $\hat{\theta}$ is the best point estimate of the statistic which derived from the original dataset (Mooney and Duval, 1993; Hinkley, 1978).

$$\widehat{se}_{MSE} = \left\{\frac{1}{k}\sum_{i=1}^{k}\left(\hat{\theta}_i - \hat{\theta}\right)^2\right\}^{1/2}$$

The estimation of the bias is

$$\widehat{bias} = \bar{\theta} - \hat{\theta}$$

The confidence intervals are,

$$\left[\hat{\theta} - z_{1-\alpha/2}\widehat{se}, \hat{\theta} + z_{1-\alpha/2}\widehat{se}\right]$$

Where z and α represent z-score from standard normal distribution and significant level, respectively.

Figure 1. Trade Flows and NTMs.

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Table 2.
Classification of non-tariff measures by chapter.

Imports	Technical measures	A	Sanitary and phytosanitary measures
		B	Technical barriers to trade
		C	Pre-shipment inspection and other formalities
	Non-technical measures	D	Contingent trade-protective measures
		E	Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade
		F	Price-control measures, including additional taxes and charges
		G	Finance measures
		H	Measures affecting competition
		I	Trade-related investment measures
		J	Distribution restrictions
		K	Restrictions on post-sales services
		L	Subsidies and other forms of support
		M	Government procurement restrictions
		N	Intellectual property
		O	Rules of origin
	Exports	P	Export-related measures

Source: UNCTAD (2019).

The perspectives of importers and exporters in Cambodia towards the non-tariff measures can be collected through the telephone or face-to-face interviews of line manager level who are responsible directly with the process of import and export goods from the companies importing agricultural products from or exporting agricultural products. A list of the import and export companies is collected from Business Directory of the Cambodia' Yellow Page. To verify the existence of the selected companies from the Page in the business, each company name will be recheck in the Business Registration of the Ministry of Commerce. During the interviewing process, the manager will be asked whether their companies have experienced burdensome NTMs or trade-related issues. In addition, the policymakers from difference ministries or institutions which involving with non-tariff measures will be interview as well to get their perspective toward the future trade policies of Cambodia.

4. Research Findings

The empirical investigation is conducted using a multiple regression analysis between dependent variable, export, and independent variables, gross domestic product, border (dummy variable), number of SPS, number of TBT, number of PSI, and number of NTB imposed by Cambodia trading partners on the exporting agricultural products. There are 41 countries determined to be the top importers from Cambodia as referring to the Direction of Trade of the International Monetary Fund. Therefore, the total sample size is 41 observations. The summary statistics of all variables under study is presented in Table 3.

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Table 3.
Summary statistics.

Variable	Observation	Mean	Standard deviation	Minimum	Maximum
$lnExport$	41	14.2586	2.5792	6.8617	19.8869
$lnGDP$	41	26.9865	1.5895	23.3628	30.7664
$Border$	41	0.0732	0.2637	0	1
$ln(1+SPS)$	41	4.0323	0.5920	2.3979	5.2627
$ln(1+TBT)$	41	3.2273	0.7451	1.9459	5.3799
$ln(1+PSI)$	41	0.7516	0.8798	0	2.6391
$ln(1+NTB)$	41	2.2828	0.5770	0	3.7377

The method which will be used to estimate sample parameters of the regression analysis is Ordinary Least Square (OLS). One of the basic assumption of OLS is no multicollinearity among independent variables. The correlation coefficient of a pair of variables equal plus or minus one mean that it has a perfectly positive or negative correlation. The correlation coefficient of any pair of variables which has value greater than -0.9 or +0.9 is assumed to have highly negative or positive correlation. Any pair of variables that has perfectly or highly negative or positive correlation, there will be one variable will be eliminated from the model. Correlation matrix in Table 4 showed that there has no problem of perfectly or highly correlation between independent variables since the correlation coefficient of all pair of variables has value less than -0.9 or +0.9.

Table 4.
Correlation matrix of independent variables.

Variable	$lnGDP$	$Border$	$ln(1+SPS)$	$ln(1+TBT)$	$ln(1+PSI)$	$ln(1+NTB)$
$lnGDP$	1					
$Border$	-0.2228	1				
$ln(1+SPS)$	0.2606	0.2102	1			
$ln(1+TBT)$	0.4605	0.1129	0.4611	1		
$ln(1+PSI)$	0.3144	0.1236	0.117	0.6016	1	
$ln(1+NTB)$	0.4537	-0.1914	0.499	0.4573	0.1792	1

In fact, all slope coefficients of the regression results presented in Table 5 are estimated using OLS method, but to get robust standard error which help improve test of statistic, bootstrapping technique is applied. The total number of replication of the model is 46.

Table 5.
Regression results using bootstrapping standard error.

$lnExport$	Coefficient	Standard error	z	P>z	[95% Conf. interval]	
$lnGDP$	0.6047	0.2378	2.54	0.011	0.1386	1.0707
$Border$	4.7326	2.1515	2.20	0.028	0.5157	8.9495
$ln(1+SPS)$	-2.0849	1.0342	-2.02	0.044	-4.1119	-0.0579
$ln(1+TBT)$	1.1700	0.9094	1.29	0.198	-0.6123	2.9523
$ln(1+PSI)$	-1.3643	0.3950	-3.45	0.001	-2.1384	-0.5901
$ln(1+NTB)$	1.9066	1.2598	1.51	0.130	-0.5626	4.3757
$Intercept$	-1.1012	4.9285	-0.22	0.823	-10.7609	8.5585

The empirical results explained that gross domestic product has a positive relationship with export at 5 per cent significant level. The rejection of the null hypothesis indicated that the demand of agricultural products from Cambodia will increase when income of Cambodia's foreign trading partner

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increased. The empirical result has further revealed that the closer the border between Cambodia and her trading partners, the greater the trade value generated which support the gravity model hypothesis. This conclusion is derived due to the rejection of null hypothesis at 5 per cent significant level that claimed that Border has no relationship with export. Non-Technical Barrier (NTB) of NTMs imposed by Cambodia's trading partner has statically insignificant explained exporting of agricultural products from Cambodia since the probability of the calculated z-test is 0.13 greater than 0.05 or 5 per cent level. Among the three classes of technical measures of NTMs, A: Sanitary and Phytosanitary Measures (SPS), B: Technical Barriers to Trade (TBT), and C: Pre-Shipment Inspection and Other Formalities (PSI), only one class, B, is statistically insignificant explain export of Cambodia, while SPS and PSI are statistically significant at 5 and 1 per cent level, respectively. Since the estimated slope coefficient of each variable is negative which confirmed that if the number of NTMs imposed by Cambodia trading partners on her exported agricultural products have increased, the sanitary and phytosanitary measures or pre-shipment inspection and other formalities, the total export of Cambodia agricultural products will decrease.

Table 6.
Country imposing NTMs: Cambodia and partner effected by NTMs: Thailand agricultural products.

Classes		Description	Number	Percent
Technical measures	A	Sanitary and phytosanitary measures	30	26.09%
	B	Technical barriers to trade	25	21.74%
	C	Pre-shipment inspection and other formalities	0	0.00%
Non-technical measures	D	Contingent trade-protective measures	0	0.00%
	E	Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade	7	6.09%
	F	Price-control measures, including additional taxes and charges	6	5.22%
	G	Finance measures	0	0.00%
	H	Measures affecting competition	0	0.00%
	I	Trade-related investment measures	0	0.00%
	J	Distribution restrictions	0	0.00%
	K	Restrictions on post-sales services	0	0.00%
	L	Subsidies and other forms of support	0	0.00%
	M	Government procurement restrictions	0	0.00%
	N	Intellectual property	0	0.00%
	O	Rules of origin	0	0.00%
Exports	P	Export-related measures	47	40.87%
		Total measures	115	100%

Source: Calculated by the author using data collected from UNCTAD-TRAINS.

According to the United Nations Conference on Trade and Development (UNCTAD), NTMs have been classified into 16 classes; the first 15 classes were the restriction on the imported products from abroad, while the last class, P, was imposed on the export of products from Cambodia to abroad. Table 6 represents number of NTMs imposed by Cambodia on the import or export of agricultural products, HS product codes covering from 01 to 24, from or to Thailand.

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Table 7.
Cambodia's NTMs issued by agencies, agricultural products.

Issuing agency	Number	Percent
Ministry of agriculture, forestry and fisheries	56	48.70%
Ministry of health	19	16.52%
Ministry of agriculture, forestry and fisheries, ministry of economic and finance	7	6.09%
Ministry of industry and handicraft	7	6.09%
National steering committee for biosafety , Ministry of environment	6	5.22%
Ministry of economy and finance	4	3.48%
Ministry of industry, mines and energy	4	3.48%
Ministry of agriculture, forestry and fisheries, Ministry of economy and finance, ministry of commerce, ministry environment and Ministry of health	2	1.74%
Ministry of agriculture, forestry and fisheries, Ministry of environment, Ministry of economy and finance and ministry of commerce	2	1.74%
Ministry of commerce	2	1.74%
Ministry of environment	2	1.74%
Office of council ministers, Ministry of interior, ministry of defense, Ministry of economy and finance, ministry of commerce, Ministry of environment, Ministry of agriculture, forestry and fisheries, ministry of industry, mine and energy, ministry of labor and vocational training, ministry of public work and transport, Ministry of health	2	1.74%
Department of Customs and Excises	1	0.87%
Office of the council of ministers, Ministry of economy and finance, Ministry of commerce and ministry of justice	1	0.87%
Total measures	115	100%

Source: Calculated by the author using data collected from UNCTAD-TRAINS.

In the imported part which accounted for 59.13% of total measures, there were four NTMs classes imposed by Cambodia on the import of agricultural products from Thailand, sanitary and phytosanitary measures (30 measures which was 26.09% of total imposed NTMs), technical barriers to trade (25 measures which was 21.74% of total imposed NTMs), non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade (7 measures which was 6.09% of total imposed NTMs), and price-control measures, including additional taxes and charges (6 measures which was 5.22% of total imposed NTMs). For the export-related measures, there were 47 measures imposed by Cambodia authorities on the export of agricultural products from Cambodia to Thailand which was about 40.87% of total measures.

The total NTMs imposed by Cambodia on Thailand counter-trade were 115 measures, 68 measures of imported agricultural products (59.13% of total measures) and 47 measures of exported agricultural products (40.87% of total measures). The ministry that issued largest number of NTMs was the Ministry of Agriculture, Forestry and Fisheries (MAFF) which was 56 measures, approximately 48.70% of total measures, while the second largest issuer of NTMs was the Ministry of Health (MoH) of 19 measures which accounted for 16.52% of total measures. There were 7 measures issued jointly by the MAFF and MEF (6.09% of total measures) and 6 measures (5.22% of total measures) issued jointly by the National Steering Committee for Biosafety and Ministry of Environment (MoE). There were 2 measures (1.74% of total measures) were jointly issued by 5 ministries, MAFF, MEF, MoC, MoE and MoH. There were 2 measures (1.74% of total measures) were jointly issued by 4 ministries MAFF, MoE, MEF and MoC, while there were another 2 measures issued jointly by 10 ministries, Office of Council Ministers (OCM), Ministry of Interior (MoI), Ministry of Defense (MoD), MEF, MoC, MoE, MAFF, MIME, MoLVT, MoPWT, and MoH. There was 1 measure (0.87% of total measures) issued jointly by four ministries, OCM, MEF, MoC and Ministry of Justice (MoJ), and there were 20 measures issued independently by Ministry of Industry and Handicraft (MoIH) (7 measures, 6.09% of total

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Vol. 8, No. 6: 6771-6785, 2024
DOI: 10.55214/25768484.v8i6.3457

measures), MEF (4 measures, 3.48% of total measures), MoIME (4 measures, 3.48% of total measures), MoC (2 measures, 1.74% of total measures), MoE (2 measures, 1.74% of total measures), and Department of Customs and Excises (1 measure, 0.87% of total measures).

In the imported part which accounted for 86.29% of total measures, there were five NTMs classes imposed by Thailand on the import of agricultural products from Cambodia, sanitary and phytosanitary measures (118 measures which was 59.90% of total imposed NTMs), technical barriers to trade (39 measures which was 19.80% of total imposed NTMs), pre-shipment inspection and other formalities (1 measure which was 0.51% of total imposed NTMs), non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade (6 measures which was 3.05% of total imposed NTMs), and price-control measures, including additional taxes and charges (6 measures which was 3.05% of total imposed NTMs). For the export-related measures, there were 27 measures imposed by Thailand authorities on the export of agricultural products from Thailand to Cambodia which was about 13.71% of total measures.

Table 8.
Country Imposing NTMs: Thailand and partner effected by NTMs: Cambodia agricultural Products

Classes		Description	Number	Percent
Technical measures	A	Sanitary and phytosanitary measures	118	59.90%
	B	Technical barriers to trade	39	19.80%
	C	Pre-shipment inspection and other formalities	1	0.51%
Non-technical measures	D	Contingent trade-protective measures	0	0.00%
	E	Non-automatic import licensing, quotas, prohibitions, quantity-control measures and other restrictions not including sanitary and phytosanitary measures or measures relating to technical barriers to trade	6	3.05%
	F	Price-control measures, including additional taxes and charges	6	3.05%
	G	Finance measures	0	0.00%
	H	Measures affecting competition	0	0.00%
	I	Trade-related investment measures	0	0.00%
	J	Distribution restrictions	0	0.00%
	K	Restrictions on post-sales services	0	0.00%
	L	Subsidies and other forms of support	0	0.00%
	M	Government procurement restrictions	0	0.00%
	N	Intellectual property	0	0.00%
	O	Rules of origin	0	0.00%
Exports	P	Export-related measures	27	13.71%
		Total measures	197	100%

Source: Calculated by the author using data collected from UNCTAD-TRAINS.

The total NTMs imposed by Thailand on Cambodia counter-trade were 197 measures, 170 measures of imported agricultural products (86.29% of total measures) and 27 measures of exported agricultural products (13..71% of total measures). The majority of NTMs issued by Thailand on Cambodia import of agricultural products were under responsibility of the Ministry of Public Health which accounted 132 measures which were about 67.01% of the total NTMs issued.

The second largest issuer was the Ministry of Agriculture and Cooperatives which were 21 measures, approximately 10.66% of total measures, while 20 measures were issued by the Department of Livestock Development (10.15% of total measures). The Office of Commodity Standards and Department of Foreign Trade under the Ministry of Commerce issued 8 measures (4.06% of total

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 6771-6785, 2024
DOI: 10.55214/25768484.v8i6.3457

measures) and 4 measures (2.03% of total measures), respectively. The Department of Industrial Works under the Ministry of Industry issued 8 NTMs which was 4.06% of total measures, while the Excise Department issued 4 measures (2.03% of total measures). The intention of Cambodia and Thailand in issuing the NTMs was guarantee food safety in order to protect human and animal health, last but not least, was to protect the environment.

Table 9.
Thailand's NTMs issued by agencies, agricultural products.

Issuing agency	Number	Percent
Food and drug administration (FDA) under the ministry of public health	132	67.01%
Ministry of agriculture and cooperatives	21	10.66%
Department of livestock development	20	10.15%
Office of commodity standards under the ministry of Commerce	8	4.06%
Department of foreign trade (DFT) under the ministry of commerce	4	2.03%
Department of industrial works under the ministry of industry	8	4.06%
The excise department	4	2.03%
Total measures	197	100%

Source: Calculated by the author using data collected from UNCTAD-TRAINS.

In 2021, Cambodia exported about $US18.269 million of agricultural products to Thailand, $US9.847 were the unprocessed agricultural products and $US8.782 were the processed agricultural products.

Regarding the logistic performance index (LPI) which developed by World Bank in 2018, over a scale between 1 (lowest) and 5 (highest), there were six difference kinds of LPIs: quality of trade and transport-related infrastructure, competence and quality of logistics services, frequency with which shipment reach consignee within schedule or expected time, ability to track and trace consignments, efficiency of customs clearance process, and ease of arranging competitively priced shipments. Among the six LPIs, Lao PDR, Thailand, and Vietnam performed better than Cambodia (See Table 11).

Table 10.
The export of agricultural products from Cambodia to Thailand, US Dollar Thousand.

Product code	Product label	Value in 2021	Percent
	Total export of agricultural products	$18,629	100%
Unprocessed agricultural products			
'03	Fish and crustaceans, molluscs and other aquatic invertebrates	338	1.81%
'07	Edible vegetables and certain roots and tubers	6,075	32.61%
'08	Edible fruit and nuts; peel of citrus fruit or melons	2,650	14.23%
'11	Products of the milling industry; malt; starches; inulin; wheat gluten	743	3.99%
'13	Lac; gums, resins and other vegetable saps and extracts	41	0.22%
	Total exports of unprocessed agricultural products	$9,847	52.86%
Processed Agricultural Products			
'19	Preparations of cereals, flour, starch or milk; pastrycooks' products	52	0.28%
'20	Preparations of vegetables, fruit, nuts or other parts of plants	7,109	38.16%
'21	Miscellaneous edible preparations	461	2.47%
'22	Beverages, spirits and vinegar	48	0.26%
'24	Tobacco and manufactured tobacco substitutes	1,112	5.97%
	Total exports of processed agricultural products	$8,782	47.14%

Source: Author's calculation using BACI dataset.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 6771-6785, 2024
DOI: 10.55214/25768484.v8i6.3457

As a mechanism to deal with the NTMs, the Royal Government of Cambodia simultaneously published two sub-decrees (hence referred to as Anukret). On September 19, 2014, the first Anukret (N° 257 HNKR.BK) was issued to establish the National Committee of Non-Tariff Measures. However, on the same day, the second Anukret (N° 258 HNKR.BK) was released to create the National Trade Repository (NTR). The organization posted all pertinent documents, including those pertaining to trade, NTMs, and other information, on www.cambodiantr.gov.kh.

Table 11.
Logistic performance index, 2018.

	Cambodia	Lao PDR	Thailand	Vietnam
Customs	2.37	2.61	3.14	2.95
Infrastructure	2.14	2.44	3.14	3.01
International shipments	2.79	2.72	3.46	3.16
Logistics competence	2.41	2.65	3.41	3.40
Tracking and tracing	2.52	2.91	3.47	3.45
Timeliness	3.16	2.84	3.81	3.67

Source: Constructed by the author using data collected from World Bank.

The official launch of NTM took place on November 23, 2015. Twenty-one representatives from twenty different ministries make up the National Committee of NTMs, which is coordinated by the ASEAN Department of MEF and the Facilitation of Economic Integration. The establishment of NTMs by a single ministry or an inter-ministerial group will result in publication of that information on the ministry's official website and inclusion on the NTR. By issuing the Anukret, which takes effect after being approved by the Council of Ministers and signed by the prime minister, each ministry is able to adopt regulations pertaining to NTMs. The MAFF is the ministry that issues the most NTMs, with a rate of roughly 48.70%, followed by the MoH at 16.52%, as was seen above in relation to the agricultural products. The primary goals of these regulations are to safeguard the environment, human and animal health, and food standards. The General Department of Royal Gazette and Computer Services of the Office of Council of Ministers assembled the laws and regulations, which were approved by the National Assembly or issued by each ministry. 2,071 laws and regulations have so far been logged and made available on www.opendevelopment.net.

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Vol. 8, No. 6: 6771-6785, 2024
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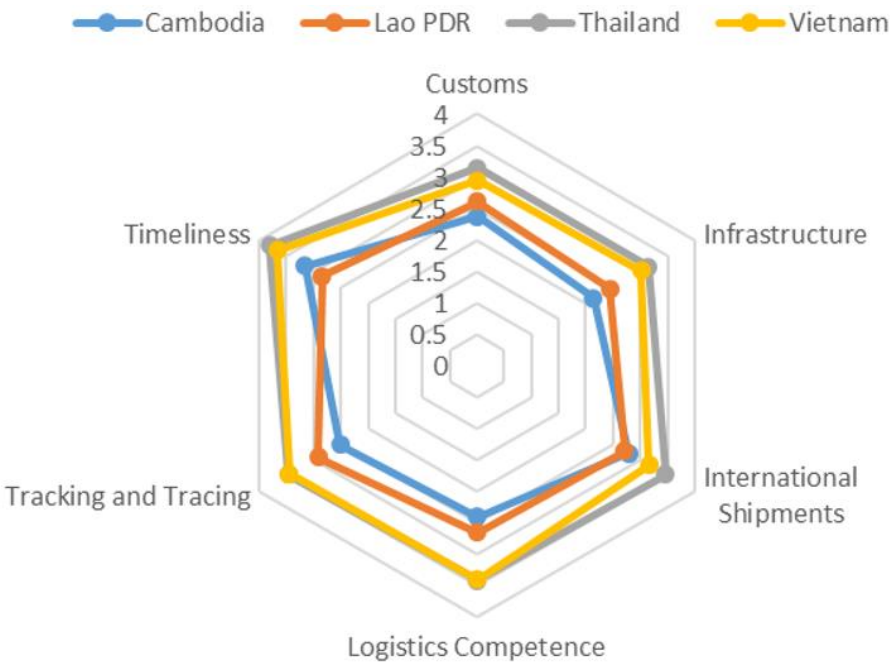

Figure 1.
Logistic performance index, 2018.

When an exporter wants to report on new NTMs and NTM-related issues they encountered when shipping their goods to the Cambodian trading partners. They can contact the officers of the Department of Export and Import of the Ministry of Commerce (MoC) directly by phone or email using the contact information listed on the ministry's website: www.co.moc.gov.kh./contactus. The ministry committee will review the pertinent rules and regulations pertaining to the concerned NTMs after obtaining the information from the exporter regarding the NTM-related issues. The officer will then get in touch with the appropriate ministry, and then they will get in touch with the authority of the trading nation to discuss and resolve the matter.

The ASEAN Trade in Goods Agreement (ATIGA) went into force on October 17, 2010, after being ratified by the ASEAN member nations in February 2009. The establishment of the ASEAN Trade Repository (ATR), a repository for all ASEAN member nations' laws, regulations, and tariffs, is the subject of Article 1 of this agreement. Additionally, the pertinent documents were made available online so that the public may quickly access them through www.art.asean.org. The public can access to nine important pieces of information, including (i) Tariff Nomenclature, (ii) MFN Tariff, (iii) Rules of Origin, (iv) Non-tariff Measures, (v) National Trade and Customs Law and Rules, (vi) Procedures and Documentary Requirements, (vii) Administrative Ruling, (viii) Best Practices, and (ix) List of Authorized Trader.

The Hanoi Plan of Action on strengthening ASEAN economic cooperation and supply chain connectivity in response to the COVID-19 pandemic, which is signed by the ASEAN Economic Ministers on November 13, 2020, includes a memorandum of understanding on the implementation of non-tariff measures on essential goods. This MOU contributed to further improving the effectiveness and cooperation of NTM implementation among ASEAN member states. As referring to Section 4: Notification Procedures and Transparency of the MOU stated that

1. Member States will observe notification obligations and abide by the notification procedures provided for in Article 11 (Notification Procedures) of the ATIGA.
2. Notwithstanding Article 11 (Notification Procedures) of the ATIGA, Member States will endeavour to immediately notify the ASEAN Secretariat with an overview of their NTMs on essential goods, including the products covered and impacted, the objective and rationale of

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Vol. 8, No. 6: 6771-6785, 2024
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the measure, and the nature of the circumstances. Should an issuing Member State not be able to comply with the above notification procedures, other Member States may notify the relevant ASEAN bodies and the ASEAN Secretariat of the NTMs on essential goods being introduced or amended by the issuing Member State.

3. Member States will ensure the timely publication and dissemination of regulatory information on matters pertaining to their NTMs on essential goods. Member States will make full use of the ASEAN Trade Repository provided for under Article 13 (ASEAN Trade Repository) of the ATIGA, where possible, towards this end.

According to the interview with exporting companies, obtaining the necessary exporting and importing paperwork between Cambodia and Thailand is not difficult because most crucial documents are now created using digital systems. While some businesses had contracted out the procedure of requesting for the importing and exporting documentation to the usual export/import professionals, who are frequently referred to as brokers. The regulations on food safety and phytosanitary measures that are imposed by Thailand are the onerous NTMs that exporters of agricultural products have encountered while exporting to Thailand. These issues have been viewed as procedural obstacles for the exporting businesses of agricultural products from Cambodia. Based on the interview with the policymakers from the relevant ministries, Cambodia has decreased the tariff and number of NTMs imposed with its trading partner for many years, which helps to lower the time needed and cost of requesting cross-country trading of traders for both local and international. They further revealed that in the long term Cambodia want to pursue trade liberalization at all kinds.

5. Conclusion and Policy Recommendation

The government should encourage private sector investment to help improve the sanitary and phytosanitary standards so they better meet the international standard and, in particular, draw investment from both domestic and foreign sources to create an agricultural product processing factory that can produce finished agricultural products. This will increase the export of agricultural products abroad and make them even better. This plan not only assists in meeting domestic demand for agro-industrial products but also aids in locating markets for Cambodian farmers.

The preceding suggestion might result in an increase in agricultural output exports over the long term. However, to expand the exporting capacity, profitability, and agricultural production—notably to lower the cost of agricultural output—the relevant ministries, particularly the MAFF, should perform technical research that can be endorsed and implemented as national policy. Along with overcoming technological challenges, finding affordable funding is essential to improve the agricultural goods produced by Cambodian farmers. Government support is also necessary for farmers to be able to take out loans from Microfinance Institutions for the duration of their planting season at relatively low-interest rates. For instance, MEF has worked with ACLEDA Bank to help SMEs to recover after Covid-19 had given loans to any SMEs who require working capital to grow or expand their businesses. Due to this, the agricultural industry should also get financial support, notably during each planting season.

In reality, of the 118 NTMs Class A: Sanitary and phytosanitary measures, Thailand imposed about 60% of the total NTMs on agricultural exports from Cambodia. Comparatively, in the same Class A, Cambodia only levied 30 NTMs—roughly 26% of all NTMs—on the agricultural products exported from Thailand to Cambodia. As a result, a bilateral meeting between the two nations should be set up to explore the prospect of reducing NTMs for the trading of agricultural products, while Cambodia is doing everything it can to improve the standard of agricultural commodities to promote export to Thailand. If the conversation is successful, trade procedures will be streamlined, which will drastically enhance the trading of agricultural products between the two nations.

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