

ADDIS ABABA UNIVERSITY
ADDIS ABABA INSTITUTE OF TECHNOLOGY
SCHOOL OF CIVIL AND ENVIRONMENTAL ENGINEERING



Evaluating International Logistics systems in Ethiopia using Logistics
and other Performance other Indexes:
the Case of Ethio-China Trade Relationship

A Thesis Submitted to the School of Graduate Studies in Partial Fulfillment of
the Requirements for the Degree of MASTER OF SCIENCE in Road and
Transport Engineering stream

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Addis Ababa, Ethiopia

CERTIFICATION

I, the undersigned, certify that I read and hereby recommend for the acceptance by Addis Ababa University a dissertation entitled: Evaluating International Logistics systems in Ethiopia using Logistics and other Performance Indexes: the Case of Ethio-China Trade Relationship partial fulfillment of degree of Masters of Science in Road and Transport Engineering.

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Abstract

Trade involves participation along the global using various logistic system. Providing efficient logistic system is a suitable solution to solve problems in Trade Logistics which could be obstacles to the competitiveness of the country. In order to get the benefits of the globalization process, determining countries logistic performance is essential by identifying its impact on competitiveness. Global benchmarks as LPI, Global Resilience Index, GCI and LSCI can provide an insight how countries stack up against their competitors and indicate the possible opportunities and strength along the trade and logistics. The main objective of this study was to evaluate logistic system of Ethiopia in international trade mainly focusing the trade with China. The evaluation was made by both primary and secondary data. Based on the secondary data mainly focusing on World Bank report, this study finds out that infrastructure and timeliness are a major bottlenecks for Ethiopia's logistics inefficiency. It is indicated that the mean score of LPI result of Ethiopia is 2.42, and ranked 126th across the year (2007-2016). Among the six indexes of LPI Custom index have the highest rank which is 95th with score of 2.44 and Timeliness index has lowest rank which is 151st with score of 2.62. Data collected from traders (Importers, Exporters) mainly with China involving on different type of commodities, determined the salient factors affecting trade competitiveness of the country on issues related to warehouse, freight transport, information technology, shipping delay, customs and logistic professionals. Comparative analysis was also made using the data collected from logistic service providers (ESLS, ERCA). These finding confirm other research that suggests that to benefit from international trade and to maximize return on logistics assets; development of infrastructure both inside and at the border, interagency coordination improvement, introduction of cargo tracking system and regional custom transit system, provision of detailed corridor monitoring are necessary.

Promoting utilization of ICT in the end to end service, establishing effective trade facilitation and regulatory programs by providing national single window system and reduce

transit check points, develop port facilities and establishing integrated transport system and corridor facilities are important points to be learned from China and develop it in our country Ethiopia .

Key words: Logistic System, LPI, International Trade, Ethiopia

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List of Acronyms

- 3PL/ 4PL - Third Party Logistics/Fourth Party Logistics
- B/L - Bill of Lading
- CAD - Cash against Document
- CBE - Construction Bank of Ethiopia
- COMESA - Common Market for Eastern and Southern Africa
- ECR - Efficient Consumer Response
- EDI - Electronic Data Interchange

EPOS - Electronic Point of sale
ERCA - Ethiopian Revenue and Customs Authority
ESLSE - Ethiopian Shipping and Logistics Service Enterprise
FDRE - Federal Democratic Republic of Ethiopia
GCI - Global Competitiveness index
GDP - Gross National Product
GNI - Gross National Income
GPS - Global Position System
ICT - Information Communication Technology
L/C - Letter of credit
LLDCs - Land locked developing countries
LPI - Logistic Performance Index
LSCI - Linear Shipping Connectivity Index
MoTr - Ministry of Trade
NBE - National Bank of Ethiopia
OECD - Organization for economic Co-operation and development
RFID - Radio Frequency Identification
SSA - Sub Saharan Africa
TEU - Twenty Feet Equivalent unit
UNDP - United Nation Development Program
UNCTAD - United Nations Conference on Trade and Development
WTO - World Trade Organization

1 Introduction

1.1 Background

Logistic is multidimensional trade facilitating factor in global trade aiming to promote process and application of skills and technologies. It specially has impact on trade performance of a country in terms of cost, time, reliability, predictability and customer service which further affect overall competitiveness of the export in international market other things being constant (Arvis et al. 2007).

In international supply chains, global logistic operators as ocean shipping, air freight, land transport, warehousing, and third-party logistics used to move goods in international trade (Korinek & Sourdin, 2011). In the global market the high logistic costs and low quality of services may be considered as obstacles. High quality logistics services could improve the competitiveness of a country's export by reducing the cost involved in transporting goods- especially for countries that are deprived by being land locked (Debela, 2013). According to Gebresenbet (2009), the theory of profit leverage by logistic cost reduction showing that saving in logistic cost of 1 USD will increase the benefit of international trade by 50%. These findings are especially relevant for developing countries such as Ethiopia that needs to invest in logistics in order to emerge in a more competitive position in international trade. In Ethiopia there is logistics inefficiency in quality of infrastructure as warehouse, transport, use of information technology, management ability in planning, search and execution of the shipment handling and warehousing. In addition to this, lack of logistic collaboration which could provide more integration among the transaction processes is problematic factor in Ethiopia.

Analyzing logistics and supply chain practices is necessary to distinguish important issues such as emerging trends and areas of concern which will help in taking remedial measures (Srivastava, 2006). In order to get the benefits of the globalization process, determining

countries logistic performance is essential by identifying its impact on competitiveness. This can be done by having a set of performance indicators as Logistic Performance Index that measure trade and transport facilitation of a countries using international comparison tool which is developed by World Bank. But literatures suggest that factors as innovation and environment is left out from the component of LPI. Beside LPI there are also other indexes that can describe countries level of performance in relation to trade using different core pillars. Factors that are not included in one index is included in other index, so that a country can know which areas of the sector have a problem and need to be improved. This include Global Competitiveness Index, Linear Shipping Connectivity Index, and Global Resilience Index. Since there is no agreement on the salient factors that influence performance of logistic system, it is important to understand trade and logistic performance components of a country to enhance trade competitiveness. Factors such as complex process of exporting and importing, expensive transport and poor infrastructure, cumbersome custom procedure, institutional inefficiency are some of the problems which are listed by different researchers.

This research also uses the logistics performance index which has been produced by the World Bank to analyze the Ethiopian logistics performance in relation to its trade partner and neighboring countries (Djibouti, Kenya, Sudan, South Sudan, Somalia, and Eritrea) which could be considered as competitor's international trade. Logistical aspects in which Ethiopia has shown large inefficiencies in relation to trade are also revealed. The difference among the logistic performance indexes appears to be relevant to governments in order to address their public policies, and also to highlight the logistic obstacles of Ethiopia.

1.2 Statement of the problem

Poor characteristics of logistics management and its less dependence on global benchmarks that shows countries how they stack up against their competitors is an important factor that lead Ethiopia to perform low in logistics and to be less competitive in market. Even though there are different salient factors that are causes for low logistic performance and factors lagging trade but there is no common agreement. Gebresenbet & Mpagalile, (2015) stated that low productivity of trucking industry, infrastructure constraints, low level of competition between service providers lead to Africa's poor trade performance. According to World Bank (2007) it is stated that with its lower wages, African enterprises can compete with Chinese and Indian firms in factory floor cost in products like garments and other simple manufactured goods, but Africa's competitiveness hindered by lack of trade logistics rather than inefficiency of its workers, managers or capital equipment. Ciuriak and Preville, (2010) stipulate complex process of exporting and importing, sluggish and expensive transport, lack of seamless transport and cumbersome customs procedure which leads to high trade cost and low trade performance. Bougheas et al. (1999) and Limao & Venables, (2001) agreed on poor government policies, cumbersome bureaucracy, poor infrastructure, institutional inefficiency and land lock as a major factor for developing countries including Ethiopia.

Productivity, distribution efficiency, and trade volumes depend on efficiency of logistic system. Especially developing countries which are characterized by poor logistic system have high trade cost and there is price fluctuation while exporting mainly primary goods. LPI is used to assess logistic performance of countries on international level and spot out the bottlenecks. By comparing logistic performance of landlocked and coastal countries by region starting from 2007 to 2012, World Bank report (2013) shows that LLDCS experienced increase in LPI (13%), then coastal countries (7%) concluding that effect of land lock is declining over time even though low level of logistic performance is still appearing in LLDCs including Ethiopia.

The increased awareness of the importance of logistics index will lead to an increase in the need to monitor logistics performance of a country, especially in comparison to competing economies. By identifying the major factors that impede the effectiveness of the countries logistic system and determining which of these factors have significant impact on the country's trade competitiveness, trade of the country can boost significantly and its performance can raise. Therefore, the major factors affecting the logistics service quality should be identified, and the degree of the effect should be tested. Similarly, this research aimed at identifying which of these factors have significant impact on the Ethiopia's s trade competitiveness.

The research questions of this paper were:

- What are the implications of different logistic indexes on trade logistic performance of a country?
- What are the major factors affecting logistic performance and how can logistic performance of a country can facilitate trade?
- What are the main logistic areas in which Ethiopia has inefficiency comparing with its competitors and trade partners in relation to trade?

- What are the challenges existing in logistic systems in relation to international trade particularly focusing between countries (Ethiopia, China) and what are the impacts of logistic systems on international trade?

1.3 Objectives of the study

The main objective of this thesis was to evaluate logistic systems of Ethiopia to facilitate trade business, mainly focusing on trade between Ethiopia and China. It was assumed that the study benefits the integration of separate logistics systems and would bring about homogenization in the performance, monitoring and accountability to those organizations.

The specific objectives were to:

- describe the main logistic system used in the trade business and evaluate logistic system of Ethiopia from traders with china (Exporters, Importers) and logistic service providers point of view.
- evaluate logistic performance of Ethiopia, using LPI, comparing the country with its trade partners and competitors.

- study the various physical and non-physical factors that influence logistics performance of country and affect its trade business.
- develop recommendations for improvement of logistics performances related to international trade.

1.4 Significance of the study

Improving logistics system is essential plan to strengthen competitiveness and to boost trade integration of one's nation and this will be attained by having efficient logistic service and high-quality infrastructure along the trade corridor. In developing countries, the need to improve logistics performance in order to increase trade flows is increasing overtime since it is becoming one of the most important factors in determining the volume of trade between countries. Ethiopia as being a developing and land locked country; its logistics system is characterized by poor logistics management system and performance which further hampers the countries competitiveness in the global market. Hence, the findings of the thesis will provide an important input for the improvement of logistics system and evaluations between two and above countries facilitator stakeholders used to increase the

country effectiveness in the international trade. Furthermore, it will provide a better understanding on the logistic systems in the trade business and provide solutions to the inefficiencies of logistic system between Ethiopia and China. It will be an additional resource for the existing resource in this area and could be used as reference for further studies.

1.5 Limitation of the study

Although this study focuses on logistics systems undertaking in Ethiopia and its impact on trade, it is acknowledged that this study has some limitations. The limitation of the study was as follows: This research did not consider any specific commodities used by traders since acquiring a well-organized data is very difficult as the traders were not willing to provide reliable data. Therefore, this study focuses on different types of commodities that Ethiopian traders deal with China. Since the study focuses the trade with china it was difficult to get the required data from Chinese due to language difficulties. In addition to the secondary data, this study is based on available information from primary sources. Accuracy of the study depends on provided information but adequate attention is given to reliability and validity of the research by persuading respondents about the importance of their response on the validity of these work and through crosschecking different literatures together with random observations.

2 Literature review

2.1 Theory of logistics aspect on international trade

International logistics is a complex sequence of coordinated activities which include ocean shipping, airfreight, land transport, warehousing, and third-party logistics as interconnected network of global operator in international trade.

Efficient logistics and trade facilitation can create national competitiveness. Countries with

better logistics can grow faster, become more competitive and increase their investment. Custom and border management, improvement of transit regimes, minimizing dissatisfaction with port infrastructure in developing countries due to lack of capacity, investment, inefficient operations at existing facilities can be some of the areas where trade facilitation can help improve logistics. According to Shatz & Venables (2000) foreign direct investment can be attracted by reducing transport cost, tariffs and access to new markets, by improving business competitiveness and reducing production cost. In addition to this, quality of infrastructure also contributes the export performance. This is approved by Iwanow & Kirkpatrick (2006) indicating in their result that improved 10% level of infrastructure increases of 8% export performance in developing countries.

Although there is no homogenous definition, the term trade facilitation is frequently used in recent studies. World Trade Organization (WTO) define it as “the simplification and harmonization of international trade procedures ,,,,,, in collecting, presenting, communication and processing data required for the movement of goods in international trade “. In the other hand (Wilson et al. 2005) define trade facilitation using four indicators: port efficiency, customs, regulations and use of e-commerce by statically analyzing significance of 75 countries with gravity model. Using LPI as descriptive variable of trade, Korinek & Sourdin (2011) confirm impact of logistic performance on trade specifically concerning infrastructure improvement for exporters and administrative improvement for importers. Marti et al. (2014) which follow the same line of research with World Bank also analyses the relationship between bilateral export and logistics, concluding that the more complex goods are in terms of transport, the greater the influence of logistics.

An efficient performing of logistic in supply chain including merchandise transport, warehousing, custom operation, payment systems and operations by producers and sellers are a vital important for countries development and diversification. World Bank provides logistic performance indicator to evaluate efficiency of domestic supply chain and their potential lag with other national supply chain showing the logistic gaps (Arvis et al.

2014).The empirical analysis suggests that measure to improve logistic performance and facilitate trade are likely to have positive effect in expanding trade of developing country. Thus, increasing the trade impacts of lowering remaining border barriers by a factor of two or more.

2.2 Transportation effects on logistics activities and transport costs in logistics

The operation of logistic determines the efficiency of moving products. The progress in techniques and management principles improves the moving loads, delivery speed, service quality, operation cost, the usage of facilities and energy saving. Transportation takes a crucial part in the manipulation of logistic as it plays an important role in connecting between various producing stages starting from place of production finally to consumers at the right time and place to satisfy customers demand. Hence efficient logistic system helps to optimize the existing production and distribution process based on the same resource through management techniques for promoting the efficiency and competitiveness of trade performance of the country.

The value of transportation varies with different industries. For those products with small volume, low weight and high value transportation cost simply occupies a very small part of sell and is less regarded, for those big, heavy, and low valued products the reverse is true (Rantasila&Ojala, 2012). According to analysis of national council of physical distribution management, USA(NCPDM) in 1982(Chang 1988, P.148) around one third to two third of expenses of enterprises logistic costs are used for transportation and cost of transportation (including means of transportation, corridors, containers, pallets, terminals, labor and time) accounted for 65% of market revenue and 44% of logistic costs. Limao&Venables (2001) finds that median landlocked country trades are much less than a coastal country and calculated that transport cost for median landlocked country is 55% higher than for the median coastal country.

Even though it is not directly included, logistic costs are indicated in Global

Competitiveness Index and the Logistics Performance Index that are developed to rank countries (Farahani et al. 2009). Rantasila & Ojala (2012) indicated the relationship between a country's LPI ranking and its level of logistics costs as "countries with a low LPI score tend to have high costs. In particular, so called induced costs (related to non-delivery or the avoidance of non-delivery and storage) tend to be low in countries with a high LPI score, and direct costs (freight and other shipment-related costs) tend to decrease until the LPI score reaches a value of around 3.3".

2.3 Overview of the logistics performance index (LPI)

Logistic performance index is a global benchmark showing countries how they stack up against their competitors and highlighting the cost of poor logistics by helping policy makers and private sectors to build a strong case for reform. It is first enhanced in 2007 and developed in 2010 by World Bank every two years which provide continuous logistic performance assessment of countries. LPI which is constructed based on survey with respondents in the field of international shipping and logistics, rate different countries between 1 (worst) and 5 (best) on six core components. This helps to reveal the bottlenecks of a country in terms of logistics and spot the needs and priorities of any improvements (Mustra, 2011).

Table 2.1: components of LPI (Arvis et al.2016)

Core components	Description
Area for regulation (inputs)	
Customs	The efficiency of custom and border management clearing procedures
Infrastructures	The quality of trade and transport infrastructure
Quality of services	The competence and quality of logistic services
Supply chain performance outcomes	
Timeliness	The frequency with which shipments reach consignees within scheduled or expected time
Tracking and tracing	The ability to track and trace consignments

International shipping	The ease of arranging competitively priced shipments
------------------------	--

Researchers attempted to ascertain the importance of component of LPI with regard to trade either by including several components in the same model (Felipe & Kumar, 2012) or by estimating regression that consider only one of the components by concluding that infrastructure is most important component in comparison to custom by using one-year data (Hertel & Mirza, 2009; Puertas et al, 2013). Besides, some researchers link LPI to other aspects of development. Guner & Coskun (2012) develop relationship between development in logistics measured by LPI and other economic and social factors focusing on 26 OECD members. Mn & Kim (2010) construct hybrid index called "Green LPI" using data envelopment analysis (DEA) by combining the LPI and environmental performance index which quantify and numerically mark environmental performance of a country.

Higher levels of efficiency in logistics are rarely achieved at the cost of more emissions of pollutions, but LPI does not take environmental damage consideration. And its direct relation to the levels of income is another distortion to this index. Developed countries such as USA, Germany and Singapore combine high income with a leading position in index. Similarly, China, India and Vietnam are all considered low cost procedures, are ranked higher than other developed nations as Portugal, Greece and Iceland. The results of Arvis et al. (2010) also supports this dimension by stating that about 45% of high income countries had higher LPI scores than low income countries.

Another factor that can be seen as a limitation of LPI is that the LPI value doesn't reflect the problems indicated in land locked countries and small islands. Arvis et al (2007) concluded that countries which have access to international markets and good economic liberation and technological advantages will have efficient logistic and well managed transport roads and trade procedures. For that reason, ranking established by index places the developed nation at top while emerging nations occupy completely mixed positions. In addition to this it is difficult to describe the logistic environment in poor countries since respondent's experience involved in World Bank questionnaire is limited. Ojala (2015)

suggested that countries as Sweden, Norway, Bahrain, New Zealand, and Ethiopia have large intervals between upper and lower bounds for scores and ranks, because of limited number of respondents.

This research also presents the LPI of Ethiopia along the year and show the results with other reference countries which are selected as top trade partners of Ethiopia (34 countries). This helps to determine the bottlenecks in logistics that have a critical impact on sector competitiveness, and trade performance.

2.3.1 Top and bottom performing countries in LPI according to World Bank

Since 2010 there is only slight change for the top performing 15 countries. The 2016 report ranks Germany the highest and Syria the lowest indicating that bottom ranking countries are either in insubstantial economies which are affected by conflict, natural disaster, political unrest or geographical constraints and the top performers are the dominant players in supply chain industry. This lead to the logistic gap between more and less developed countries, which widely seen in 2016 World Bank report. According to the World Bank (2007) the countries with higher logistic performance present private sector well developed and countries with low performance have problems in both public and private sectors. And the difference in satisfaction among countries of high and low performance is higher for timeliness index compared to any other indexes. Data about thefts, bribes and fraud, percentage of physical inspection among others are used to compare countries. The major concern for traders and logistic service providers is border management reforms. Low income economies especially which are landlocked struggle with paperwork and long delays. And also, infrastructure which assure connectivity and access to gateways for most developing countries is improving at much slower pace than those at top of the scale. "Among the top 30 countries in the LPI, approximately only 1 in 10 shipments fail to meet quality criteria in the top 30 performers. Among the bottom 30 countries, nearly three times as many shipments fail to meet these standards "(World Bank, 2007)

Table 2.2: Top performers of LPI by income level (World Bank, 2016)

Upper Income	Upper-middle income	Lower middle income	Low-Income
Germany	South Africa	India	Uganda
Luxembourg	China	Kenya	Tanzania
Sweden	Malaysia	Egypt	Rwanda

2.4 Global competitiveness index (GCI)

Global competitiveness Index is presented by the World Economic Forum (2016) and published yearly since 2004. By considering countries strength and weaknesses, it analyses significant factors in business climate environment and identifies priorities for the facilitation of trade. In total statistical data, 114 indicators are divided under 12 pillars of competitiveness in three different groups, ranking 138 countries expressing their score on 1-7, with 7 being the most desirable outcome. Infrastructure is common pillar for both GCI and LPI. In GCI it is calculated by nine different indicators among them four could be useful for LPI validation. These are quality of Ports infrastructure, quality of roads, quality of air transport infrastructure, and quality of railroad infrastructure. And other indicators as goods market efficiency which is improved by better logistics and innovation which is an important factor in a logistics system is included. Also, education, labor market efficiency and market size have influence on logistical performance.

Table 2.3: GCI pillars of competitiveness (WEF, 2016)

Components	Description
------------	-------------

Basic requirements

Institution	Efficiency of both public and private stakeholders.
Infrastructure	Extensive and efficient infrastructure which is critical for functioning of the economy, thus include high quality roads, railroads, ports and air transport
Macroeconomic environment	Stability of macroeconomic environment which is important for business and overall competitiveness of the country
Health and primary education	Healthy work force, quantity and quality of basic education received by population which is vital for countries competitiveness and productivity

Efficiency enhancers

Higher education and training	Quality higher education which is crucial for economies that move up the value chain beyond simple production process and products
Goods market efficiency	Efficient goods market that produce the right mix of products and services given in their particular supply and demand conditions and can be traded effectively in the economy
Labor market efficiency	Efficiency and flexibility of labor markets which are critical to ensure that the workers are allocated to their most effective use in economy and provided with incentives to give their best effort in their jobs
Financial market	Efficient financial sector allocates the resources saved by a

development	nations population, as well as those entering the economy from abroad, to the entrepreneurial or investment projects with highest expected rates of return rather than to the politically connected
Technological readiness	Measure the agility with which an economy adopts existing technologies to enhance the productivity of its industries, with specific emphasis on its capacity to fully leverage ICTs in daily activities and production process for increased efficiency and enabling innovation for competitiveness
Market size	Size of market affecting productivity since large markets allow firms to exploit economies of scale
Innovation and sophistication factor	
Business sophistication	Quality of countries overall business networks and quality of individual firm's operations and strategies
Innovation	Sufficient investment in research and development, possibility of generating more value by merely integrating and adapting exogenous technologies

2.5 Linear Shipping Connectivity Index (LSCI)

The Liner Shipping Connectivity Index (LSCI) is an index created by the United Nations Conference on Trade and Development (UNCTAD) presenting analysis of connectivity using five different parameters. It indicates how well a country lies in the shipping network and

shows how country can improve its access to the global trade markets. A high ranking in the index means that a country has easy access to this network and is likely to have a well-developed economy and trading system (Hoffmann & Fuguzza, 2015). But the data is not available for Ethiopia, so there is no rank provided.

The highest correlation between the LSCI and the LPI is presented by different researchers. Hoffmann (2010), describe the correlation in two different ways. 1. Higher LPI score, makes it more attractive for carriers, which will lead to a higher LSCI score. This means that a higher LPI will lead to a higher LSCI. 2. If a country has a high LSCI this means the services are better, which are also a component in the LPI and will lead to a higher LPI score. However, countries such as China will score very high on the LSCI due to the high amount of container movements but lags behind on the LPI. Also, for both indexes trade is critical, so it is likely that even though they have some different components, more trade will lead to a higher score on both indexes. There is relation between connectivity and logistics performance and that connectivity is needed to achieve high logistics performance and vice versa (Arvis et al. 2016).

Table 24: LSCI parameters (Hoffmann & Fuguzza, 2015)

Parameter	Explanation
Fleet deployment	The number of ships that are calling a port each year for import, export or transshipment purposes. However, a high level of transshipment can be misleading since it is not an indicator for connectivity to global trade, but indicates the country has a transshipment hub. Measured per capita.
Carrying capacity	The availability of containers for the concerned country, measured in TEU. Fleet deployment is an indicator of frequency whereas carrying capacity concerns size of shipments. Measured per capita.
Liner companies	The amount of liner companies that include a port in this country in their shipping lines. Also includes the number of ships per liner that service the country per year.
Liner services	The amount of companies that offer a service that will increase the rotation of containers in the concerned country.
Maximum vessel size	The maximum size of a vessel that can load or unload goods in the concerned country, gives an insight in economies of scale.

2.6 Correlation between LPI and Gross Domestic Product (GDP)

The GDP of a country is the sum of the consumption, investments, government spending, and net volume of the exports. GDP per capita indicates how developed a country is and there is a relation between the logistics performance and the GDP of a country. When comparison is made many countries with a high GDP also score high on the LPI. The reason the regression coefficient is not even higher is that some countries with a very high GDP, such as Luxembourg, Switzerland, and Qatar do not score higher on the LPI than countries with a lower GDP but with a high LPI, such as Germany and the Netherlands. Also, some countries with a very low GDP, such as Uganda and Bangladesh, score relatively well on the LPI.

On the other hand, the Gross National Income (GNI) is the GDP plus the incomes earned by foreigners in the country, minus the salaries earned by non-residents. Same correlation is gained as of the GDP. According to (Roekel, 2017) the Doing Business report 2017, the Global Competitiveness Index have a correlation of around 0.55 and the Liner shipper connectivity index has a correlation of 0.40 with the LPI. The gross domestic product and the gross national income have correlations of 0.59 and 0.62 with the LPI. These metrics can be seen as indicators of the economic state of a country of which logistics is an important part.

2.7 Supply chain Global Resilience index

When business is dependent upon more than one country as each has its own drivers of resilience it becomes vital by developing the ability to withstand disruption and rebound quickly. But some of which may be unknown in developing countries. The goals of supply chain visibility are to reduce enterprise and supply chain risk; improve agility, lead times and performance; and identify shortage and quality issues along the supply chain. Using data

sourced from the World Bank, visibility is defined as the ability to track and trace consignments across a country’s supply chain. Enhancing visibility is essential to improve enterprise resilience and maximizing value in supply chain performance.

In the other hand visibility shows awareness about companies’ location, operations and vulnerabilities of its suppliers. It is important for both domestic companies with multitier supply chains, and also with global supply networks. The 2017 FM Global Resilience Index ranks 130 countries and territories according to their enterprise resilience to disruptive events using 12 core drivers that affect the enterprise resilience of countries significantly and directly. The main pillars are: economic, risk quality and supply chain. The rank is presented a score, bounded on a scale of 0 to 100. A score of 100 does not imply a perfect score, but rather, that the territory ranks highest in that particular dimension. Switzerland occupies the top position in the FM Global Resilience Index. Because Switzerland is among the best in the world for its infrastructure and local suppliers, its political stability, control of corruption and economic productivity. The lowest-ranking country in the index is Haiti, which is among the poorest countries in the world. Ranked second to last, Venezuela is hampered by exposure to wind and earthquake, perception of extensive corruption, poor infrastructure and ill-perceived local supplier quality. Fortifying resilience to disruption is essential for protecting stakeholders against tragedy and loss and sustaining long-term economic performance. The scores, therefore, are a relative measure of resilience across countries, rather than an absolute measure.

Table 2.5: Global Resilience index parameters

Economic		
Productivity	Gross domestic product (GDP) based on purchasing power parity, divided by total population	International Monetary Fund (IMF)
Political risk	The perceived likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically motivated violence and terrorism	World Bank
Oil intensity	Vulnerability to an oil shock (shortage, disruption, price hike); oil consumption divided by GDP; measures dependency on oil	U.S. Energy Information

	for productivity	Administration
Urbanization rate	The average annual rate of change in the extent to which a country's population is living in an urban area	United Nations (UN)
Risk quality		
Exposure to natural hazards	The percentage of a country's area devoted to economic activities that is exposed to at least one natural hazard: wind, flood or earthquake	FMGlobal
Natural hazard risk quality	The quality and enforcement of a country's building code with respect to natural hazard resistant design (80%), combined with the level of natural hazard risk improvement achieved, given the inherent natural hazard risks in a country (20%)	FMGlobal
Fire risk quality	The quality and enforcement of a country's building code with respect to fire-based design (80%), combined with the level of fire risk improvement achieved, given the inherent fire risks in a country (20%)	FMGlobal
Inherent cyber risk	Vulnerability to a cyber-attack combined equally with the country's ability to recover; captured by internet penetration (the percentage of individuals in a country who have access to the internet) and civil liberties	UN and Freedom House, respectively
Supply chain		
Control of corruption	The perceived extent to which public power is exercised for private gain including both petty and grand forms of corruption, as well as capture of the state by elites and private interests	World Bank
Quality of infrastructure	The perceived quality of general infrastructure: transport, telephony and energy	World Economic Forum(WEF)
Local supplier quality	The perceived quality of local suppliers	World Economic Forum(WEF)
Supply chain visibility	The ability to track and trace consignments across a country's supply chain	World Bank

Source: authors elaborated from Resilience index annual report (2017)

2.8 The valuations in logistics systems

Logistics can be seen as a system (an integrated system of different kinds of activities). A system approach to logistics put forward all activities and changes in a system and

collection of optimizing the procedures through separate productions, and transportation to the final users. Logistic system intends to minimize the operation costs and promote the competitiveness and the quality of services by providing position in business operation. Activities cannot be analyzed as isolated events, but instead in terms of how they interact with their surroundings. (Lambert & stock, 1998). The goal of any logistics system is to provide complete logistic services which will fully satisfy the requirements and expectations of customers.

It is clear that poorer countries have weaker logistics systems and have not yet benefited from the productivity gains of logistics modernization and internationalization implemented over the past 20 years by advanced countries. The studies of eastern Asia society for transportation studies (vol. 5, pp. 1657 - 1672, 2005) and Bureau of Transport and Regional Economics (2001) provides an overview of the logistics system as Logistics services, information systems and infrastructure/resources as the three main components of logistic system and are closely linked. The interaction of the three main components in the logistics system is interpreted as follows.

2.8.1 Logistics services

Complete logistics service is the most important part of any logistics system where all processes and activities within logistics chain must be designed to support the required structure and level of logistics services. Activities in logistics services are bi-direction by supporting the movement of materials and products from inputs through production to consumers, as well as associated waste disposal and reverse flows. This logistic service is carried out by different sectors of logistics service providers which can be seen as companies, by performing logistics activities of a customer either completely or only in part (Delfmann et al. 2003; Lai, 2004). These functions can include traditional activities such as transporting, warehousing, packaging, etc. but also less conventional activities as those related to custom clearance, billing as well as tracking and tracing.

In developing countries institutions are characterized by poor capacity which can be seen by transit delays, failure to deliver in the needed time window or without the necessary quality and storage cost, false in cargo composition and wrong documentation. Impact of institutional quality on logistics and trade is also getting higher as the main stakeholders like customs authority, banks, transport service providers and other institutions become unreliable. On the administration side, procedures (especially added control procedures) are often nonselective and essentially independent of the nature of the shipment (Arvis et al. 2010). These leads to the prevalence of physical inspection which increases inspection time, red tape, compulsory warehousing, theft, and informal (corrupt) payments in low performance countries.

According to the World Bank’s logistics performance index (LPI, 2012) which measures trade logistics efficiency, Ethiopia was ranked 141st out of 155 countries and all scores are below the averages of the sub-Saharan Africa region which is related to complex border clearance and inland transportation. Since many developing countries still rely heavily on tariff duties, they tend to develop redundant procedures to avoid fiscal loss associated with diversion. In this case transit becomes a chain of control rather than a freedom given to compliant operators in exchange of guarantees.

Table 2.6 Activities of logistics service provider (based on Sink et al, 1996)

Transportation	Shipping, Forwarding, (de)consolidation, Contract delivery, Freight bill payment /audit, Cross-Docking, Brokering
Warehousing	Storage, Receiving, (Re) Assembly, Return goods
Inventory Management	Forecasting, Coactions analysis, consulting management, Call center
Order Processing	Order entry/fulfillment, Consignee management, Call center
Information System	EDI, Routing/scheduling, Artificial Intelligence, Expert systems, Bar coding, RFID, Web-based connectivity, Tracking and Tracing

Value-added activities	Design and Recycling of Packaging, Marking/labeling, billing, call center activities.
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2.8.2 Information systems

The efficient and effective operation of the logistics system depends on reliable and timely information flows, involving both providers and users of services. Nearly, a logistics chain usually contains a variety of logistics information systems equipment (e.g. computers, terminals) and software which is operated by different participants (e.g. suppliers, transport operators, retailers). As a component of ICT, consumer response (ECR) technique incorporates continuous replenishment of inventory and flow through distribution. This enables inventory to be managed on a just-in-time (JIT) basis, rather than stockpiling goods in warehouses and distribution centers. Choi (2003) shows that when the number of the internet hosts or users in a host country increased by 10 percent, the foreign direct investment inflows increased by more than 2 percent.

Francois and Manchin (2007) also find that exports performance depend on communications infrastructure. For developing economies to participate in global production their ability is affected by ICT infrastructure and electronic single windows which in reverse can reduce transaction cost. In order to make logistic network work effectively it needs to combine physical objects and digital information flow which are vital to support the process and physical structure of the operation. This include electronic point of sale (EPOS), electronic data interchange (EDI) between companies, barcodes/radio frequency identification (RFID), warehouse management system, forecasting and inventory management system and vehicle recognition.

2.8.3 Infrastructure on logistics

Infrastructure and resources are major components in logistic system comprising human resources, financial resources, packaging materials, warehousing, transport and

communications. Quality and volume of infrastructure across countries can easily show the difference in trade competitiveness of countries. Especially in developing countries the need to compete effectively in export market is restricted by lack of infrastructure. Using evidence from European countries, Bougheas et al. (1999) by extending Dornbusch-Fisher-Samuelson (DSF) Ricardian trade model they show a positive relationship between level of infrastructure and trade volumes for pairs of countries for which it is optimal to invest on infrastructure. Similarly, Limao & Venables (2001) shows that improvement in infrastructure is quantitatively significant in determining trade cost and inadequate and / poor infrastructure accounts for 40 and 60 percent of transport cost for coastal and landlocked countries respectively.

Costs mainly from logistics, facilitation and infrastructure (i.e. transactions costs) influence the pattern and volume of trade since it is significant determinant of trade and the influence of these factors on trade volume and cost is presented in many papers. (Turkson, 2006) indicated the reason why countries like china and India (known as “globalizers”) have tremendous growth in trade, whereas developing countries (mainly in Africa) have limited trade growth in the era of globalization that is because of infrastructure. (Dollar & Kraay, 2002; Rodrik et al. 2004) provided evidence on poor / good condition of infrastructure and management of institution relating with trade and growth. This also supported by Behar & Manners (2008) showing that trade can be facilitated by substantially reducing trade costs by using well established logistics, physical infrastructure and port facilities (Clark et al. 2004)

2.9 Logistics system in Ethiopia

Ethiopia being a landlocked country in East Africa with a land area of about 1.13 million square kilometers and a population of about 106 million as of 2018, has set the goal of becoming a middle-income country by 2025 (GNI per capita between \$1036 and \$4085). Its proximity to the Middle East and Europe puts the country on a strategic position to

enhance international trade. But trade competitiveness of the country is not increased due to low efficient logistic system. poor characterization of Ethiopia's logistic system is due to un coordination between organization and stakeholders in Ethiopia's logistics sector including Minister of transport, customs, banks, service providers such as ship agents, carriers and forwarders locally and at Djibouti , inadequate logistics infrastructure and fleets of freight vehicles in number and age , Inadequate port/terminal and corresponding facilities, inefficient ICT utilization and unavailability of facilities such as GPS and ,intact and damaged warehouses(Shewangizaw, 2016 ; Debela, 2013). The federal democratic republic of Ethiopia (2013) also stipulates complex process of exporting and importing, though export and import performance analysis doesn't follow same step but both have similar way of procedure.

2.9.1 Bank process

Since imports, exports and outgoing foreign payments require foreign exchange permit, trade finance of Ethiopia is provided by both public and private banks in which NBE authorizes commercial banks to approve any values up to 1 million US dollars, except coffee which is handled by NBE itself and exports to China handled by CBE. But these permits may be amended (increased, decreased, date extended) or cancelled (full or partial utilization)

Import

The payment method used are Letter of credit (LC), Cash against document (CAD), or advance payment having validity period of 120 and 30 days respectively. Using survey conducted in 2015 by (Shewangizaw,2016) the total waiting time for both investors and commercials (waiting time to get foreign exchange after submitting request, time to get import permit after submitting request, waiting time for LC confirmation after receiving bank permit) is 184 days and 32 days for private and public banks respectively. But governmental imports as manufacturing, pharmaceuticals and fertilizers, etc. takes one

month using public banks.

Export

Bank service related to export as permit and LC advice is provided free cost and no export tax is levied on export products except semi processed hides and skins (1.5%). Total bank process time (time to get export permit after submitting request and time to advice export that LC is opened by the buyer after they receive the correspondent's bank for export) takes 2-3 days.

2.9.2 Shipping

Shipping involves cargo from port of loading to port of discharge. Most of the time global shipping service operates on regions that have huge trade movement. According to UNDP 2014, Africa accounts only about 6% of global sea bound cargo which resulted in less optimal and subservient service than other global operators. ESLSE provides international shipping service under protection (FOB directives) without competition relying on Djibouti port. But type, size, number and capacity have limitation with magnitude of business needs and also performance features of delivery time of cargo and inefficient freight contract for spot space booking lead to arguments between service levels and slot carriers.

Table 2.7: Advertised frequency of sailing and transit time

Trade route	Port	Frequency of sailing		Transit time(days)	
		Own vessel	Slot vessel	Own vessel	Slot vessel
Far east	Shanghai	Monthly	Weekly	21	24
	Pusan	Monthly	Weekly	21	27
Gulf	Dubai /Sharjan	Every	Weekly	12	18

		2weeks			
India	Nava Shella	Every 2weeks	Weekly	12	18
North continent	Rotter dam		Weekly	-	21
	Turkey	Monthly		7	-

Source: ESLSE Annual report, 2015

2.9.3 Port

Ethiopia as a land locked country, its sea bourn trade is served through neighboring coastal state ports including Port Sudan (1.2%), Barbera (0.2%) and Djibouti (98.6%). Higher vessel waiting time at anchorage/berth which lead to port congestion, shipping delay (15 to 20 days to discharge due to limitation in organization activities and shortage of facilities for the operation are major concerns at Djibouti port in relation to stevedoring.

Import

Transit process affects logistic service efficiency by taking longer time to clear goods through port. (Shewangizaw, 2016) in his report stated as two types of transit. Unimodal transit representing discharge of cargo at the port on port and to move into Ethiopia with prior completion of customs and import formalities, holding average port clearance time of 10 days for containerized cargo which is higher compared to global practice holding 3 days. Multimodal transport of cargo holds shipments covered under combined transport and transferred through the port to inland terminal with single document under custody of single carrier holding relatively short clearance time because its short process time. At the same time cargo port dwelling time (amount of days (hr.) the cargo stays lying in the port terminal from the time it is offloaded from the vessel until it is moved to inland obtaining all permit and clearance requirement) for multimodal cargo is shorter than unimodal. And port

charges for import vary across ports holding higher rates for Djibouti because of Ethiopia's inability to use alternative corridors.

Export

Export freight handling time at Djibouti takes total of 9 days for clearance and stuffing including empty container positioning (2days) and waiting time for shipping (7days) as seen from ESLSE annual report. And transit cost is reduced if all stuffing is carried out locally.

2.9.4 Freight transportation

Freight transportation performance is different for unimodal and multimodal operation by considering the time from assigning trucks (Djibouti) to the cargo discharge. Trucking is the only and primary mode of land transport in Ethiopia, but this truck has limited carrying capacity and inadequate for container haulage as well as age of 44% of the current truck on the road are more than 10 years against licensing requirements. (Shewangizaw, 2016)

Import

Transport of import cargo by trucks in the corridor takes about 3-5 days depending up on the type of cargo including waiting time at check points (Galafi, Mile and Awash), driving time from Djibouti to Mbdjo, Gelan /Comet and truck waiting time to discharge at destination or consignee premises (Shewangizaw, 2016)

Export

According to (Shewangizaw, 2016) export freight transport including time for assigning trucks and preparation of truck way bill, driving time to Djibouti, waiting time at check points takes 4 days for exports.

2.9.5 Inland dry ports

ESLSE maintains dry ports at various inland location (Semera, Mekele, Diredewa, Kombolcha, Mbdjo, Gelan and Comet (AA)) to provide multimodal transport service but Mbdjo dry port is the main operation center. From the survey of MOTr by Shewangizaw, during importation processing time to clear containers and take delivery of cargo from the terminal (trucking waiting time for discharge at dry port and delivery time at dry port) takes 7.7 days. While dwelling time at inland dry port is very high than Djibouti taking 64 days for containers.

2.9.6 Customs process

As trade facilitator custom speeds transit of goods through customs frontiers by removing cumbersome documents and checking formalities and simplifying and streamlining its procedures. Efficiency of logistic operation affected by time taken in waiting for customs transit permit, large number of documents and custom inspection at destination terminals.

Import

In ERCA annual report, 2015 it is indicated that custom process time (days) for container import including time taken for custom inspection at comet and delivery at customs custody is 3 days if it is unimodal transport, whereas 7 days for multimodal transport since it needs custom inspection at dry ports and delivery time from dry ports.

Export

Custom process time for export cargo takes 2 days including inspection by relevant organization and waiting time for transit permit from ERCA including inspection. (ERCA annual report, 2015)

All these have resulted in inefficiencies in the logistics operation leading to higher logistics cost, longer lead time and unreliable service offering. On the other hand, logistic performance index developed by World Bank related to the six dimensions indicators on

trade related logistics performance, from 1 to 5 shows relatively low result for Ethiopia. Therefore, the major factors affecting the logistics service quality should be identified, and the degree of the effect should be tested. Similarly, this research will be aimed at identifying which of these factors have significant impact on the country's trade competitiveness.

1.10.1 Ethio- Djibouti railway

Ethio – China railway is Chinese-built electrified rail project which is owned by the governments of Ethiopia (75% share) and Djibouti (25% share) that can able to handle 95% of Ethiopia's trade that passes through Djibouti. 70% of the activity is held at Djibouti. The total railway capacity is 24.9 million tons of freight annually, with 6 million tons annually expected in 2023. According to World Bank (2013), the routes connecting the Djibouti port to Ethiopia are central to the role Djibouti plays in the region and the lowlands separating Djibouti city from the Ethiopian border are largely arid desert. But modernization of customs procedures in both countries, together with raised fees for storage in or near the port, is causing Ethiopian importers to transport their containers all the way to Addis Ababa or to a Modjo dry port, 60 km away from Addis Ababa (World Bank, 2013). In Djibouti, the trucking market for transport of goods on the Djibouti-Addis Ababa route is dominated by Ethiopian trucking firms than Djiboutian trucking firms (10%). Because Djibouti trucks (200-250) cannot compete with Ethiopian truck (6,000 to 8,000). The other thing is tariff, which is very low by international standards. In addition to this, almost all trucks have to return empty because of the severe imbalance between imports and exports (imports have therefore to bear the full cost of the round trip). So Djiboutian firms are forced to return with empty freight.



Figure 2.1: overview of Ethio-Djibouti railway

2.10 Overview of logistic system in China

China shows massive progress in its logistic industry gives quality of service, reliability, flexibility as more important than price when selecting transportation and logistics service providers (Kearney, 2015). The increase in express technology of e-commerce, overseas infrastructure, logistics network, technological innovation, and efficiency lead companies to move their distribution channels from dealership models to multi-channel and direct sales models, requiring higher density networks with quicker response times. A typical example is Taobao's which is logistics network covering more than 90% of Chinas cities, countries and districts. It focuses only on tier –one –two cities.

Ethiopia is as landlocked country in East Africa, its poor logistics management system and poor transportation infrastructures reduces its ability to transport freight goods quickly, economically and reliably . And its underdeveloped inland transportation and its dependence only in Djibouti port hinders the country trade performance. Optimizing the management of road transport, improving the assessment of freight transport licenses and permits and the inspection mechanism for logistics vehicles, establishing batch of national logistics hubs with multi-transport functions and supporting regional and industrial economic development,

and integration of ports, railways and highways are some of the lessons learned from China. Since Ethiopia is china's important cooperation partner in Africa, they support each other on issues concerning respective core interests. Among them, China's one belt, one road initiative is designed to enhance the orderly free-flow of economic factors and the efficient allocation of resources by expanding business cooperation. Its advantage is development of infrastructure and investments for ports, freeways, bridges & rail, which will open up new international trade & manufacturing, logistics & maritime services, banking & finance and professional services. Ethiopia was among the first in the continent to show interest in the china-initiated B&R, so from benefit of china's one belt one road initiative, Ethiopia may improve its logistic system especially in areas of infrastructure and ports that will lead Ethiopia to a better performance and improvement in trade that will help to cop on with same level to its competitors.

2.11 Ethio-china trade relation-ship on different types of commodities

Ethiopia became source of attraction for China and a potential access for other regional markets such as the common market for eastern and southern Africa (COMESA) because of its regional hub with several international organizations having headquarters in its capital (Wilson et al. 2004). The bilateral trade between china and Ethiopia was started in 1956. Since Ethiopian exports to china are relatively small, china wants Ethiopia's agricultural exports, and rising production costs in china to spur Chinese firms, such as Huajian, to build factories in Ethiopia. Ethiopian government show private operational Chinese investments from 1992-2015 stood at 16.2 billion birrs (\$773m), bigger than any other country's investment in Ethiopia during this period. However, there are also negative views of china's role in Ethiopia as Chinese goods suffer from perceptions that they are of low quality, and Chinese firms operating in the country have been criticized for not transferring knowledge to Ethiopians.

Based on statistics from the international monetary fund's world economic outlook database, Ethiopia's total gross domestic product amounted to \$194.98 billion as of April

2017. Therefore, exports account for about 1.2% of total Ethiopian economic output. As seen from 2017 data, Ethiopia's total import by share of countries continent are Asia (67%), Europe (19%), America (9.8%), Africa (4.2%) and while for exports Asia (43%), Europe (32%), Africa (13%), America (11%), Oceania (1%). By country, the top export destinations of Ethiopia are the United States (\$169M), Saudi Arabia (\$167M), Germany (\$148M), Switzerland (\$130M) and China (\$88.7M). The top import origins are China (\$3.21B), India (\$830M), the United States (\$826M), France (\$476M) and Turkey (\$404M).

Ethiopia became the 91st largest export economy in the world in 2016 by exporting \$1.71B and 57th largest importer in the world by importing \$19.1B, resulting in a negative trade balance of \$17.3B. Ethiopia's top 10 exports are highly concentrated, representing 94% of the overall value of Ethiopian global shipments. The most recent top exports of Ethiopia are Coffee (\$705M):41%, Dried Legumes (\$248M):15%, Gold (\$128M):7.5%, Sheep and Goat Meat (\$98.2M):5.7% and Tanned Sheep Hides (\$42.3M):2.5%. Its top imports are Refined Petroleum (\$1.92B):10%, Delivery trucks (\$803M):4.2%, Packaged Medicaments (\$636M):3.3%, Palm Oil (\$522M):2.7% and Mixed Mineral or Chemical Fertilizers (\$427M):2.2%.

2.11.1 Ethiopia's years of overseas trade, focusing on China

Table 2.8: Ethiopia's years of overseas trade, focusing on China

Year	Ethiopia's Export to China (USD/Thousand)	Export share partner (%)	Export share in total products (%)	Ethiopia's Import from China (USD/Thousand)	Import share partner (%)	Import share in total products (%)
2010	241763.38	10.38	11.70	2062084.70	23.97	79.81
2011	283442.81	10.84	11.39	1718111.46	19.31	81.66
2012	320919.10	11.10	11.65	2572358.00	21.59	80.82
2013	329051.98	8.07	10.78	3244696.55	21.78	79.31
2014	533171.81	9.41	12.81	5808429.60	26.51	80.59
2015	378491.35	7.53	18.14	7166912.40	27.76	81.23
2016	88693.60	5.14	14.02	6095987.65	31.88	85.32

Source: UN comtrade (2016) World Bank

Table 2.9: Types of goods imported from and exported to China (2016)

Imported goods	Value (USD)	Import share of goods (%)	Exported goods	Value (USD)	Export share of goods (%)
Machinery, nuclear reactors, boilers	1.24B	20	Raw hides, skins rather than fur skin and leather	34.28M	39
Electrical, electronic equipment	1.12B	18	Footwear, gaiters and the like	9.32M	11
Articles of iron or steel	575.99M	9.4	Vehicles other than railway, tramway	8.39M	9.5
Vehicles other than railway, tramway	485.92M	8	Machinery, nuclear reactors, boilers	7.65M	8.6
Iron and steel	484.96M	8	Ores slag and ash	7.5M	8.5
Articles of apparel, not knit or crocheted	274.92M	4.5	Coffee, tea, mate and spices	6.91M	7.8
Plastics	184.45M	3	Cotton	3.58M	4
Aluminum	147.64M	2.4	Optical, photo, technical, medical apparatus	2.8M	3.2
Rubbers	135.64M	2.2	Electrical, electronic equipment	2.16M	2.4
Furniture, lighting signs, prefabricated buildings	125.77M	2.1	Lac, gums, resins	1.4M	1.6

Source: UN Comtrade (2016) and World Bank

2.12 Over view of similar studies using different indexes

Table 2.10: overview of similar studies

Authors	Description
Jumadi & Zailani (2010)	Use LPI to address Malaysia's logistics situation and compare it with other economies
Kim & Min (2011)	Examine whether some countries achieve high logistical performance by undermining environmental quality and creating a hybrid index called Green Logistics Performance index

Hoekman & Nicita (2011)	Review different indices of World Bank that concern trade restrictiveness and trade facilitation and apply them to developing countries
Marti et al. (2014)	Present study on the importance of each of the components of the LPI for trade in emerging economies
Solakivi et al. (2014)	Describe logistic system in Finland and uses LPI to compare Finland to its neighboring countries
Erkan (2014)	Researched the connection between the infrastructure – weighted indicators of the GCI and LPI
Ram et al. (2015)	Evaluate LPI of brazil in international trade
Çemberci et al. (2015)	Studied moderator effect of Global competitiveness index(GCI) on the LPI
Vaillancourt & Haavisto (2015)	Studied the relation between the state of logistics in country and the impact of different types (epidemic, flood, storm) of disasters
The International Transport Forum (ITF, 2015)	Present a case study on the logistical performance of Turkey based on component of LPI
Uca et al. (2016)	Study about mediator effect of the LPI on the relation between corruption perception index(CPI) and Foreign Trade volume(FTV)
Ekici et al. (2016).	Research done to prove a close connection between GCI and LPI

Dekker et al. (2016)	Take ranking of Costa Rica as one of the reason for development and need for improvement
Roekel(2016)	Assign weights to its six core components to improve LPI

3 Research Methodology

3.1 Study design and sample selection strategy

To meet the objective, the procedure used in the methodology was, first literature review was made to assess relevant documents related to Ethiopian Logistic system Performance as a whole and using the data taken from World Bank which rank countries by their trade and transport facilitation every two years, countries logistic bottlenecks were determined. Secondly experts in logistic in China and also who are working in logistic service areas with

Ethiopia were selected and interviewed about the logistic activities between the two countries. This help the researcher to develop the questionnaires' distributed to the stakeholders. Thirdly stakeholders were selected for in-depth analysis about the existence, cause and effects of the problem. The target populations of the study were those playing direct role in the due course of processing logistic activities. These are exporters and importers, Ethiopian shipping and logistics services enterprise (ESLSE), Ethiopian revenues and customs authority (ERCA), Ethiopian Freight forwarders and Shipping Agents Association and Transporter in China.

3.2 Data collection

The data collection process undertaken for this study was both primary and secondary data. In addition to gathering all necessary documents from different public and private organizations such as Ethiopian Customs Authority, Ethiopian Shipping Lines Share Company (ESLSC), National Bank of Ethiopia (NBE), Ethiopian Ministry of Trade, different related documents such as; World Bank Reports, books, international journals, studies and other logistic system related materials were reviewed to assess the current condition of logistic system problems and its effect in Ethiopia. This helps to strengthen the analysis and to have an understanding on what has been done in the past and current situation and to tell the experience of different countries for an efficient logistic system. In contrast, primary data was collected by the researcher based on the knowledge gained through the secondary data. The survey questionnaire was presented to Ethiopian importers and exporters who participate in trade business with china in different kind of commodities. Data was collected from traders to give the opinion on possible problems related to customs, warehouse, international shipping, Djibouti dry ports, and information technology. At the same time logistic service providers of Ethiopia (ELSE, ERCA) evaluate the service performance of the logistic system used in Ethiopia on the same issues raised for traders. Sampling size of 5-10% of the total population of each stakeholder has been considered. The chosen percentages depend on the time constraints, trustworthiness of the respondents or richness of the data and

representativeness of the stakeholder. Therefore, the distribution of questionnaire was made to be representative to 60 traders and 40 Logistic service providers. In general, responses for questionnaire were collected from 100 respondents. The Questionnaire consists of closed choice or fixed questions and open-ended questions (See Annex 2 and 3). Simple random sampling technique is used to select a participant from each group in which each element has an equal and non-zero chance of selection, though random selection does not always produce a sample that is representative of the population. Therefore, the samples were selected randomly. The owners/manager that had authority over the company shipping decision and employees of logistic service providers are involved on the presented questionnaires. On the other hand, semi-structured interviews were also conducted from Ethiopian freight forwarders and shipping Agent Associations in China to get a detailed explanation of the current situation.

3.3 Data analysis

In order to identify the main trade partners of Ethiopia, first the main Import origins and export destination of Ethiopia was determined and 34 countries were chosen. Indexes values of LPI which is determined by World Bank were used to spot out Ethiopia's logistic bottlenecks and used to compare Ethiopia with its trade partners and also neighboring countries. The LPI indexes data from 2007 to 2016 were used for analysis. The collected data from traders were analyzed in order to describe the existing conditions of Ethiopian logistic system and salient factors occurring in trade business. The problems faced by traders are ordered sequentially depend on the frequency in which they were chosen by the respondents. Similarly, the results from logistic service providers were analyzed from the evaluation made in 5-points rating scale where: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; and 5, strongly agree. At the end, results from the two stake holders compared so that the result distinction was observed and the factors that seek improvement to meet the required customers' satisfaction were determined. In order to analyze the results, tables, charts and graphs were used.

4 Result and Discussion

4.1 Evaluation of Logistic Performance Indexes of Ethiopia in the International Trade (2007-2016)

Figure 4.2 shows LPI values of Ethiopia for all of its six components starting from 2007 to 2016 which is developed by World Bank every two years.



Figure 4.2: Ethiopian logistics performance from 2007 to 2016

Source: authors based on World Bank LPI report (2007-2016)

Indicating ability of customs and border agencies in clearance process, Custom index of Ethiopia shows relatively good improvement across the year. According to World Bank 2016 by custom, Ethiopia is ranked 80th among 160 countries. This is comparatively the same to the rank of countries which is in medium logistic performance.

In case of Quality of transport and IT infrastructure for logistics, Ethiopia shows improvement in infrastructure in year 2012, but have lower score in year 2014 and 2016. According to World Bank 2016, Ethiopia ranked 132 out of 160 countries by the score of infrastructure index.

International shipment index analysis shows the ease and affordability of arranging international shipments. As per the indexes, Ethiopia shows inconsistency across the year

2007 – 2016 and ranked 101 out of 160 countries as World Bank report 2016.

According to the competence of the local logistics industry, Ethiopia’s logistic service and competency index shows continuous improvement across 2007 to 2014. But in 2016 it decreases with a relatively small point. Leading Ethiopia to be ranked 117 out of 160 countries according to World Bank 2016.

By ability to track and trace international shipments and by quality of information technology in logistic process, Ethiopia is ranked 133 out of 160 countries according to World Bank 2016, and as seen from the figure there is inconsistency across the year.

According to timeliness of shipments in reaching destination Ethiopia’s timeliness index score shows inconsistency across the year (2007 – 2016). And in 2016 Ethiopia is ranked Ethiopia 149 out of 160 countries in 2016.

4.1.1.1 Custom index variables of LPI

Custom index variables of LPI includes variables that are provided during custom clearance which include clearance time, physical inspection of goods while entering the country and total number of documents necessary to accomplish the customs clearance process.

Table 4.11: Averaged custom variables of LPI according to the World Bank (2016)

Country	Clearance time with physical inspection (days)	Clearance time without physical inspection (days)	Physical inspection (%)	Multiple inspections (%)	Number of agencies - exports	Number of agencies - imports	Number of documents - exports	Number of documents - imports
Ethiopia	2	3	4.83	8.18	7	4	7	5
Djibouti	1	1	8.14	5.01	3	3	3	3
Kenya	2	2	40.18	10.22	5	4	5	4
Sudan	3	5	34.14	48.27	5	5	5	5
China	3	2	9.68	3.38	3	3	5	4

Source: Elaborated by authors using data from World Bank report (2016)

Table 4.11 presents Number of import agencies at the border, Physical inspection of shipments imported, Multiple inspection of the shipments physically inspected, Documents required to allow exports (customs procedures), Documents required to allow imports (customs procedures), Customs clearance time with physical inspection, Customs clearance time without physical inspection.

In terms of customs clearance with or without physical inspection it is observed that Ethiopia holds 2 days and 3 days respectively. Regarding the number of export and import agencies, Ethiopia has 7 export and 4 import agencies, while China has 3 number of import and export agencies respectively. And Ethiopia needs 5 documents to allow the import and 7 documents for exports while in China the amount is 4 and 5 respectively.

4.1.2 Relative comparison of Ethiopia with its neighboring countries using LPI

According to World Bank report (2016), domestic LPI results indicate that, the main determinant of the performance difference between two countries is the efficiency of processes in clearance and delivery of the shipments. Efficiency of customs in terms of speed, simplicity and predictability, quality of logistic service and infrastructure quality is critical to assure connectivity and access to trade gateways for any country.

Table 4.12: Relative comparison of Ethiopia with its neighboring countries using indexes of LPI in 2016 (1- worst to 5- best)

	Rank	Trackin g & Tracing	Logistic & competen ce	Internation al Shipment	Custom s	Timelines s	Infrastructu re
Djibouti	134	2.09	1.96	2.48	2.37	2.69	2.30
Kenya	42	3.42	3.24	3.24	3.17	3.70	3.21
Eritrea	144	2.03	2.25	2.16	2.01	2.50	2.06

Ethiopia	126	2.18	2.37	2.56	2.60	2.37	2.12
Somalia	158	1.51	1.85	1.86	1.29	2.35	1.57
Sudan	103	2.49	2.36	2.57	2.23	3.28	2.20

Source: authors based on LPI report (2016)

Table 4.12 shows comparative values using six pillars of World Bank for six countries. When Ethiopia (126th) is compared with its border countries using the rank given by World Bank it has lower rank than Kenya (42nd) and Sudan (103rd) and higher rank than Djibouti (134th), Eritrea (144th) and Somalia (158th).

4.1.3 Comparative Rank of Ethiopia along with Its Trade Partners using LPI (2016)

Based on the criteria described in the methodology, 34 countries which are Export destination and Import Origin of Ethiopia were selected. The results in Annex 1 is taken from World Bank report (2016) showing the scores (5 – point scale) of the six indicators of LPI. From Annex 1 it might be observed that among 10 top trade partners of Ethiopia which include China, Kuwait, Switzerland, Netherland, US, Japan, India and Somalia in international trade, Ethiopia has presented a relatively low performance indexes, only overcoming countries like Somalia and from all 34 trade partners it overcomes Djibouti in addition to Somalia.

The export roles in global economy and high level industrial environment is essential for countries development. “This indicate that the countries can be competitive in global market if its industry can produce at least equal to or above that of its foreign competitors.” (Mustra, 2011).

4.2 Logistic Performance analysis using LPI

Logistics and other indexes together determine how country is performing and state on which standard the country is performing related to logistics and trade. World Bank (2014)

finds that to improve logistics performance different strategies should be taken by low income, middle income and high-income countries. And slow logistic development of low income countries came from infrastructure improvement and border management which is reforming custom agency.

In recent LPI report (World Bank, 2016) Germany ranked as 1st and Syrian as last performance country. Ethiopia ranked 126th with mean score of 2.42. Along LPI editions the score for Ethiopia shows inconsistency. by custom index Ethiopia ranked 95th having 2.14 score, by infrastructure index 144th with score of 2.12, by international shipment index 117th with score of 2.53, by logistics quality and competence index 121th with score of 2.39, by tracking and tracing index 132th with score of 2.35, by timeliness index 151th with score of 2.62. It can be concluded that the score shows where the problem is and problem related to the sectors dimension will lead to lower scores, this also tells about the causes that lower trade performance. Lower score and bottom performance ranking are caused by variant factors, these factors are result of either logistic service providers or by government or by traders itself, which has a direct effect on trade competitiveness of the country. From World Bank report (2007-2016) it can be seen that depending on the ranks and scores each activity on logistic system can directly affect the country.

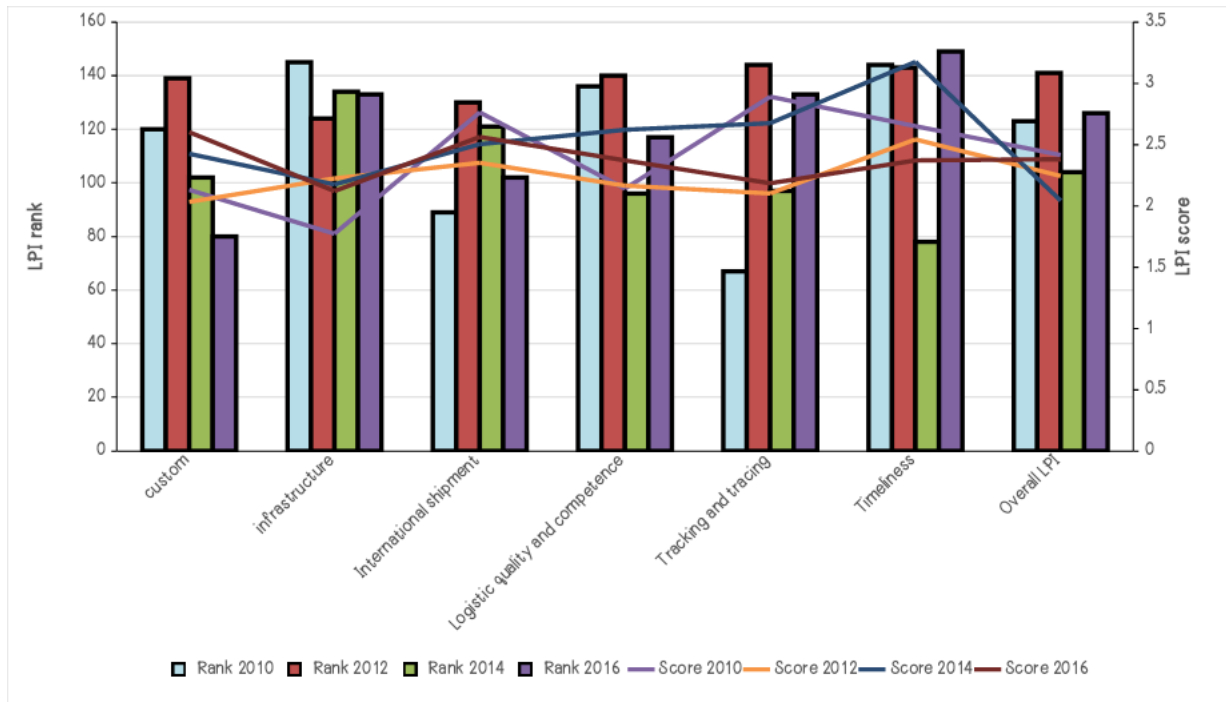


Figure 4.3: LPI score and rank of Ethiopia (2010-2016)

Source: Elaborated by the authors using data from World Bank (2010 - 2016)

The elaboration in indicators such as Timeliness, Logistic competence, and tracking and tracing capability lead Ethiopia to increase its overall LPI score in 2014, and LPI score of Ethiopia has declined from 2.59 of 2014 to 2.38 of 2016. This is because of the indexes value related to infrastructure, tracking and tracing and timeliness.

As it is seen infrastructure and timeliness shows the lowest performance for Ethiopia. In accordance, other indexes also show low results for infrastructure. Global competitiveness index (GCI) presented by World Bank have common pillar with LPI. These include infrastructure as very common pillar and also, GCI presents problem factors for doing business in their country. In this index, from the basic requirements Ethiopia's infrastructure is ranked 115th /137 countries with score of 2.7 which is very low. Goods

market efficiency can be improved by better logistics and innovation can also be important factor in logistic system. By innovation and institution Ethiopia is ranked 86th with score of 3.2 and 73th with score of 3.83 respectively. GCI briefly describes the ranks for every infrastructure which are stated in the result. In the other hand Linear shipping connectivity index which is created by United Nations conference on trade and development indicates how well a country lies in shipping network. But this index doesn't provide data for Ethiopia. This ranking will lead to easy access to this network and is likely to have a well-developed economy and trading system. GDP gives an impression of how developed a country is and it is likely that there is a correlation between logistic performance and GDP of the country. Other index as supply chain Global resilience index which is related to supply chain visibility identifies supply chain risk, improve agility, lead time and performance, identify shortage and quality issues along the supply chain. In this index with supply chain core index including control of corruption, quality of infrastructure and local supplier quality Ethiopia is ranked 110th with score of 22.9.

Developing countries and countries which are landlocked share some characteristics. Especially countries which share borders have almost similar flow of supply chain in logistics and economy. Ethiopia is located in horn of Africa and shared borders with Eritrea to the north and northeast, Djibouti and Somali to the east, Sudan and South Sudan to the west and Kenya to the South. Sudan has largest economy with GDP of US\$95.5% billion with annual growth of GDP 4.7%in 2016.only South Sudan and Ethiopia are land locked countries which are categorized as low-income countries.

Table 4.13: Macroeconomic indicators and information on 7 countries (2016)

Description	Ethiopia	Djibouti	Eritrea	Somalia	Sudan	Kenya	South Sudan
Total area (km ²)	1000000	23180	101000	627340	2376000	569140	-
Population in 2016(millions)	102.4	0.94	-	14.3	39.5	48.4	12.2
GDP in 2016(US\$ billion)	72.3	-	-	6.2	95.5	70.5	-
export of good and service (%of GDP)	8.01	-	-	14.86	9.83	14.57	-
Import of good and service (%of GDP)	27.78	-	-	63.04	12.53	23.36	-
Trade (%of GDP)	35.79	-	-	77.9	22.36	37.93	-
Income level	Low income	Lower middle income	Low income	Low income	Lower middle income	Lower middle income	Low income

Source: authors elaborated from World Bank data (2016)

Measuring burden of preparing bundle of documents that will enable completion of international trade is good foot print to know the effects of logistic activities. In Ethiopia, total number of documents needed to import and export is 5 and 7 respectively, which is

relatively higher than other border countries as Kenya, Djibouti and Sudan (World Bank, 2016). Higher documents will lead to low performance which is due to excessive beurocracy of the country. At the same time, longer custom clearance lead to longer time for importing and exporting as well as examination delay can occur due to physical examination. In addition to this cost and time associated with economies custom regulation and compliance with documentary is higher for imports than exports which can affect import trade of the country. The lead time excluding international shipping, indicating shipment from point of origin (seller's factory /commercial center) to port of loading (equivalent port /airport) is greater for imports in Ethiopia than exports. And also, the total necessary time needed to comply with all procedures to export and import goods including the waiting time during procedures for example during unloading of cargo is higher for Ethiopia when compared to Kenya and Djibouti. From the comparative analysis along the country, Ethiopia scores higher scores by customs and international shipping index than sub-Saharan Africa and low-income countries and by logistic competence index than low income countries. Along Ethiopian border countries, Kenya and Sudan shows good logistic performance than Ethiopia having high scores with all indexes of LPI. Among 6 indexes of LPI, Ethiopia have higher scores than all other border countries except Sudan and Kenya by tracking & tracing and international shipping. Using logistic competence and custom index Ethiopia has good performance than all other border countries except Kenya. But by timeliness and infrastructure index Ethiopia only exceeds Somalia and Eritrea.

Number of calendar days needed to complete all the necessary procedure to start business is improving along the year. But still problematic factors that affect doing business as foreign currency regulation, corruption, inefficient government beurocracy, inadequate supply of infrastructure and inadequately educated work force still occurs. World Bank (2016) defines quality of port infrastructure as it measures business executive's perception of countries port facilities. As per the data from world economic forum, respondents in land locked country are allowed to answer how accessible port facilities as extremely

inaccessible and extremely accessible. Ethiopia as one of land locked country its quality of port infrastructure is good during the year of 2010 holding value of 4.43 but shows declining in recent years with value of 2.7. And also the volume of freight, express and diplomatic bags carried on each flight stage shows greater improvement along the year and custom procedure along the year shows in consistency indicating higher results in 2010 and lower results in 2014, but again improvement in current year with the value of 3.6.in the coming years Ethiopia is expected to excel in logistic performance since the development of the country is on the rise.

Above and beyond best practice of LPI, its components miss two things which are very important. These are innovation and environment. The World Bank could review which factors should be added or left out before a new report is produced. This all indexes shows relative development of country related to its logistic system and the score with respective core pillars presents countries competitiveness and trade and transport development of a country. The aim of these thesis is also to find the gap that lead the country to be less competitive and to evaluate the constraint factors in logistics system.

Table 4.14: Ethiopia’s LPI along countries score card

	Ethiopia		Against top performer in 2016 rank		Against its region and income group Sub-Sahara n Africa		Against top performer in region		Against top performer in income group	
	Rank	Score	Germany Rank	Score	Low income Score	South Africa Rank	Score	Uganda Rank	Score	
All LPI indexes	126	2.38	1	4.23	2.47	2.41	20	3.78	58	3.04
Customs		2.60		4.12	2.36	2.29		3.60		2.97
Infrastruc		2.12		4.44	2.29	2.18		3.78		2.74

International shipments	2.56	3.86	2.49	2.49	3.62	2.88
Logistic competence	2.37	4.28	2.42	2.34	3.75	2.93
Tracking and tracing	2.18	4.27	2.39	2.32	3.92	3.01
Timelines	2.37	4.45	2.84	2.79	4.02	3.70

Source: authors elaborated from World Bank data (2016)

4.3 Comparative analysis using GCI and FM Global resilience index

❖ Analysis using GCI

GCI define competitiveness and factors that determine the level of productivity of a country. The level of productivity sets the level of prosperity that can be reached by an economy and rates of return obtained by investments in an economy, which in turn are the fundamental drivers of its growth rates. In other words, a more competitive economy is one that is likely to grow faster over time.

Table 4.15: Rank and score of Ethiopia using GCI

GCI	Rank /137 countries	Score (1-7)
A. Basic requirements	107	4
1.Institutions	73	3.8
2.Infrastructure	115	2.7
3.Macroeconomic environment	57	4.9

4. Health and primary education	111	4.8
B. Efficiency enhancers	120	3.4
5. Higher education and training	125	2.8
6. Goods market efficiency	124	3.7
7. Labor market efficiency	72	4.2
8. Financial market development	109	3.4
9. Technological readiness	130	2.4
10. Market size	67	3.9
C. Innovation and sophistication factor	100	3.4
11. Business sophistication	112	3.5
12. Innovation	86	3.2

Source: Elaborated by authors using data from Global competitiveness report (2017-2018)

The core pillar that is common with LPI is infrastructure. Extensive and efficient infrastructure is critical for ensuring the effective functioning of the economy. Effective modes of transport including high-quality roads, railroads, ports, and air transport enable entrepreneurs to get their goods and services to market in a secure and timely manner and facilitate the movement of workers to the most suitable jobs. A solid and extensive telecommunications network allows for a rapid and free flow of information, which increases overall economic efficiency by helping to ensure that businesses can communicate and decisions are made by economic actors taking into account all available relevant information.

Table 4.16: Rank for Ethiopia using infrastructure pillar of GCI

	Value	Rank
Infrastructure	2.7	115
Quality of overall infrastructure	3.5	94
Quality of roads	3.3	97

Quality of rail road infrastructure	2.9	61
Quality of port infrastructure	2.7	119
Quality of air traps infrastructure	4.2	77
Quality of electricity supply	3.2	109
Fixed telephone lines /100 population	1.1	118

Source: Elaborated by authors using data from Global competitiveness report (2017-2018)

❖ Analysis using FMGlobal Resilience Index

Global resilience index shows supply chain visibility relating the following core pillars. Ethiopia's rank is presented in the table 4.15

Economic – represents political and macroeconomic influences on resilience by combining productivity, political risk, and oil intensity and urbanization rate.

Risk quality – is related to ability to draw upon the wealth of experience.

Supply chain – relates to the supply chain itself and comprises four drivers: control of corruption, quality of infrastructure, local supplier quality and supply chain visibility.

Table 4.17: Rank and score of Ethiopia using Global resilience index

Composit e		Economi c		Risk Quality		Supply chain	
Rank	Score	Rank	Score	Rank	Score	Rank	Score
127	12.7	129	1.1	111	17.9	110	22.9

Source: Elaborated by authors using data from Resilience index annual report (2017)

4.4 Logistic system evaluation from Ethiopian Traders point of view

Customers involved in trade business with different kind of commodities were asked the type of problems they face in trade related to the countries logistic system. The questions given include the problems that are related to customs, international shipping, shipping delays, cargo delay at port, transportation, warehouses at dry port, and logistic professionals. The question was opened to choose more than one criteria of which they normally challenged with and also asked how it affect their company. In addition to this they are asked to specify type of problems they face if it is not mentioned in the list.

General information

❖ **Gender**

Out of 60 respondents, more of them (41) are males and the rest 19 of them are females.

❖ **Educational background**

The educational background of the respondents was mainly at first degree graduate (53.3 %). followed by Diploma level and High school (31.7%) graduates.

❖ **Work experience**

43.3% are in the sector for 1 – 10years time while 28.3 % are in sector of 11-20 years and the rest of the respondents were beyond 20 years of experience.

❖ **Number of employees**

44.9 % of respondents have fewer than 50 employees and 44.8 % of the respondents have 50– 500 employees while the rest has more than 500 employees

❖ **Direction of trade and transport dealing with**

53.3 % of the respondents import goods from foreign countries and 30 % of

respondents export to other countries while 16.7 % of the respondents use both direction of trade. Among 60 respondents 66.7% of them import goods from china and export goods to china while the rest deal with other countries.

4.4.1 Customs related problems

Respondents were asked if they face problems that occur at customs during custom clearing procedure which include dishonesty of clearing agents, high custom duties, corruption environment, late receipt of shipping document, delay in custom clearing procedure and absence of labors. And also the impacts of the late custom clearance procedure be challenge for the traders , including Demurrage(a cost charged by steamship lines which occurs at port area when containers held longer than agreed standard free time for the use of their shipping container), Per diem (charge applied by the steamship lines for the use of their equipment) , detention (charges often charged by truckers due to excess time taken by the consignee for unloading cargo) , missing documents and physical damage to the containers .

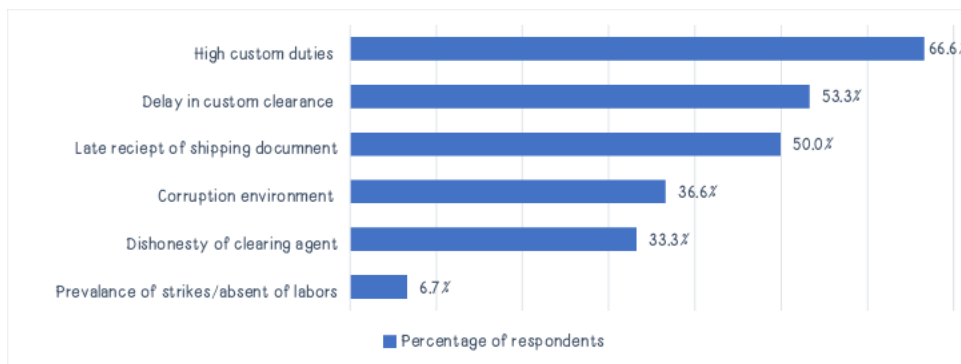


Figure 4.4: Percentage of response for custom related problems

Note: This question was opened to choose more than one criteria to apply that's why it adds up more than 100%.

Out of listed problems 66.6% of respondents choose unexpected custom duties, late receipt of shipping document 50%, delay in custom clearance procedure 53.3%, corruption

environment and dishonesty of clearing agent holding 36.6% and 33.3% respectively.

4.4.1.1 Impact of frequency delay of cleared goods

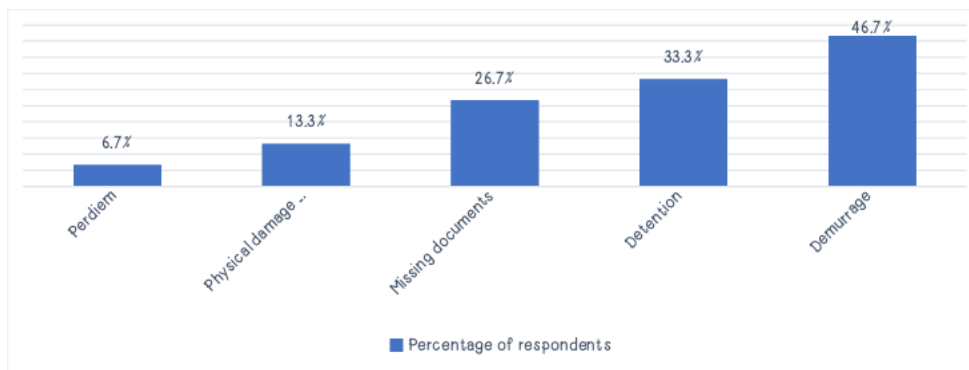


Figure 4.5: Impact of frequency of delay of cleared goods

The delays in custom clearing procedures cause traders to face Demurrage 46.7%, Detention 33.3%, Missing documents and physical damage to the container 26.7 % and 13.3% respectively.

4.4.2 International shipping related problems

Importers and exporters who deal with foreign countries to ship goods to and from a country may face problems while shipping internationally. As the response of the respondents 46.7 % holds unexpected additional duty fees, 40% is for Trucker shortage, 33.3 % is to less shipping company, 26.7 % to Port congestion and High Shipping costs and 20 % is due to less experience in international freight forwarding. And also, other problems as, Chassis shortage, inefficient mode provision, and Insufficient shipping time are occurred with smaller percentages.

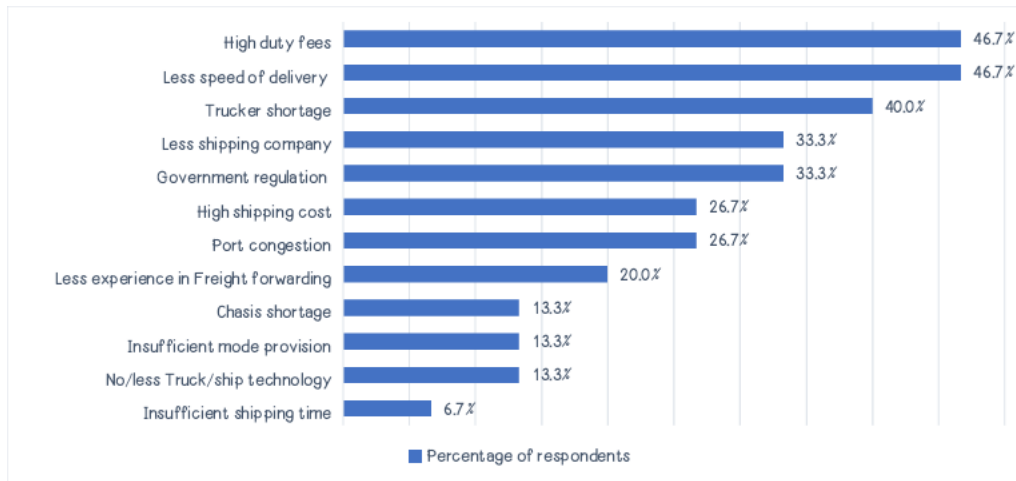


Figure 4.6: Percentage of response for international shipping related problems

4.4.3 Shipping delays

When exporting to and importing from a country the respondents were asked to choose which factor causes their shipping to be delay. As per the percentage of respondent's port and/terminal congestion holds 33.3 % of causing shipping delay and vessel delays due to weather condition (which include when a vessel has to skip a port of call due to poor weather condition and when the vessel is at the port but cannot leave due to bad weather) and customs inspection at both port of loading and port of destination holds 26.7 % of respondents. While 13.3 % of respondents agreed on the causes of shipping delay due to incorrect documentation and container not being returned to liner by cutoff date (the date by which the loaded container should be returned at the port)

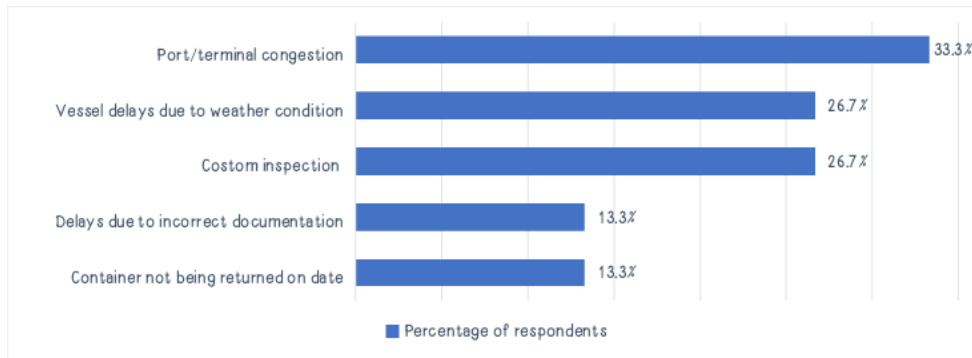


Figure 4.7: Percentage of response for shipping delay related problems

4.4.4 Delay of cargo at the port

Respondents were asked to choose the cause of delay of cargo at the port is whether due to Lengthy examination of goods, Overweight or damaged container, Delayed freight release or due to problems with Custom clearance issues.

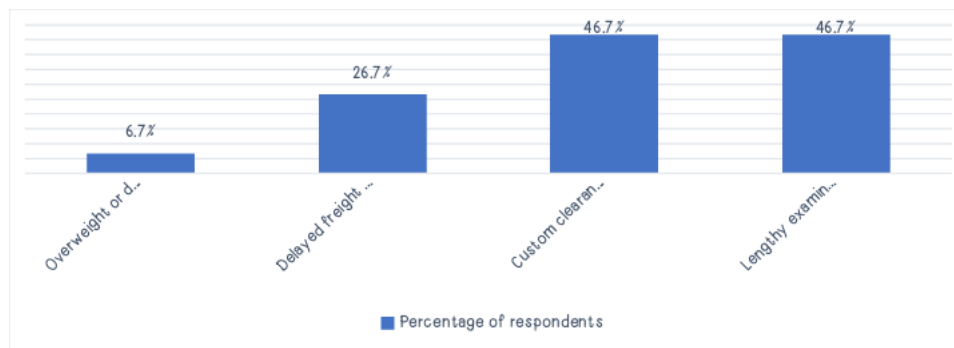


Figure 4.8: Percentage of response related to delay of cargo at the port

- Out of which 46.7 % of the respondents agreed on the cause of delay is by custom clearance issues and lengthy examination of goods respectively and 26.7 % respond that cargo can be delayed because of the delayed freight release.
- Besides the occurrence of these problems, traders especially importers intentionally

let the goods to stay at the port until they find markets for their goods, but respondents stated that the reason behind is due to unexpected custom duties.

4.4.5 Transport related problems

Respondents were asked of the listed problems to select of which they typically face from transportation related problems among them: Increase in unit cost (46.7 %), less speed of delivery and timely delivery (40 %), less flexibility (33.3 %), Government issues (26.7%) as Restriction in shipment size, less security and less transportation management are the major problems which get highest responses from the respondents which are related to transportation. Beside this problems like under capacity, inefficient mode provision and arguments with transporters occur in smaller amount as percentage of respondents.

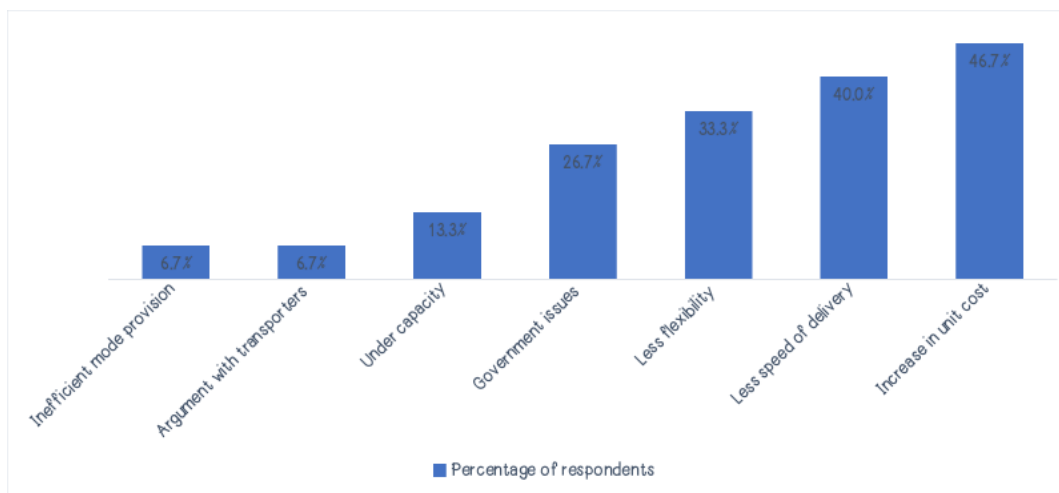


Figure 4.9: Transport related problems

4.4.6 Factors considered by traders when choosing Freight mode

Respondents were asked which reliable factors they consider while selecting mode of transport in trades from air, water and land transport along the international trade with China , 60 % of respondents chooses comparative unit cost which the modes incur to select the transport mode followed by, 53% the reliability that the mode demonstrates in

its ability to fulfill service requirements, 46.7 % required delivery date, 33.3 % transit time, 33.3 % possibility of damage, 26.7 % the flexibility that the mode exhibits and number of transshipment points, and 20 % for each select shipment size, the speed which the mode exhibits and item type.

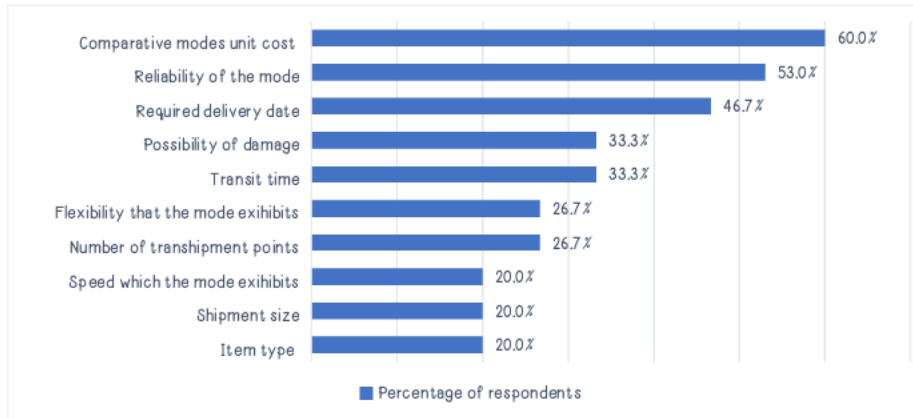


Figure 4.10: Factors considered when choosing freight mode

Freight mode

Respondents were asked which freight mode they typically use in their trade business and which one is convenient for them. 53.3 % of respondents use multimodal transport, 20% % use maritime and 26.7% use air transport. Multimodal transport service implies the service given by ESL which is door to door cargo service with single administrative document from point of origin to point of destination. When traders use multimodal transport, cargos are shipped from port of origin via Djibouti port and finally to Modjo dry port as well as other needed inland dry ports. Unimodal transport service is also given by ESL which is disintegrated services with many operators and agreements. Service given by ESL in case of unimodal transport ends at port of Djibouti after that consignee will choose their transporter to receive the cargo.

Table 4.18: Freight mode used by traders

Freight mode of transport used		
Multimodal	sea	Air
53.3%	20%	26.7%

4.4.7 Information technology

Respondents were asked to choose problems occurred in logistic systems in relation to IT infrastructure based on points of identification delay, identification accuracy, configuration check points, aggregated shipping, information standardization, and information accessibility.

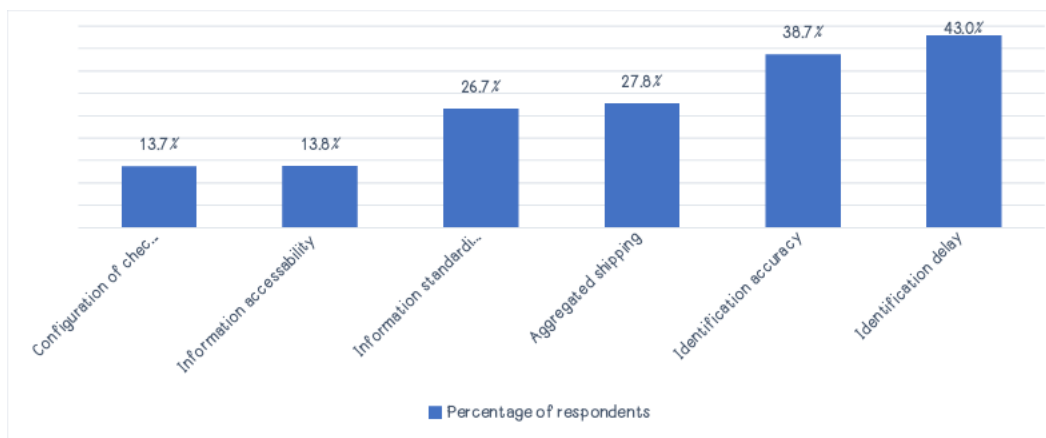


Figure 4.11: Percentages of respondents for location tracking problem

- 43 % chooses identification delays (when product at the warehouse or other supply chain site wait for long period of time in the receiving area without being booked into information system causing information auto dated until products are processed)
- 38.7% respond to identification accuracy (shortage of identification technologies as Barcode, contact memory button and RFID)
- 13.7 % chooses configuration check point problem (less number and location of

check points along the supply chain)

- 27.8% of respondents agreed on less use of identifiers in containers or pallets.
- 26.7 % chooses information standardization by stating that there is no enough standardized information sharing in logistic activities.
- Information accessibility through participating entities holds 13.8% of respondents.

4.4.8 Warehousing at dry port

Respondents were allowed to evaluate the performance of warehouse at the dry port. They were asked if the listed issues are occurring in a good performance and services are given in a manageable way, by letting them to choose YES or NO.

Table 4.19: Number and Percentage of responses for warehousing at dry port

	YES	Percentage (%)	NO	Percentage (%)
Conditions	Number of response		Number of response	
There is enough space for utilization and handing	26	43.3	34	56.7
There is good Warehouse lay out	28	46.7	32	53.3
The warehouse can handle all the merchandise	24	40.0	36	60.0
It is easily accessible for Picking of goods	32	53.3	28	46.7
There is sufficient Handling equipment	24	40.0	36	60
Duration of storage is enough	27	45.0	33	55.0
There is access and parking for vehicles	22	36.7	38	63.3
There is enough Number of docks	24	40.0	36	60.0
There is Secure compound	22	36.7	38	63.3
Assembling consignments are done properly	24	40.0	36	60.0
Dispatching consignments are done properly	24	40.0	36	60.0
Receiving and issuing of supplies are in a good accordance	26	43.3	34	56.7
There is suitable quality control and	25	41.7	35	58.3

verification				
Detection and dealing with losses are done	27	45.0	33	55.0
Rejected material managed easily	30	50	30	50.0
Deal with unwanted material and disposal of goods	31	51.7	29	48.3

For this section, it is analyzed based on the highest percentage of responses

According to this, respondents agreed on good performance of the warehouse related to

- Easily picking of goods from the warehouse,
- dealing with unwanted materials and disposal of goods,
- Managing of rejected materials in the warehouse.

Apart from this, respondents disagreed on the well performance of warehouse that include

- Enough area for slotting of goods,
- good warehouse lay out with enough space utilization and handling,
- efficient merchandise handling,
- inventory replenishments,
- sufficient handling equipment,
- enough long and short duration of storage,
- sufficient access and parking of vehicles with secure compound,
- enough number of docks,
- Managed assembling and dispatching consignments, and good quality control and verification.

4.4.9 In terms of logistic professionals

The respondents were asked to evaluate the logistic professionals from which they get services. 26.7 % of the respondents agreed that there is few logistic trained expertise and No new IT developments in logistics that control the competencies of existing work force, 20 % agreed that there is low prestige of operational logistic workers and low quality in educational experience, and 13.3 % holds for the limited labor supply in remote areas where logistic hubs are often located and hiring and retaining issues difficulties

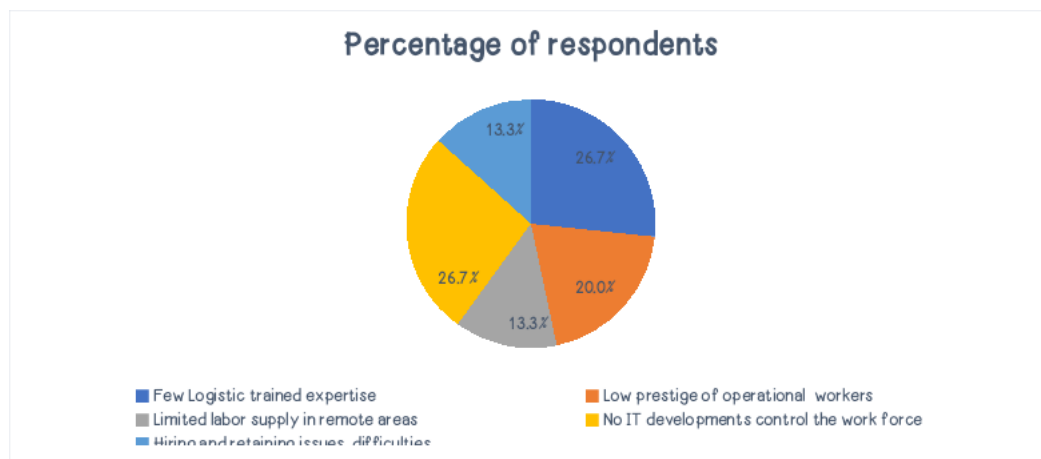


Figure 4.12: Percentage of response for logistic professional performance

4.5 Logistic system evaluation from logistic service providers point of view

Logistic service providers were asked to evaluate the service performance on the following issues in logistic system of the country's trade partnership. The results are analyzed on which the respondents made 5-points rating scale where: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; and 5, strongly agree.

General information

- The educational background of the respondents was mainly at first degree graduate and Diploma level (80%)
- Out of 40 respondents, more of them (32) are Females and the rest 8 of them are

males.

- All of the respondents were from different sectors of Ethiopian logistic service enterprise (68 %) and Ethiopian revenues and Custom Authorities (32 %)
- Year of experience; 70% are in the sector for 1 – 10years' time while the rest of the respondents were beyond 10 years of experience.
- 56.7 % of respondents have mentioned that they have less than 50 employees and the rest of the respondents specify that there are 50– 500 employees in the company.

4.5.1 Port and Terminal

The respondents were asked to evaluate the service performance of port and terminals in Ethiopia. The result is analyzed based on the highest percentage of the respondents as a whole, due to the limitation because of the number of issues listed are not convenient to analyze independently. Listed issues are presented in Table 4.18

- more of the respondents agreed that dry port and terminal facilities are well accessed throughout the country giving their service in efficient way with reasonable charges and in time of service they follow as per the schedule and solve if any discriminations occurred and also safety of cargo at any movement be ensured.
- all most all of the respondents agreed that overall management practice of dry port and terminal is satisfactory but half of the respondents still have doubt that it can serve as good point of destination to Ethiopia's export and import cargoes.
- Related to customs the respondents agreed that custom control and clearance are done completely but they stayed neutral on the issue that custom inspection is done at port of loading and port of destination. The respondents agreed on provision of cargo stuffing and un stuffing, loading and unloading services in all dry ports but

stayed neutral with occurrence of port / terminal congestion.

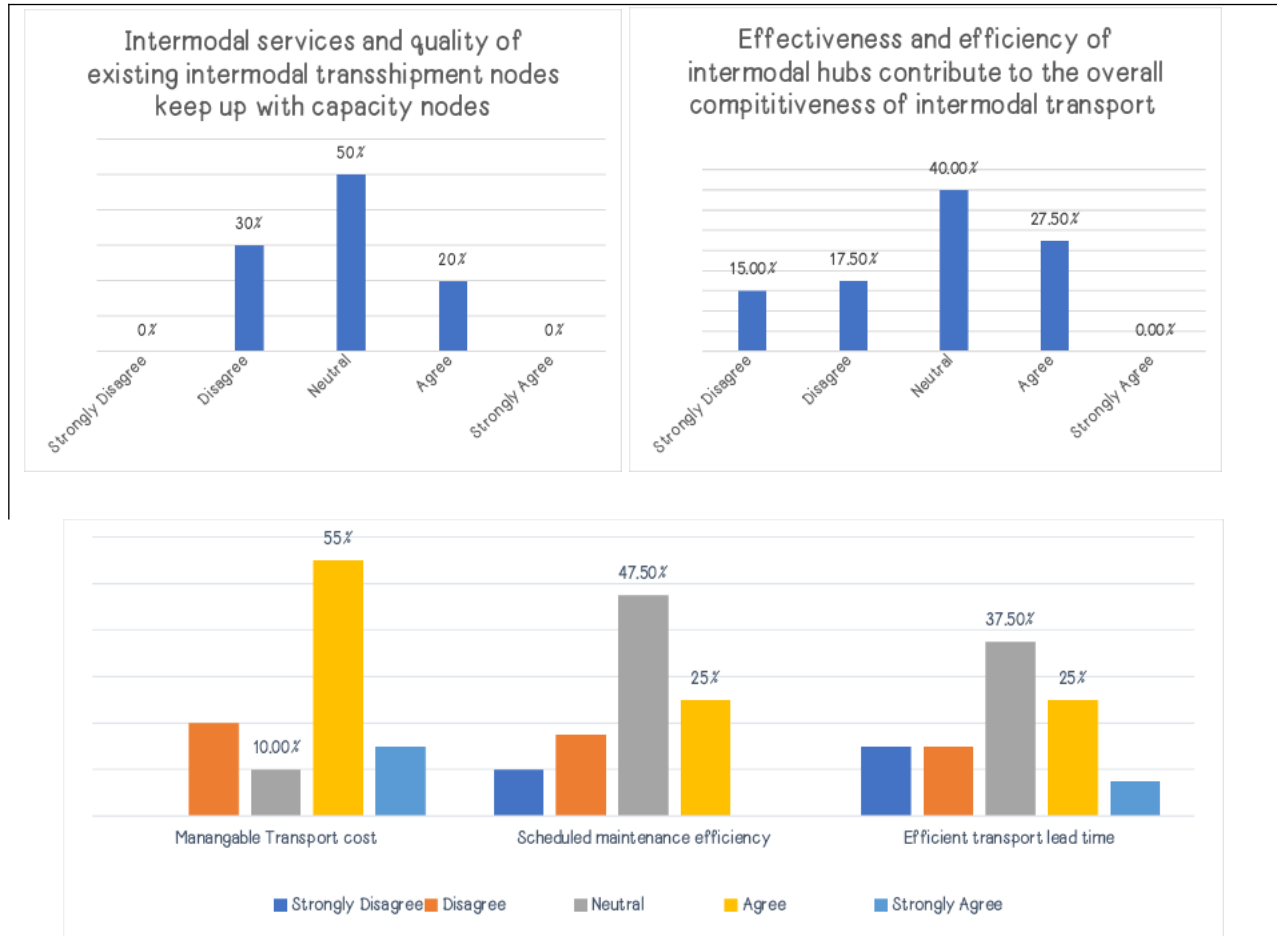
- Related to necessary equipment's and facilities, the space and capacity to accommodate all incoming and outgoing cargoes, about (40%) of respondents did not agree.

Table 4.20: Percentage of response for port and terminal

Conditions	Percentage of respondents %					Total
	SD	D	N	A	SA	
Dry port and terminal facilities are well accessed throughout the country	5.0	35.0	15.0	45.0	0.0	100.0
All the available dry ports and terminals are well equipped with all the necessary equipment and facilities	5.0	45.0	35.0	15.0	0.0	100.0
The available dry ports and terminals have enough space and capacity to accommodate all incoming and outgoing cargoes even in peak periods	15.0	40.0	30.0	15.0	0.0	100.0
Dry port terminal services are provided easily with acceptable waiting time	15.0	40.0	20.0	20.0	5.0	100.0
The charges being requested for dry port, terminals and warehouses services are reasonable	0.0	20.0	15.0	50.0	15.0	100.0
Dry port and terminal services are provided with law of first come first served, if discrimination is done it is justified and approved by higher officials	5.0	15.0	35.0	45.0	0.0	100.0
Port/terminal congestion managed	5.0	0.0	52.5	42.5	0.0	100.0
Cargos are located in identifiable way and their safety is well ensured in any movement	0.0	5.0	35.0	55.0	5.0	100.0
Cargo stuffing and un stuffing, loading and unloading service are provided in all dry ports	0.0	10.0	40.0	45.0	5.0	100.0
Custom control and clearance formalities are complete	15.0	15.0	30.0	40.0	0.0	100.0
Customs inspection is done (at both port of loading and port of destination)	0.0	7.5	52.5	22.5	17.5	100.0
Serve as good point of destination to Ethiopia's Import and Export cargoes	10.0	10.0	50.0	10.0	20.0	100.0

SD- strongly disagree D- disagree N-neutral A- agree SA -strongly agree

4.5.2 Intermodal transport



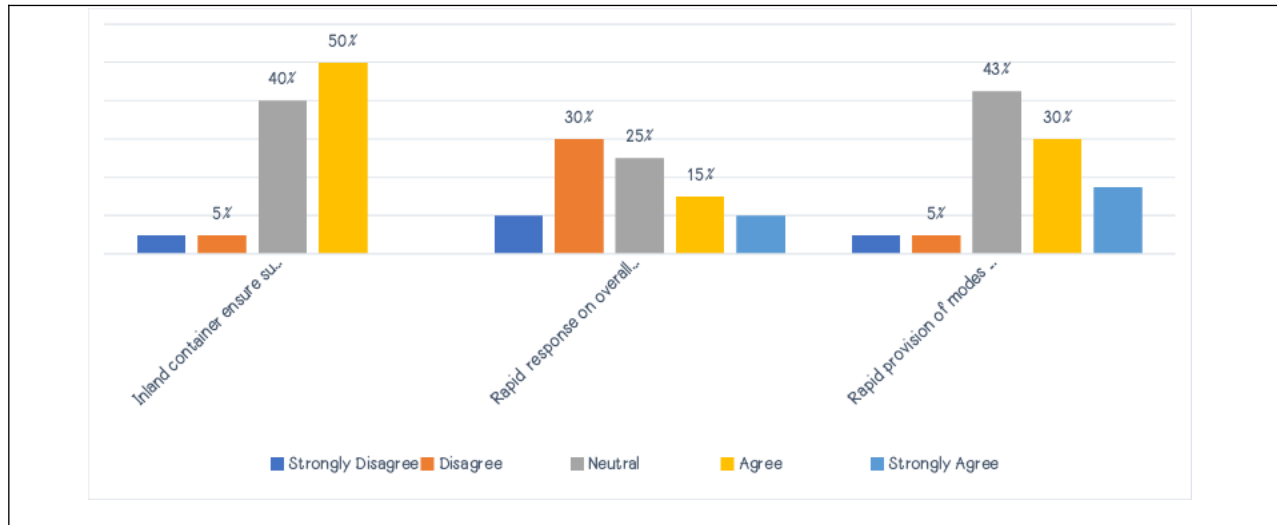


Figure 4.13: Percentage of response for intermodal transport

- Respondents were asked to evaluate intermodal transport based on 8 points ; which include the service and quality of intermodal transshipment nodes, effectiveness and efficiency of intermodal hubs, intermodal transport cost, maintenance efficiency, rapid provision of modes during delay, rapid response on overall damages, efficient turnover in intermodal logistic network and the lead time.
- 27.5% of respondents agreed that Effectiveness and efficiency of intermodal hubs contribute to the overall competitiveness and attractiveness of intermodal transport, while 40% of respondents remained neutral.
- 30 % of respondents Disagreed that intermodal services and quality of existing intermodal transshipment nodes keep up with capacity nodes and 50% of respondents remained neutral.
- 55% of respondents agreed that there is manageable transport cost and there is scheduled maintenance efficiency (47.5%) while for efficient transport lead time of intermodal transport (37.5%) of, respondents remained neutral.
- On rapid response of overall damages of intermodal transport including

losses/thefts 30% of respondents Disagreed while 25% remained neutral. For the rapid provision of relevant modes during delay, 42.5% remained neutral and 30% agreed.

- 50% of respondents agreed that inland container ensure sufficient turnover in intermodal logistic network, while 40 % remained neutral.

4.5.3 Information technology

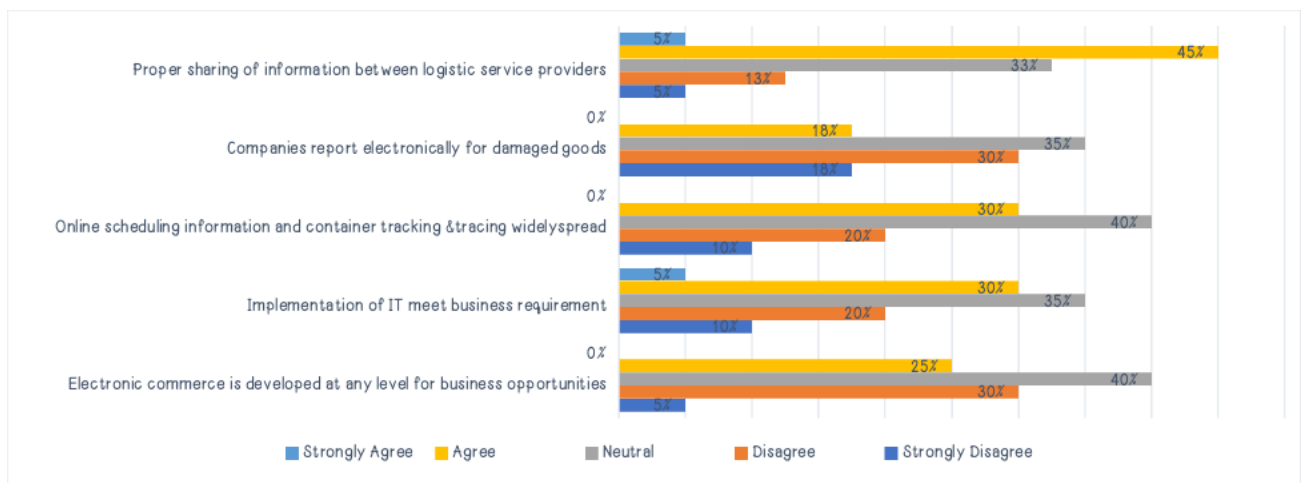


Figure 4.14: Percentage of response for information technology

- The respondents agreed that there is proper sharing of information between logistic service providers as shipping lines, shipping agents, Forwarders, port operators and custom Authorities (45 %) but remained neutral on electronically reporting of companies on usual damage of goods (35%)
- Issues related to development of electronic commerce at any level (40%) and implementation of IT to meet business requirement (35%), widely use of online schedule information and container tracking and tracing facilities (40 %) respondents

remained neutral.

4.5.4 Warehouse at dry port

Table 4.21: Percentage of response for warehousing by logistic service providers

	SD	D	N	A	SA	Total
Enough space for storing and receiving goods even in peak periods	10.0	40.0	30.0	15.0	5.0	100.0
Warehouse lay out is suitable for all merchandised goods handling and Picking	5.0	30.0	40.0	22.5	2.5	100.0
All the available warehouses are well equipped with all the necessary equipment and facilities	5.0	35.0	40.0	20.0	0.0	100.0
Replenishment of Inventory done when needed	5.0	25.0	50.0	20.0	0.0	100.0
Secure compound is provided at all warehouses	5.0	10.0	40.0	35.0	10.0	100.0
Assembling consignments and Dispatching consignments done as per the schedule	5.0	20.0	40.0	35.0	0.0	100.0
Import and export shipment arrive at schedule	5.0	25.0	10.0	55.0	5.0	100.0
Shipments are cleared and delivered as schedule	5.0	10.0	42.5	37.5	5.0	100.0
Quality control and verification are provided at warehouses	10.0	20.0	45.0	30.0	0.0	100.0
Detection and dealing with stock losses are done properly	10.0	25.0	45.0	25.0	0.0	100.0
Managing of rejected/unwanted material and disposal is done early	5.0	10.0	50.0	15.0	0.0	100.0
Shipments not meeting company quality criteria are supervised	5.0	15.0	35.0	40.0	0.0	100.0

SD- strongly disagree D- disagree N-neutral A- agree SA -strongly agree

- Respondents agreed that Import and export shipments arrive as per the schedule and shipments not meeting company quality criteria are supervised early.
- On overall management practices of the warehouse and services (as replenishment of inventory, making assembling and dispatching consignments as per the schedule, clearing and delivery shipments as schedule, on quality control and verification

provided at the warehouse including detection and dealing with stock losses), respondents remained neutral.

- Also, on space and layout of the warehouse for merchandising, handling and picking and with secure compounds of the warehouse, the respondents remained neutral.
- As seen from this on some of the issues remained neutral, comparing the result with the traders of Ethiopia it shows comparatively the same result implying that the ware house at the dry port need special improvement.

4.5.5 Freight forwarding

This section presents the service performance of Ethiopian freight forwarders based on eight points of evaluation; arrange the distribution or forwarding of the cargo as per the instruction of the clients, store of cargo belonging to clients at the ware house, deliver within promised window , negotiate freight rates with shipping line to cover the interest of the clients, book the cargo with the shipping lines as per the requirement of the client, prepare bills of lading and associated shipping/negotiating documentation, approving house bill of lading as applicable, and do custom clearance on time.

Table 4.22: Percentage of response for Freight forwarding

	SD	D	N	A	SA	Total
Proper Storing of cargo belonging for the clients at the warehouse	5.0	10.0	30.0	45.0	10.0	100.0
Arrange the distribution or forwarding of the cargo as per the instructions of the clients	5.0	0.0	30.0	55.0	10.0	100.0
Deliver within promised window	10.0	15.0	35.0	40.0	0.0	100.0
Negotiate freight rates with shipping line to cover the interest of the clients	10.0	15.0	35.0	40.0	0.0	100.0
Book the cargo with the shipping lines as per the requirement of the client	5.0	5.0	20.0	70.0	0.0	100.0
Prepare bills of lading and associated shipping /negotiating documentation	0.0	10.0	5.0	80.0	5.0	100.0
Issues the approved house bill of lading as applicable	5.0	5.0	10.0	62.5	17.5	100.0
Do custom clearance on time	5.0	15.0	25.0	55.0	0.0	100.0

SD- strongly disagree D- disagree N-neutral A- agree SA -strongly agree

- On all of the issues stated above, highest percentage respondents agreed and specify that services given by Freight forwarders are satisfactory.

4.5.6 International shipping and trucking

On issues related to international shipping and trucking, respondents agreed that

- There are experienced professionals in international forwarding
- There is alternative mode provision in international shipping and trucking
- There is affordable shipping cost and no unexpected additional duty fees
- There is enough shipping company giving service at any time
- Delays at customs due to incorrect documentation and vessel delays due to weather condition is managed and physical damage to the container determined early

Respondents remained neutral on the issues that

- Products booked into information system without waiting for long period of time
- Government regulation enhance the shipping/trucking process
- There are enough hours of service whenever clients want
- There is efficient number and location of check points along the supply chain
- The use of identifier in containers or pallets are widely spread
- There is efficient configuration traceability system and information communication between participating entities

Respondents disagreed that there are sufficient drivers available in international trucking.

Table 4.23: Percentage of response for international shipping and trucking from logistic service provider's view

	SD	D	N	A	SA	Total
Good experienced professionals in international freight forwarding	0.0	25.0	15.0	42.5	17.5	100.0
Provide remarkable provision of alternative modes	0.0	10.0	30.0	45.0	15.0	100.0
Container being returned to liner by cut – off date	15.0	20.0	30.0	25.0	10.0	100.0
Shipping costs is affordable and there are no unexpected additional duty fees	5.0	15.0	35.0	45.0	0.0	100.0
Sufficient shipping company available	15.0	20.0	20.0	45.0	0.0	100.0
Shipping companies gives service any time	5.0	10.0	25.0	60.0	0.0	100.0
Delays at customs due to incorrect documentation and Vessel delays due to weather condition well managed	0.0	10.0	25.0	65.0	0.0	100.0
loading of the cargo in the vessel, physical damage to the container or the contents are determined	0.0	10.0	30.0	45.0	15.0	100.0
The right Products arrive at the right place on the Expected delivery date	5.0	20.0	25.0	22.5	27.5	100.0
When there are damaged products and too many return of products, will be managed early	0.0	30.0	55.0	15.0	0.0	100.0
Sufficient Driver available	5.0	45.0	15.0	25.0	10.0	100.0
Government Regulation enhance the shipping/ trucking process	15.0	10.0	47.5	25.0	2.5	100.0
Enough Hours-of-Service whenever clients want	5.0	10.0	52.5	27.5	5.0	100.0
Environmental Issues problems solved early, if occurred	0.0	20.0	45.0	35.0	0.0	100.0
Product arrive at warehouse or other supply chain site booked into information system without waiting for long period of time in the receiving area	0.0	25.0	40.0	35.0	0.0	100.0
Sufficient identification technology as barcode, contact memory button and RFID	10.0	35.0	30.0	25.0	0.0	100.0
Efficient number and location of check points along the supply chain	10.0	10.0	45.0	25.0	10.0	100.0
Aggregated shipping use of identifier in containers or pallets	12.5	17.5	42.5	27.5	0.0	100.0
Efficient configuration traceability system and information communication between participating entities	10.0	10.0	40.0	25.0	15.0	100.0

SD- strongly disagree D- disagree N-neutral A- agree SA -strongly agree

When comparative analysis is done from the result of the two different sectors (traders and logistic service providers) there are some issues that are agreed in common as well as different result that appear in both sectors.

The results are the same on issues

- Alternative mode provision
- Management of delays due to incorrect documentation at custom and vessel delay due to weather condition
- Early determination of physical damage to the container
- Enhancement of government regulation
- Trucker shortage

The results are not the same on issues

- Appearance of experienced professionals in international freight forwarding
- Affordable shipping cost and unexpected additional duty fees
- Enough shipping companies

4.5.7 Customs

This section evaluates the service performance of Custom agents (custom Authorities)

- 50% agreed that customs take care custom clearance aspect of the business and arrange to pass the relevant documents at customs
- 52% agreed that customs inspection is arranged as required
- 60 % agreed that customs check and process duty and vat payments as applicable and 45 % agree that information is complete and available on time due to changes in

regulation.

- 45 % agreed that there is application to refunds where applicable.
- And on issuing own bill of lading when there is no registration (37.5%), processing custom declaration electronically (65%), serving imports and exports according to schedule (40%), long time submission of documentation in custom clearance among others (50%), respondents remained neutral.

Table 4.24: Percentage of response for custom by logistics service providers

	SD	D	N	A	SA	Total
Take care customs clearance aspect of the business	12.5	0.0	25.0	50.0	12.5	100.0
Arrange to pass the relevant documents at customs	15.0	0.0	35.0	50.0	0.0	100.0
Arrange the customs inspection as required	0.0	12.5	22.5	52.5	12.5	100.0
Check and process duty and tax payments as applicable	0.0	17.5	22.5	60.0	0.0	100.0
Apply for refunds where applicable	0.0	10.0	30.0	45.0	15.0	100.0
Issuing own bills of lading if not registered	12.5	17.5	37.5	32.5	0.0	100.0
Customs declaration are processed electronically and this process is clear	0.0	12.5	65.0	22.5	0.0	100.0
Information is complete and available on time due to changes in regulation	0.0	20.0	30.0	40.0	10.0	100.0
If imports and exports occur served according to schedule	0.0	15.0	40.0	35.0	10.0	100.0
Time between submission of the documentation in custom clearance is long, among others	10.0	15.0	50.0	22.5	2.5	100.0

SD- strongly disagree D- disagree N-neutral A- agree SA -strongly agree

But as seen from evaluation of customs by the traders from previous section they mention that there are problems that are related to customs as demurrages, detention, and difficulties in clearance of goods through customs. The result shows a difference in measuring the service between the two sectors. On special case, some study must be conducted to investigate the relevant problems with providing appropriate solutions.

4.5.8 In terms of Logistic professionals

This section asses about logistic professional based on 4 points

- 45% of respondents agreed that there is limited logistic training due to budget, few source of expertise, low quality in educational experience and lack of vocational school preparation, while 30% remained neutral.
- 47.5% of respondents agreed that there is limited labor supply in remote areas where logistic hubs are located, while 27.5% remained neutral
- 40% agreed that there are no new IT developments in logistics that control the competencies of existing work force, while 25% remained neutral
- 30% both agreed and remained neutral that hiring and retaining issue is difficult due to low salary levels relative to other sectors, while 15% disagreed.
- When the results are compared to the previous section, it holds the identical results.

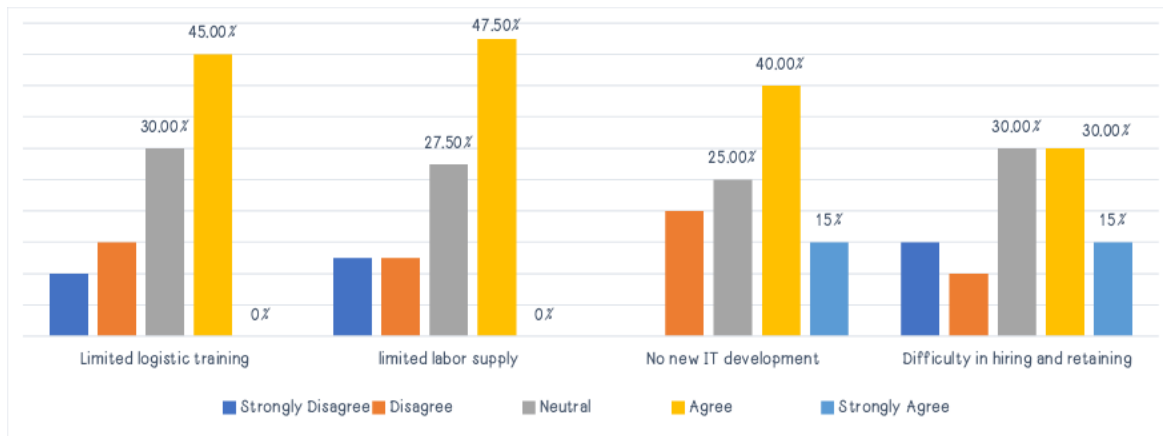


Figure 4.15: Percentage of response for logistic professionals' in logistics service providers view

4.5.9 In terms of logistic assets

Respondents were asked on which sector they support or not to maximize the return on logistic assets and to increase investment in logistic system of the country

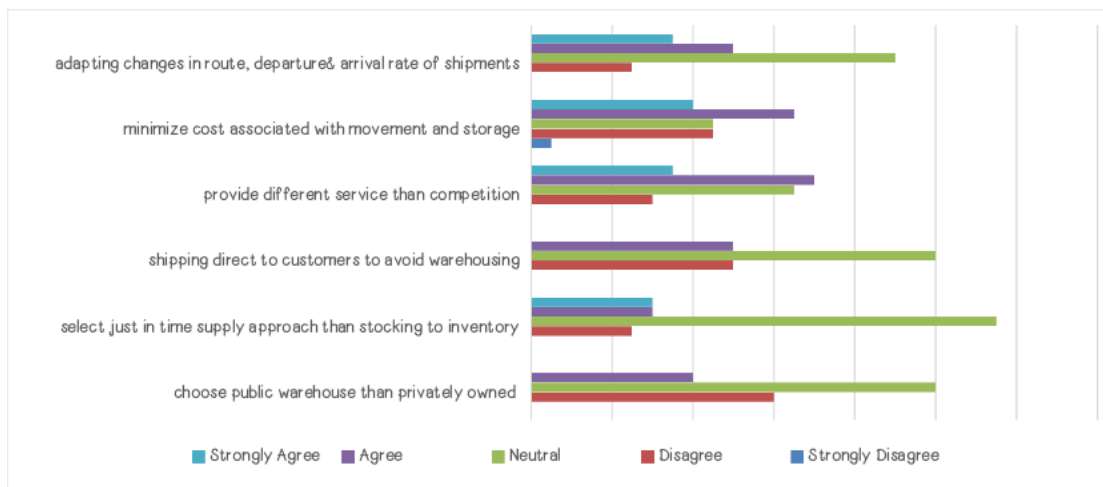


Figure 4.16: Percentage of response for choosing on return on logistic asset

- 50% remained neutral related to shipping direct to customs to avoid warehousing
- 57.5% remained neutral in selecting just in time approach rather than stocking to inventory
- 50 % remained neutral on choosing public warehouses over privately owned ones
- 45 % remained neutral on the ability to adapt changes in route, or departure and arrival rate of shipments.
- Respondents agreed on providing different and better service than competitions (35%), minimizing available cost associated with movement and storage (32.5 %)

4.5.10 In terms of trade facilitation

Respondents were asked, of the listed issues on which of they support to facilitate trade in relation to logistic services. The issues are related to maximizing return on logistics and minimizing investment in logistic system of the country.

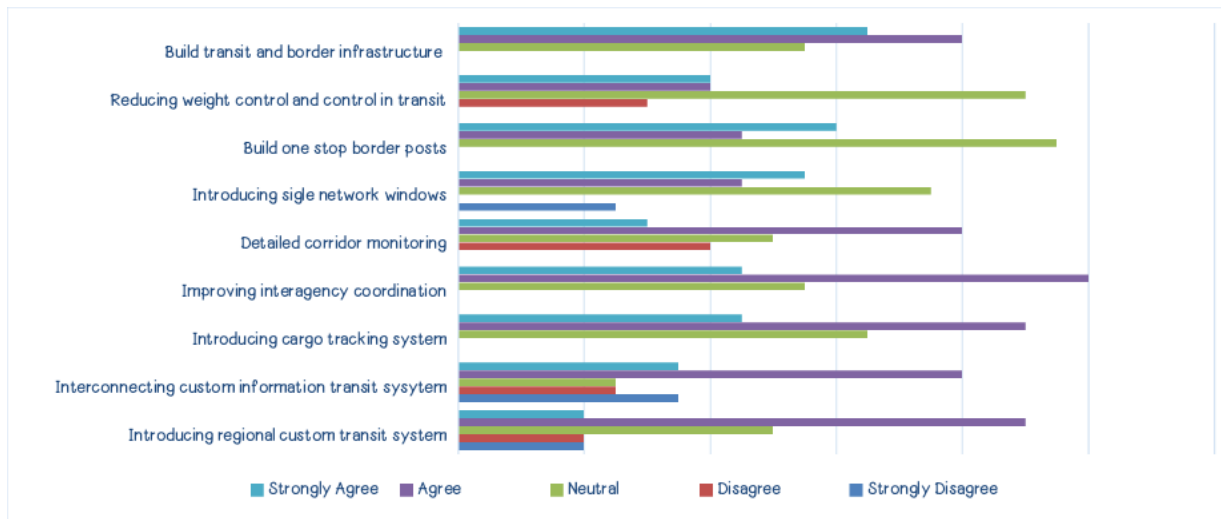


Figure 4.17: Percentage of response for trade facilitation

- Respondents agreed that introducing regional custom transit system (45%), interconnecting custom information transit system (40%), introducing cargo trucking system (45%), improving interagency coordination (50%), detailed corridor monitoring (40%) and building transit border infrastructure (40%) will facilitate trade.

4.5.11 Improvement needed from logistic system

Respondents were asked from the logistic systems provided in the country to select best needed to be improved to facilitate trade.

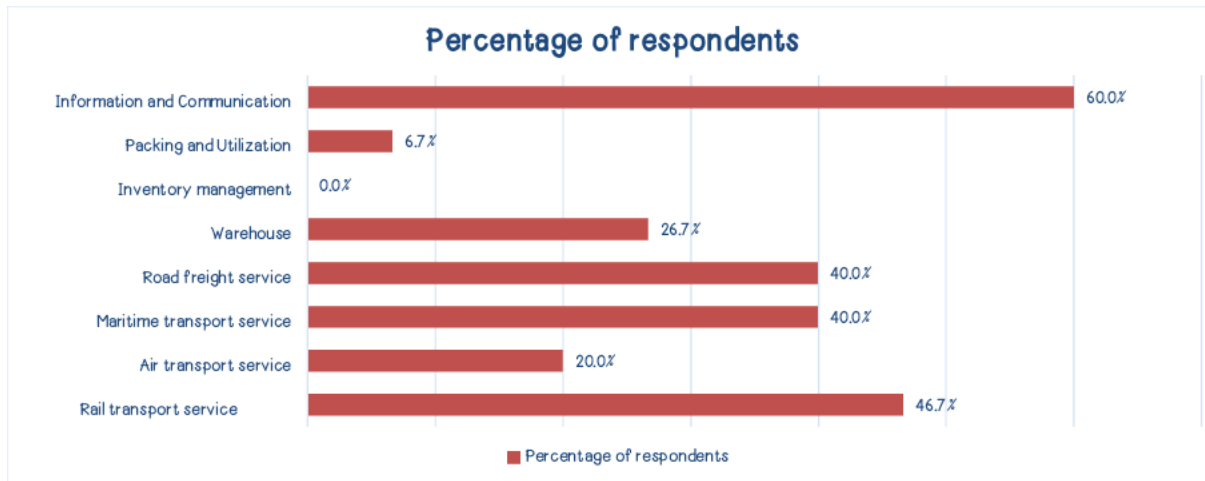


Figure 4.18: Percentage of response for logistic system improvement

- 60 % choose information and communication technology need to be improved
- 46.7% choose rail transport service to be improved
- 40% choose road freight service and maritime transport service to be improved
- 20 % agreed on improvement of air transport service

4.6 Comparative Logistic evaluation analysis by traders and logistic service providers

Good logistic performance is acquired through wise resource utilization to drive best result which will lead to efficient logistic system. Trade involves participation along the global using various logistic system. Most trades in Africa are international not sub regional because of similar production between neighboring countries, inadequate infrastructures and other related barriers in trade as logistics encompasses ports and shipping issues in addition to land transport(Gebresenbet,2015). External factors as lack of adequate infrastructure, lengthy procedures at ports, bureaucracy, limitation on train network and road infrastructure at both national and regional level as they are important in international trade, and internal factors as logistic professionals, lack of storage, less use of ICT system

are mentioned as factors that affect overall performance of logistic system. Ethiopian traders (both importers and exporters) of which more of them have trade relationship with china (66.7%) and some Chinese importers were asked the type of problem they face while doing business that is related to logistic system in the country.

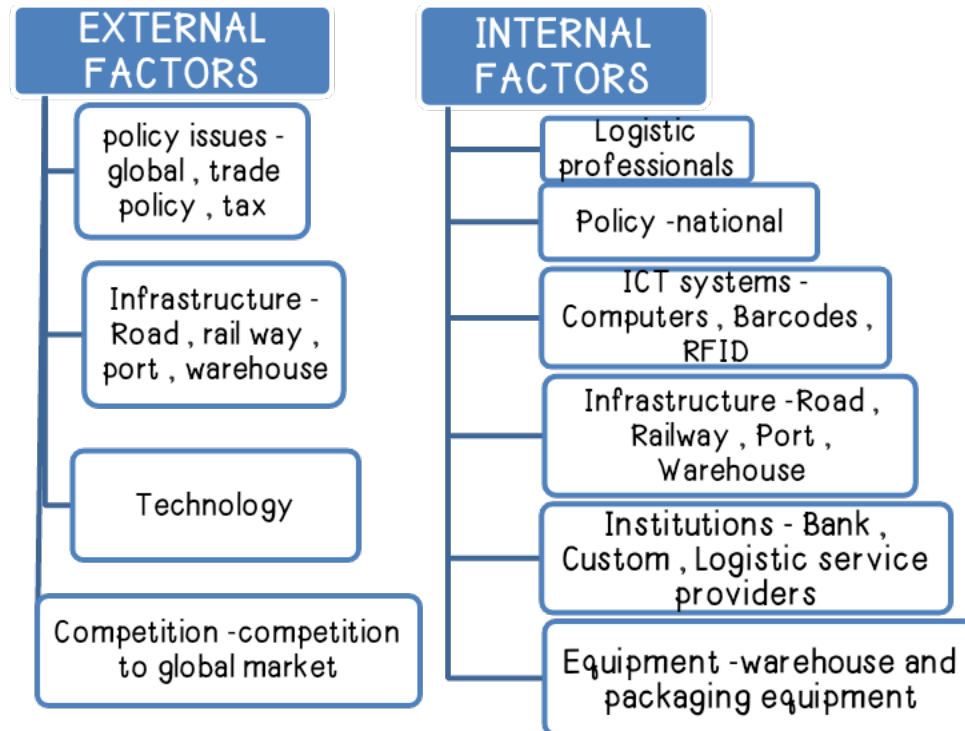


Figure 4.19: External and Internal factors affecting logistic system of Ethiopia

Source: authors elaborated from respondent's view

Policy issues have aggravated the whole economic situation as the production, wholesale distribution and retail trade activities are under the grip of the bureaucratic control of the government. And also participation of private sector in the economic activities was highly discouraged. On the other hand there is lack of foreign currency. Facilities like transportation system and services by institution like banks customs office, maritime, standard authority and shipping lines could negatively or positively impact foreign trade activity. For all delays and red tapes in one of these institutions is lagging trade

competitiveness of Ethiopia in international market.

Infrastructure which is common variables in all indexes, have adverse effect related to its quality, improvement and quantity. In all indexes it is presented that there is low level of infrastructure across the country. Transport is crucial for trade facilitation. Respondents (traders) use air transport (26.7%), sea transport /20%) and multimodal transport (53.3%) in their business activity. They choose their mode of transport by considering possibility of damage (33.3%), transit time (33.3%), required delivery date (46.7), comparative mode unit cost (60%) and reliability of the mode (53%). During importation and exportation, traders experience increases in unit cost (46.7%), less speed of delivery and less flexibility (73.3%), government issues concerning restriction in shipment size when they use maritime and air transport as major freight transport. In addition to this less service and quality of existing intermodal transshipment nodes that cannot keep up with capacity nodes, inefficiency of intermodal hubs to contribute overall competitiveness of intermodal transport, less rapid response on overall damages and less provision of modes during delay put Ethiopia in a great risk and lag the country to facilitate trade as in low income countries responding to increasing demand for physical infrastructure is a big challenge.

Custom variable has highest impact on the flow of trade in terms of speed, simplicity and predictability. Among the results, unexpected custom duties (66.6%), delay in custom clearance (53.3%), late receipt of shipping documents (50%), corruption environment (36.6%), and dishonesty of clearing agent (33.3%) are some of the problems faced by the traders. These problems related to customs cause physical damage to container (13.3%), missing documents(26.7%), detention(33.3%) and demurrage(46.7%), which have greater impact on traders.

International shipment to and from the specified country can be affected by efficient organization of shipments in terms of deliveries and competitive cost which have direct relation with trade. Less shipping company (33.3%), high shipping cost, port congestion, trucker shortage (40%) and less experience in freight forwarding are some of problems

faced by Ethiopian traders. In addition to this government regulation on shipment size, less speed of deliveries and less hours of service are major factors lagging trader's competitiveness in a country. In their business activities port and terminal congestion (33.3%) causes shipping delay and lengthy examination of goods (46.7%) and custom clearance issue (46.7%) cause delay of cargo at the port. But related to hours of service, shipping company, experienced professionals in international forwarding, number and location of checkpoints along the supply chain and relative shipping cost traders result as a problem and logistic service provider result as a performance has indirect /inverse relationship.

Quality of information technology in logistic process, transparency of custom procedures and continues innovation in communication is main factor in cargo transportation system. In Ethiopia shortage and inefficient of logistic information technology is wide spread specially related to location tracking and life cycle information tracing related problems. Traders mentioned that there is problem as identification delay (43%), identification accuracy (38.7%) and less object identification accuracy (33.3%). This include shortage of identification technologies as barcodes & RFID , when product arrive at warehouse /other supply chain site wait for long period of time in receiving area without being booked into information system causing information auto dated until products are processed , less use of identifiers in containers or pallets , information accessibility , no enough standardized information sharing in logistic activities and among logistic service providers and implementation of IT does not meet business requirements at any levels.

If there is lack of timeliness and reliability in the trading system, trade will be restricted through increasing cost and lowering competitiveness since the frequency with which shipments reach consignees is limited. This is also a factor in Ethiopia. Shipping delay can occur due to port/terminal congestion, vessel delays due to weather condition, less customer inspection, delays due to incorrect documentation. And also, lengthy examination of goods, delayed freight release, custom clearance issues and overweight /damaged

container cause delay of cargo at the port. In relation to warehouse respondents evaluate the service and performance as they agreed on warehouse accessibility for picking goods, dealing with unwanted materials and they disagreed on more issues of the listed factors that can be considered as a problem. Among them , less space utilization and handling , less warehouse layout , less access for parking vehicles , less number of docks , no enough area for slotting of goods , less quality control and verification , less performance in assembling and dispatching of consignments, less handling equipment and unsuitable inventory replenishment are the problems that occurred frequently.

Logistic services are performed both by public and privates in Ethiopia. At the end traders evaluate logistic professionals from which they get service. As the response of traders, the quality and competence of logistic service affected by few logistic trained expertise, low prestige of operational workers (20%), limited labor supply in remote areas, no IT development to control the workforce and difficulties in hiring and training (26.7%). On the contrary, Freight forwards in Ethiopia perform good service by booking cargo and negotiate freight rate with shipping lines as per the requirements of the client, arranging the distribution or forwarding of cargo, preparing bill of lading and associated shipping /negotiating documentation. Most of freight forwarders used by Ethiopian traders with china are located in Ethiopia and /or china.

Common finding with this research also stated in other studies. (Shewangizaw, 2016) in his report concluded that, uncertainty in foreign exchange availability and access, inadequate and unregulated bank service with less use of ICT, no integrated port system to accomplish single window basis, officially unknown export consolidation, lack of ICT to plan and timely arrange export shipment ,less consultation due to limited carriers in Ethiopia and longer checking process between Ethiopia and Djibouti prior to release are all factors that can impede trade of country. He also suggests on inadequate and low-level development and unavailability of some of logistic infrastructures including inadequate road, rail and other mode of transport facilities, old and inadequate type and capacity of trucks, inefficient ICT

utilization, and unavailability of facilities that hampers development of trade in the country. Another is excessive waiting time at the border for clearing customs leading to high transshipment cost, which is also main problems in Sub-Saharan Africa and south eastern European countries along transport corridors. In east Africa cost of delays at borders, weigh bridges and port which can be demonstrated by trucking companies affect the performance (Gebresenbet, 2015). Lower productivity of trucking industry, infrastructure constraints, low level of competition between service providers and weak infrastructure lead to Africa's poor trade performance and creation of one stop border post is provided as a solution. (Gebresenbet, 2015)

In Figure 4.20, factors are listed according to their percentage of holding higher value followed by lower value which are dramatic challenges for traders. The logistic activities that are done in trade and in each elements of logistic system can affect trade respectively and also can lead to low competitiveness of a country.

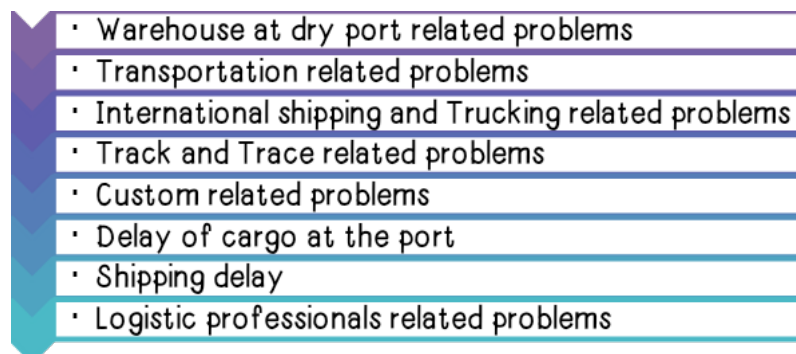


Figure 4.20: problems faced by trader orderd by their value

From open-ended questions that provide respondents the opportunity to respond in their own words rather than to choose from fixed responses or pre-fixed alternatives; the following result was made:

Traders stated that custom clearance related problems are hardly affecting their

business activity. Due to custom clearance problems which is caused by incorrect documents and not timely clearing of goods, they face higher price for goods and losing out competition in the market. If the consignees cannot pick up their container at the right time it will make port/terminal congestion and also, they face warehouse charges. In addition to this, damages occur when examination takes longer for products which are fragile in nature. Whenever incorrect documents appeared, correcting time for documents takes longer time causing high cost and late issues of B/L extension.

Sometimes when government took truckers for their own purpose and for maintenance, seasonal truck shortage affects timely delivering of goods on time. Transporters ask to be paid for the duration they waited, when unloading takes more time than required. So, they are forced to store the goods in the warehouse, but the warehouses are congested and non-suitable to handle goods in a better safety especially for goods which are sensitive to temperature and parking areas around and inside the warehouse are dirty. Apart from this, containers are missed at the warehouse which is big problem for the traders.

Website of Ethiopian shipping company doesn't work regularly, this make hard to track the shipment. And identification delay occurs mostly at airport, goods couldn't have found and by the time all is order, they face high storage challenges. High shipping cost, insufficient shipping time causing to miss catching of the streamer on time, less speed of delivery, less shipping company causing time value of money and long delay at port waiting to load Ethiopian vessel, insufficient work force and low prestige of operational logistics workers, unsatisfactory service given by logistic professional, this all make low rate of sales and high cost of goods which affect the traders and also the country.

The interview made to freight forwarders in China indicates that ESL is not effective and does not provide efficient service specially while booking. This freight forwarder

provide warehouse, consolidation (if trader's product are in separate ports), truck and custom clearance service from any port of China. They usually use other shipping line as OOCL to give good service and competitive price to customers. But traders mostly not prefer the service given by other shipping line because they disadvantaged that the product is promised to reach Djibouti only. As ESL can provide service till Modjo dry port.

It is clear that every logistics activities are done by logistic service providers, and these logistic service providers should be evaluated if the service they are providing is in manageable way or not. the activities done in logistic system is performed by logistic service providers that can lead to good logistic performance as well as can enhance trade competitiveness of the country by serving the traders and other sectors in efficient way. In this perspective logistic service providers of Ethiopia including Ethiopian logistic service enterprise and Ethiopian revenue and custom Authority are evaluated by different status.

The employees agree on service performance of port and terminal including accessibility of the facilities with managed operations and efficient service that can provide the law of first come first serves by justifying discrimination if happened and allowing reasonable charges for port, terminal and warehouse services. Cargos are located safely in identifiable way and stuffing & unstuffing; loading & unloading service are provided in all dry ports with complete custom control and clearance formalities. Apart from these employees disagreed on sufficient equipment and facilities in dry port and terminals and also enough space that can accommodate all incoming and outgoing cargoes even in peak periods. Easily provision of service with acceptable waiting time is also one factor. Employees claim that transportation of freight in an intermodal container have manageable transport cost and inland container ensure sufficient turnover in intermodal logistic network. But rapid response on overall damage remains as the main constraint. More percentage holds for approving that there is proper sharing of information between logistic service providers but on issues related to online scheduling information, spread of tracking and tracing,

electronically reporting of damaged goods employees remain neutral. On issues related to freight forwarding and international shipping respondents from the two sectors (Traders and logistic service providers) cope up on different results specifically on appearance of experienced professionals in international freight forwarding, affordable shipping cost and unexpected additional duty fees, enough shipping company. At the same time custom related problems listed by traders are not a factor when come to logistic service providers as their respective response. This shows a difference on the results causing the traders not effectively serviced by logistic service providers which can be the result of limited labor supply, limited logistic training, and no IT development in logistics that control the competencies of existing work force. And also, respondents from logistic service providers does not provide accurate result because they want to cover their own problems.

A functional logistic system is essential in enabling trade. This can be attained by improving quality and quantity of logistics infrastructures. This include improvements in different of mode of transport and also information technology.

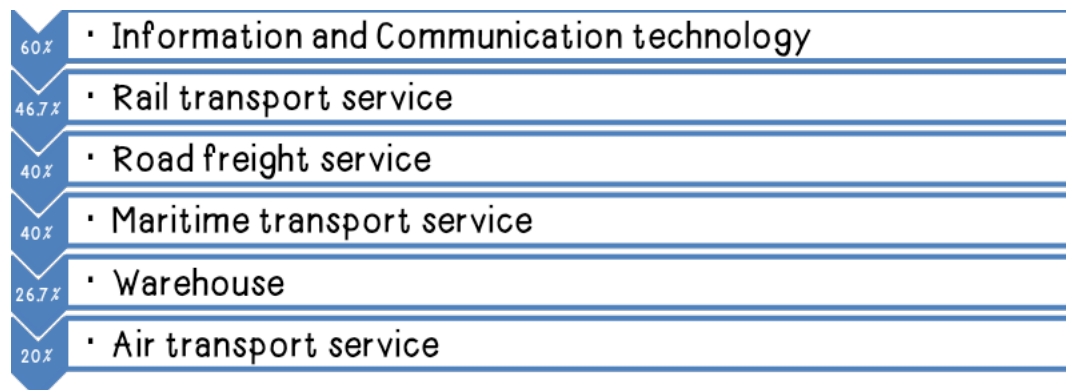


Figure 4.21: Improvements needed to facilitate trade along logistics infrastructure

Finally, it can be concluded that to maximize return on logistic assets and minimize investment in logistic system of the country, adapting changes in route as departure and arrival rate of shipments, minimizing cost associated with movement and storage, providing

different service than competition is necessary.

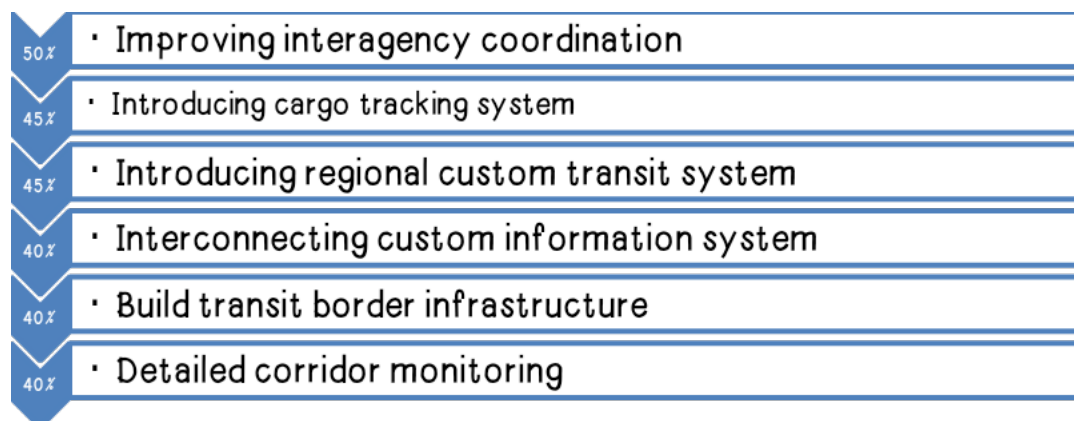


Figure 4.22: Consideration given to maximize return on logistics assets

And to facilitate trade, building transit and border infrastructure, providing detailed corridor monitoring, improving interagency coordination, introducing cargo tracking system, interconnecting custom information transit system and introducing regional custom transit system is vital by improving information and communication, warehouse, road freight service, maritime and rail transport service and air transport infrastructure.

Also, World Bank puts trade facilitation indicators to put benchmarking tool for a country which can be a foot print to know current countries performance. The listed pillars in Table 5.30 provides Ethiopia's current (2016) situation that will be a good base to find out the bottlenecks to facilitate trade.

Table 4.25: Trade facilitation indicators by World Bank

	ETHIOPIA
LPI 1-5(WORST TO BEST)	2.38
BURDEN OF CUSTOMPROCEDURE 1-7 (WORST TO BEST)	3.2

LEAD TIME TO EXPORT (DAYS)	14
LEAD TIME TO IMPORT (DAYS)	13
DOCUMENTARY COMPLIANCE COST TO EXPORT (US \$)	175
DOCUMENTARY COMPLIANCE COST TO IMPORT (US \$)	750
LSCI	-
QUALITY OF PORT INFRASTRUCTURE 1-7 (WORST TO BEST)	3.2
FREIGHT COSTS TO THE UNITED STATES 1 KG DHL NON-DOCUMENT AIR PACKAGE (\$)	196.77

Source: authors elaborated from World Bank data (2016)

5 Conclusion

This study was aimed to evaluate logistic system of Ethiopia in trade business focusing on the trade between Ethiopia and China only.in order to meet the objective Logistic

performance and other indexes were used to spot out the bottlenecks in Ethiopia comparing it with its neighboring countries. In addition to this traders and logistic service providers were also evaluate the logistic system of Ethiopia in their point of view.

The study identified the specific area in which Ethiopia shows inefficiency in logistic system using the data gained from LPI. Using performance indicators of World Bank based index LPI, infrastructure and Timeliness were identified as major bottlenecks for countries good performance. In accordance logistic quality and competence is also an adverse effect. In addition to this GCI and FM Global resilience index also provide supportive result showing low performance in supply chain and countries trade competitiveness. The top performers are in general the leading exporters and importers worldwide (Germany, Luxemburg, Sweden, and Netherlands). From the comparative analysis along the country, Ethiopia scores higher scores by customs and international shipping index than sub-Saharan Africa and low-income countries and by logistic competence index than low income countries. Among 6 indexes of LPI, Ethiopia have higher scores than all other border countries except Sudan and Kenya by tracking & tracing and international shipping. Using logistic competence and custom index Ethiopia has good performance than all other border countries except Kenya. But by timeliness and infrastructure index Ethiopia only exceeds Somalia and Eritrea.

From the evaluation done by traders it was obtained that problems related to warehouse at dry port concerning loading & unloading, reception area, storage area, picking area and dispatching area are frequently occurring. Traders face increase in unit cost, less speed of delivery & flexibility and government issues concerning restriction in shipment size while transporting of goods. So they consider comparative mode unit cost, reliability of the mode, possibility of damage and required delivery date when choosing their freight mode in business activity. And unexpected additional duty fees, trucker shortage, less shipping company, high shipping cost, shipping delay and delay of cargo at the port are most common problems faced by traders while performing trade internationally. In addition to

this quality of information technology in logistic process of Ethiopia is very low as there are inefficient technologies in relation to location tracking and life cycle information tracing. Another most important challenge faced by traders are difficulties in custom procedures. Which are characterized by unexpected custom duties, delay in custom clearance and corruption environment. Thus, causing demurrage and detention costs as well as damages to the containers. Also, service given by logistic service providers impedes the trade as there is few logistic trained expertise, low prestige of operational workers and limited labor supply in remote areas.

Using evaluation made by logistic service providers same result were obtained for issues related to warehouse at dry port and logistic professionals indicating that enhancement is needed. But in relation to custom, the result is quite different, as problem faced by traders are not described by logistic service providers. This shows dishonesty of the respondents on showing the true performance of the service.

To benefit from international trade and development improvement should be made along with infrastructure (information and communication technology, Rail transport service, Road freight service, Maritime transport service, warehouse and air transport service). In addition to literatures support, respondents also agreed on improving interagency coordination, introducing cargo tracking system, introducing regional custom transit system, interconnecting custom information system, building transit border infrastructure, providing detailed corridor monitoring as a tool to maximize return on logistic assets and minimize investment in logistic system.

In general the result from this study shows the salient factors that influence logistic performance of Ethiopia and its affects in trade business only focusing the trade between Ethiopia and China.

6 Recommendation

In order to enhance logistic performance of a country in every aspect of logistic system which can provide efficient logistic service and to boost trade and competitiveness of a country this analysis recommends the following measures.

- Establishing a logistics governance structure in Ethiopia (such as coordinated border management, one stop border post, and single window system) that oversees the national logistics transformation efforts anchoring and spearheading the logistics industry developments and provide strategic leadership as well as devising policy to support the efforts.
- Improving logistic service offering in Ethiopia which can be supported by providing comprehensive legal framework in accordance with government regulation for the industry and strengthening freight forwarding and shipping association which can establish standard practice.
- Establishing e commerce in trend of business benefits for both companies and consumers. e commerce develops the market area from regional to global by using electronic techniques instead of traditional paper works which can promote industries efficiency and competitiveness.it also might reduce number of warehouse and stock and trips in transport system that will lead to lower cost of goods and services.
- Improving simplified procedures and controls (a heightened awareness of the need for customs and other border management agencies) governing the movement of

goods across borders to reduce associated cost trouble, documentary requirements & maximize efficiency and Develop/strengthen port facilities and service utilization to expedite transit process.

- Establishing an integrated transport system by liberizing transport activity and cancelling regulatory and operation function of state. along the supply chain with different freight modes, corridor facilities as well as a well performing logistics system (in terms of quantity and quality)
- Creating a strong trade finance system in Ethiopia by providing predictable processing for imports and exports (the result of increased private sector investment in advanced logistics and just in time manufacturing regimes) and procedures so as to improve access to foreign exchange and address credit constraints by increasing financial products and services.

The review of logistics system in two countries in a broad sense might help to integrate the advantages from different application cases to overcome the current weakness. The review of transport system provides a clearer notion on transport applications in logistics activities. The development of logistics in two countries is still vigorous in the following decades and the logistics concepts might be applied in more fields.

7 References

- Arvis, J.F., Mustra, M, Panzer, J., Ojala, L and Nuala, T. 2007, *Connecting to Compete, Trade logistics in the global economy* World Bank, Washington.
- Arvis, J.F., Mustra, M, Ojala L, Shepherd, B. and Saslavsky D. 2010, *Connecting to Compete, Trade logistics in the global economy* World Bank, Washington.
- Arvis, Raballand.G, and Marteau.J. F 2010, *The Cost of Being Landlocked Logistics Costs and Supply Chain Reliability*, the World Bank
- Arvis, J.F., Saslavsky, D., Ojala, L, Shepherd, B., Busch, C., Raj, A., & Nuala, T. 2016, *connecting to Compete: Trade Logistics in the Global Economy*, World Bank, Washington DC.

- Arvis, J. F. Raballand, G. Marteau, J. F. 2007, *The Cost of Being Landlocked, Logistics Costs and Supply Chain Reliability*, World Bank Policy Research Working Paper 4258
- Behar, A. and P, Manners .2008, "*Logistics and Exports*", Mimeo, CSAE, Oxford
- Bougheas, S., P. Demetriades, and E. Morgenroth, 1999. "*Infrastructure, transport costs and trade*", Journal of International Economics 47: 169-189
- BTRE 2001, *Logistics in Australia: A Preliminary Analysis, Bureau of Transport and Regional Economics*, Canberra.
- Clark, X., Dollar, D. and Mcco A. 2004, *Port efficiency, maritime transport Costs and bilateral trade*, NBER Working paper 10353
- Chang, Y H 1998, *Logistical Management*, 1st edn, Hwa-Tai Bookstore Ltd., Taiwan
- Çemberci, M, Civelek, ME., & Canbolat, N. 2015, *The moderator effect of global competitiveness index on dimensions of logistics performance index*. Procedia-Social and Behavioral Sciences, vol.195, pp.1514-1524.
- Choi, C. 2003, "*Does the Internet Stimulate Inward Foreign Direct Investment?*" Journal of Policy Modeling, 25(2003): 319-326.
- Ciuriak D. and Claudius Preville.2010, *Ethiopia's Trade and Investment*, Policy Priorities for the New Government
- Debela, Fekadu M 2013. "*Logistics Practices in Ethiopia*", Swedish University of Agricultural Sciences Institutionen
- Dekker, MJ., Looff, E.J. de, Roelofsen, D.S., & Roekel, W.S. van.2016, *Improving the logistical situation of Costa Rica*. Delft: TU Delft
- Dollar, D. and A. Kray .2002, "*Institutions, Trade, and Growth*", Journal of Monetary Economics, vol.50, pp. 133-162.
- Delfmann, W., Albers, S., Gehring, M 2002, "*The impact of electronic commerce on*

logistics service providers' International Journal of Physical Distribution and Logistics Management, Vol.32, pp. 203-222.

- Erkan, B. 2014, *The importance and determinants of logistics performance of selected countries*, Journal of Emerging Issues in Economics, Finance and Banking, vol.3(6), pp. 1237-1254.
- Ekici, S. O., Kabak, O., & Ulengin, F. 2016, *Linking to compete: Logistics and global competitiveness interaction*. Transport Policy, vol.48, pp.117-128.
- ESLSE 2015, *Transforming Ethiopia's logistic sector report*, Addis Ababa
- Farahani, R.Z. – Asgari, N – Davarzani, H. 2009, *Supply Chain and Logistics in National, International and Governmental Environment – Concepts and Models*. Physiga-Verlag, Berlin, Germany
- Felipe, J. and Kumar, U. 2012, *The Role of Trade Facilitation in Central Asia: A Gravity Model*, Eastern European Economics, vol.50, pp.5-20.
- François, J. and M Manchin 2007, "*Institutional Quality, Infrastructure and the Propensity to Export*." World Bank Policy Research Working Paper No. 4152, Washington, D.C.
- Festus E. Turkson 2006, "*Logistics and Bilateral Exports in Developing Countries: A Multiplicative Form Estimation of the Logistics Augmented Gravity Equation*", Credit Research Paper, University of Nottingham.
- Gebresenbet, G. 2009, *Freight transport, market-structure and technology course material*.
- Gebresenbet, G. & Mpagalile, J. FAO, Rome, Italy .2015, *Firm-level logistics systems for the agrifood sector in sub-Saharan Africa – Report based on appraisals in Cameroon, Ghana, Uganda and the United Republic of Tanzania*,
- Guner, S. and Coskun, E. 2012, *Comparison of Impacts of Economic and Social Factors on Countries', Logistics Performances, A Study with 26 OECD Countries*, Research

in Logistics & Production, vol.2, pp.329 - 343.

- Hoekman, B. and Nicita, A. 2008, *Trade Policy, Trade Costs and Developing Country Trade*, World Bank Policy Research Working Paper No. 4797
 - Hoekman, B. and Nicita A. 2010, " *Assessing the Doha Round, Market access, transactions costs and aid for trade facilitation*," The Journal of International Trade & Economic Development, vol.19, pp.65-79.
 - Hoekman, B., & Nicita, A. (2011). *Trade Policy, Trade Costs, and Developing Country Trade*. World Development, vol.39(12), pp. 2069–2079
 - Hertel, T. and Mirza, T. 2009, *The Role of Trade Facilitation in South Asian Economic Integration, Study on Intraregional Trade and Investment in South Asia*, (ADB, Mandaluyong City).
 - Hoffman, J. 2010, *Introduction at OECD experts meeting on transport services*, Retrieved from <http://www.oecd.org/tad/services-trade/46483066.pdf> on October 12th, 2017.
 - Hoffman, J., & Fugazza, M 2015, *Liner connectivity shipping*. Retrieved from http://unctad.org/meetings/en/Presentation/tdc_7th2015_JHoffmann_MFugazza_en.pdf on May 2018
 - <https://comtrade.un.org/>
 - International Transport Forum (ITF). 2015, *Drivers of Logistics Performance: A Case Study of Turkey*, corporate partnership report
 - Iwanow, T. Kirkpatrick, C. 2006, " *Trade facilitation, regulatory quality and export performance*." Journal of International Development, 19 (6), pp. 735-753.
- Jumandi, H., & Zailani, S. 2010, *Integrating Green Innovations in Logistics Services Towards Logistics Services Sustainability: A Conceptual Paper*, Environmental Research Journal, vol.4(1), pp. 261-271

- Kaerney A.T.2015, *Transportation and Logistic strategies*, China
- Korinek, J. and Sourdin, P.2011, *To What Extent Are High-Quality Logistics Services Trade Facilitating*, OECD Trade Policy Working Papers, No. 108, OECD URL: <http://dx.doi.org>
- Kim, I., & Min, H. 2011, *Measuring supply chain efficiency from a green perspective*, Management Research Review, vol.34(11), pp. 1169-1189.
- Lauri. ojala 2015, *The World Bank's Logistics Performance Index (LPI) and drivers of logistics performance*, Turku School of Economics, Finland
- Lambert, D.M, Stock, J.R. and Ellram, LM 1998, *Fundamentals of Logistics Management*
- Lai, K.H., Ngai, E.W.T., Cheng, T.C.E. 2004, "An empirical study of supply chain performance in transport logistics", International Journal of Production Economics, Vol.87, pp. 321-331
- Limao, N. and Venables, A.J., 2001. "Infrastructure, Geographical Disadvantage, Transport Costs and trade."The World Economic Review, Vol. 15, No. 3, pp. 451 - 479
- Martí, ML, Puertas, R. and García, L 2014, "Relevance of Trade facilitation in Emerging Countries Export", The Journal of International Trade and Economic Development, vol. 23, pp.202-222
- Mustra, M. A. 2011, "Logistics Performance Index, Connecting to Compete 2010", UNESCAP Regional Forum and Chief Executives Meeting, siteresources.world-bank.org
- Min, H. and Kim. I. 2010, Measuring the Effectiveness of the Country's Green Supply Chain form a Macro Perspective, Proceedings of the First Annual State International Symposium on Green Supply Chains, Canton, Ohio
- Martí, L, Puertas, R., & García, L (2014). *The importance of the Logistics Performance Index in International trade*. Applied Economics, vol.46(24), pp.2982-2992

- Navickas, V., Sujeta, L, and Vojtovich, S. 2011, "*Logistics Systems as a Factor of Country's Competitiveness*", Economics and Management, 16, pp. 231-237
- Puertas, R., Marti, L and García, L2013," *Logistics performance and export competitiveness, European experience*," Empirica Journal of European Economics
- Ram, Rev.Adam, Mackenzie .2015, *Evaluation of logistic performance index of Brazil in international trade*, vol.16(1), pp.213 - 235
- Rodrik, D., A. Subramanian and F. Trebbi .2004, "*Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development*", Journal of Economic Growth vol.9, pp. 131-165.
- Rantasila, Karri; Ojala, Lauri 2012, *Measurement of national-level logistics costs and performance*, International Transport Forum Discussion Paper, No. 2012-4
- Roekel v. wilco 2017," *improving international logistics performance index by assigning weights to its six core components, using the best-worst method*, MSc thesis, Delft university of technology .
- Shatz, H. Venables, A.J. 2000, *The geography of international investment*, World Bank Policy Research Working Paper 2338.
- Srivastava, S. K. 2006," *Logistics and Supply Chain Practices in India*. "Vision: The Journal of Business Perspective.
- Solakivi, T, Ojala, L, Laari, S., Lorentz, H, Toyli, J., Malmsten, J., & Viherlehto, N2015, *Finland state of logistics*
- Sink, H. L, Langley Jr., C. J., Gibson, B. J 1996, "*Buyer observations of the US third-party logistics market*", International Journal of Physical Distribution Logistics Management, Vol.26, No.3, pp. 38-46.
- Shewangizaw, Dagmawi. 2016. *Assessment of the Impact of Logistic Performance on Trade in Ethiopia*

- Yung yu. T, wenlong. Y, Tylor, peter.MA. 2005, *eastern Asia society for transportation studies*, vol. 5, pp. 1657 - 1672, Japan
- United Nations report, 2014, "*The Vulnerability of Land Locked Countries to External Shocks*"
- Uca, N, Ince, H, & Sumen, H. 2016, *The mediator effect of logistics performance index on the relation between corruption perception index and foreign trade volume*. European Scientific Journal, vol.12(25)
- Vaillancourt, A., & Haavisto, I. 2015, *Country logistics performance and disaster impact*. *Disasters*, vol.40(2), pp.262-283.
- World Bank .2013, *Republic of Djibouti Transport and logistics in Djibouti: contribution to job creation and economic diversification*. Report no. 75145
- World Economic Forum (2016a). Global Competitiveness report 2016-2017, World economic forum, Geneva, ISBN-13: 978-1-944835-04-0
- World Economic Forum (2016b). GCI Dataset 2016
- Wilson, J.S., C.L Mann and T. Otsuki 2004, "*Assessing the Potential Benefit of Trade Facilitation: A Global Perspective*." World Bank Working Paper 3224, Washington, D.C.

Annex 1: Comparative Rank of Ethiopia to Its Trade Partners using LPI

	Country	LPI Rank	LPI Score	Customs	Infrastructure	International shipments	Logistics competence	Tracking & tracing	Timeliness
	Ethiopia	126	2.38	2.6	2.12	2.56	2.37	2.18	2.37
1	Germany	1	4.23	4.12	4.44	3.86	4.28	4.27	4.45
2	Sweden	3	4.2	3.92	4.27	4	4.25	4.38	4.45
3	Netherlands	4	4.19	4.12	4.29	3.94	4.22	4.17	4.41
4	Belgium	6	4.11	3.83	4.05	4.05	4.07	4.22	4.43
5	United	8	4.07	3.98	4.21	3.77	4.05	4.13	4.33

	Kingdom								
6	Hong Kong, China	9	4.07	3.94	4.1	4.05	4	4.03	4.29
7	United States	10	3.99	3.75	4.15	3.65	4.01	4.2	4.25
8	Switzerland	11	3.99	3.88	4.19	3.69	3.95	4.04	4.24
9	Japan	12	3.97	3.85	4.1	3.69	3.99	4.03	4.21
10	United Arab Emirates	13	3.94	3.84	4.07	3.89	3.82	3.91	4.13
11	France	16	3.9	3.71	4.01	3.64	3.82	4.02	4.25
12	South Africa	20	3.78	3.6	3.78	3.62	3.75	3.92	4.02
13	Italy	21	3.76	3.45	3.79	3.65	3.77	3.86	4.03
14	Spain	23	3.73	3.48	3.72	3.63	3.73	3.82	4
15	Korea, Rep.	24	3.72	3.45	3.79	3.58	3.69	3.78	4.03
16	China	27	3.66	3.32	3.75	3.7	3.62	3.68	3.9
17	Israel	28	3.66	3.5	3.49	3.38	3.6	3.72	4.27
18	Malaysia	32	3.43	3.17	3.45	3.48	3.34	3.46	3.65
19	Turkey	34	3.42	3.18	3.49	3.41	3.31	3.39	3.75
20	India	35	3.42	3.17	3.34	3.36	3.39	3.52	3.74
21	Kenya	42	3.33	3.17	3.21	3.24	3.24	3.42	3.7
22	Bahrain	44	3.31	3.14	3.1	3.33	3.38	3.32	3.58
23	Thailand	45	3.26	3.11	3.12	3.37	3.14	3.2	3.56
24	Egypt, Arab Rep.	49	3.18	2.75	3.07	3.27	3.2	3.15	3.63
25	Saudi Arabia	52	3.16	2.69	3.24	3.23	3	3.25	3.53
26	Kuwait	53	3.15	2.83	2.92	3.62	2.79	3.16	3.51
27	Indonesia	63	2.98	2.69	2.65	2.9	3	3.19	3.46
28	Jordan	67	2.96	2.55	2.77	3.17	2.89	2.96	3.34
29	Pakistan	68	2.92	2.66	2.7	2.93	2.82	2.91	3.48
30	Ukraine	80	2.74	2.3	2.49	2.59	2.55	2.96	3.51
31	Morocco	86	2.67	2.22	2.46	3.09	2.6	2.3	3.2
32	Sudan	103	2.53	2.23	2.2	2.57	2.36	2.49	3.28
33	Djibouti	134	2.32	2.37	2.3	2.48	1.96	2.09	2.69
34	Somalia	158	1.75	1.29	1.57	1.86	1.85	1.51	2.35

Source: Elaborated by the authors using data from World Bank (2016)

Annex 2: Sample Questionnaire template for Traders

The purpose of this questionnaire is to collect primary data is to fulfill an academic requirement for MSc. degree program in Road and Transport Engineering at Addis Ababa University. To obtain reliable and valid information for the research, your open and genuine response is highly appreciated. Kindly spare some of your valuable time to go through the questionnaire and give your view on this topic. The information provided by you would be kept confidential and only be used for this research study.

Please give your response for the questions here under by putting a “ ” mark at your appropriate choice or by putting your answers in the space provided. You may use the back side of the paper if the space provided is not sufficient.

Respondent Background information

Gender	Male	
	Female	
Educational Background	High school	
	Diploma (10+3/12+2)	
	First Degree Graduate	
	Second Degree Graduate	
	Above Second degree	
Work experience	1-5 years	
	6-10 Years	

	11-15 Years	
	16-20 Years	
	Above 20 years	
Direction of Trade and Transport you are dealing with	Export	
	Import	
	Export and import	
Number of employees in your company	1-9	
	10-49	
	50-249	
	250-499	
	More than 500	

In order to put the country to better perform, physical and non-physical factors in the logistic service of the country need to be evaluated. Which of the following problems do you normally face **(you can tick more than one)**

A. Custom clearance related	TICK	B. Delay of holding cargo at the port occurs due to	TICK
The charge by steamship line when containers held longer than the agreed		Lengthy examination of goods	

standard free time at the destination port			
Improper leashing or loading of the cargo in the vessel, physical damage to the container or the contents		Overweight or damaged container	
Rental fee for the equipment used in international shipments due to delay		Delayed freight release	
More time for unloading, causing the trucks to be held up for long duration due to delay of customs		Custom clearance issues	
Missing /Incorrect documents		Please write if any	
Issues with getting goods cleared through customs			
Prevalence of strikers or absent of labors			

C. While exporting/importing to and from a country shipping delays occur due to	TICK	D International shipping related	TICK
Container not being returned		Less experience in international	

to liner by cut – off date		freight forwarding	
Delays at customs due to incorrect documentation		Trucker shortage	
Customs inspection (at both port of loading and port of destination)		Port congestion	
Port/terminal congestion		Rail congestion	
Vessel delays due to weather condition		Chassis shortage	
Please write if any		Inefficient mode provision	
		Unexpected additional duty fees	
		High Shipping costs	
		Less shipping companies	
		Insufficient shipping time	
		Please write if any	

E. TRANSPORT RELATED	TICK	F. Which one you will consider when selecting mode of transportation	Tick
Increase in unit cost		the speed which the mode exhibits	

Under Capacity		the reliability that the mode demonstrates in its ability to fulfill service requirements	
Restriction in shipment size		the flexibility that the mode exhibits	
Less flexibility		The comparative unit costs, which the modes incur	
Less speed of deliver (and timely delivery)		required delivery date	
Inefficient mode provision		shipment size	
Government issues		transit time	
Argument with transporters within and without the country		number of transshipment points	
Less security		item type	
Less transportation management		possibility of damage	
Please write if any			

G.Shipping/trucking related	TICK	H. Related to logistic	TICK
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		professionals	
Out of packaging material		few source of Logistic trained expertise, low quality in educational experience	
Out of product		Low prestige of operational logistic workers	
Product arriving at the Wrong place		Limited labor supply in remote areas where logistic hubs are often located	
Products not arriving on Expected delivery date(including handling time)		No new IT developments in logistics that control the competencies of existing work force	
Too many returns		Hiring and retaining issues difficulties	
Many of products arrive damaged		Please write if any	
Driver Shortage/Retention		J.Which freight mode you typically deal with	
Government Regulation		Air	

Less Hours-of-Service		Sea	
Environmental Issues		Multimodal	
No/less Onboard Truck/Ship Technology			
I. Track and trace related problems			
Identification delays (product arrive at warehouse or other supply chain site and wait for long period of time in the receiving area without being booked into information system)			
Identification accuracy (scarcity of identification technology as barcode , contact memory button and RFID)			
Configuration check points (inefficient number and location of check points along the supply chain)			
Aggregated shipping less use of identifier in containers or pallets)			
Less configuration traceability system and low information communication between			

participating entities	
Please write if any	

K. Warehouse related problems	YES	NO
There is enough space for utilization and handing		
There is good Warehouse lay out		
The warehouse can handle all the merchandise		
It is easily accessible for Picking of goods		
There is proper Inventory replenishment		
There is sufficient Handling equipment		
Duration of storage is enough		
There is access and parking for vehicles		
There is enough Number of docks		
There is Secure compound		
Assembling consignments are done properly		
Dispatching consignments are done properly		
Receiving and issuing of supplies are in a good accordance		
There is suitable quality control and verification		
Detection and dealing with losses are done		
Rejected material managed easily		
Deal with unwanted material and disposal of goods		
There is enough Area for slotting of goods		

Annex 3: Sample Questionnaire template for Logistic service providers

What type of service provider is your company?

- A. Logistic service provider (3PL)
- B. 4PL
- C. Freight forwarders (logistics intermediaries)
- D. Road transport company warehouse
- E. Carriers (shipping line, airline, trucking)
- F. Other Logistics (Please specify)

How you evaluate the service performance of the company on the following issues in logistic system of the country's trade partnership? Please give your evaluation by ticking (X) mark under your choice. **SD= Strongly Disagree, D= Disagree, N=Neutral/ Neither agree nor disagree, A= Agree, SA= Strongly Agree**

A. Port and Terminal	SD	D	N	A	SA
Dry port and terminal facilities are well accessed throughout the country					
All the available dry ports and terminals are well equipped with all the necessary equipment and facilities					
The available dry ports and terminals have enough space and capacity to accommodate all incoming and outgoing cargoes even in peak periods					
Dry port terminal services are provided easily with acceptable waiting time					

Dry port and terminal operations are well managed and efficient in their service					
The charges being requested for dry port , terminals and warehouses services are reasonable					
Dry port and terminal services are provided with law of first come first served, if discrimination is done it is justified and approved by higher officials					
Port/terminal congestion managed					
Cargos are located in identifiable way and their safety is well ensured in any movement					
Cargo stuffing and un stuffing , loading and unloading service are provided in all dry ports					
Custom control and clearance formalities are complete					
Customs inspection is done (at both port of loading and port of destination)					
Serve as good point of destination to Ethiopia's Import and Export cargoes					
Overall management practices of dry port and terminal sector is satisfactory					

B. Intermodal transportation	SD	D	N	A	SA
Intermodal services and quality of existing intermodal transshipment nodes keep up with capacity nodes					

Effectiveness and efficiency of intermodal hubs contribute to the overall competitiveness and attractiveness of intermodal transport					
Inland container ensure efficient turnover (exchange between transport modes: rail/road and inland navigation) of loading units (containers , swap bodies and semitrailers)in intermodal logistic network is good					
Manageable transport cost					
Scheduled maintenance efficiency					
Efficient transport lead time					
Rapid response on overall damages(losses/thefts)					
Rapid provision of relevant choice of modes during delays (arrival and departure)					

C. Information technology	SD	D	N	A	SA
Electronic commerce is developed at any level for business opportunities					
Implementation of information technology meet business requirements					
Online schedule information and container tracking and tracing facilities more widespread					
Companies report electronically for damaged goods					
There is proper sharing of information between logistic service providers (shipping line, ship agents, forwarders, port operators, custom authorities)					

D. Warehousing at dry port	SD	D	N	A	SA
Enough space for storing and receiving goods even in peak periods					
Warehouse lay out is suitable for Merchandising handling and Picking					
All the available warehouses are well equipped with all the necessary equipment and facilities					
Replenishment of Inventory done when needed					
Secure compound is provided at all warehouses					
Assembling consignments and Dispatching consignments done as per the schedule					
Import and export shipment arrive at schedule					
Shipments are cleared and delivered as schedule					
Quality control and verification are provided at warehouses					
Detection and dealing with stock losses are done					
Managing of rejected/unwanted material and disposal is done early					
Shipments not meeting company quality criteria are supervised					

E. Freight forwarding	SD	D	N	A	SA
Store cargo belonging to the clients at the warehouse					
Arrange the distribution or forwarding of the cargo as per the instructions of the clients					
Deliver within promised window					
Negotiate freight rates with shipping line to cover the interest of the clients					
Book the cargo with the shipping lines as per the requirement of the client					
Prepare bills of lading and associated shipping /negotiating documentation					
Issues the approved house bill of lading as applicable					
Do custom clearance on time					

F. International shipping and trucking related	SD	D	N	A	SA
Good experienced professionals in international freight forwarding					
Provide remarkable provision of alternative modes					
Container being returned to liner by cut – off date					
Shipping costs is affordable and there is no unexpected additional duty fees					
Sufficient shipping company available					

Shipping companies gives service any time					
Delays at customs due to incorrect documentation and Vessel delays due to weather condition well managed					
Proper leashing or loading of the cargo in the vessel, physical damage to the container or the contents are determined					
The right Products arrive at the right place on the Expected delivery date					
When there are damaged products and too many return of products, will be managed early					
Sufficient Driver available					
Government Regulation enhance the shipping/ trucking process					
Enough Hours-of-Service whenever clients want					
Environmental Issues problems solved early ,if occurred					
product arrive at warehouse or other supply chain site booked into information system without waiting for					
long period of time in the receiving area					
Sufficient identification technology as barcode , contact memory button and RFID					
efficient number and location of check points along the supply chain					
Aggregated shipping use of identifier in containers or pallets					
Efficient configuration, traceability system and information communication between participating entities					

G. Related to logistic professionals	SD	D	N	A	SA
Logistic training limited due to budget ,few source of expertise, low quality in educational experience and Lack of vocational school preparation					
Limited labor supply in remote areas where logistic hubs are often located					
No new IT developments in logistics that control the competencies of existing work force					
Hiring and retaining issues is difficult due to Low salary levels relative to other sectors					

H.Custom Related	SD	D	N	A	SA
Take care customs clearance aspect of the business					
Arrange to pass the relevant documents at customs					
Arrange the customs inspection as required					
Check and process duty and Vat payments as applicable					
Apply for refunds where applicable					
Issuing own bills of lading if not registered					
Customs declaration are processed electronically and					

this process is clear					
Information is complete and available on time due to changes in regulation					
If imports and exports occur served according to schedule					
Time between submission of the documentation in custom clearance is expensive , among others					

I.To maximize the Return on logistic assets, minimizing level of investment in the logistic system is advised. On which of the following solution you support	SD	D	N	A	SA
Shipping direct to customs to avoid warehousing					
Selecting just in time supply approach rather than stocking to inventory					
Choosing public warehouse over privately owned					
Provide different and better services than the competition					
Minimizing available cost associated with the movement and storage					
Ability to adapt changes in the route , or departure and arrival rate of shipments					

K.Of the following measures on the trade facilitation, on which of the following you support	SD	D	N	A	SA
Introducing regional customs transit system					

Interconnecting customs information transit system					
Introducing cargo tracking system					
Improving interagency coordination					
Detailed corridor monitoring					
Introducing network single windows					
Build one stop border posts					
Reducing weight controls and controls in transit					
Build transit and border infrastructure					
J.From the logistic systems provided select best needed to be improved to facilitate trade	Tick				
Transport					
Rail transport service					
Air transport service					
Maritime transport service					
Road freight service					
Warehouse					
Inventory management					
Packing and Utilization					
Information and Communication					

