Journal of Co-operative and Business Studies (JCBS)
Vol.8 No.1 Publication Date: June 30, 2024
ISSN: (Online) 2714-2043, (Print) 0856-9037
The current issue and full-text archive of this journal is available at: journals.mocu.ac.tz
Cite this article as: Jonath, A., Panga, F., Nkunda, R., and Scovia, A. (2024). Customs clearance procedures and Cross border Logistics performance in East Africa: a case of Malaba-Busia and Taveta-Holili one-stop Border Posts. *Journal of Co-operative and Business Studies,* 8(1), 1-20

Customs clearance procedures and Cross-border Logistics performance in East Africa: a case of Malaba-Busia and Taveta-Holili one-stop Border Posts.

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Abstract

The regional trading blocs' economic integration, especially the East African Community (EAC) with its four noncoastal countries (Uganda, Rwanda, South Sudan and Burundi), depends heavily on an effective and dependable cross-border logistics performance. Even though each of the member countries has seen economic growth, the region still lacks optimal economic integration, and as a result, cross-border logistics costs in the region are among the highest globally, primarily because of ineffective customs clearance procedures. This study aimed to investigate the impact of four components of customs clearance processes on the effectiveness of cross-border logistics: trade facilitation, coordinated border agencies, one-stop border strategy, and customs harmonization (delivery time, competitive advantage, and cost). The research was conducted using a cross- sectional design, and information was gathered from 376 participants at the Taveta-Holili, Busia, and Malaba one stop border posts via key informant interviews and closed-ended questionnaires. For data analysis, multiple regression modeling and descriptive analysis were employed. The results show that the One Stop Border Post strategy ($\beta = 0.636$, $p<0.05$), coordinated border agencies ($\beta = 0.261$, $p<0.05$), trade facilitation ($\beta = 0.245$, $p=0.000$), and customs harmonisation ($\beta = 0.211$, $p<0.05$) have positive and significant relationships with cross-border logistics performance. The study concluded that more efficient customs clearance procedures result in improved cross-border logistics performance. The report suggests that the East African Community (EAC) secretariat should endeavour to achieve greater integration and coherence of the customs system by fully implementing the East African Community Single Customs Territory.

Keywords: *Single customs, customs clearance, cross-border logistics, customs union, East African Community*

1.0 Introduction

1.1 Background information

Cross-border trade is constantly increasing as a result of growing regional integration and globalization, with nations eager to take advantage of their economic comparative advantage. It is expected that continents are heading toward a borderless village, primarily to promote economic growth via enhanced trade cooperation (Agyei and Idan, 2022). An important but sometimes disregarded aspect of economic development is cross-border logistics. Investments in consumer goods cannot improve people's lives if the cost of importing them is too high, investments in agriculture is pointless if there is no supply chain in place to get produce to market, and vital medication is useless if it cannot be transported under the right conditions (Movin'On LAB, 2019). When a business exports or imports goods or services to customers in or from a neighboring country, this is known as cross-border logistics (Zhang and Hai-Na., 2023). Cross-border logistics has important precursors, including notable mutual closeness (as in the cases of Tanzania, Kenya, and Uganda), a shared history, and cultural assimilation of communities at the three border points under study.

In Europe, a significant portion of business and consumer spending is attributed to logistics. Given that logistics expenses account for about 13% of all final consumer spending for households in the European Union (EU), efficient and improved logistics can have a noticeable impact on individuals and businesses (De Oliveira, 2014). Common cross-border challenges in North America include the minute details of customs paperwork, which is now completed electronically, constantly evolving customs compliance issues necessitating the establishment of cost-effective distribution networks that can shorten wait times, and a host of other issues pertaining to robust border clearance procedures (Schulz, 2020).

Infrastructure has a higher Logistics Performance Index (LPI) score than customs in SADC (South Africa, Tanzania, Namibia, Zambia, Angola, Zimbabwe, and Lesotho), indicating that customs clearance is a larger regional bottleneck than infrastructure as we would have predicted (Konstantinus, Zuidgeest, Christodoulou, Raza and Woxenius, 2019). A shipment of goods traveling across West Africa should be prepared for considerable delays due to customs bottlenecks, which can range from 18 to 29 minutes per 100 kilometres or 7 hours each trip (Amadi and Lenaghan, 2020). Torres and Seters (2016) show that this is brought on by the lengthy inspection of products and vehicles by plainly dressed border post officials, the absence of standardized travel documents, institutional corruption in the corridors, and the lack of cooperation from border agents. In Africa, transportation expenses typically account for half to seventy-five percent of the retail price of the goods (Muogboh, & Ojadi, 2018).

The need for long-term solutions to handle the cross-border logistics challenges in Africa should increase as a result of these skyrocketing costs. The cross-border logistics landscape in East Africa has seen substantial upheaval and change in recent years. Efforts to harmonize trade regulations among East African countries, infrastructure improvements, increased investment in transportation networks, and the adoption of technology in supply chain management are some of the major factors driving this transformation (Lilian, 2024). The creation of the Single Customs Territory (SCT) by the East African Community (EAC) is a significant initiative that is influencing cross-border logistics in East Africa. Its goals are to simplify customs procedures, lower trade barriers, and make it easier for goods to move across borders within EAC member states (Kipchumba, 2020)

Additionally, the development of transport corridors such as the Northern Corridor (linking the port of Mombasa in Kenya to landlocked countries like Uganda, Rwanda, Burundi, and South Sudan) and the Central Corridor (connecting the port of Dar es Salaam in Tanzania to countries like Rwanda,

Burundi, and the Democratic Republic of Congo) has helped to improve connectivity and trade within the region (Brock, Charis, Ramson, Masalu and Alex, 2021). Furthermore, the use of digital platforms for tracking shipments, streamlining routes, and controlling inventory is just one example of how technological advancements have greatly improved the efficiency and transparency of cross-border logistics operations in East Africa as well as customs clearance processes (Louis and Saleh, 2024). All things considered, these changes are anticipated to improve delivery times, lower expenses, and boost regional competitiveness by improving the effectiveness and dependability of cross-border logistics.

Cross-border logistics in East Africa faces a number of challenges that reduce the effectiveness and affordability of intraregional trade (Golubeva and Shcherbinin, 2022). These include subpar road conditions, with many of the country's roads being untarmacked and badly maintained, and lacking appropriate signage (Abdulkadr, Juma, Gogo and Neszmélyi, 2022). This causes delays, higher transportation costs because of wear and tear on the vehicles, safety risks for drivers, and a lack of border infrastructure because border posts are frequently crowded with insufficient space for handling cargo and staff resulting into lengthy truck wait times, which raise the cost of transportation even more coupled with ineffective customs procedures, which cause delays and higher expenses for companies due to intricate and bureaucratic customs clearance procedures (Olyanga et al., 2022). This covers problems like uneven laws between countries, paperwork that is done on paper, opaque customs processes, and non-uniform standards that cause delays and confusion at borders. Because of these difficulties, cross-border logistics in East Africa take longer and cost more money than they should. This restricts economic growth, discourages trade within the region, and raises consumer prices for goods.

Declaring goods to customs authorities upon entering or departing a country is the process known as customs clearance (Omenyi, 2019). Items that are being imported or exported, as well as personal belongings and commercial shipments, are all considered goods that require customs clearance (John, 2024). Ensuring that goods adhere to all relevant regulations and that all applicable import duties and taxes are paid is the goal of customs clearance (Kinyua, 2019). Businesses and individuals must provide comprehensive details about the shipment, such as its value, origin, destination, and contents, bill of lading and invoices in order for it to clear customs and be released for delivery (Moses, 2023). A standardized numerical method for categorizing traded products known as the Harmonized System (HS) is frequently used for the classification of goods throughout the import and export process in customs harmonisation to consistently identify and characterize goods for things like calculating tariffs and compiling data (Kamau and Odongo, 2020).

Specialized border crossing locations known as One-Stop Border Posts (OSBPs) are designed to expedite and facilitate trade, as well as the movement of people and goods between adjacent nations to minimize duplication and inefficiencies by combining border control procedures and services into a single location (Muqayi and Manyeruke, 2015). The idea is to combine different border agencies like immigration, customs, and quarantine into a single, well-coordinated strategy to facilitate quicker and more effective customs clearance while addressing the historical effects of economic fragmentation with the practical goal of making it easier for goods to move freely and people to travel freely along approved transportation corridors (Hanaoka, Sota, Kawasaki and Thompson, 2019). In East Africa this investment is embodied in large structures, such as expanded port facilities, bridges and highways, but also the soft infrastructure that enables data to be collected, processed and shared more efficiently

Coordinated Border Management (CBM) is the term for a cooperative strategy used by different government agencies both inside and outside of a nation to expedite the flow of people and goods while preserving security. Basically, it comes down to finding a balance between border security and trade facilitation (Njenge et al., 2021). Within the EAC, coordinated border management has allowed various government agencies involved in border control, including customs, immigration, agriculture, and health, to work together, reducing duplication of effort and expediting processing times. It has also brought about technology integration, standardized procedures, and risk management among these agencies. Ergashev (2023), states that the Customs community now acknowledges coordinated cross-border management as a potential remedy for the problems of the twenty-first century, particularly in terms of effective and efficient border management and is listed as one of the ten essential components for border management in the modern world by the World Customs Organization (WCO).

1.2 Statement of the problem

The East African Community has recorded tangible improvements in cross-border logistics performance in the last two decades (Kilonzi et al., 2019). These improvements are crucial for enhancing trade and economic growth within the region. Enhancements in logistics infrastructure, customs clearance processes, and logistics service quality have been identified as key factors that can significantly boost trade between African countries (Takele, 2019). The logistics performance of a region is closely tied to economic growth and sectoral value added, highlighting the importance of efficient cross-border logistics systems in promoting sustainable agriculture and overall economic development (Omenyi, 2019). Moreover, the slow customs harmonization underscores the need for member states to develop specific policies to improve cross-border logistics performance (Wei, 2024). Customs harmonization and the establishment of One-Stop Border Posts (OSBPs) have been recognized as crucial measures to enhance cross-border logistics in the East African Community (Otele and Guguyu, 2023).

However, challenges such as high costs and delayed deliveries persist despite these efforts. The lack of significant progress in harmonizing customs procedures, information sharing, online cargo tracking, and the establishment of one-stop border posts has been hindered by factors like pressures related to loan repayment and the enactment of national legislations by member states that undermine the regional institutional framework (Zukumumpa et al., 2019). Despite the advantages of customs clearance procedures in promoting industrialization and harmonizing regulations and policies, challenges persist in aligning regulations, adapting to increased competition, and navigating regional cooperation complexities (Wakhungu and Odhiambo, 2021).

Despite the efforts that have been made to enhance customs harmonization and streamline cross-border logistics in the EAC, challenges such as high costs and delays in deliveries continue to impact the efficiency of trade within the region. Addressing these challenges will require a concerted effort to harmonize customs procedures, charges, and regulations across member states, as well as strengthening regional institutional frameworks to support effective implementation. Studies above have not addressed the effect of customs clearance procedures specifically customs harmonization, coordinated border management, adoption of one stop border strategy and trade facilitation on cross-border logistics performance among EAC states which leaves a gap that informs the need to carry out the current study on the effects of the customs clearance procedures on cross-border logistics performance within the East African Community.

2.0 Theoretical and Empirical Reviews

2.1 Customs Union Theory

Viner (1950), presented the idea of a customs union. In a customs union, the member states decide to implement free trade between them as well as a single external tariff that applies to imports from non-member nations when they are sold to any member state (Boria, 2017). According to Viner (1950) establishment of a customs union creates new trade and diverts existing trade. Trade diversion happens when lower-cost imports from non-member states are replaced by higher-cost imports from member states, and trade creation happens when higher-cost products produced domestically are replaced by lower-cost imports (Inançli and Addi, 2019). The economic benefits of a customs union include; (1) Increase in trade flows and economic integration due to elimination of tariffs, (2) Efficiency in regulations due to elimination of some customs and border controls hence easing financial burdens for member states, (3) Negotiating power due to pooled resources and (4) Prevention of trade deflection due to existence of a common external tariff which doesn't accept nonmember states to find a member with the lowest tariff and move their products through them. Based on these fundamental ideas, Viner postulated that the integration of two or more nations would enhance the welfare of the participating nations, provided that the arrangement results in the creation of trade, minimum trade diversion, or trade creation that surpasses trade diversion.

Viner assumed that there would be one commodity market, that trade would be discriminated against by three participating countries, that there would be perfect competition in commodity factor markets, that there would be no transportation costs, that tariffs would be the only kind of trade restrictions, and that resources would be fully employed (Michaely, 1976). Viner's theory of the customs union has drawn criticism for its implicit assumptions. According to Johnson (1965), Viner's assumption that tariffs are arbitrary measures taken to impede the freedom of international trade is lacking since governments are free to alter it any time. Parai and Yu (1989), emphasize that there is no empirical evidence to support the assumption of perfect factor mobility and (Imlah, 1951) offers a historical perspective while claiming that customs unions might not encourage political unification and are not a cure-all. All of these criticisms raise the possibility that Viner's theory is inflexible and does not accommodate the constantly evolving ways of thinking that lead developing nations to prioritize resource reallocation over development, which results in actual income loss for the low-income countries involved due to trade diversion (Langhammer and Hiemenz, 1990). Within the larger framework of regional integration, the customs union theory has a major effect on inclusive growth.

Park and Claveria (2018); Dion (2004), accentuate the benefits of regional integration for income distribution, economic growth, and the eradication of poverty. Park's multifaceted strategy highlights how social and institutional integration, human mobility, and regional value chains all contribute to growth Although Dion's model emphasizes the value of trade and knowledge spillovers in promoting growth and convergence.

However, Lachler (1989) highlights the need for a more outward-focused approach and issues a warning that the advantages of regional integration might not be fully realized without effective policies and strategies. In this study the customs union theory provides a basis for analysis of the impact of customs clearance procedures on cross-border logistics performance. A customs union makes it easier for member countries to trade freely with each other through enablement of customs harmonization, one stop border strategy and joint inspection. Thus, reducing delivery time, cross border logistics costs, increased efficiency and competitive advantage (Will, 2022). Customs Union increases the welfare of participating countries even when trade is diverted due to lower relative

prices within the block compared to the rest of the world (Jakob and Anna, 2021). The resulting lower customs clearance procedures result into reduced consumer prices, increase competitive advantage, enhance delivery times and lower cross-border logistics costs. As such customs clearance procedures can lead to achievement of better cross-border logistics performance.

2.2 Empirical Review

A study by (Hoa, 2023), examined how customs affected ten ASEAN countries' National Logistics Performance Index (LPI) improvements. The study employed a quantitative methodology, testing the Cronbach's alpha coefficient, EFA factor analysis, and linear regression between the logistics service quality index, customs clearance criteria, and service quality index using SPSS 20 software. Ten ASEAN countries' international LPI index data sets were used in the study (World Bank overall announced six times in 2007, 2010, 2012, 2014, 2016, 2018). The information included 56 observations and six key customs-related activities, including the development of customs brokers and customs-related enterprises, the reform of customs administrative procedures, the ASEAN Single Window (ASW), the National Single Window (NSW), specialized management, risk management, and compliance management. The study discovered a positive correlation between the two criteria of customs clearance and the caliber of logistics services with the LPI index, based on particular research objectives and methods. In order to increase the national logistics capacity of the ten-member countries, the study examined and demonstrated how the crucial actions of the customs authorities positively impact the two criteria of customs clearance and the caliber of logistics services.

Another study by (Kilonzi, Odunga and Kibet, 2019), determined how customs administration affects the effectiveness of cross-border logistics amongst member states in East Africa. The borders between Tanzania and Uganda comprised the study's entire population, and it employed an explanatory research design. 51 senior employees, 94 middle management employees, and 141 junior employees were the focus of the study. There were 139 junior employees, 92 middle management employees, and 47 senior employees in the sample. The main tools used to collect data were questionnaires. Both descriptive and inferential statistics were applied to the data analysis. The results demonstrated a robust and favorable correlation between cross- border logistics efficiency and custom harmonization.

The efficiency of cross-border logistics and custom automation were positively correlated. Additionally, there was a significant and favorable correlation between the effectiveness of cross-border logistics and cross-border management. Additionally, the results demonstrated a robust and favorable correlation between cross-border logistics efficiency and capacity enhancement. The study found that the effectiveness of cross-border logistics had not significantly improved. Cross-border logistics efficiency has significantly increased thanks to automated coding systems. The member countries' centralized customs had improved the efficiency of the flow of goods. The study suggested that member states develop a policy that harmonizes customs procedures to shorten the time it takes to clear goods. To guarantee that the automated system identifies every item going through the border posts, East African member states should make improvements to it.

In yet another study, Jeevan, Bin, Othman, Salleh, Somu and Ming (2021) examined the contemporary problems at the borders between Thailand, Malaysia, and Singapore. They started by identifying the difficulties and some crucial success criteria for modeling the effectiveness of cross-border transactions between these nations. A qualitative methodology was modified to address the suggested research inquiries. The preliminary findings emphasized that the main problems encountered during cross-border freight movement are congestion, lengthy and laborious documentation procedures, involving numerous documents, and the time-consuming clearance of documents.

This predicament was leading to a number of problems, including slow freight delivery, lost tax revenue as a result of delays, information reluctance, and consequences for the freight supply chain's ability to compete. The study proposed improvements in regulations, information sharing, infrastructure, logistics performance, and customs clearance procedures as means of mitigating issues that may arise during cross-border operations between Thailand, Malaysia, and Singapore. It is anticipated that the model's outputs will streamline the administrative procedure involved in customs clearance and effectively cut expenses.

Olyanga *et al*. (2022) studied the impact of trade infrastructure, export logistics components (tracking and tracing, customs quality, timely delivery, shipment arrangements, and trade infrastructure) on the export competitiveness of East African Community firms. The Poisson pseudo-maximum likelihood and the Structural Gravity Model were used in the study. PPML a nonlinear estimation method was applied in STATA on balanced panel data for the period of 2007–2018. Data were obtained from the World Bank International Trade Centre (ITC), World Bank Logistics Performance Index (LPI), and World Bank development indicators. According to the study, export competitiveness in EAC countries is positively and significantly correlated with timely delivery as well as tracking and tracing of exports. On the other hand, trade infrastructure, shipment planning, and customs quality have no bearing on export competitiveness. The study's findings demonstrate that in terms of boosting export competitiveness in the EAC, trade infrastructure, customs quality, and shipment arrangements are not currently relevant export logistics components.

To establish a common economic area among member states, the study advised EAC partner states to embrace deep integration by eliminating trade barriers both behind and beyond borders. This will increase the efficiency of export tracking and tracing as well as delivery times, making EAC exports more competitive both domestically and internationally. Mutual recognition agreements, in which nations consent to recognize each other's conformity assessments, should also be used to implement common and harmonized trade policies and regulations.

Although that was the case, Liang, Guo, Li, Zhang, and Fei (2021) accessed cross-border e-commerce transactions between China and nations along "The Belt and Road" by using the transaction cost theory. To comprehend how trade facilitation affects the scale effect of cross-border e-commerce, the study uses the GMM method. According to the study, the infrastructure supporting land and marine transportation has the biggest influence, followed by that supporting government governance and the process for clearing customs. The study's conclusions help to shed light on the variations in how various cross-border logistics facilitation measures are applied. They also offer a theoretical framework for enhancing the promptness of cross-border e-commerce transactions, cutting trade costs, and serving as a guide for the implementation of land-sea integration and land-sea interconnection under the "Belt and Road" initiative.

A study by Tyson (2018), examined the impact of the OSBP at Busia on the Kenya–Uganda border on the livelihoods of informal traders and workers. The study used a household survey and found positive effects through enhanced access to cross-border trade. However, it also found negative effects, including reduced work opportunities for unskilled manual workers. The study recommended further research into the long- term effects on the price and foreign exchange differentials which currently incentivise informal trade, before the effects can be fully assessed yet another study Siu (2020), investigated the connection between trade expenses and informality. More precisely, the study took advantage of time and custom point variation in the introduction of a border facility with the goal of lowering corruption and delays at borders by employing an augmented gravity model. The study discovered that, in the

second quarter following the implementation of an OSBP, trade informality significantly decreased, with signs pointing to a decline in large-scale informal trade as the primary cause of this change. Using a first-hand data set of traders operating at two border towns between Kenya and Uganda, the study further investigated whether this result can be explained by formalizing individual cross- border traders. The study discovered that trade costs and border crossing decisions are not only correlated with export restrictions but also gendered, and that few traders formalize despite the lower costs associated with the introduction of the border facility.

Zimano and Ruffin (2018) revealed how Road Entry Point Management Systems (REPMS) affect the relationship between the flow of goods and the best possible performance of the supply chain. 345 respondents, including international truck drivers and small- to medium-sized business owners, completed surveys at border crossings between Zimbabwe and Botswana, Mozambique, South Africa, and Zambia. The survey data was then analyzed using a unique transdisciplinary theoretical framework derived from supply chain and international relations theories. The authors contend that in a logistical corridor, the conversion of two-stop border posts to one-stop border posts must occur simultaneously. The results demonstrate that not doing so impairs international trade, regional integration, and supply chain logistics. The conclusions show that the Southern African Development Community's (SADC) REPMS are not in line with non-state actors and the facilitation of international trade, among other things. Developing public-private partnerships is one of the recommendations for REPMS transformation.

Another study by Hiraide, Hanaoka and Matsuda (2022) examined the trade volume and value per required cost, time, and documents in the trading procedures, and determined the efficiency of document and border procedures in each of the 190 countries. Using cross-sectional data from 2019 and panel data from 2014 to 2019, a data envelopment analysis and a window analysis were used to determine the efficiencies. The study discovered that while import efficiency improved only with the introduction of electronic documentation, export procedure efficiency improved when all three types of reforms were implemented in a nation. Based on the strengths and weaknesses of their border procedures and documents, all countries were categorized.

Another study by Nugent and Soi (2020) examined four OSBPs in East Africa and asked whether they constitute a different kind of border management regime and, if so, to what extent they deviate from ingrained operational patterns within government bureaucracies. Although there has been progress in Customs data sharing, the study discovered that each country's unique institutional cultures continue to be reflected in the design and administration of OSBPs. Furthermore, practical workarounds that undermine the idea of a paperless border are a part of working practices. Second, the article discovered that because OSBPs are built to handle both people and cargo, they differ from other border crossings and have certain characteristics in common with seaports and airports. However, they differ in that they are co-produced spaces of interaction where the organizational patterns have been shaped by transporters and members of the surrounding community, and they are not highly securitized. The results combine local conceptions of ownership, routine bureaucratic procedures, and official ideologies of service.

Although that was the case, Zang, Wang and Li (2022) discussed the state of cross-border e-commerce development and its challenges, including high costs, inadequate information, imperfect e-commerce credit evaluation systems, and a lack of qualified personnel, in the context of cross-border e-commerce logistics distribution.

The cloud logistics distribution network model is constructed using the precise center-of- gravity method, and advanced cloud distribution mode is introduced into cross-border e-commerce logistics. In order to improve the stability and security of cross-border logistics distribution, lower logistics costs, and enhance service quality, the paper makes some recommendations for the development of cross-border logistics based on the cloud distribution. These recommendations include optimizing the path to reduce transshipment links, optimizing the level of logistics informatization, improving the market supervision system and credit evaluation mechanism, and improving the talent training mechanism.

Another study by Kunaka, Raballand, and Fitzmaurice (2019) used a mix of published data (primarily port data) and unpublished data surveys to determine the level of regional integration. Many key insights can be gleaned from the trucking industry based on different types of data: the cost of long-distance trucking services has significantly decreased along the Northern Corridor (the route connecting Mombasa, Kenya, to Uganda, Rwanda, Burundi, and the eastern Democratic Republic of the Congo); the integration of trucking services is progressing quickly in East Africa (along the Northern Corridor), with Rwanda accounting for three-quarters of the market share of foreign-owned trucks; the characteristics and management of the trucking fleet have greatly improved and is now on par with those in South Africa; the streamlining of border clearance procedures have significantly increased fleet productivity. Even with these advancements, Tanzania's fleet continues to perform below par even though it is shielded from foreign-owned fleets. The study concludes that competitiveness is fueled by an effective and functional transportation and logistics system, especially in this day of tightly integrated global supply chains and cross-border trade.

Kuteyi and Winkler (2022) examined the potential for the region to adopt digital technologies and advance beyond traditional supply chain practices in Sub-Saharan Africa by systematically evaluating prior research and supplementing it with semi-structured interviews. 287 articles were used for the final analysis as a result of a systematic literature analysis that was carried out on published academic literature within a specific period and according to predefined criteria. The most prevalent logistics issues have been noted, along with possible fixes. The results outlined in the systematic literature review have been confirmed through semi- structured interviews with local logistics service providers. The interviews revealed that an emphasis on infrastructure investments, regulatory and institutional framework improvements, and human capital training is a major factor when adopting digital technologies. These factors will boost economic growth in Sub-Saharan Africa. Enhancements in the efficiency of logistics are thought to be a major factor in economic expansion. Globalized trade has been made possible by the digitalization of logistics, which includes improved tracking systems, digital information flows, automation, and artificial intelligence. Sub-Saharan African (SSA) economies, which are primarily dependent on exports of commodities, are still lagging behind, though, as a result of trade barriers, severe infrastructure shortages, and insufficient policy frameworks. These issues cause a broken supply chain, which hinders growth.

3.0 Methodology

The study adopted a cross-sectional research design since it intended to collect data at a single point in time over a large sample size. A mixed method approach was used to collect both qualitative and quantitative data from 376 respondents involving truck drivers, clearing agents, and customs duty officials by use of questionnaires, and key informant interviews. The study was conducted at three One-Stop Border Posts along Kenya-Uganda and Kenya-Tanzania borders namely Malaba OSBP, Busia OSBP and Taveta-Holili OSBP. The study areas were chosen because of being among the first to adopt the rationale that immigration and customs formalities for the two countries sharing a border post ought to happen once at the entry point (Tyson, 2018).

3.1 Reliability, Validity, Normality and Other Tests

3.1.1 Reliability test

The survey questionnaires were pre-tested for internal consistency reliability using Cronbach's Alpha coefficient. The results in Table 1 indicate that the questionnaire was highly reliable with Cronbach's Alpha coefficient of 0.926 which is way above the acceptable limit of 0.7 (Kılıç, 2016). The questionnaires were distributed through a convenience sampling technique since most of the respondents such as truck drivers were in transit and lacked a specific physical location for future reference

Table 1: Reliability test

Cronbach's Alpha Coefficient	No of Items	Comment
0.926	6	Highly acceptable

3.1.2 Validity of data

Validity refers to the extent to which the research tool measures what it is intended to measure (Fitzpatrick, 2019). In this study, the content validity of the data collection instrument was determined by seeking expert opinion on the research instrument from the research supervisor of the university. The valuable comments, corrections, and suggestions given assisted in the validation of the research instrument. The researcher also developed questions relative to the study to ensure consistency while the validity of the responses obtained from key respondents was tested against the study objectives as well as the findings of other studies carried out in cross-border logistics. Reliability is an essential measure of consistency and stability in the measurement of a concept (Turner and Houle, 2019). A pilot study was conducted to determine the reliability of the data collection instrument. The study selected a pilot group of 20 participants from Namanga OSBP. Internal consistency was tested using Cronbach Alpha reliability test of alpha= 0.70 or above (Turner *et al,* 2019).

3.1.3 Normality test

To test whether the data was normally distributed, the study used two statistical tests of normality that is the Kolmogorov-Smirnov and Shapiro-Wilk were performed on the study variables. The findings as seen in Table 3 show that p-values are greater than 0.05 both in Kolmogorov and Shapiro-Wilk, thus implying that the assumptions of normality were satisfied in this study

Table 2: Normality test

Variable	Kolmogorov-Smirnova			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Cross border logistics p erformance	.041	376	.110*	.425	376	.250
Customs harmonisation	.587	376	.423*	.368	376	.156
Coordinated border agencies	.451	376	.254*	.646	376	.259
Adoption of OSBP	.163	376	.312*	.872	376	.073
Trade facilitation	.169	376	.344*	.451	376	.158

3.1.4 Multicollinearity test

The general assumption in regression models is that predictor variables used in the study should be independent of each other (Shrestha, 2020). Multicollinearity exists when there are high linear relationships between two or more explanatory variables, going up against the assumption that explanatory variables in a study should be independent of each other. The Variance Inflation Factor was used whereby if the VIF value is between 1 and 10 indicates no multicollinearity but if it is below 1 and above 10 it means that multicollinearity exists (Gómez et al., 2019). Based on the coefficients output relating to collinearity, the VIF for all of the independent variables were between 1 and 10

implying that no multicollinearity was detected

Table 3: Multicollinearity test

Variable	Tolerance	VIF
Cross-border logistics performance	0.582	1.716
Customs harmonisation	0.413	2.421
Coordinated border agencies	0.475	2.104
Adoption of OSBP	0.634	1.578
Trade facilitation	0.452	1.621

3.1.5 Test for heteroscedasticity

Heteroscedasticity is a major concern in the application of regression analysis, which always occurs in cross-sectional data, when the variances of the error terms are no longer constant, it is often investigated with the ideology of relationship between error terms and exogenous variables (Falong *et al*., 2021). Violation of this assumption makes coefficient estimates less precise increasing the probability that the estimates are not a true representation of the population. The study used Levene's test to detect homogeneity and where the value was above 0.05 it meant that the populations were independent observations (Khaled et al., 2019). All the study variables used had a value above 0.05 which indicates that heteroscedacity was not violated.

Table 4: Heteroscedasticity Test

Variable	Levene Statistic	Sig.
Cross border logistics Performance	2.154	0.631
Customs harmonisation	1.371	0.638
Coordinated border agencies	1.561	0.961
Adoption of OSBP	0.457	0.759
Trade facilitation	1.382	0.867

3.2 Data Analysis

Qualitative data collected through key informant interviews was analysed using content analysis since it allows systematical extraction of valuable insights from a wide range of textual data sources(Gaur and Kumar, 2017) while descriptive analysis was used to analyse data collected through closed ended questionnaires since it condenses large datasets into easily digestible summaries, revealing central tendencies (like mean or median) and variability (like standard deviation or range) of data (Contreras, Tate, Morris and Kahng 2022). Multiple regression model was applied for inferential analysis to test the independent variable against the dependent variable since it captures the influence of multiple factors and isolates the effect of each variable (Hoffman, 2019).

The multiple regression equation was as follows;

$Y= \alpha + \beta 1EAC + \beta 2CBA + \beta 3OSBP + \beta 4TF + \varepsilon$ … *Equation 1*

Where;

Y= Cross-border logistics performance (D.V)

α=Intercept

$\beta 1$-$\beta 3$ =Regression coefficient EAC = Customs harmonisation

CBA= Coordinated border agencies OSBP = OSBP strategy adoption TF = Trade facilitation

4.0 Findings and Discussions

4.1 Findings

Table 5 presents the respondents' perception of the influence of customs clearance on cross-border logistics performance.

Table 5: Perceptions of the influence of customs clearance procedures on cross-border logistics performance

Statement	Mean	Std. Deviation
Harmonisation of customs	4.4	0.601
Adoption of the OSBP strategy has improved logistics performance.	4.4	0.659
Coordination among border agencies hinders service delivery.	3.8	1.278
Trade Facilitation has improved logistics performance.	4.3	0.702
Average	3.160	0.81

A multiple regression analysis was conducted to find out whether custom clearance procedures through its sub-independent variables; EAC SCT, OSBP, and trade facilitation could significantly predict cross-border logistics performance. The results of the regression, in Table 4 indicate that the model accounted for 65.5% of the variance in the dependent variable. In addition, the regression also indicated that the model was a statistically significant predictor of cross-border logistics performance, F (6,369) = 2631.57, p =0 .000).

From the model coefficients (table 6), it was discovered that customs harmonisation (β= 0.211 p<0.05), coordinated border agencies (β = 0.261, p<0.05), OSBP strategy (β = 0.636, p<0.05), and trade facilitation (β =0.245, p=0.000) significantly contributed to the model hence rejecting the null hypotheses. Therefore, the final predictive model is shown below.

*Cross-border logistics performance =(0.211*EAC) + (0.261*CBA) + (0.636*OSBP) + (0.245*TF) + 0.13991*
……Equation 2

Table 6: The relationship between custom clearance procedures and cross-border logistics performance

Model Summary					
Model	**R**	**R2**	**Adjusted R2**	**Std. Error of the estimate**	
1	0.810	0.656	0.652	1.14144	
ANOVA					
Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	309.053	6	51.509	2631.507	0.000[b]
Coefficients					
Variable	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
Constant	0.032	0.062		0.522	0.602
Customs harmonisation	0.211	0.018	0.239	11.801	0.002
Coordinated border agencies	0.261	0.013	0.363	20.848	0.001
Adoption of t h e OSBP	0.636	0.023	0.631	27.407	0.005

strategy					
Trade Facilitation	0.245	0.025	0.187	9.687	0.004

According to this model, cross-border logistics performance increases by 0.239 for every unit increase in custom harmonization. Cross-border logistics performance rises by 0.261 with each additional coordinated border agency. The performance of cross-border logistics increases by 0.636 for every unit increase in the adoption of OSBPs. The performance of cross-border logistics increases by 0.245 for every unit increase in trade facilitation.

4.2 Discussion

The statement that adoption of the OSBP strategy had improved cross-border logistic performance had a mean of 4.4 which shows that most of the respondents agreed with the statement. This indicates that adoption of the OSBP strategy had improved cross-border logistics performance to a greater extent the study findings agree with Tyson (2018) by demonstrating that for cross-border logistics to be seamless, many countries ought to see the advantage of cross-border logistics less restriction through adoption of OSBP strategy as a way of easing the movement of services and cargo across borders. The findings here imply that, OSBPs bring about improved border management efficiency by streamlining cargo inspections, reducing export, import and cargo transit documents across borders resulting into reduced border delays and transportation costs. The findings show that harmonization of customs clearance documents is essential for EAC to boost cross-border logistics performance since it involves benefits such as delivery time predictability, reduced costs and document adherence. Hoa (2023) also indicated that simplifying and harmonizing customs clearance documents has the capacity to reduce the cost of transportation by averagely 10% leading to an increase in the flow of goods especially in developing countries dealing in perishable intermediate and agricultural goods that are sensitive to delays in delivery.

That statement that coordinated border management improved cross-border logistics performance, had a mean of 0.261 showing that respondents agreed to the statement. Coordinated border management is a strategic approach that involves the collaboration and coordination among various agencies and stakeholders involved in the management of international borders. This includes customs, immigration, border security, and other regulatory bodies. The primary goal of CBM is to enhance the security and efficiency of border crossings while facilitating legitimate trade and travel. The findings align with those of Takele (2019) who stated that when effectively implemented, CBM can significantly improve cross-border logistics performance through reduced border wait times as well as enhanced security and compliance

The statement that trade facilitation improved cross-border logistics performance, had a mean of 4.3 showing that respondents agreed with the statement. The findings indicate that cross-border logistics performance can increase highly if the obstacles to seamless logistics, such as poor infrastructure, cumbersome clearance procedures, and customs clearance delays are addressed. A study by Zimano and Ruffin, (2018), specifically found that trade facilitation among member states reduced logistics costs by ensuring that shortest routes were used when shipping goods from one member country to another. The model also identified that a unit increase in coordinated border agencies will lead to 26.1% increase in cross- border logistics performance, holding other variables constant. The study implies that all border agencies should work together as a team to avoid duplication of procedures. Such an approach can significantly cut down clearance time at the border. Similar findings were reported by Takele (2019), who found multiple inspection by different border agencies to be costly and wasteful to logistics further indicating that border agencies' cooperation is instrumental in the reduction of border delays. This can be achieved through combined inspection

tests on cargo and sharing of resources to make cross-border logistics performance better and cost effective.

Lastly, a unit increase in customs harmonisation will lead to an increase in cross-border logistics performance by 21.1%. These findings imply that fully actualization of single custom territory can significantly improve cross-border logistics performance within the region. The findings are consistent with those published by East African Community (2024) who reported that, the SCT has led to great improvement in trade by reducing the cost of doing business which has seen many shippers save on money and time while allowing final consumers to enjoy reduced commodity prices. Full implementation of EAC-SCT is also in line with argument by the customs union theory that economic integration only occurs when countries are committed to eliminating trade barriers and achieving a levelled trading ground. Theoretically the study findings relate to the theory customs union since the theory relies more on the impact of forming a customs union on both the participants and those outside the union. In the customs union theory participants agree on elimination of tariffs and import quotas among themselves, a common market and free movement of factors of production (Lipsey, 1960). Under the customs union, member states interconnect their customs systems to allow the flawless flow of information between customs stations as well as a payment system to manage transfers of revenues between EAC Partner states to guarantee reduced delivery times and costs involved resulting into better cross-border logistics performance.

5.0 Conclusion and Recommendations

5.1 Conclusion

Cross-border logistics is the lifeblood of regional integration. By ensuring the smooth flow of goods, people, and information, EAC countries can create a more dynamic and prosperous region for all its members. Despite ongoing efforts, cross-border logistics in East Africa still face significant challenges that increase transportation costs and time. However, regional initiatives and technological advancements offer a glimmer of hope for future improvement. Continued investment in infrastructure, harmonization of regulations, and capacity building are crucial for creating a more efficient and integrated East African logistics network. The community faces a complex interplay between customs clearance procedures and cross-border logistics performance. While regional initiatives promote harmonization and technology adoption, significant challenges remain. Streamlining customs procedures with clear, consistent regulations and electronic documentation can significantly reduce clearance times and associated costs. Efficient cross-border logistics are essential for realizing the full potential of the EAC's economic integration. Continued investment in infrastructure, fostering regional collaboration, and prioritizing efficient customs processes are crucial for a more vibrant and competitive East African trade environment. By addressing these challenges and capitalizing on positive developments, the EAC can unlock the true potential of cross-border trade and economic growth for the entire region.

5.2 Recommendations

For the East African Community to achieve customs harmonization they community should work towards a unified EAC Customs Act that applies consistently across all member states. This would eliminate discrepancies and ensure a common legal framework for customs procedures. For coordinated border management the EAC should establish dedicated task forces composed of representatives from customs, immigration, agriculture, health, and security agencies. These teams can work together to develop and implement CBM strategies, share information, and resolve operational challenges.

For One Stop Border Posts the EAC should conduct feasibility studies to identify the most strategic locations for new OSBPs, considering trade volumes, infrastructure needs, and regional integration goals and also explore various funding mechanisms for OSBP development, including public-private partnerships (PPP), grants from international development agencies, and budgetary allocations from EAC member states.

For trade facilitation the EAC should focus on a multi-pronged approach that tackles challenges at various levels such as policy and regulatory reforms, infrastructure development, technology automation and institutional capacity building. The EAC should also establish clear benchmarks and metrics to track progress on trade facilitation initiatives. This allows for data-driven decision making and adjustments to strategies as needed. Regularly evaluate the impact of implemented measures on trade flows and business environment.

Acknowledgements

Thanks to the East African Community scholarship programme funded by the Germany Development Bank (KFW) and implemented by Inter University Council for East Africa (IUCEA) and Adroit Consult International for awarding me a fully funded master's scholarship without which academic journey wouldn't have been this smooth.

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