CHAPTER 2: Traffic Congestion and Its Impact on Business Performance at Ports: A Review

Boulder (2015) is of the plausible view that a literature review serves as a compilation, classification, and evaluation of what other researchers have written on a particular topic with a view to ascertaining a research lacunae. Literature review afford a means for "validating assumptions" and opinions and "providing insight into the dynamics underlying the findings of other studies," and may offer more conclusive results than a single primary research study (Marshall, 2010). Aitchson (1998) argues that literature review allows the researcher to find out what has been done in terms of the problem being investigated to ensure that duplication does not occur.

This chapter examines the theoretical framework of the study and reviews previous empirical studies done on traffic congestion and its impact on the performance of customs at Ports of Entry. A detailed description of the main variables and how they interrelate from previous research findings is given together with identified research gaps. Finally, a discussion of the conceptual framework for the study is done showing the interrelationship of the variables.

An overview of current evidence on traffic congestion and its impact on performance of Customs at Ports of Entry. Goes & Simon (2015) postulate that defining important concepts is essential to ensure a common understanding of key concepts and how terminology is shared between the researcher and his or her audience, particularly if the term is unusual or not widely known.

A commercial vehicle is a vehicle that is authorized to be utilized for the transportation of goods or materials as opposed to travellers (Collins Dictionary, 2014). Similarly, Carkeys (2017) argues that the term commercial vehicle is used to recognize a vehicle which primary intention is to transport products or materials instead of travellers. A commercial vehicle will for the most part have the capacity to convey two, three or more travellers, however behind the seating will be something intended to convey materials or tow something extensive, and this component will make up most of the commercial vehicle. The European Union (1998) defines a commercial vehicle as any automated road vehicle, that by its kind of advancement and equipment is planned for, and fit for transporting, regardless of whether for installing or not: more than nine individuals, including the driver; merchandise and "standard fuel tanks". This suggests the tanks forever settled by the maker to each motor vehicle of an indistinct sort from the vehicle being alluded to and whose invariable fitting allows fuel to be used particularly, both for driving force and, where legitimate, to control a refrigeration system.

Gas tanks fitted to motor vehicles for the prompt use of diesel as a fuel are seen as standard fuel tanks.

According to Revolvy (2017), in the United States a vehicle is assigned "commercial" when it is titled or registered to an organisation. This is a broad definition, as commercial vehicles might be fleet vehicles, company cars, or different vehicles utilized for business. Vehicles that are intended to convey more than 15 travellers are viewed as a commercial vehicle. A vehicle might be viewed as a commercial vehicle if it belongs to an organisation or cooperation, is utilized for business, however is in a person's name, for example, a sole proprietor, is a rented vehicle and for the sake of the financial institution that possesses it, surpasses a specific weight or class and subsequently, is "arranged" as business despite the fact that it may not be economically utilized or financially claimed. A weight rating of 26,001 pounds or more is dependably considering business and is utilized to pull any dangerous material. A vehicle can be utilized for a business, if not solely, and remain secretly authorized, contingent upon the measure of time utilized for business.

Even though there are many definitions for commercial vehicle in the literature, this study will use a definition proposed by The Road Traffic Act of Zimbabwe Chapter 13:11 which defines a commercial vehicle as "any type of motor vehicle designed altered or added to for the transportation of goods and having a carrying capacity exceeding 1400 kg". In Zimbabwe, vehicles designed for the transportation of goods fall under traffic heading 87:04 according to Statutory Instrument 154 of 2001.

"If you can't define performance, you can't measure or manage it" (Armstrong & Baron, 1998). Performance is alluded to as being tied in with taking the necessary steps, and in addition being about the outcomes accomplished (Otley, 1999). Performance is a multidimensional construct, the estimation of which differs, depending upon a variety of elements that include it (Fitzgerald & Moon, 1996). Others contend that performance should be defined as the results of work since they give the most grounded linkage to the vital objectives of the organisation, consumer satisfaction, and economic contributions (Rogers, 1994). It is imperative to decide if the estimation objective is to survey performance results or conduct. In this manner, an organisation should distinguish between results (output), conduct (the process) and suitable performance measurement devices. Campbell (1990) subscribes to the preface that performance is conduct and should be distinguished from outcomes because they can be contaminated by system factors, which are outside the control of the entertainer. What is suggested in Campbell's contention is that performance measurement can only concentrate on

an individual/group's final output, if and just if, system factors are controllable. Conversely, Edis (1995) contends that performance is something that the individual abandons and that exists separated from the reason.

WCO (2011) asserts that performance in many customs administration is mainly based on the budget constraints they are facing. They are accordingly most keen on proficiency, for example, the relationship between costs and results of Customs houses or innovative means. Accordingly, they measure their organisational performance to drive their strategy of deploying human and material resources on the ground, develop transparency and user-oriented policies of organisations to comply with global democratic norms, fight against corruption since corrupt practices means weaker performance of customs functions. In this study, the researcher used a definition proposed by Wu (2009) who defines performance as the extent to achieving proposed objectives using resource economically in the face of internal or external environment. According to Olaja & Celebi (2015) performance of customs at Ports of Entry is measured in terms of speed, simplicity and predictability of customs procedures.

According to OECD (2015), simple, transparent and harmonised trade policies reduce administrative complexities, increase predictability, and reduce the incentives for market-distorting behaviour and corruption. Improvements in customs clearance performance are tied to overall trade policy environment. Even though the objectives, implementation capacities and resource availability differ greatly across countries, policies targeting customs performance basically cover efficient risk management, optimal use of information and communications technology, effective partnership with the private sector, including programmes to improve compliance, increased cooperation with other border control agencies and transparency through information on laws, regulations, and administrative guidelines (OECD, 2015).

Globally, customs performance is one of the two slacking parts of the Logistics Performance Index in 2014, particularly in low-income and lower middle-income countries, even after they have gained the fastest progress in this dimension (Arvis et al., 2014). Customs and other border agencies, including improvements of transit regimes, represent areas where policymakers can adopt comprehensive reforms. Customs performance, therefore, needs to be examined in the context of trade policy reform (OECD, 2015). Olaja et al. (2015) argue that that the main determinant of the performance difference between two countries is the efficiency of processes in clearance and delivery of the shipments. Table 2.1 shows the key performance indicators for customs process efficiency and border clearance.

Table 2.1: Performance indicators of customs process and border clearance (*World Bank, 2012*)

Customs process	Description
Customs efficiency	The rate of efficiency of the clearance process(i.e. speed, simplicity and predictability of formalities) by border control agencies including customs
Quality and competence of service of customs agencies	The competence and quality of service delivered by customs agencies
Clearance and delivery of imports	Whether import shipments cleared and delivered as scheduled
Clearance and delivery of exports	Whether export shipments cleared and delivered as scheduled
Transparency of customs clearance	Transparent of the customs clearance process
Provision of adequate and timely information and regulations change	Receiving adequate and timely information when regulations change
Expedited customs clearance for traders with high compliance levels	Whether traders demonstrating high levels of compliance receive expedited customs clearance
Major delays due to solicitation of informal payment	How often do cross-borders experience solicitation of informal payments
Changes in customs clearance procedures	Have the customs clearance improved or worsened
Changes in solicitation of informal payments	Have the incidence of corruption improved or worsened
Number of agencies for imports	Government agencies involved in the clearance process do you typically deal with
Number of agencies for exports	
Number of documents for imports	The number of documents submitted for clearance
Number of Documents for exports	
Clearance time without physical inspection	For imports, estimate the average time taken between the submission of an accepted customs declaration and notification of clearance
Clearance time with physical inspection	
Physical inspection be automated risk assessment	The main methods for determining whether physically inspected by customs
Physical inspection by inspector discretion	
Physical inspections	Average percentage of import shipments that is physically inspected
Multiple inspections	Import shipments physically inspected as a proportion of shipments inspected more than once

The above performance indicators helped the researcher in examining the causes of traffic congestion, identifying the challenges faced by Customs at Beitbridge Border Post, exploring the impact of delays in traffic clearance on performance of Customs at Beitbridge Border Post and in suggesting feasible strategies to improve the performance of Customs at Ports of Entry to overcome traffic congestion.

Beneke (2001) defines a ports-of-entry as point on a nation's fringe through which individuals and merchandise may enter or leave the nation. This incorporates land, ocean and air travel. Ports-of-entry are regularly kept an eye on by police authorities, home issues and security authorities who have their individual assignments to do to guarantee consistence with the laws of a nation as to merchandise and individuals entering a nation. The World Bank (2007) associates that a port of entry (POE) is an office that gives controlled section all through any nation – generally pleasing traditions and movement, and additionally other assessment organisations in charge of the implementation of that nation's laws. This view is strengthened by the United States Department of Border Protection (2012) which characterizes a port of entry as a formally assigned area (seaports, air terminals, and additionally arrive fringe areas) where Customs and Border Protection Officers or workers are doled out to acknowledge sections of stock, clear travellers, gather obligations, and implement the different arrangements of Customs and Border Protection and related laws.

This study used a definition proposed by the African Development Bank (2012) that a port of entry as an area where a large number of government organisations (such as Revenue Authority Customs; Immigration; Security Police; Ministry of Agriculture; Ministry of Health; Bureau of Standards) are associated with the different record and products controls, the computation and gathering of obligations and charges, and additionally migration.

In the same vein as other social terms, traffic congestion does not have a generally acknowledged definition. Subsequently, extraordinary researchers have offered distinctive definition to what they conceptualize as traffic congestion. As a physical phenomenon traffic congestion can be defined as a circumstance where interest for road space surpasses supply and is reflected by slower speed, longer outing circumstances and expanded engine vehicular lining (Institute of Transport Engineers, 1989). On the hand the Victoria Transport Policy Institute (2005) alludes traffic congestion to the incremental expenses coming about because of impedance among road users. Conversely, Mahesh & Lingaiah (2016) contends

that traffic congestion is a condition on street organises that happens as utilize increments, and is portrayed by slower speeds, longer excursion times, and expanded vehicular queuing. Congestion is the state of movement stream on a transportation facility described by high concentrations and low speeds, in respect to some picked reference state (with low densities and high speeds) (Bovy & Salomon, 2002). Varma (2016) agrees that traffic congestion is a circumstance on street systems that happens as its utilization increments, and is portrayed by slower speeds, longer outing circumstances and expanded vehicular queuing. Weisbrod *et al.* (2003) were of the view that traffic congestion is a state of movement delay (i.e., when movement stream is impeded underneath sensible rates) considering that the quantity of vehicles endeavouring to utilize a road surpasses the plan limit of the movement system to deal with it.

The definitions proposed by the Institute of Transport Engineers (1989); Bovy *et al.* (2002); Varma (2016); Mahesh *et al.* (2016) above are demand-capacity related whereas the definition provided by the Transport Policy Institute (2005) is cost-related. However, to address the impact of traffic congestion on performance of Customs at Ports of Entry, a delay time-related definition was adopted in this study. The study used a definition proposed by Cambridge Systematics and TTI (2005) that defines traffic congestion as a phenomenon which relates to an excess of vehicles on a segment of roadway at a specific time bringing about speeds that are slower sometimes much slower than typical or "free flow" speeds.

Defee *et al.* (2010) stated that good research should be grounded in theory. There are many theories that exist to analyse the movement of people and vehicles across borders. These theories are used to identify important aspects of policy and explain and predict policy and its consequences. To build the critical concerns of traffic congestion and its impact on performance of Customs at Ports of Entry this study borrowed from the Customs Performance Model, Queuing Theory and the Theory of Constraints.

Generally queuing theory begins in the early 1900's with the work A.K. Erlang on telephone traffic. In his work Elrang sought to answer such questions as what number of phone circuits and administrators are required to fulfil a given request (Erlang 1909, 1917). Queuing theory is the mathematical study of waiting lines, or the act of joining a line (queues). In queuing theory, a model is developed with the goal that queue lengths and waiting times can be predicted (Sundarapandian, 2009). Ozigbo (2000) specifies the following as the assumptions of queuing theory:

- Arrival are served on a first in, first out basis;
- Every arrival waits to be served regardless of the length of line;
- Arrivals are independent of preceding arrivals, but the average number of arrivals does not change over time;
- Service times also vary from one customer to the other and are independent of one another, but their average rate is known;
- Service times occur according to the negative exponential probability distribution; and
- The average rate is greater than the average arrival rate.

Altiok & Melamed (2007) stress the view that a queue occurs when service rendered is low compared to the high-level demand in a particular place and time. Waiting lines are probably going to form in all circumstances where customs are involved. Wherever there is competition for limited resources queuing is probably going to happen. The role of transportation in human life cannot be overemphasized. According to Intikhab *et al.* (2008), efficient transportation systems plays an important role in catering for the daily necessities in the lives of the citizens. Ordinarily any queuing system is made of units, alluded to as customers, requiring some sort of service and who arrive at a service facility, join a queue if service is not immediately available and, in the end, leave after receiving the service. A server refers to mechanisms that delivers service(s) to the customers. If upon arrival a customer finds the server busy, then he or she may form a queue, joint it or leave the system without receiving any service even after waiting for some time (Waters, 2008; Gupta, & Khanna, 2007).

The issue of queuing has been a subject of scientific debate for there is no known society that is not confronted with the problem of queuing. The mathematical discussion on queuing theory gained extensive ground in mid-1930s though the work of Pollaczk (1930, 1934), Kolmogrove (1931), Khintchine (1932, 1955), and others. Kendall (1951, 1953) gave a symmetric treatment of the stochastic process occur the theory of Queues and Cox (1955) analysed congestion problems statistically. Khinchive (1960) examined the mathematical methods in theory of queue. Morse (1958) discussed the wide variety of special Queuing problems and applied queuing theory was given by Lee (1958). A component of lining hypothesis with applications was given by Saaty (1961). On a few issues in lining and booking framework has given by Badoni (2001). Chime (1980) tended to the utilization of servers in a traditional Markovian (M=M=2) choice process where

the servers could be evacuated and portrayed the ideal approach by modifying the quantity of working servers. In research of comparable lining frameworks, Whitt (2007) took a gander at the staffing issue in lining administration frameworks with time-differing request. Cetin & List (2004) contends that when IT frameworks or assets are shared among different procedures or servers, the administration times of these procedures or servers wind up noticeably related. Ozigbo (2000) contends that the fundamental segments of queuing system are arrival, servers and waiting lines. Enwurum (2003) looks at it from more extensive point of view, as he outlines the queuing theory into four namely; an input source or calling population that generate customer, a service system that consists of one or more service facilities, a queue that indicates the number of customers waiting for service and a queue discipline or service discipline is the rule for service.

Usually, the interarrival times are independent and have a common distribution. In many practical situations customers arrive according to a Poisson stream (i.e. exponential interarrival times). Customers may arrive one by one, or in batches (Adan & Resing, 2015). An example of batch arrivals is the customs officer at the border where travel documents of commercial vehicles must be checked.

Customers may be patient and willing to wait (for a long time). Or customers may be impatient and leave after a while (Adan *et al.*, 2015). For example, commercial vehicles at Ports of Entry will wait too long before a ZIMRA officer is available for physical inspection or customs clearance.

Generally, the service times are independent and identically distributed, and that they are independent of the interarrival times. For example, the service times can be deterministic or exponentially distributed. It can also occur that service times are dependent of the queue length (Adan et al, 2015). For example, the customs clearance rate can be increased once the number of lanes is increased.

A queue discipline is a priority rule or set of rule for determining the order of service to customers in a waiting line. The rule selected can have a dramatic effect on the systems overall performance. The number of clients in the line, the average waiting time, the range of variability in waiting time and the efficiency of the service facility are some factors that could affect the choice of priority rules Probably, the most common priority rule is first to come, first to serve. This rule states that the customers in line are served on the basis of their chronological arrival (Onyeizugbe, 2011). The discipline could be last in, first out (LIFO). The

quality of service one receives could be judged, at least in part, by the length of time one waits in the queue for service, and this is very much influenced by what constitutes the configurations of the system (Gross & Harris, 1998; Forbs *et al.*, 2011).

This study used the Queuing theory to examine the causes of congestion at Ports of Entry. Arriving commercial vehicles at Beitbridge Border Post can be considered as the customers of a queuing system. Traffic congestion at Beitbridge Border Post may also occur due to an undue wait in service may be because of new employee. Delays in customs clearance may result in reduced trade volumes, corruption and illicit trade.

The CPM was produced considering a need to utilize a complete estimation model to evaluate the Key Performance Indicators' (KPI's) and grow new KPI's in customs organisation. It was likewise intended to be non-specific, with the goal that different customs administrations can utilize it to start the procedure of KPI definition and audit of existing pointers and measures. The model depends on benchmarks effectively created by the WCO, World Trade Organisation (WTO), World Bank (WB), International Monetary Fund (IMF), and other global and national associations. The CPM has been left at the vital level; nobody format exists, as customs administrations are at different levels of advancement as far as change and modernization. The model is adaptable and outlined as a guide; in any case, certain KPI's must be measured to decide a customs administration's advance in connection to its vital arrangement. The achievement of KPI execution is needy upon an association's senior level duty, great administration, and responsibility structure, as it denotes the start of a change administration process (Watts & Hekala, 2006; WCO, 2002).

The WCO has made various instruments and rules for use for or of measuring customs forms, for example, assertion handling, and in addition diagnostics to recognize regions for development and limit working in customs operations (WCO, 2002). Other WCO instruments and presentations give understanding into estimation, yet there is no comprehensive way to deal with measuring the performance of customs administrations (Watts *et al.*, 2006). These worldwide instruments generally do not portray how to quantify the "results" as they identify with customers, partners, and corporate administration, but instead concentrate primarily on customs forms, for example clearance times. Fig. 2.2 reflects the Customs Performance Model.
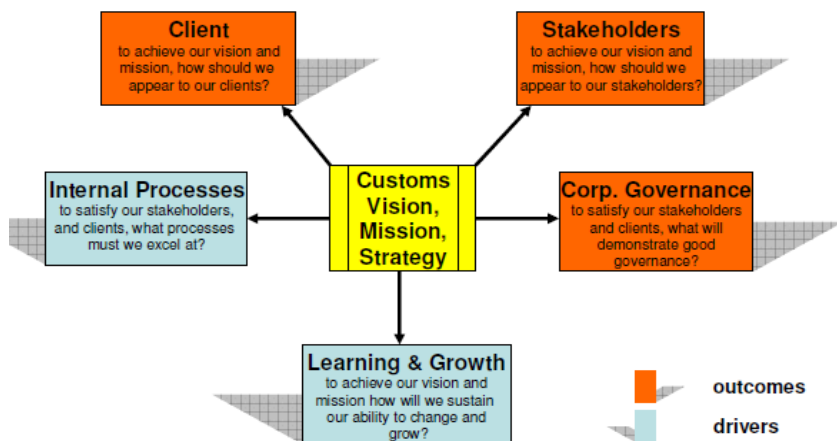
Fig. 2.2: Customs Performance Model *(Watts & Hekala, 2006)*

The CPM model comprises five sectors of measurement and comes from the Balanced Scorecard approach that is increasingly used by organisations as a strategy management and communication tool, and a means of ensuring that all aspects of performance are measured, hence a "Balanced" Scorecard. It is not a rigid set of measurement areas but can be adapted to suit organisations in both the private and public sectors. The CPM was developed to best represent the types of measures that customs administrations should use. The traditional BSC business model described in comprises four areas of measurement namely: financial, customer, internal business process and learning and growth perspective. This does not reflect the public service environment, where budgets are imposed, and the Minister of Finance and the public are key stakeholders. Customs organisations are also responsible to the Auditor General and Parliament for "good governance." The model with a defined vision, mission, and strategic goals and objectives for the customs administration is a starting point for defining performance indicators and measures (Watts *et al.*, 2006).

Outcome or Lagging Indicators are measured at the end of a process, a consequence of past actions (e.g. revenue collected, seizures, fines and penalties, client/stakeholder satisfaction, etc.). On the other hand, drivers or leading Indicators are measured during a process and show progress towards goals and targets (future performance). This type of indicator relates to business processes (e.g. cycle times, quality, effectiveness, and service delivery), and process development (e.g. AEO program, technology innovation) and employee competency (Watts *et al.*, 2006). The lagging indicators tend to be common to

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most customs administrations, while the performance drivers, the lead indicators, would be unique to each administration. If the lead indicators are viewed in relation to the WCO Framework, then there are areas that cut across customs administrations (e.g. technology innovation; ASYCUDA and other processes relating to Integrated Supply Chain Management). A good Balanced Scorecard should have a mix of outcome measures and performance drivers. Outcome measures without performance drivers do not communicate how the outcomes are to be achieved. They also do not provide an early indication of whether the strategy is being implemented successfully. Conversely, performance drivers such as cycle times without outcome measures will fail to reveal whether the operational improvements have been translated into client satisfaction (Watts *et al.*, 2006).

To improve the quality and speed of the clearance cycle and hence client satisfaction, ZIMRA employees must possess the required competencies. The CPM is not just a collection of measures in five categories but a linked set of measures that define both long-term strategic objectives and the means for achieving those objectives. If jobs and accountabilities are not well defined and or employees are not motivated to perform for reasons of poor pay or lack of consequences for performance results, then the process becomes longer and more difficult resulting in congestion. The CPM model is used in this study to identify the KPI's used by ZIMRA and how they reflect its operations at Ports of Entry particularly in supply chain management. In addition, the model is used to help the researcher to examine the ways in which the ZIMRA's organisational structure better define its staff's authorities and accountabilities at Ports of Entry. Furthermore, the model was used examine ZIMRA's organogram and how tasks are delegated to facilitate greater decision-making responsibility to the customs officers at Ports of Entry.

TOC is a management framework defined by Goldratt (1990). It prescribes methods for controlling and overcoming constraints (also referred to as bottlenecks) that limit a system to achieve its goals. The framework prescribes, that the resources around a constraint are expanded until the system is relieved of a particular limitation, and then the new cycle of defining a new constraint and taking further action begins (Goldratt, 1994). Goldratt (1999) suggests that every system there exists for a purpose. In other words, all parts of the system strive towards the same goal.

Gupta & Boyd (2008) suggest that an organisation can be viewed as a chain, whereas Nave (2002) states that systems can be viewed as a chain. Either way, Nave (2002) suggests that the chains are independent links that are all working to

achieve the overall goal. In this sense, weak links represent constraints. Similarly, Şimşit, Günay, Vayvay (2014) argues that TOC views processes as they are rings of the same chain instead of thinking they are independent from each other. At the same time, the theory focuses on the weakest points which are bottlenecks for the entire company and try to determine the relationship of these bottlenecks. Therefore, this integrated management philosophy changes the way of thinking of managers and become an important tool for solving root problems. Additionally, Simatupang *et al.* (2004) argue that constraints can be physical and non-physical, internal and external (inside or outside supply chain).

The theory focuses on three areas, logistics, performance measurement and logical thinking (Cox & Spencer, 1997; Simatupang *et al.*, 1997). Logistics prescribe drum-buffer-rope, the method used for managing a system with respect to the constraint. Drum-buffer-rope is a scheduling technique, where drum prescribes the pace of production flow, buffer prescribes protection time in critical areas and rope as a mechanism for keeping all elements of the system working in the same pace (Schragenheim & Ronen, 1990). Performance measurements are used to verify whether the system is achieving expected outcomes and is on target to reach the goal. The measures include throughput, inventory and operating expenses. Although originally defined as financial measures, they are also used in other, non-financial contexts (Anderson, 2004; Motwani *et al.*, 1996).

The question that the performance measures answer is, "How do we know whether our constraint-breaking has had a positive effect on our overall system" (Dettmer, 1997). Goldratt (1994) asserts that effects of local actions taken to advance progress of the system can be gauged using these performance measurements. The concept of the goal is based on assumptions that the resources are limited and that the only way to maximise their utility is to direct their use towards the well-defined and focused goal (Weston, 1991). Although Goldratt (1999) defines the goal as "To make money now and in the future", it is not unusual for other authors to set the goal using other parameters. Kohil & Jaworski (2009) define the goal as "To recruit with integrity high quality men and women to meet Army mission recruitment requirements now and in the future [...]" – the definition that clearly is not of a financial nature. Shoemaker & Reid's (2005) observation is that financial goals for government organisations are usually replaced by service goals.

In the throughput world, there are three dimensions namely organisational mind-set, performance measurements and decision making and methodology (Boyd & Gupta, 2004). The main assumption in the TOC is that every for-profit

organisation has the goal of making as much money as possible, now and in the future. However, while doing these certain conditions cannot be violated, such as satisfying the market demand and providing a good work environment for employees (Nieminen, 2014). The TOC suggests that traditional accounting measures are inappropriate with respect to the actual goal of the organisation and they do more harm than good since they distract plant managers from the true goal. The TOC has evolved into a continuous process, emphasizing that change should be embraced. This is important, since constraints tend to shift within the organisation as time goes by. These methodologies will be examined in more detail later. (Gupta & Snyder, 2009).

According to Goldratt (1999), identifying constraints also means focusing on their impact. In other words, prioritizing the constraints depending on how they impact the goal is important. The second step implies maximising the efficiency of the constraint and eliminating non-productive activities. Goldratt (1999) means that the other resources should supply what the constraints are consuming. Reid (2007) suggests that this step includes maximising the efficiency of the constraint. The third step, subordinating, implies organising the non-constraints in such a way that they are strategically aligned with the constraints and support the overall strategy. The fourth step, elevating the constraints, involves a capacity increase of the constraint, while last step implies preventing inertia by going back to step 1.

In this study, the researcher used the TOC to identify and outline bottlenecks in the customs clearance process of Customs at Beitbridge Border Post. These bottle necks are the root cause of traffic congestion at Beitbridge Border Post. Christopher & Holweg (2011) suggests that logistics processes, customs clearance in this case, can be perceived as a link of activities. He also states that all these activities belong to one of two categories, bottlenecks and non-bottlenecks. A bottleneck is considered the slowest activity, which determines the throughput time of the system. Another perspective on the same matter is introduced by Slack *et al.* (2010). They suggest that some parts of an operation might not operate to its full capacity, whereas other parts are. The part of the operations operating to its full capacity will then determine the performance of the whole operation. Therefore, this part can be called a constraint. In this study, the theory of constraints (TOC) was a useful theory and tool when identifying and locating constraints hindering the performance of Customs at Ports of Entry.

Traffic congestion is a phenomenon of increased disruption of traffic movement on an element of transport system. It is most visible when the level of demand for

movement approaches or exceeds the present capacity (Taylor, 1999). According to Downie (2008), traffic congestion occurs when the volume of vehicular traffic is greater than the available capacity. In the modern business environment of just-in time production and delivery, it has become ever more important that traders are guaranteed fast and predictable release of goods. Being the foremost agency at the border and a prominent player in the release of goods, Customs should therefore strive to reduce the complex clearance procedures and limit information requirements to the essentials (WCO, 2015). The major cause of traffic congestion at Ports of Entry includes customs inefficiencies, inadequate and poorly managed infrastructure and lack of integrating activities of border management agencies (Stantchev & Whiteing, 2005; Tanigichi & Thompson, 2007; Arvis *et al.*, 2007; World Bank, 2012).

Outdated, cumbersome systems and overly bureaucratic border clearance processes imposed by customs and other agencies delays the clearance of imports, exports, and transit goods. Border clearance processes are among the most troublesome links in the global supply chain. For example, it frequently takes three times as many days to import goods in poor countries as it does in rich ones. Imports to poor countries require nearly twice as many documents and six times as many signatures (World Bank 2006; Arvis *et al.*, 2007). Customs administrations in developing countries still inspect majority of cross-border traded cargo during their clearance processes at the borders (Geourjon & Laporte, 2004). They noted that, regional agreements in Africa are often times unwilling to forgo these systematic inspections due to fear of risking revenue loss. In line with this belief, they deliberately choose not to use selectivity techniques that allow for targeted inspections which in turn promote reduced delays and unnecessary border constraints. While they regard targeted physical inspections as a hindrance to maximising their revenue collections, in reality these approaches cause congestion and effectively impede rather than facilitate cross-border trade. The above situation is worsened by the nature of existing import and export procedures which are plagued by lack of transparency and predictability, insufficient application of automated systems and too many documentary requirements for a single transaction World Customs Organisation (2008) estimated that 100% inspection of every container would bring global trade to half. On the other hand, Hummels (2001), in his research linked restricted abilities of Customs ports and inefficient procedures with time cost. A day less in delivery times reduces landed costs of cargo by 0.5%. Table 2.3 presents the number of documents, days and cost required for import and export.

Table 2.3: Number of documents, Days and Cost required for Import and Export

Region	Export			Import		
	Number of documents	Required days	Cost (US$/container)	Number of documents	Required days	Cost (US$/container)
East Asia/ Pacific	6	21	923	7	22	958
East Europe/ Central Asia	7	26	2134	8	29	2349
South America/ Caribbean	6	17	1268	7	19	1612
Middle East/ North Africa	6	19	1083	8	22	1275
OECD High-income Countries	4	10	1028	5	10	1080
South Asia	8	32	1603	9	33	1736
Sub-Saharan Africa	8	31	1990	9	37	2567
World average	6	22	1470	7	24	1742

Source: Doing Business Report 2012, World Bank

According to The World Bank Connecting to Compete 2010 indicators of red tape also illustrate a lack of coordination at the border and the burden this imposes on logistics operators. Operators in the lowest performance countries typically deal with around double the number of government agencies as operators in high performance countries. The question of simplifying documentation has always featured very high in the trade facilitation agenda, reflected in the many initiatives to create trade single window and simplified and harmonized transit procedures and documents. While COMESA has harmonized transit documentation, despite being explicitly targeted, it is still missing within the SADC region. From Durban to Malawi for example, the same information is declared seven times at different locations. Simplifying documentation and pushing forward single window initiatives heavily depend on the will of SADC Members for regional cooperation. They must come along with addressing weaknesses in both dimensions of border management, the soft and hard trade-related infrastructure (Feidieker, 2011). Fig 2.3 shows export and import agencies and documentation, averaged by LPI quintile.
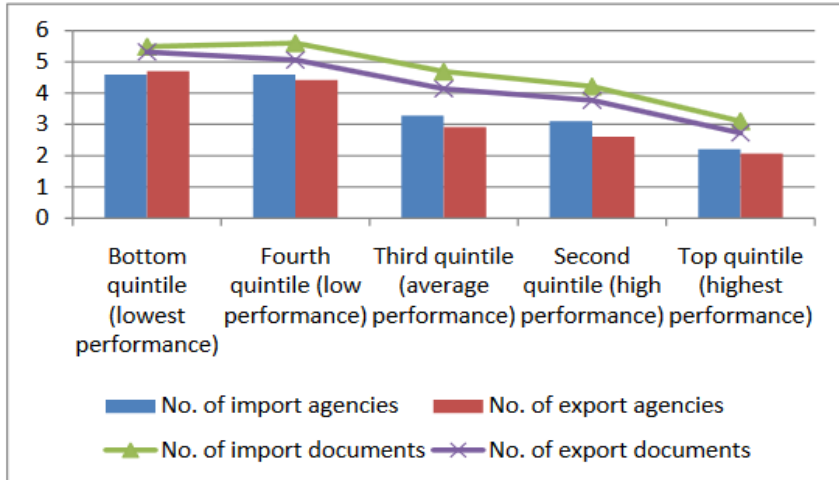
Figure 2.3: Export and Import Agencies and Documentation, Averaged by LPI Quintile *(The World Bank Connecting to Compete, 2010)*

Bugbilla & Asamoah (2016) argues that the causes of traffic congestion at Ports of Entry are largely attributed to physical examination, tariff classification, goods valuation and delay in receiving permits and exemptions from institutions. A Report by B&FT (2015), to the effect that excessive physical examination of goods at the Tema harbour, by 23 agencies was a major cause of congestion in clearing goods.

Infrastructure includes road and truck parking bays, commercial offices, office space, inspection bays, bridge development, truck and baggage scanners, information and communication technology, surveillance technology are essential at Ports of Entry (Wilmott, 2007; Japan International Cooperation Agency, 2009). The World Shipping Council (2015) argues that border and port infrastructure need to be prepared for greater volumes and efficient ways to handle increased volumes of trade that pass through them. Markets accessibility and volume of trade are largely dependent on the quality of infrastructure and especially transport which facilitates the physical movement of people and goods (Muchori, 2015). Downie (2008) opines that traffic congestion occurs when the volume of vehicular traffic is greater than the available road infrastructure and capacity, a point commonly referred to as saturation. He describes many specific circumstances which cause or aggravate congestion. Most of such circumstances are concerned with a reduction in the capacity of the road at a given point or

over a certain length or increase in the number of vehicles required for the movement of people and goods.

The short-to-medium term effect of underinvestment in transport infrastructure is traffic congestion which serves as a compromising factor of logistics efficiency (Tanigichi & Thompson, 2007; Stantchev & Whiteing, 2005). This view was upheld by Trevor (2011) who argues that road traffic congestion has an adverse effect on border and port efficiency especially in developing countries where there is the lack of appropriate transport infrastructure composed of intermodal freight system to facilitate efficient cargo evacuation and integrated freight logistics systems. Agility Emerging Market Logistics Index (2015) argues that poor infrastructure result in lack of physical connectedness, increased transport cost and negatively impacts a country's overall trade development. Accordingly, to both investment in port infrastructure and the capital-intensity level are other factors that can explain the differences in performance and efficiency between ports, because without infrastructures or the ability to offer services, a port could not be able to handle an increasing number of vessels or cargo (Liu, 1995; Mussema, 2016). Inadequate transport infrastructure has been discussed in port literature as an impediment to port efficiency and supports this finding (Raballand et al., 2012; Refas & Cantens 2011). This view correlates with Ojadi & Walters (2015) who postulate that transport infrastructure deficiencies on the sea and land sides of the port were identified as constituting a hindrance to the efficient flow of goods through the ports.

In Africa, ports and the land transport system serving inland areas were developed in the colonial era. As these African colonies gained independence in 1960s to 1980s, their transport infrastructure progressively degraded due to insufficient investment (Japan International Cooperation Agency, 2009). This view correlates with Millar (2014) who points out that Africa's transport infrastructure lags well behind that of the rest of the world and doing business in Sub-Saharan Africa has remained challenging due largely to weak transport infrastructure. This situation has greatly impeded logistics services, thereby driving cost of doing business even higher (Onyemejor, 2015). Acknowledging the seriousness of infrastructure deficit in Africa, Raballand et al., (2012) puts the shortfall at about $48 billion per annum, pointing that the shortcomings impede competitiveness and economic growth in the region. Confirming the empirical findings by Hummels & Schaur (2012), demonstrating how longer travel time negatively impacts trade, Raballand et al. (2012), further stressed that infrastructure gaps and high transport cost hinders growth and poverty reduction in Sun-Saharan Africa.

OECD (2006) estimates that cross border infrastructure can increase trade, improve security, addresses the need of landlocked countries, save money, build on national and regional comparative advantage and strengthen natural resource management. An Interim Report of the Canadian Senate Committee on National Security and Defence (2005) announces that border congestion and infrastructure deficiencies cause delays at the Windsor-Detroit crossing and costs the Ontario economy $7 million in lost production. Many countries of the sub-Saharan region have a history of major ineffective infrastructure improvement due socio-economic problems. Infrastructure at Ports of Entry in the region reflects colonial legacy of the past which at the time restrict rather facilitate movement across the borders (Department of Transport South Africa, 2012; UN Policy Brief, 2007). According to Cross-border Operations Report (2016), SADC land borders are currently characterised by various infrastructure and operational constraints. The report also announces that impediments such as inadequate approach roads to border posts, inadequate parking for vehicles within the border precinct, no separation and freight and passenger traffic, limited cooperation and coordination amongst border post officials and complex documentation and inspection systems are examples of hard and soft infrastructure constraints that result in excessive delays and traffic congestion for cross-border road transport operators.

Traffic congestion at ports is exacerbated by inefficient rail services, for example Kenya and Uganda Railways Corporations were once incredible. Abidjan (Côte d'Ivoire) is proficient, yet costly. Land border crossings are overfilled. Incidentally, handling at air terminals, which is ordinarily anticipated that would be more productive because of the higher cargo charges and value of goods, is likewise no better as it routinely takes days to clear goods. The airports experience lack of inspection equipment like scanners. Capacity for perishable or dangerous goods may likewise be missing or simple (Waterman, Esscobedo *et al.*, 2009; Buyonge & Kireeva, 2008).

Another cause of traffic congestion at Ports of Entry is the lack of coordination between the government departments and agencies involved in controlling cross-border transactions. The multiplicity and diversity of sometimes uncoordinated data and document requests by different agencies increases transaction costs and the risk of making mistakes. The multiplicity of those agencies operating on both sides of the same border doubles the bureaucracy at border posts, which translates into congestion and delays (ESA BMO Network, 2010).

According to the Doing Business (2012) report most of the congestion and delays in the import export process are due to the time take it in the documents' preparation. Until the year 2011 the days it takes in Mexico to prepare the

paperwork were 14 days to exports and 17 days to imports with an average cost of 1470USD and 2050USD respectively. CRCI cites that UNCTAD estimates that on average, each single Customs transaction requires 20 to 30 different players, 40 documents, 200 data entities of which 30 of these are at least repeated 30 times and the re-inputting of 60 to 70% of all data at least once. On this same note, World Trade Organisation (1998) observed that in some nations, non-harmonization of systems and too many documentations all increase paperwork so involved to 4 times. This result in unnecessarily prolonged release waiting times accounting for 20% of total transport time and 25% transport costs. This is particularly true of Africa not only due to lack of adequate infrastructure in many countries, but also due to a past characterised by poor national governance structures. Imports to poor countries require nearly twice as many documents and six times as many signatures (World Bank and International Finance Corporation 2006).

In most African nations, there are two complete sets of controls to be completed– one on each side of the border post – with various types of documents to be filled and cleared. These authoritative obstacles raise trade costs (it is estimated that every day of delay at customs is comparable to an extra 85km between the trading nations) (African Development Bank, 2012). The customs environment in the Southern and Eastern African sub-region is characterized by a lack of coordination among the multiple government agencies on both sides of borders. This raises the common challenge of the duplication of procedures at each border, which increases the potential for risk management and fraud. While some countries in the sub-region have entered into agreements to standardize customs procedures and to coordinate government agencies, limited progress has been achieved in the integration of processes and cooperation between border checkpoints. Furthermore, the lack of computerized customs management systems results in lengthy and inefficient manual operations carried out by traders and officials at borders. In most cases where customs systems are not harmonized, the different government agencies at borders cannot interact or trade. Even when computerized systems are used, such as ASYCUDA. The incompatibility of the systems that are tailor-made to suit each country's specific needs, together with unreliability of the networks, pose additional threats to the cost of trade in the sub-region (AFDB, 2012).

Countries exercise their right to control the movement of goods, people and craft entering and exiting their territorial jurisdiction at Ports of Entry (World Customs Organisation, 2009). Customs administrations operate in dynamic and complex environment that deals with an array of traders, classification of goods, rules of origin, tariffs and valuation differences (Zake, 2011). The changes in the operating

environment pose challenges and affect the operations of customs administrations (Mpumela, 2015; World Bank, 2005). Customs administration worldwide face a plethora of challenges which eventually thwart their performance and have a significant impact on service delivery and perceptions of taxpayers (Cross-border Operations Report, 2016, World Customs Organisation, 2009; World Bank, 2005). A recent survey by Bugbilla & Asamoah (2016) revealed that obtaining permit and exemption, classification of goods and valuation of goods, were the most problematic confronting Customs in the clearance process, across the ports and borders. These findings were similar to those identified by APCF (2008), when they conducted a study on the challenges faced by Customs in developing Countries. Duval (2008) listed Customs valuation and tariff classification as factors militating against trade facilitation, while Bosche & Zdouch (2014) revealed that tariff classification, goods valuation and how to identify the country of origin of imported goods, are the factors hindering revenue collections.

The challenges faced by customs administrations in traffic clearance Ports of Entry include corruption, insufficient state of supporting infrastructure, illicit trade and Customs, Contribution of various agencies to customs delays, lack of coordination with border agencies and other stakeholders (Cross-border Operations Report, 2016; Khumalo, 2015; Munyanyi, 2015; OECD, 2009; World Bank, 2005). These challenges are discussed in the following sections:

The World Bank (2012) postulates that systems incompatibility is a hindrance to efficient management of customs clearance processes at ports and borders. Most of the customs offices in the different countries are not on Wide Area Network and again this is an obstacle in management of transit traffic as customs offices must rely on physical documents upon arrival of the truck at the port of exit. This view was reinforced by the World Bank (2012) which states that the lack of computerized customs management systems results in lengthy and inefficient manual operations carried out by traders and officials at borders. In most cases where customs systems are not harmonized, the different government agencies at borders cannot interact or trade. Even when computerized systems are used, the incompatibility of the systems that are tailor-made to suit each country's specific needs, together with unreliability of the networks, pose additional threats to the cost of trade between countries.

Mutombodzi (2007) argues that customs automated systems in most African regions are not interfaced and therefore this pose a serious challenge in ensuring that goods have left the country and accounted for in the next transit country and also those acquittals are genuine and authentic. Customs administrations run systems that are different and even those that run the same systems e.g. Asycuda,

their systems do not talk to each other. There is closer customs cooperation and consequent facilitation for countries within the more integrated regional economic blocs such as the Common Market for Eastern and Southern Africa (COMESA), the East African Community Customs Union (EACCU), the Southern Africa Development Community (SADC) and the West African Economic & Monetary Union (UEMOA, 2006). However, even within these economic blocs, there are variations. For example, Kenya adopted the SIMBA 2005 IT System, which is different from ASYCUDA, the most widely used customs IT System in Africa (USAID, 2008).

Infrastructure such as road and truck parking bays, commercial offices, inspection bays, office space, housing, bridge development, information and communication technology, surveillance technology, and truck and baggage scanners is essential at Ports of Entry (Matsushita, 2009; Wilmott 2007). Agility Emerging Market Logistics Index (2015) suggest that poor infrastructure result in lack of physical connectedness, increased transport cost and negatively impacts a country's overall trade development. Ports and transportation infrastructure need to be prepared for greater volumes and efficient ways to handle those volumes through ports regardless of ship size (World Shipping Council, 2015). Transport infrastructure deficiencies on the sea and land sides of the port were identified as constituting a hindrance to the efficient flow of goods through the ports (Ojadi et al., 2015). Nyema (2014) argues that infrastructure is the necessary condition for efficient cargo handling operations and adequate infrastructure is needed to avoid congestion, foster trade development and securing connectivity for economies heavily dependent on international trade.

A study by Keceli (2011) found that despite the intense infrastructure investments and capacity enhancement efforts at ports in Turkey, ports are still restricted by hinterland transport facilities and connections between international ports and manufacturing sites. As port hinterlands are limited, increased throughput causes delays and congestion to the movement of goods and increased variability in handling times. According to Millar (2014), Africa's transport infrastructure lags well behind that of the rest of the world and doing business in Sub-Saharan Africa has remained challenging due largely to weak transport infrastructure at Ports of Entry. This situation has greatly impeded logistics services, thereby driving cost of doing business even higher (Onyemejor, 2015). Ports and the land transport system to serving inland areas were developed in the colonial era. As these African colonies gained independence in 1960s to 1980s, their transport infrastructure progressively degraded due to insufficient investment. Under the import substitution industry policy at the time, the public sector played a leading role in imports of raw materials and exports of agricultural products. As a result,

the transportation system, which was integrated into this industry policy, lost its efficiency. From the latter half of 1960s other industrialized nations rapidly underwent a transport revolution and containerization, and significantly improved their transport efficiency (Japan International Cooperation Agency, 2009).

Corruption at borders and ports involves various actors, including customs officials, border guards and port operators, with different powers and bureaucratic mandates, resulting in different discretionary powers and opportunities to extract bribes. For example, customs officials are responsible for collecting taxes on particular types of goods and for ensuring that import or export procedures are adhered to. In Customs, one of the major corruption risks is a high rate of duty to be paid. Sometimes it is easier and cheaper for businessmen to bribe a customs officer than to discharge all duties or to avoid paying customs duties by wrongly declaring goods at customs (Buyonge *et al.*, 2008). They also argues that wrong declaration of goods at customs brings risks, that customs officer might reveal the cheating during inspection of cargo.

The discretionary power of customs officials and their monopoly over the flow of persons and goods, combined with weak accountability and difficult supervision are some of the reasons explaining the incidence of corruption in customs authorities. Corruption in border control and customs authorities most often manifests itself either as a collusive form of corruption to avoid taxes and tariffs (e.g. the company offers the bribe), or as coercion to speed up routine procedures (the public official requests the bribe) (Wickberg, 2013). Corruption has tragically hindered economic development and growth in African and most people live on less than $2 per day. Like a spider's web the tentacles of corruption are spread in every African country Transparency International (2013). This view was reinforced by Martini (2013) who argues that weak institutions, poor governance and under resourced customs services and police forces make many of Africa's borders porous and difficult to control. Customs and border officials often operate in remote posts that are geographically dispersed, and work around the clock with relatively few staff. They often lack adequate supervision, opportunities for corruption abound (Ferreira *et al.*, 2007). According to the 15th report by the Improved Road Transport Governance Initiative (IRTG), there are between 1.8 and 3.2 checkpoints per 100 km along corridors in West Africa and the bribes collected by customs, police, gendarmerie, and other uniformed services range from US$ 3 to US$ 23 per 100 km (close to US$ 200 per average trip) (World Bank, 2012).

While various border agencies have different missions at ports and borders, this has obviously posed challenges in smooth movement of transit traffic as each

agent endeavours to satisfy their requirements. Border agencies range from police officers, immigration, state security agents, Vehicle Inspection departments, health and customs officers (Mutombodzi, 2007). It is also found that the stakeholders involved in Customs clearance processes, in some way or others, are also responsible for delayed clearance. Such delays are mainly due to the coordination between the parties, among the government agencies, and between the government agencies and the stakeholders involved in the Customs clearance processes (World Customs Organisation, 2016). The array and variety of sometimes uncoordinated data and document requests by different agencies increases transaction costs and the risk of making mistakes. The array of those agencies operating on both sides of the same border doubles the bureaucracy at border posts, which translates into congestion and delays (ESA BMO Network, 2010). Where interaction with Customs is mediated by customs brokers, businesspeople usually get the impression that delays are largely caused by customs authorities (Buyonge *et al.*, 2008). This may be partly true in the case of delays caused by pre-shipment inspection companies sub-contracted by Customs to carry out verification of values, quantities and quality of goods. In other cases, customs usually have limited control over the activities of other government agencies responsible for checking goods standards, phytosanitary and health inspection. Unless reform and modernisation of Customs is done in tandem with modernisation in these agencies, the gains from Customs may not benefit businesses to the optimum (Buyonge *et al.*, 2008).

The customs environment in the Southern and Eastern African sub-region is characterised by a lack of coordination among the multiple government agencies on both sides of borders which, in turn, increases the potential for fraud and the need for risk management (Barka, 2012). Although some countries in the sub-region have entered into agreements to standardize customs procedures and to coordinate government agencies, limited progress has been achieved in the integration of processes and cooperation between border checkpoints (World Bank, 2012). Savage *et al.* (2013) point out the burdensome paperwork being the reason for holdups in customs.

O'Hare *et al.* (2014) define illicit financial flows as the unrecorded movement of capital out of the country in contravention of regulations. According to Mashiri & Mpofu (2015), illicit trade refers to 'any practice or conduct prohibited by law and which relates to the production, shipment, possession, distribution, sale or purchase of goods and services including any practice or conduct intended to facilitate such activity'. The key drivers of illicit trade include low chances of being discovered and prosecuted, weak legal and regulatory frameworks, and weak enforcement (Thornton, 2013).

Illicit trading or duty evasion at Ports of Entry include outright avoidance of official customs controls, under-declaration of goods, undervaluation of goods, misclassification of goods, falsification of documents, collusion with tax authorities and smuggling. Fishman & Wei (2004) found a one per cent increase in tax rates being associated with a three per cent increase in customs evasion, and mostly through misclassification of imports and underreporting of import values. The impact of these activities has negatively affected trade and had a devastating impact on the formal economy. For example, in Russia in 2004, the minister of the economy estimated lost revenue of about USD4.5 billion in duties on goods imported from Europe which could have been a result of false declaration. In Bangladesh in 2000, the foregone customs revenue traced to customs inefficiency was estimated to exceed five per cent of GDP (OECD, 2003).

Differences in national economic policies, regional resources, and monetary currencies make borders 'lucrative zones of exchange and trade, often illicit and clandestine' (Flynn, 1997). Flynn (1997) also points out that smuggling occurs across borders around the world, providing an important means of livelihood for border residents and prompting creative social networking and cross-border ties within borderland populations. Araia (2009) adds that customs officials are reportedly paid regular 'stipends', bribed on an ad hoc basis, and encouraged using improper influence, to make smuggling possible in various ways and to protect the smugglers from arrest and prosecution. Increased checks as a deterrent to smuggling often led to higher costs on compliant businesses. The phenomenon of illicit trade and counterfeiting has been estimated by the OECD to cost billions in lost profits to companies and revenue to governments and represents between 5 to 7 per cent of global trade (OECD 1998; Shapiro & Hasset 2005).

A study entitled 'Tackling the black market in Ireland', estimated that illicit trade at Ports of Entry in Ireland is costing the economy USD860 million per annum. The OECD (2009) has estimated the cost of illicit trade of physical goods to the global economy to be around USD250 billion whilst the International Anti-Counterfeiting Coalition estimates the figure to be USD600 billion per annum. According to WCO statistics, the discovery by customs officials of over 9.5 tonnes of illicit products, including cocaine and heroin, more than 360 tonnes of chemicals and 200 kilograms of methamphetamines is an indication of the magnitude of this illicit trade.

Although the WCO has formulated a Model Law on Intellectual Property rights incorporating measures expected to be implemented by customs officials at the border, this has not been adopted at the national level in many African countries

where counterfeiting is rampant (Trade and Development Report, 2004). Goods often enter the African market without payment of duties and taxes because of collusion between importers, customs brokers and Customs. This is particularly so in Western Africa. Another aspect of illicit trade is importation of counterfeited goods, which was cited in Benin, Tanzania, Togo and Zimbabwe. Anti-counterfeiting activities have had a significant impact in Kenya, Nigeria, Uganda and Zambia (1998). In 2001, Collier, Hoeffler & Pattillo estimated that if illicit outflow of funds was not taking place, GDP per capita in Africa would have been approximately 16 per cent higher. The researchers further argued — in line with the arguments by Ndikumana & Boyce (2011) — that illicit financial flows are a constraint to poverty reduction in Africa. According to the 'World Trade Report' (2013), the toxic and corrosive nature of illicit trade harms economic growth and job creation, challenges the rule of law, robs governments of the much-needed revenue and threatens human life and the quality of life and thus requires a strong internationally coordinated response. These findings were upheld by the African Forum and Network on Debt and Development (AFRODAD) (2014) which approximates that between 2009 and 2012 cash-strapped Zimbabwe lost USD2.79 billion through illicit financial flows, which represents nearly half of the country's national budget of USD4 billion. If these funds could find their way to the national coffers it could fund half of the national budget and be redistributed to all the citizens of the country through infrastructural developments, investments, and even poverty alleviation programmes.

A study conducted in Mozambique by Van Dunem & Arndt (2006) found a positive relationship between high tax rates and underreporting of import values and evasion. Some countries simplified their procedures and created a system which allows fewer contacts between staff and traders, while others upgraded IT systems and introduced the customs information systems software, ASYCUDA, to improve service delivery, increase transparency and shorten customs clearance time. In their reforms, Uganda and Peru employed measures such as cooperation with other authorities, private entities and police, expanded audits and preventative inspections to increase enforcement. However, these were not very effective in Mozambique and Bolivia.

The WCO revise Kyoto Convention, defines customs clearance as "the accomplishment of the customs formalities necessary to allow goods to enter home as to be exported or to be set under another customs procedure" and release as "the action by the customs to allow goods undergoing clearance to be at the disposal of the person connected. Customs clearance implies a responsibility for activities that are largely determined and undertaken by customs officers (Teweldeberhan, 2012). There are different roles of customs in different

countries, but the core function of customs administration is common for all states. There are four main areas that are covered ubiquitously; revenue collection, regulatory compliance, trade facilitation and security (Sokolova, 2017; De Wulf & Sokol 2004, 17; Truel, 2010). According to De Wulf & Sokol (2005), the overall objective of the existence of customs administrations is to provide security to the supply chain, prohibit illegal and unsafe imports with respect to commitments of WTO. Gopal (2007) explains the objective as smuggle checking and prevention of prohibited transactions. De Wulf *et al.*, (2005) also point out that customs administrations are expected to carry through its operations effectively and efficiently. Since Customs is the foremost agency at the border and pays a prominent role in the release of goods, Customs should strive to reduce the complexity of clearance procedures and to limit their information that is really necessary (Teweldeberhan, 2012).

In discharging their often-complex tasks of revenue collection, security, environmental and health protection and application of trade policy, Customs administrations need to have direct access to and temporary custody of (if necessary) export and import consignments. The time period for which Customs and/or other border agencies require these controls, thereby halting the overall movement of the goods, has gained great importance for all international traders and their customers. It is now a crucial operational or commercial concern for Governments, just-in-time business operators, intermodal carriers and the cargo industry, and providing for a focused opportunity to gain an invaluable insight into standards of Customs efficiency. Governments and the Trading community have a powerful common interest in this regard. Therefore, activities that relate to the calculating and recording of the time needed by Customs to release goods can provide pertinent information to guide any necessary process improvements or identify desirable regulatory changes to ensure the effective facilitation of trade (World Customs Organisation, 2011). Many global indexes such as the World Bank's Ease of Doing Business 2016 and Logistics Performance Index 2014 and the World Economic Forum's Global Enabling Trade Index 2014 and World Competitiveness Report 2014 reports that the impediments to on time clearance of traffic are cumbersome regulatory systems and bureaucratic clearing procedures; and Lack of communication between stakeholders (PMAESA Secretariat, 2008).Delays in traffic clearance increases corruption, reduces customs revenue, reduces trade volumes and increases clearance times (Ferreira *et al.*, 2007; Ndenga & Ayuma, 2013; Hummels *et al.*, 2001; Bugbilla *et al.*, 2016; Zamora-Torres *et al.*, 2013).

Delays in traffic clearance is one of the root causes of corruption at Ports of Entry (Ndenga *et al.*, 2013). A manifestation of corruption would typically encompass

customs officials delaying the initiation or conclusion of customs procedures until a bribe is offered to them (Hors, 2001). The techniques of creating such delays may involve officials promptly attending to files of operators who have paid bribes while making others (non-bribe-paying operators) wait; or the officials may pretend to be absent or engaged elsewhere when a requested action is much needed and only become available once a bribe is paid. For instance, Ferreira *et al.* (2007) report that despite being employed to work 24 hours a day, the customs officials in Cambodia's port of Sihanoukville would end their daily operations at 5.00 pm and could only be persuaded to work past that time through informal payments.

Another expression of routine corruption occurs when customs officials create or threaten to create unwarranted complications in the clearance process. This often takes the form of officials conducting examinations in extreme detail; or requesting documents that are difficult to adduce; or sending the cargo for further controls such as quarantine or any other unnecessary actions that may complicate the clearance process (Hors, 2001). Previously the task of risk assessment was manually handled by customs officials who would regularly misuse their discretion by delaying or threatening to delay shipment through unnecessary inspection unless a bribe was offered (Hors, 2001). According to the UNECE Trade Facilitation Guide (2016), administrations that do not use audit-based controls usually concentrate their controls entirely at the border and at the time of import, and often apply a 100 % physical examination approach. This leads not only to unnecessarily long delays at the border but is also a very ineffective and inefficient use of the limited control and inspection staff at the border. In addition, 100% physical examination creates an enabling environment for corrupt practices and fraud. A study conducted by the World Bank (2012) reports that the agricultural sector is one of the sectors affected by delays in traffic clearance.

The ability to deliver goods and services on time is an increasingly important determinant of export success (World Bank, 2007). This is mainly due to two significant changes in exports in recent years. Firstly, a greater share of exports is due to global production sharing, where stages of a firm's value chain are allocated in different countries (Hummels, 2001). Secondly, there has been an increase in competition among countries due to lower tariffs and non- tariff barriers. These changes mean that any delays that an exporter faces in its country of origin can have an important detrimental effect on its ability to remain competitive. This is reinforced by recent evidence that such delays can have a significant adverse effect on trade. Trade facilitation needs an integrated approach because it requires the combined effort and efficiency of many government agencies and private parties and individuals. The World Bank's Logistics

Performance Indicators (LPIs) suggest that customs authorities are only responsible for approximately one-third of the delays that the trading community encounters at the border, and that many other government institutions are responsible for most of the problems traders face at the border (McLinden *et al.*, 2011).

OECD (2014) research finds that Customs and administrative procedures have substantial effects on international trade. Cumbersome Customs and administrative procedures have been found to be a challenge for developing countries in exporting to developed and other developing countries (Wilson, 2007). Djankov *et al.* (2010) find that an additional day spent prior to shipment reduces trade by more than 1 percent. Similarly, Volpe Martincus *et al.* (2015) find that a 10 percent increase in customs delays lowers firm exports by 3.8 percent. For example, in Latin America, there are on average 15 to 30 agencies involved in border crossings transactions. Roughly 75 percent of delays at the border are due to inefficient processes, whereas the remaining 25 percent are due to inadequate physical infrastructure (Estevadeordal, 2017). This is particularly important for the Latin America and the Caribbean (LAC) region, where burdensome procedures, high costs, and delays are some of the biggest obstacles to trade. Currently, it takes an average 3.5 days for goods to clear customs in LAC, compared to just three days in East Asia and the Pacific, and less than a day in OECD countries (World Bank, 2012). The United Nations Conference on Trade and Development (UNCTAD) estimates that the average customs transaction involves 20–30 different parties, 40 documents, 200 data elements (30 of which are repeated at least 30 times) and the re-keying of 60–70 per cent of all data at least once. With the lowering of tariffs across the globe, the cost of complying with customs and trade related formalities have been reported to exceed in many instances the cost of duties to be paid. In the modern business environment of just-in-time production and delivery, traders need fast and predictable release of goods (World Trade Organisation, 2014).

Some recent studies have tried to determine how time delays affect international trade. Djankov *et al.* (2006) assert that on average, each additional day that a product is delayed prior to being shipped reduces trade by at least one per cent. Another important insight from that work is that the use of averages as indicators of trade facilitation in Africa can be very deceptive because of the large variations across African countries. For example, while it takes 16 days to get a product from the factory to the ship in Mauritius, it takes 116 days in the Central African Republic. On the other hand, Soloaga *et al.* (2006) evaluate the impact of changes in trade facilitation measures on trade for main industrial sectors in Mexico, using four indicators of trade facilitation: port efficiency, customs environment,

regulatory environment, and e-commerce use by business (as a proxy for service sector effectiveness) (Soloaga *et al.*, 2006). Finally, the Global Facilitation Partnership for Transportation and Trade conducted the Logistics Perception Index (LPI) in 2006. The LPI survey uses an anonymous, web-based questionnaire which asks the respondent to evaluate their country of residence, and eight countries they are dealing with on several logistics dimensions including domestic and international transportation costs, timeliness of shipments, transport and IT infrastructure, Customs and other border procedures, and logistics competence.

Customs revenue constitute a greater part of tax revenue for many countries. For instance, in Ghana, Customs revenue constitute about 50 percent of total tax collected (CEPS News, 2007); 49.8% in Sierra Leone, 44.5% in the Gambia, 18.4 percent in Burundi, 0.9percent in Israel, 71.5% in Kuwait and 20.2 percent in Panama (Wulf & Sokol, 2004). The WCO (2014) identified increase in cross border trade, improvement in border clearance procedures, transparency, and compliance by traders, as some of the factors that can help increase revenue collection. Delay in clearance partly contributes to an increase in smuggling, suppression of invoice or documents and corruption. These phenomena could lead to low revenue mobilization (Bugbilla et al, 2016).

Customs clearance includes clearance by customs authorities and all other border agencies involved (OECD, 2013). Delays in traffic clearance has a significant impact on performance of customs at Ports of Entry (Zamora-Torres *et al.*, 2013). The World Customs Organisation (2009) points out that if interventions and inspections are not properly managed, the result is slow clearance times. While border clearance processes are among the most troublesome links in the global supply chain, they are especially so in poor countries, where it frequently takes three times as many days to import goods as it does in rich ones. Imports to poor countries require nearly twice as many documents and six times as many signatures (World Bank, 2006).

In Africa, the difficulties are particularly great: excessive physical inspections are a major source of delays there, and the time between accepted customs declaration and customs clearance is four days, while in OECD countries it is one (Arvis *et al.*, 2007). For importing or exporting goods, landlocked countries face the time equivalent of at least three or four clearance processes, while coastal countries face only one. On the North-South corridor for example, it takes on average 39 hours to enter Zambia from Zimbabwe at Chirundu border-post (Curtis, 2009). Figure 2.5 shows, the time taken for clearance of goods through customs is highest in the bottom quintile, whereas clearance of imports in the bottom quintile is ten times higher than in the top performer quintile. Notably, in addition the

clearance time significantly increases when goods are physically inspected. Border management reforms, therefore, need to focus on the prevalence of physical inspection, proliferation of procedures, and red tape in low performance countries. The source of underperformance can be also of exogenous nature to the supply chain, the quality of service, or the speed of clearance of goods (World Bank, 2012). Figure 2.5 shows the median import lead time and average clearance time (in days) Averaged by LPI Quintile.
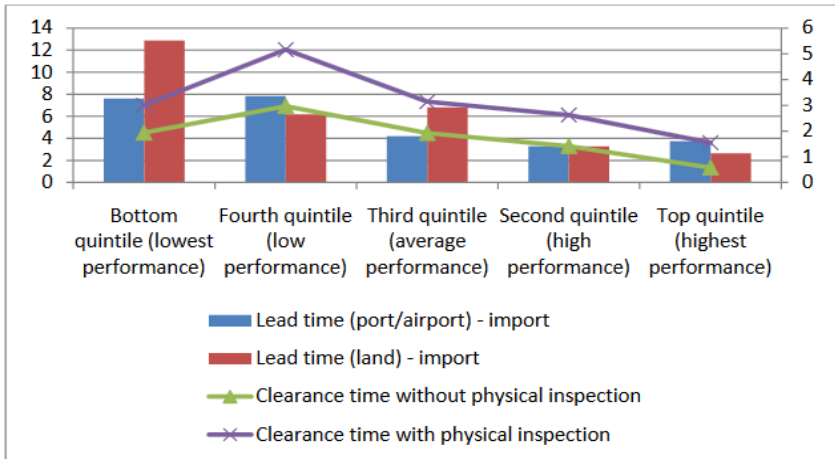

Figure 2.5: Median import lead time and average clearance time *(The World Bank Connecting to Compete, 2010)*

Muchori (2013) underscores the fact that there is need to improve the goods clearance process by implementing measures that will establish an elaborate risk management system that will remove bureaucracies, allow faster clearance for shippers and eliminate the need for physical inspection. Streamlining clearance process allows various regulatory controls (e.g. veterinary, phytosanitary, agricultural) to be managed through a single IT interface. This will eliminate red tape, saving time and money as goods will only be stopped once for checks (Meiren, 2016).

Kieck (2017) conceives a one-stop border post (OSBP) as the legal and institutional framework, facilities, and associated procedures that enable goods, people, and vehicles to stop in a single facility in which they undergo necessary controls following applicable regional and national laws to exit one state and enter the adjoining state. The OSBP concept calls for the application of joint controls to minimise routine activities and duplications. He also emphasized that through a

"whole of government" approach, the OSBP concept reduces the journey time for transporters and travellers and shortens the clearance time at border crossing points thus reducing traffic congestion.
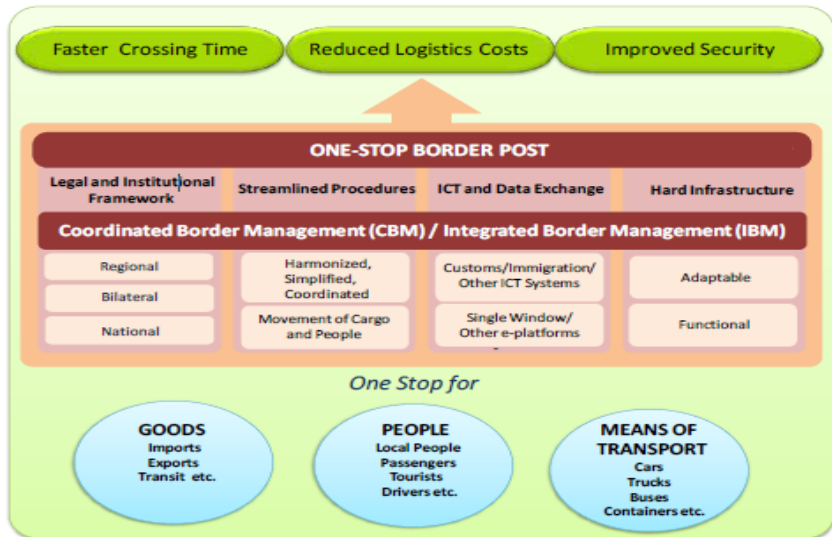

Figure 2.6: The OSBP Concept *(Nepad, 2017)*

The OSBP concept consists of four pillars:

New Partnership for Africa's Development (NEPAD) (2016) asserts that under international law, it is generally agreed that the application of national laws is limited to the territory of a state. Therefore, OSBPs rely on the principle of extraterritorial application of laws, which allows a state to extend the application of specific national laws outside its own territory. Implementation of OSBPs, therefore, demands that a detailed analysis of the legislative, regulatory and institutional framework governing the operations of border agencies is undertaken. At a typical border post, there are several government agencies that are responsible for border controls. For efficient and effective OSBP operations, these agencies need to operate in a coordinated manner to minimise duplications and redundancies (NEPAD, 2016).

According to NEPAD (2016), implementing an OSBP without simplifying and harmonizing border crossing procedures renders an OSBP ineffective. Whereas users would be required to stop once to undertake exit and entry formalities at a

border, subjecting such users to routine and redundant formalities would have little impact on reducing the time spent at the border. The process of reviewing and aligning procedures should be continuous to ensure that OSBPs operate with border crossing procedures that are not only effective but also facilitative and relevant to the prevailing circumstances. Joint operations and the need to observe jurisdiction in an OSBP environment require specific considerations when crafting OSBP procedures (NEPAD 2016).

NEPAD (2016) argues that information technology is a critical component of collaborative single window systems, simplification of documentation, border management, and modernization of customs, immigration, and related services. The increase in the number of travelers along with increases in volumes of vehicular traffic and cargo at borders requires a strategic balance between controls and facilitation. ICT allows for the efficient use of limited resources to manage borders by facilitating intra/interconnectivity of agencies for implementing responsive risk management systems and for understanding mobility and trade patterns.

According to NEPAD (2016), this includes OSBP facilities such as offices for border officials, operational equipment, warehouses, and parking. While all border posts require physical facilities for border operations, the level of facilities required depends on the type and size of operations at a border post. In principle, facilities for OSBP operations should be appropriately functional and not unnecessarily elaborate ("gold-plated") or inadequate (NEPAD, 2016).

The implementation of the Chirundu (Zambia/Zimbabwe) in Southern Africa project began in earnest in 2007 and the OSBP began its operation in 2009. Passengers cross the border in 15 minutes in passenger cars and less than an hour in buses. Final cargo clearance into Zambia, which used to average 3 days now takes one day. At a fixed daily truck cost of US$250-500, this represents a savings of US$500-1,000. Efficiency is also demonstrated by the fact that the commercial terminal, which cleared 150 trucks a day when Chirundu OSBP opened, now clears 400 a day (Muqayi & Manyeruke, 2012).

Malaba (Uganda/Kenya) in East Africa achieved the significant reduction by following soft component measures such as joint operation across both border agencies enabled by EAC law; verification of cargo (where necessary) is conducted by all agencies of both countries at the same time; interconnections of both customs IT systems that allows preparing the documentation process prior to the arrival of the trucks; and streamlined flow of trucks (World Bank, 2013).

The international trading system relies on the fast, low-cost movement of goods through global value chains. Combined with other transportation infrastructure, access to high-quality port infrastructure helps determine a country's integration with international trade flows. Moreover, ports can host a range of value-added services and thus provide significant direct economic benefits to host countries. Despite their importance, ports in many developing countries are characterized by underinvestment, low productivity, inefficient use of resources, high user prices, long delays, and ineffective services (United Nations Conference on Trade and Development, 2011). The short-to-medium term effect of underinvestment in transport infrastructure is traffic congestion which serves as a compromising factor of logistics efficiency (Tanigichi *et al.*, 2007; Stantchev *et al.*, 2005). The infrastructure-related strategies to curb traffic congestion at Ports of Entry are:

The term 'e-government' refers to the 'use of Information Technology to enhance the access to and delivery of government services to benefit citizens, business partners and employees' while 'e-Customs' is the 'use of Information Technology to carry out customs compliance using electronic communications channels replacing paper format customs procedures, thus creating a more efficient and modern customs environment' (Granqvist *et al.*, 2010). Such an integrated system is essential because it integrates the operations of business and government departments and enables the detection of irregularities in business operations and fiscal declarations such as income tax, value-added tax and customs duty.

Wanyanya (2015) postulates that to ensure that there is minimal interaction between private and commercial importations, there is a need for clear demarcation of the two sections so that it is clear where the importer belongs. In addition, the parking bays for commercial vehicles need to be improved to enable effective surveillance. Disorganised and random parking encourages illegal activities through reduced visibility. There is also a need to emphasise to importers that transhipments conducted inside the customs yard should be authorised or supervised by an appropriate officer.

Accompanying the growth of the Internet has been the ability for people, businesses and governments to change the way data is collected, shared and used. In particular, the Internet has enabled cross-border data flows to happen in a networked, dynamic fashion and in real-time (Schwartz, 2010). According to the World Bank's Doing Business 2013 Report, the average number of documents that developing countries take to export have decreased from 9 in 2006 to 8 in 2014 whilst for importing from 11 to 10. The average time taken by developing countries to complete export formalities has decreased from 48 days to 42 and to

import from 57 to 47 days. However, when compared to transit developing countries where the average days to export is 22 days and 27 days to import, the developing countries need to do more to reduce delays in exporting and importing. The broad application of ICT in reducing paperwork, customs clearance, border crossing, and tracking of shipment that is in transit would have a major role to play to reduce traffic congestion and delays in border and transit procedures and formalities, reduce trade transaction costs, and promote further international trade. The use of ICT in terms of e-payments would assist in trade facilitation by eliminating the need to use cash in payments of customs duties, taxes and fees and reduce time at borders and unnecessary costs. Use of the Single Window Concept and the Automated System for Customs Data (ASYCUDA) which use ICTs have greatly improved customs clearance and procedures. This result in improvement in efficiency and competitiveness of LLDCs' exports which is crucial for enhancing their export performance and thereby improved economic growth (Meltzer, 2013).

Organisations, regardless of industry and size, strive to create a strong and positive relationship with their employees. However, employees have various competing needs that are driven by different motivators. For example, some employees are motivated by rewards while others focus on achievement or security. Therefore, it is essential for an organisation and its managers to understand what really motivates its employees if they intend to maximise organisational performance (Lee & Raschke, 2016). According to USAID (2004) more than 40 percent of many developing countries' government revenue comes from Customs collections, and expanded trade can more than offset the revenue impact of lowered tariff rates. To streamline border processing and to collect the maximum due, governments must try to achieve the goal of a well-trained, highly motivated, and productive border control workforce. An effective incentive awards program for Customs and other border control personnel can help achieve this goal. Wanyama (2017) suggested that employees at ports of entry should be trained on customer service and operation handling, handling machines should be increased, employees need to be motivated by paying them extra hours worked i.e. overtime or bonus, documentation process should be shortened, and corruption be stopped.

In most countries, companies engaged in international trade regularly must submit large volumes of information and documents to governmental authorities. This information and documentation often must be submitted through several different agencies, each with its own specific system and paper forms. These requirements constitute a burden both to Governments and to the business community particularly in developing countries. Establishing a Single Window

facility is one means of addressing this problem (Abeywickrama & Wickramaarachchi, 2015). According to World Customs Organisation (2011), the single window concept grew out of efforts to simplify border formalities for traders and other economic operators by arranging for a single electronic submission of information to fulfil all cross-border regulatory requirements. UN/CEFACT (2003) a single window can be described as a system that allows traders to lodge information with a single body to fulfil all import or export related regulatory requirements. In practical terms single window environment provides one entrance, either physical or electronic, for the submission and handling of all data and documents related to the release and clearance of an international transaction. This entrance is managed by one agency, which informs the appropriate agencies and direct combined controls. In a "single automated system" trader can submit electronic trade declarations to the various controlling authorities for processing and approval of a single application thus reducing congestion (Abeywickrama *et al.*, 2015).

This chapter critically reviewed the work done by different authors on traffic congestion and its impact on the performance of customs at Ports of Entry. The chapter presented empirical evidence on conducted case studies and surveys relating to the study. With reference from the above literature, it is clear that there is need to accost more data concerning traffic congestion and its impact on the performance of customs at Ports of Entry to fill the gap and bring more light and understanding on whether traffic congestion is impacting the performance of customs authorities at Ports of Entry.