

THE IMPACT OF WATER TRANSPORT AND ECONOMIC DEVELOPMENT OF
UGANDA'S LANDING SITES; CASE STUDY OF GGABA REGION, MAKINDYE
DIVISION OF KAMPALA CITY.

By

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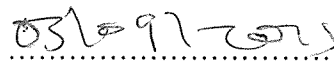
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APPROVAL

This is to certify that this research report has been done under supervision and guidance. It's now ready for submission and examination as the university supervisor.

Signature: 

MS. NAKAWUNGU FARIDAH

Date: 

DEDICATION

I dedicate it to my beloved mothers Mrs. Joyce Nondo and Mrs. Phiona Segawa, brothers and sisters especially Nkambwe Sharif, and friends for their support, encouragement, prayers and their tireless efforts that made this work a success.

LIST OF ACRONYMS AND ABBREVIATIONS

GDP	Gross Domestic Product
ILO	International Labor Organization
KIS	Kalangala Infrastructure Service
MDGS	Millennium Development Goals
SPSS	Statistical Package for Social Scientists
STD.DEV	Standard Deviation
UITP	International Union of Public Transport

ACKNOWLEDGEMENT

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ABSTRACT

The study examined the impact of water transport and economic development in Ggaba region of Makindye division, Kampala city. The study objectives were; (i) to find out the influence of water transport on employment level in Ggaba, (ii) to find out the impact of water transport on the productivity of economic activities in Ggaba, (iii) to identify the challenges facing water transport in promoting economic development in Ggaba and (iv) to find out the relationship between water transport and economic development. Quantitative methodological approach was used specifically the descriptive correlation research design. Self-administered questionnaires were distributed to a sample of 80 respondents who were retailers, fishermen, fishmongers and passengers of water transport by simple random sampling procedure. The findings of the study indicated that the degree of water transportation is high and the level of economic development is high. Water transportation was mainly determined by its reliability and efficiency. The findings further indicated that there is a significant positive correlation between water transport and economic development. The research concluded that water transport is a significant factor that promotes economic development. Therefore the government should focus on how to improve on water transport services by encouraging more foreign investors in water transport, directing more support in terms of funds towards the development of water transport and also monitoring funds that have been directed to water transport.

CHAPTER 1

1.0 Introduction

This chapter presents the background (that is historical, conceptual, theoretical and contextual perspective), objective of the study, problem statement, research questions, hypothesis, scope of the study (that is geographical, time, content scope), and significance of the study.

1.1 Background

1.1.1 Historical perspective

Economic development originated in the post war period of reconstruction initiated by U.S. In 1949, during his inaugural speech, president Harry Truman identified the development of areas as a priority for the west. There have been several major phases of development theory since 1945. From the 1940s to 1960s, the state played a large role in promoting industrialization in developing countries, following the idea of modernization theory. This period was followed by a brief period of basic needs development focusing on human capital development and redistribution in the 1970s. Neo-liberalism emerged in the 1980s pushing an agenda of free trade and removal of import substitution industrialization policies. In economics, the study of economic development was borne out of an extension to traditional economics that focused entirely on national product, or the aggregate output of goods and services.

Economic development was concerned in the expansion of people's entitlements and their corresponding capabilities, morbidity, nourishments, literacy, education, and other socio-economic indicators. Borne out of the backdrop of Keynesian advocating government intervention, and neo-classical economics, stressing reduced intervention, with rise of high-growth cities (Singapore, South Korea, Hong Kong) and planned governments (Argentina, Chile, Sudan, Uganda), economic development, more generally development economics, emerged amidst these mid-20th century theoretical interpretations of how economies prosper. Also, economist Albert O. Hirschman, a major contribution to development economics, asserted that

economic development grew to concentrate on the poor regions of the world, primarily Africa, Asia and Latin America yet on the outpouring of fundamental ideas and models. It has also been argued notably by Asia and European proponents of infrastructure-based development; that systematic, long-term government investments in transportation, housing, education and healthcare are necessary to ensure sustainable economic growth in emerging countries. Although nobody is certain when the concept originated, most people agree that development is closely bound up with the evolution of capitalism and the demise of feudalism. Mansell and Wehn also state that economic development has been understood since the world war ii to involve economic growth, namely the increases in the per capita income and (if currently absent) the attainment of a standard of living equivalent to that of industrialized countries. There have been several factors believed to influence economic development of a country among which include; capital accumulation, natural resources(according to Professor Lewis), availability of markets, human resources, technology, infrastructure, among others. To gain an adequate appreciation of the manner in which transportation can facilitate the active participation of a country or a region in the globalization process, it is necessary to understand the link between transportation and development. The debate surrounding the relationship between transportation and development remains fierce and contentious. However, it is important to note that, with the exception of the period from the 1960s to the early-1970s, most, including researchers and policymakers have, with or without empirical evidence, assumed that this relationship is positive, thereby accentuating the importance of transportation to development.

1.1.2 Theoretical perspective

The research study is based on Charles Horton Cooley's theory of transportation who believed that the character of transportation as a whole and in detail, at any particular time and throughout its history, is altogether determined by its inter-

relations with physical and social forces and conditions. And according to him, to understand transportation means simply to analyze these inter-relations. So far, attention has been fixed as much as possible on the simpler and more obvious conditions, the physical. He proposed that the need for the movement of things and persons underlies every sort of social organization, every institution whatever. And that it is equally necessary to that economic organization which supplies society with food and other material goods, and to those psychical organizations, the church, education, research and the like, which, though ideal in their aims, require material instruments. The transfer of books, of scientific instruments and, above all, of men charged with multifarious social functions, is as necessary to society in its way as the transfer of grosser material substances. According to Cooley, there can be no adequate theory of transportation which has regard only to some one aspect of its social function, as the economic aspect. Precisely because transportation underlies social development it is in turn determined by that development. It is a tool of the economic, the political, the military organizations, and the character of the tool varies with their needs. Further, the most permanent conditions of its progress are the natural obstacles it has to overcome and the natural forces it employs; but even these in their practical bearings are relative to social development.

1.1.3 Conceptual perspective

Economic development is the sustained, concerted actions of policy makers and communities that promote the standard of living and economic health of a specific area. Economic development can also be referred to as the qualitative and qualitative changes in the economy. Such acts involve multiple areas including development of human capital, critical infrastructure, regional competitiveness, social inclusion, health, safety, literacy and other initiatives. Economic development can also be considered as a static theory that documents the state of an economy at a certain time. According to Schumpeter (2003), the changes in this equilibrium state to document in economic theory can only be caused by intervening factors coming

from the outside. Economic development has got many indicators both social and economic but however for this research, the level of employment, housing starts, GDP, and income levels will be considered.

Transport or transportation is the movement of people, animals, and goods from one location to another. Modes of transport include air, rail, road, water, cable, pipelines and space. The field can be divided into infrastructure, vehicles and operations. Transport is important because it enables trade between persons, which is essential for the development of civilizations.

Water transport refers to the process of moving people, goods among others by barge, boat, ship, or sail boat over a sea, ocean, lake, canal, river among others. Water vessels such as passenger vessels including ferries and cruise vessels, inland vessels that include salvage operations and heavy transportation, offshore support pontoons and workboats and luxury yachts. However, for this research workboats and luxury yachts will be considered.

1.1.4 Contextual perspective

Agricultural sector is the most dominant in Uganda's economy and the major employer of about 80% of the Uganda's labor force. Agriculture also accounts for about 90% of Uganda's export earnings. One study noted that the development of Uganda largely depend on agriculture and the availability of road network.(Douglas Gollin and Richard Rogerson, "agriculture, roads and economic development in Uganda" march 2010). According to Douglas Gollin and Richard Rogerson, agriculture alone contributes about 23.1% to Uganda's GDP(CIA World Fact Book, August 23, 2014). They also noted that one of Uganda's constraints to development is the low levels of physical infrastructure and public services. However, due to increasing business opportunities, cross border trade is highly preferred to local trade which requires a better transport. Much as there have been efforts to improve the road network, much more is needed to improve the entire transport sector for development of other economic activities besides agriculture, such as fishing which

will later provide employment opportunities, increase people's incomes among others.

1.2 Problem statement

There have been several projects by government to improve water transport in Uganda. For example Kalangala Infrastructure Service project(KIS) in order to serve the island residents with improved access to water, safer transportation, and more reliable, renewable electricity. It involves development, construction, operating and maintenance of two roll on, roll off passenger and vehicle ferries each with a capacity of 16 cars and 200 passengers. The acquisition of three additional ferries in Uganda bringing to a total of 6 ferries in operation has facilitated traffic between the mainland and islands on lake Victoria but also used to crossing in particular the Nile at select places where no bridges are available. Some of the most important ferry links in Uganda are on Lake Victoria to the Ssese islands from port bell, Entebbe, or Bukakata near Masaka and the Pakuba ferry cross the Nile in Murchison falls national park. However, there are challenges facing this progress among which includes working through bureaucracy and lack of supporting infrastructure, low maintenance and modernization and also there is lack of clarity by government about certain areas of responsibility. This has led to continued delays in the services rendered by these ferries hence not achieving the intended objective.

1.3 Purpose of the study

The main purpose of the study was to investigate the impact of water transport on economic development in Ggaba.

1.4 Objectives of the study

- (i) To find out the influence of water transport on the employment level of Ggaba region.
- (ii) To find out the impact of water transport on the productivity of economic activities in Ggaba.

(ii) To identify the challenges facing water transport in promoting economic development in Ggaba.

(iv) To find out the relationship between water transport and economic development in Ggaba region.

1.5 Research questions

(i) What is the influence of water transport on employment opportunities in Ggaba?

(ii) What is the impact of water transport on the productivity of economic activities in Ggaba?

(iii) What are the challenges facing water transport in promoting economic development in Ggaba?

(iv) What is the relationship between water transport and economic development in Ggaba region?

1.6 The scope of the study

This section includes the coverage of the study in terms of time, content and geographical.

1.6.1 Content scope

The study included the impact of water transport on economic development, the challenges facing water transport in promoting economic development, the influence of water transport on employment opportunities and the impact of water transport on the productivity of economic activities in Uganda.

1.6.2 Geographical scope

The research was limited to Ggaba region in Uganda, which is located in Kampala, Makindye division.

1.6.3 Time scope

The study covered information of a 5years period that is from 2010-2014. This period was considered enough to enable the researcher acquire enough information about the study.

1.7 Significance of the study

To the government, the research would help the government to know how best water transport, inland ways in particular could be improved to ensure greater contribution of transport sector to the development of Uganda.

To Ggaba community, the study would bring residents to awareness of the importance of water transport to the development of the landing site and the need to preserve transport infrastructures at the shores.

To the students, the study would provide information for future researchers in related topics.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

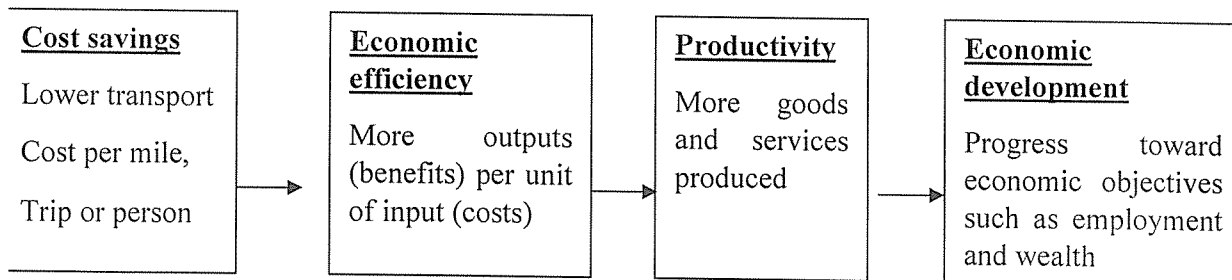
This chapter presents the literature on empirical evidence from other researches related to the study variables in the order of objectives set and giving opinions their about the variables that are constructed in this study, the theory that underpins the study and the conceptual frame work.

2.1 How transportation affects economic development (Todd Litman, August 2010)

Economic efficiency and productivity

Economic efficiency refers to the ratio of total benefits to costs. Increased economic efficiency increases productivity (quantity of goods produced), which increases economic development, as illustrated below. Logistics is the discipline concerned with maximizing transport system efficiency.

Figure 1



Increasing transport system efficiency provides productivity gains that filter through the economy in various ways. For example, reduced shipping costs may increase business profits, reduce retail prices, improve service quality (more frequent deliveries), allow tax increases or a combination of these. Even modest efficiency gains can provide significant benefits. For example, if a business has an 8% annual return on investment and transport represents 16% of its costs, 5% reduction in transport costs increases profits 10%.

Economic efficiency increases if transport resource costs (including time, land, risks and energy) are reduced or if the value provided by transport activity increases. For example, transport system efficiency can be increased if higher value trips are given priority over lower-value trips, such as if a freight or service vehicle with a \$100 per hour opportunity cost is given priority over vehicles with only \$10 per hour opportunity cost. This is why efficient road and parking pricing which tests users' willingness to pay roads and parking can increase transport system efficiency even if this reduces total vehicle traffic.

The ultimate goal (or output) of transportation is accessibility, people and industry's ability to access desired resources, services, business meetings, clients and distributors. Increased accessibility (a reduction in the time, money or risk required to reach resources and services) increased productivity.

Conventional planning tends to be mobility-based: it assumes that transportation means vehicle travel and evaluates transport system performance using such as vehicle traffic speeds, miles per gallon, cents per passenger mile and ton miles per dollar, which reflect the

Speed and affordability of vehicle travel, and so favor automobile-oriented transportation improvements and sprawled land use development. Accessibility based analysis expands the range of impacts and options considered in transport planning. For example, accessibility based analysis recognizes that land use sprawl can increase the distances between destinations and therefore accessibility costs, and that telecommunications and delivery services can substitute for physical travel.

Accessibility based planning expands the range of solution that can be applied to solve transport problems, including some strategies that reduce total vehicle travel, for example, by improving alternative modes (walking, cycling, ridesharing, public transit etc), encouraging more efficient use of existing transport resources (such as more efficient road, parking insurance, and fuel pricing and roadway management

that favors more efficient modes and higher value trips, such as high-occupant and freight vehicles), more accessible (more compact, mixed, connected, multi-modal) land use development, and improved mobility substitutes (telecommunications and delivery services). These strategies can result in more efficient use of transport resources, for example, by encouraging travelers to shift to more resource efficient modes (walking, cycling, ridesharing, public transit, telework) when feasible, so higher value vehicles(freight, service, bus, urgent personal errands, etc.) can travel unimpeded by congestion.

2.2 Contribution of transport to global employment: public transport in particular

Provides employment at public transport operators and authorities

Public transport companies and authorities offer green local jobs that cannot be offshored or moved out of the local area. These jobs are therefore less affected than jobs in other sectors in the event of an economic downturn.

The 2011 survey carried out by the UITP Observatory of Employment demonstrated that urban public transport operators provided employment to about 7.3 million people worldwide. Public (mainly local) authorities in charge of public transport employ about 300,000 people worldwide.

Public transport companies also according to United Nations Environment Program and the International Labor Organization (ILO) are the best in class providers of green jobs inclusive growth. Due to its nature and mission, the public transport sector, like other soft mobility modes, is a creator of green jobs. Any job in the public transport sector helps reduce greenhouse gas emissions, save energy and alleviate congestion, and therefore preserves and restores environmental quality. In all countries, growing public transport helps fight unemployment and boost the economy. Providing skilled jobs for unqualified people encourages social integration and helps stabilize living conditions, which in turn leads to the creation of a middle class.

In most European countries, jobs in the public transport sector offer a good level of remuneration compared to other jobs requiring similar qualifications and in particular in comparison to national minimum wages

Innovation and maximizing productivity lead to labor productivity gains

As is the case for any other services sector, the public transport industry is a labor-intensive sector. Labor costs represent 60 to 80% of the total costs of a public transport company.

In the public transport sector, productivity gains are a permanent preoccupation in existing companies. To maximize productivity, both internal and external productivity need to be addressed. To achieve significant results in terms of internal productivity, some expenditure will be required in order to develop new tools. These can include IT systems, innovative management tools (Operational Support Systems), new ticketing technologies, and modernized operations such as automated metros, but also investment in human capital (training programs), so as to create new organizational structures and business models.

External productivity gains on public transport networks can be achieved by improving the way road space is shared between collective transport modes and individual transport modes. The use of dedicated bus corridors and priority at traffic lights makes it possible to improve a bus' commercial speed by 10 to 15% or even 20%. This means additional capacity and a better service can be offered using the same means of production.

Innovation, quality management and corporate social responsibility help public transport companies improve labor productivity. Public transport intrinsically serves the public interest and brings major social and societal benefits. Irrespective of whether they are publicly or privately owned, public transport companies are therefore one of the spearheads of corporate social responsibility, including quality

management. Initial and vocational training programs are also efficient tools for social advancement and key indicators of corporate performance.

Delivering a high-quality public transport service requires high-quality internal performance standards. The performance capacity of an organization only grows by improving the quality of working life and nurturing employee competences.

A growing number of formalized jobs

In countries currently lacking formal public transport infrastructure, the development of organized public transport leads to a drop in the number of informal jobs. Formal public transport operations help offer employment opportunities for people currently employed in insecure or vulnerable forms of employment in the informal sector. Beyond their green credentials, formalized jobs in public transport companies are skilled jobs that provide better conditions for stable, possibly full-time permanent jobs, a decent level of remuneration and long-term employability in accordance with the definition of green jobs given by the ILO.

In Latin America, public transport employment has undergone major changes and made progress towards formalization. The sector drives an important part of the economy and is estimated at around 2% of the total GDP of the region. However, it is important to highlight the relatively high rate of formalization in the public transport sector compared to other sectors.

Resilient in the face of economic and financial crisis

Regardless of the financial and economic situation of a city, public transport has a fundamental mission, which is to ensure everyone's basic right to mobility. This public service mission is linked to the objectives of social inclusion, accessibility for all, and quality of life, all of which are crucial for the sustainable development of urban areas. Moreover, growing awareness of environmental issues, rising energy costs, and growing mobility needs mean that a certain level of public transport

services must be maintained. This therefore enables local authorities to provide relative stability in the service offered by the public transport sector

Currently, this public service mission has led to relative employment stability in the public transport sector in Europe. This shows that, even in times of crisis, the public transport sector seems to be more resilient than others.

Employment in the public transport supply chain: a dynamic, innovative and growing sector.

The public transport supply chain is involved in the provision of goods and services for public transport operators and authorities. This notably includes the manufacturing of vehicles and the building of infrastructure, and the integration of vehicles and infrastructure into the urban fabric.

Any estimation of the number of jobs in the public transport supply chain will vary according to where boundaries are set. A conservative estimate made by UITP puts the figure at about 5 million jobs worldwide. Beyond this figure, the public transport supply chain can be characterized as a job-intensive industry that involves a variety of competences and is at the cutting edge of innovation.

Investment in public transport infrastructure and services has a direct impact on the creation of jobs in the supply chain. A better understanding of the above characteristics of the supply chain can help make the case for investing in public transport.

2.3 Transport effect on economic productivity

("Assessing Productivity Impact of Transportation Investment" Glen Weisbrod and Naomi Stein, May 2014)

Intermodal connectivity from other access impact

Access measures could, in theory, be defined in a way to encompass travel by all modes. In practice, this does not occur.

For example, current modeling practice almost never integrates road network time, cost and access measures with corresponding intercity rail, marine and air system network measures. As a result, changes in intermodal connectivity enabled by transportation infrastructure improvements are typically measured separately from agglomeration and market access impacts.

There are sound reasons for this approach.

First, air, marine and intercity rail transportation often involves private operators who release limited information about their service performance. Second, intermodal services provide links to markets that are typically outside of what would otherwise be the area modeled by an individual MPO (metropolitan planning organization) or State DOT.

For those reasons, this guide treats intermodal connectivity as a separate element of transportation impact measurement, apart from reliability and market access measurement.

The fundamental benefit of an intermodal terminal is that it provides a gateway to access longer distance destinations or outlying market areas via a transfer of modes

Broader effects on productivity and the economy

The previously-cited efficiency, technology, access and intermodal connectivity effects lead directly to productivity benefits for firms that rely on the transportation system. Those direct effects can be measured and considered in the evaluation of transportation projects, plans and policies. However, they can also lead to even broader changes in the economy of an area, which can affect both economic growth and multi-factor productivity.

The broader changes in the economy occur through both supply side and demand side effects of productivity increases. For instance, business may expand production

to meet greater demand for their products, if demand is “elastic” or sensitive to price changes.

Alternatively, businesses may produce the same output more cost effectively, if demand is “inelastic” or insensitive to price changes. In many industries, the supply-demand situation is in between those two extremes and thus a combination of both effects occurs. Efficiency effects can lead to further, multi-faceted changes in the economy. For instance, reduced commuting costs to an area can make working there more attractive: in the long run, workers in affected areas may not require the same level of compensation (through wages) and people on the margin of working/not working may be tempted into the labor market.

In theory, increased productivity in the transportation services sector can lead to a reduction in transportation sector jobs, if the level of business output is not expanded. However, it is more likely that as transportation costs fall and cost competitiveness increases, there will be increased production and increased shipping of products for at least some industries and regions.

Technology Adoption and Agglomeration Benefits can further lead to the reorganization of firms, as reliability constraints and spatial barriers are reduced. As firms in a region can access a broader customer base in a cost-competitive manner, their output may grow further. Increased global competitiveness can lead to expansion of the national economy; increased domestic access can also lead to the expansion of some regional economies.

Both effects can also lead to distributional changes among sectors and locations of economic activity.

They can facilitate an expansion in the scale of operations for some firms, while allowing fewer firms to ultimately survive in the marketplace. The end result can be job losses for some business types and locations. However, that outcome can be more than offset by increased domestic and global competitiveness—growing income

and demand for products, and ultimately overall gain for both residents and businesses.

All of these changes in supply and demand for products may also lead to changes in their prices over time. Depending on the prices changes, the relative value of output produced and cost of inputs required to produce them may also change.

The result is that the productivity ratio can ultimately become larger or smaller than the initially-measured impact on users and beneficiaries of the transportation system

2.4 Theoretical view

2.4.1 Transportation theory (mathematics)

In mathematics and economics, transportation theory is a name given to the study of optimal transportation and allocation of resources.

The problem was formalized by the French mathematician Gaspard Monge in 1781. In the 1920s A.N. Tolstoi was one of the first to study the transportation problem mathematically. In 1930, in the collection Transportation Planning Volume I for the National Commissariat of Transportation of the Soviet Union, he published a paper "Methods of Finding the Minimal Kilo met rage in Cargo-transportation in space". Major advances were made in the field during World War II by the Soviet/Russian mathematician and economist Leonid Kantorovich. Consequently, the problem as it is stated is sometimes known as the Monge Kantorovich transportation problem. The linear programming formulation of the transportation problem is also known as the Hitchcock–Koopmans transportation problem.

Mines and factories

Suppose that we have a collection of n mines mining iron ore, and a collection of n factories which consume the iron ore that the mines produce. Suppose for the sake of argument that these mines and factories form two disjoint subsets M and F of the Euclidean plane $\mathbb{R}^2$. Suppose also that we have a cost function $c: \mathbb{R}^2 \times \mathbb{R}^2 \rightarrow [0, \infty)$, so that $c(x, y)$ is the cost of transporting one shipment of iron from x to y . For

simplicity, we ignore the time taken to do the transporting. We also assume that each mine can supply only one factory (no splitting of shipments) and that each factory requires precisely one shipment to be in operation (factories cannot work at half- or double-capacity). Having made the above assumptions, a transport plan is a bijection $T: M \rightarrow F$. In other words, each mine $m \in M$ supplies precisely one factory $T(m) \in F$ and each factory is supplied by precisely one mine. We wish to find the optimal transport plan, the plan T whose total cost

$$c(T) := \sum_{m \in M} c(m, T(m))$$

is the least of all possible transport plans from M to F . This motivating special case of the transportation problem is an instance of the assignment problem. More specifically, it is equivalent to finding a minimum weight matching in a bipartite graph.

The importance of the cost function

The following simple example illustrates the importance of the cost function in determining the optimal transport plan. Suppose that we have n books of equal width on a shelf (the real line), arranged in a single contiguous block. We wish to rearrange them into another contiguous block, but shifted one book-width to the right. Two obvious candidates for the optimal transport plan present themselves:

Move all n books one book-width to the right; ("many small moves")

Move the left-most book n book-widths to the right and leave all other books fixed. ("one big move")

If the cost function is proportional to Euclidean distance ($c(x, y) = \alpha |x - y|$) then these two candidates are both optimal. If, on the other hand, we choose the strictly convex cost function proportional to the square of Euclidean distance ($c(x, y) = \alpha |x - y|^2$), then the "many small moves" option becomes the unique minimizer.

Interestingly, while mathematicians prefer to work with convex cost functions, economists prefer concave ones. The intuitive justification for this is that once goods have been loaded on to, say, a goods train, transporting the goods 200 kilometers costs much less than twice what it would cost to transport them 100 kilometers. Concave cost functions represent this economy of scale.

Abstract formulation of the problem

Monge and Kantorovich formulations

The transportation problem as it is stated in modern or more technical literature looks somewhat different because of the development of Riemannian geometry and measure theory. The mines-factories example, simple as it is, is a useful reference point when thinking of the abstract case. In this setting, we allow the possibility that we may not wish to keep all mines and factories open for business, and allow mines to supply more than one factory, and factories to accept iron from more than one mine.

Let X and Y be two separable metric spaces such that any probability measure on X (or Y) is a Radon measure (i.e. they are Radon spaces). Let $c: X \times Y \rightarrow [0, \infty]$ be a Borel-measurable function. Given probability measures μ on X and ν on Y , Monge's formulation of the optimal transportation problem is to find a transport map $T: X \rightarrow Y$ that realizes the infimum

$$\inf \left\{ \int_X c(x, T(x)) d\mu(x) \mid T(\mu) = \nu \right\},$$

Where $T(\mu)$ denotes the push forward of μ by T . A map T that attains this infimum (i.e. makes it a minimum instead of an infimum) is called an "optimal transport map".

Monge's formulation of the optimal transportation problem can be ill-posed, because sometimes there is no T satisfying $T_*(\mu) = \nu$: this happens, for example, when μ is a Dirac measure but ν is not).

We can improve on this by adopting Kantorovich's formulation of the optimal transportation problem, which is to find a probability measure γ on $X \times Y$ that attains the infimum

$$\inf \left\{ \int_{X \times Y} c(x, y) d\gamma(x, y) \mid \gamma \in \Gamma(\mu, \nu) \right\},$$

Where $\Gamma(\mu, \nu)$ denotes the collection of all probability measures on $X \times Y$ with marginals μ on X and ν on Y . It can be shown that a minimize for this problem always exists when the cost function X is lower semi-continuous and $\Gamma(\mu, \nu)$ is a tight collection of measures (which is guaranteed for Radon spaces X and Y). (Compare this formulation with the definition of the Wasserstein metric W_1 on the space of probability measures.) A gradient descent formulation for the solution of the Monge-Kantorovich problem was given by Sigurd Angenent, Steven Haker, and Allen Tannenbaum.

Duality formula

The minimum of the Kantorovich problem is equal to

$$\sup \left(\int_X \phi(x) d\mu(x) + \int_Y \psi(y) d\nu(y) \right),$$

Where the supremum runs over all pairs of bounded and continuous functions

$\Phi: X \rightarrow \mathbb{R}$ and $\psi: Y \rightarrow \mathbb{R}$ such that

$$\phi(x) + \psi(y) \leq c(x, y)$$

Solution of the problem

Optimal transportation on the real line

For $1 \leq p < \infty$, let $\mathcal{P}_p(\mathbb{R})$ denote the collection of probability measures on $\mathbb{R}$ that have finite p th moment. Let $\mu, \nu \in \mathcal{P}_p(\mathbb{R})$ and let $c(x, y) = h(x-y)$, where $h: \mathbb{R} \rightarrow [0, \infty)$ is a convex function.

If μ has no atom, i.e., if the cumulative distribution function $F_\mu: \mathbb{R} \rightarrow [0, 1]$ of μ is a continuous function, then $F_\nu^{-1} \circ F_\mu: \mathbb{R} \rightarrow \mathbb{R}$ is an optimal transport map. It is the unique optimal transport map if h is strictly convex.

We have

$$\min_{\gamma \in \Gamma(\mu, \nu)} \int_{\mathbb{R}^2} c(x, y) d\gamma(x, y) = \int_0^1 c(F_\mu^{-1}(s), F_\nu^{-1}(s)) ds$$

Separable Hilbert spaces

Let X be a separable Hilbert space. Let $\mathcal{P}_p(X)$ denote the collection of probability measures on X such that have finite p th moment; let $\mathcal{P}_p^r(X)$ denote those elements $\mu \in \mathcal{P}_p(X)$ that are Gaussian regular: if g is any strictly positive Gaussian measure on X and $g(N) = 0$, then $\mu(N) = 0$ also.

Let $\mu \in \mathcal{P}_p^r(X)$, $\nu \in \mathcal{P}_q(X)$, $c(x, y) = |x - y|^p/p$ for $p \in (1, \infty)$, $p^{-1} + q^{-1} = 1$. Then the Kantorovich problem has a unique solution κ , and this solution is induced by an optimal transport map: i.e., there exists a Borel map $r \in L^p(X, \mu; X)$ such that

$$\kappa = (\text{id}_X \times r) \# (\mu) \in \Gamma(\mu, \nu).$$

Moreover, if ν has bounded support, then

$$R(x) = x - |\nabla \phi(x)|^{q-2} \nabla \phi(x)$$

for μ -almost all $x \in X$ for some locally Lipschitz, c -concave and maximal Kantorovich potential ϕ . (Here $\nabla \phi$ denotes the Gâteaux derivative of ϕ .)

2.4.2 Classical Theories of Economic Development

2.4.2.1 The Linear Stages of Growth Models

The first generation of economic development models was formulated in the early years after the World War II. These early models focused on the utility of massive injections of capital to achieve rapid GDP growth rates. The two famous models are Rostow's stages growth model and the Harrod-Domar model (Todaro and Smith 2009).

Theorists of the 1950s and early 1960s viewed the process of development as a sequence of historical stages. This view was popularized by Rostow (Ingham 1995). Building on the historical pattern of the then developed countries, Rostow (1960) claimed that the transition from underdevelopment to development would pass through five stages: the traditional society, the preconditions for take-off, the take-off, the drive to maturity and the age of high mass consumption. The decisive stage is the take-off, through which developing countries are expected to transit from an underdeveloped to a developed state. Increasing rate of investments is considered to be necessary to induce per-capita growth. Like Rostow's stages growth model, the Harrod-Domar model emphasized that the prime mover of the economy is investments (Ghatak2003). Every country therefore needs capital to generate investments. The principal strategies of development from the stage approach were commonly used by developing countries in the early post-war years.

With a target growth rate, the required saving rate can then be known. If domestic savings were not sufficient, foreign savings would be mobilized.

Although Rostow (1960), Harrod (1948) and Domar (1947) were right about the important role of investments that is most closely correlated with the economic growth rate, this is not the only condition for a country to develop. The key weakness of these models lies in their simplifying assumptions. A single production function is simply assumed for all countries (Adelman 2000). Every economy is

assumed to have the same necessary conditions and would pass through the same phasing, stage by stage. But that economic growth path, which historically had been followed by the more developed countries, is not the only one pathway. The development process is actually highly nonlinear (Chenery1960; Chenery and Syrquin1975). Countries may pursue distinct development paths (Morris and Adelman 1988). Economies may miss stages, or become locked in one particular stage, or even regress depending on many other complementary factors such as managerial capacities, and the availability of skilled labor for a wide range of development projects (Todaro and Smith 2009).

2.4.2.2 Structural Change Models

During most of the 1960s and early 1970s, economists generally described the development process as structural change by which the reallocation of labor from the agricultural sector to the industrial sector is considered the key source for economic growth. Two well-known representatives of this approach are the two-sector theories of Economic Development model (Lewis 1954), and the structural change and patterns of development (Chenery 1960).

In Lewis' (1954) two-sector model or theory of surplus labor, labor increasingly moves away from the agricultural sector to the industrial sector. However, with unlimited supply of labour from the traditional sector, these transferred workers continually received only subsistence wages. The excess of modern sector profits over wages and hence investments in the modern sector continued to expand and generate further economic growth on the assumption that all profits would be reinvested. Both labor transfer and modern sector employment growth were in turn brought about by output expansion in that sector. This process of modern sector self-sustaining growth and employment expansion facilitated the structural transformation from a traditional subsistence economy to a more modern developed economy to take place. Like the Harrod–Domar model, the Lewis model considered

savings and investments to be the driving forces of economic development but in the context of the less developed countries. However, several Lewis' assumptions are not valid such as those relating to rural surplus labour, and the proportional rate of expansion in capital accumulation in the modern sector (Todaro and Smith 2009).

Although promoting the roles of savings and investments, the structural change and patterns of development analysis extended in comparison with the Lewis model.

The analysis identified that the steady accumulation of physical and human capital is among conditions necessary for economic growth, apart from savings and investments.

Moreover, the structural changes occurred not only in the two sectors but also in all economic functions, including the change in consumer demand from an emphasis on food and basic necessities to desires for diverse manufactured goods and services, international trade and resource use as well as changes in socioeconomic factors such as urbanization and the growth and distribution of a country's population.

The most significant explanation of this approach was provided by Chenery (1960), Chenery and Taylor (1968), Kuznets (1971) and Chenery and Syrquin (1975).

By focusing on the pattern of development rather than theory, the structural change models may mislead policy-makers. Since the reallocation of labour from the agricultural sector to the industrial sector is considered the engine of economic growth, many developing countries implemented policies that often promote the industry and neglect agriculture. But the negative effects of policies that turned against that vital sector have come to be widely recognized (World Bank 2000). Criticisms of these models were reinforced by the fact that in many developing countries, poverty was prevalent. Following the pattern recommended by structural change economists, in the late 1960s, the attention of policy-makers began to shift towards an emphasis on human capital, i.e. education and health (Meier 2000). Then again, investments in health and education alone do not guarantee development. "In

Sub-Saharan Africa, for example, life expectancy and school enrolment rates have increased dramatically in recent decades, but as a group the economies in the region have had slow and even negative growth since the early 1970s" (World Bank 2000, p. 16).

The structural change models focused on the pattern of development and hypothesized that the pattern was similar in all countries and was identifiable.

However, empirical works, such as Chenery (1960), Chenery and Taylor (1968),

The Evolution of Economic Development Thoughts 17 and Chenery and Syrquin (1975), on the process of structural change does recognize that pattern of development can be different among countries, which is dependent on the countries' particular set of factors including "a country's resource endowment and size, its government's policies and objectives, the availability of external capital and technology, and the international trade environment" (Todaro and Smith 2009, p. 120).

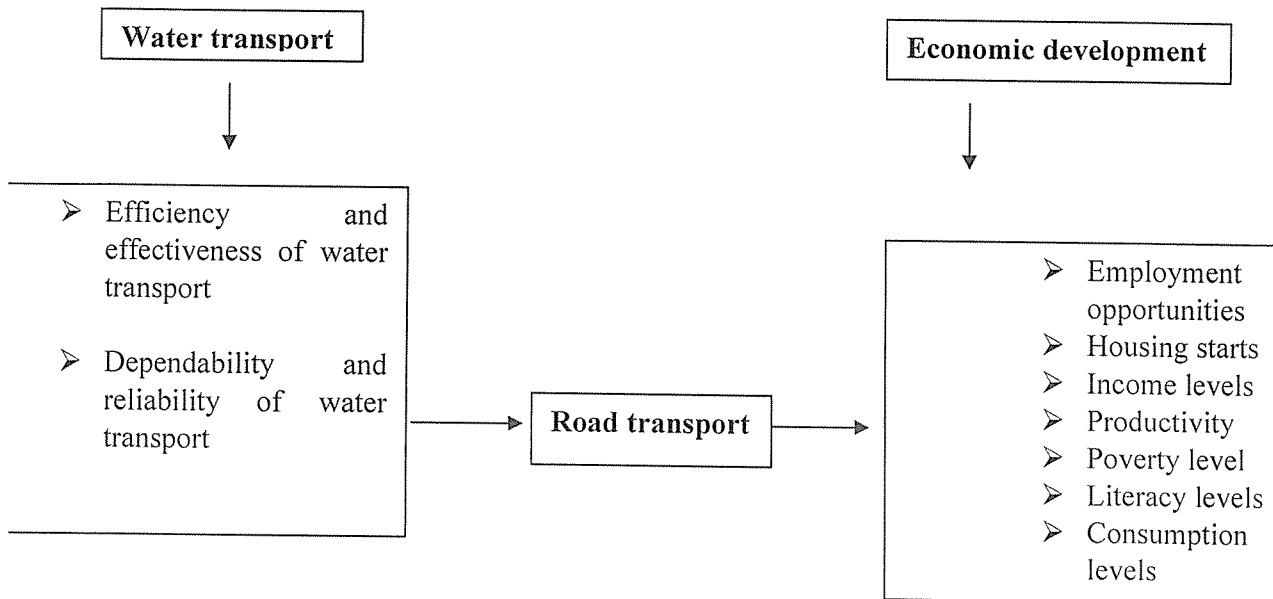
2.5 Conceptual framework

This is the graphical depiction of the relationship between the independent variable and dependent variables in this study. This maps how economic development is influenced by water transport. The figure below shows the relationship between, water transport, road transport and economic development.

Figure 2

Independent variable

dependent variable



Source: Researcher devised 2015

CHAPTER THREE

METHODOLOGY

3.0 Introduction

This chapter presents the study design, study population and the sample size, sampling procedure, data collection methods, data management, data analysis and editing, ethical consideration, dissemination of results and limitations of the study.

3.1 Study design

The methodological approach used in this research was Quantitative. The research employed the descriptive research design specifically the descriptive correlation strategy. This research as a descriptive study was a non-experimental investigation that also describes the characteristics of the respondents. It dealt with the relationship between variables, water transport and economic development.

3.2 Study population

The study covered a target population of 100 people which were limited to only fishermen and fish mongers, passengers in water transport and retailers Ggaba region. The population was chosen because it is relatively large enough to produce a sample that would generate findings to make generalizations about the entire population.

3.3 Sample size determination

Yamane's formula was used to calculate the sample size. It is a simplified formula which can be used to calculate proportions and it has been used for known finite population in several studies (Israel, 2006).

$$n = \frac{N}{1 + N(e)^2}$$

Where, n is the sample size

N is the population size (100)

e is the level of acceptable error(0.05)

Thus,

$$\begin{aligned}\text{Total sample (n)} &= \frac{100}{1+(100 \times 0.05^2)} \\ &= 80\end{aligned}$$

The study therefore involved only 80 respondents.

3.4 Sampling procedure

In the selection of the 80 respondents, the researcher used a simple random sampling method which help the researcher get detailed information for evaluation of the study, and this also gave freedom to select certain respondents with depth knowledge regarding the issue under investigation for inclusion of only those who held vital information that the researcher needed.

3.5 Data collection method

The data collection instruments that were used in the study included the face sheet and self-administered questionnaire. The face sheet was used to gather data on the respondent's demographic profiles in terms of gender, age, Occupation, Level of education. A self-administered questionnaire was developed to measure the impact of water transport on economic development in Ggaba region. The five-point Likert scale was adapted in measuring water transport, economic development and the challenges facing the development of water transport in Ggaba region. Where 1 = "Strongly agree", 2 = "agree", 3 = "Not sure", 4 = "disagree" and 5 = "Strongly disagree"

3.6 Data management

The completed forms were put in a box file and stored by the researcher to ensure confidentiality and security.

3.7 Data analysis

The researcher carried out manual analysis and tallying of data using both mathematical and statistical methods in organizing and presenting data. EPIDATA

and SPSS were employed by the researcher in coding questionnaires and also to produce frequencies, tables, means and standard deviation.

3.8 Data editing

Errors and mistakes in the research were thoroughly checked. This was be done during data analysis and after data collection.

3.9 Ethical consideration

The researcher obtained a letter of introduction from Kampala international university by the head of department. The research commenced after the purpose of the study had been well explained to the respondents. Confidentiality of all information was received and assured to the respondents and this was attained by using study numbers and not names while carrying out data collection.

3.10 Dissemination of results

The findings were disseminated to the department of economics and applied statistics as a partial requirement for the award of a degree of economics and applied statistics, Kampala international university and a copy was submitted to the school library.

3.11 Limitations of the study

Limited time. The time given to complete the research was short because the respondents and the researcher had other commitments; however, the researcher was guided by a work plan, which showed the activities to be done at a given period. The inadequate finances given the high operating costs of photocopying, typing, printing and other costs were a limitation to the study but the researcher sought assistance from all sources and tried to work within the boundaries of the budget. The research was also limited by doubts by the respondents about the confidentiality of the information.

CHAPTER 4

DATA PRESENTATION, ANALYSIS AND INTERPRETATION

In this chapter, the researcher presented the analysis and interpretation of the data according to the set objectives. The study was guided by four objectives that included; (i) to find out the influence of water transport on employment level, (ii) to find out the impact of water transport on the productivity of economic activities, (iii) to identify the challenges facing water transport in promoting economic development in Ggaba region and (iv) identifying the relationship between water transport and economic development in Ggaba region.

4.1 The demographic characteristics of respondents

Table 1

Respondents' gender		Frequency	Percent
	male	42	52.5
	female	38	47.5
	Total	80	100.0

Respondents' age group		Frequency	Percent
	20-29	24	30.0
	30-39	22	27.5
	40-49	16	20.0
	50 and above	18	22.5
	Total	80	100.0

Respondents' occupation		Frequency	Percent
	Fishing and related activities	24	30.0
	Civil servant	20	25.0
	Retailer	16	20.0
	Farming	8	10.0
	Total	68	85.0
	Missing System	12	15.0
Total		80	100.0

Respondents' marital status		Frequency	Percent
	single	20	25.0
	married	50	62.5
	divorced/separated	6	7.5
	widowed	4	5.0
	Total	80	100.0
Respondents' highest level of education attained		Frequency	Percent
	completed PLE	24	30.0
	completed O-LEVEL	34	42.5
	certificate/diploma	10	12.5
	Degree and above	12	15.0
	Total	80	100.0

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 1 gives the demographic characteristics of the respondents who participated in the study. Most of the respondents were male 52.5% while 47.5 were female. According to age, 30% of the respondents were aged between 20-29 years followed

by 27.5% aged between 30-39 years followed by 22.5% aged 50 years and above and lastly 20% were between 40-49 years. According to marital status, 25% were single, 62.5% were married, 7.5% were divorced/separated and 5% were widowed. Table 1 further indicates that most of the respondents completed O-level represented by 42.5%, followed 30% of those who completed PLE, followed by 15% of those with a degree and above and lastly 12.5% of those who completed their certificate/diploma. Table 1 lastly indicates that most respondents were employed in fishing and related activities 24(30%), followed by civil servants 20(25%), followed by retailers 16(20%), followed by those in farming 8(10%) and the rest were employed in other activities.

4.2 Measurement of water transportation in Ggaba region

Table 2; Reliability of water transport

	Mean	Std. Deviation	Interpretation
Transportation of goods and people involves less/no damages/accidents	1.74	.910	Very high
The available water boats are adequate/sufficient for transportation	1.65	.677	Very high
Purchase and acquisition of business goods is most aided by water transport	1.54	.635	Very high
Mean value	1.64		Very high

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 3; Efficiency and effectiveness

	Mean	Std. Deviation	Interpretation
Usage of water transport involves less money costs compared to other means	1.46	.856	Very high
There is punctuality in using water transport	2.31	1.001	High
Water transport is the most widely used means by people in Ggaba	1.95	.634	High
There is evidence that the majority are satisfied by services water transport in Ggaba	1.80	.719	Very high
Mean value	1.88		High

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 2 findings reveal that transportation of goods and people involves less/no damage/accidents (mean=1.74, std.dev=0.910). More so respondents agreed that the available water boats are sufficient for transportation (mean=1.65, std.dev=0.677). The findings further indicate that purchase and acquisition of goods for business is most aided by water transport (mean=1.54, std.dev=0.635). According to table 3, the findings reveal that using water transport involves less money costs compared to other means (mean=1.46, std.dev=0.856). The findings also agree that there is punctuality in using water transport (mean=2.31, std.dev=1.001), the respondents also agreed that that the most widely used means of transport in Ggaba is water transport (mean=1.95, std.dev=0.634), and they also agreed that the majority are satisfied by services of water transport in Ggaba.

Table 4; Interpretation of mean values for table 2 and table 3

Minimum	Maximum	Scale rating	Interpretation
1.00	1.80	Strongly agree	Very high
1.81	2.61	Agree	High
2.62	3.41	Not sure	Medium
3.42	4.21	Disagree	Low
4.22	5	Strongly disagree	Very low

4.3 Measure of the economic development in Ggaba region

Table 5; Measurement of employment level

	Mean	Std. Deviation	interpretation
There is increased income levels among individuals in Ggaba region	1.58	.759	Very high
There is evidence of increased purchasing power of individuals in Ggaba region	1.67	.689	Very high
There is reduced poverty levels among individuals in Ggaba region	1.71	.783	Very high
There is increased consumption of goods and services in Ggaba region	1.55	.840	Very high
There is a reduced number of idlers in Ggaba region	1.66	.635	Very high
Mean value	1.634		Very high

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 6; Measure of productivity of economic activities

	Mean	Std. Deviation	interpretation
There is increased volume of sales of goods and services in the market	1.65	.748	Very high
there is a variety of quality goods and services in the market	1.78	.675	Very high
profits are being realized from the economic activities being carried out	1.41	.567	Very high
Mean value	1.61		Very high

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 5 findings indicate that there is increased income levels among individuals in Ggaba region (mean=1.58,std.dev=0.759), the findings further indicate that there is increased purchasing power of individuals in Ggaba region(mean=1.67,std=0.689). Table 5 continues to reveal that there is a reduction in poverty levels among individuals in Ggaba region (mean=1.71,std.dev=0.783), further findings reveal that there is increased consumption of goods and services in Ggaba region(mean=1.55,std.dev=0.840), and finally the findings also agreed that there is reduced number of idlers in Ggaba region(mean=1.66,std.dev=0.635).

On the hand, table 6 reveals that there is an increase in the volume of sales of goods and services in the market (mean=1.65, std.dev=0.748), further, the findings in table 6 indicate that there is a variety of goods and services in the market (mean=1.78,

std.dev=0.675) and also the findings agreed that profits are being realized from the economic activities being carried out in Ggaba region (mean=1.41, std.dev=0.567)

Table 7; Interpretation of mean values for table 5 and table 6

Minimum	maximum	Scale rating	Interpretation
1.00	1.80	Strongly agree	Very high
1.81	2.61	Agree	High
2.62	3.41	Not sure	Medium
3.42	4.21	Disagree	Low
4.22	5	Strongly disagree	Very low

4.4 Examining the influence of water transport on the level of employment

Table 8; correlation between water transport and employment level

		EL	WTP
	Pearson Correlation	1	.201
	Sig. (2-tailed)	.074	.074
	N	80	80

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 8 shows the correlation between water transport and employment level. The dependent variable is employment level(EL) and the independent variable is water transport (WTP). Findings reveal that 0.201 is the correlation coefficient between water transport and employment level. This implies a weak significant positive relationship between water transport and employment.

4.5 Examining the impact of water transport on the productivity of economic activities

Table 9; Correlation between water transport and productivity of economic activities

		PRO-ECO-ACT	WTP
	Pearson Correlation	1	.253**
	Sig. (2-tailed)	.023	.023
	N	80	80
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 9 represents the correlation between water transport and the productivity of economic activities. The dependent variable is the productivity of economic activities (PRO-ECO-ACT) and the independent variable is water transport t(WTP). Findings indicate that all variables are significant at 1% level of significance. 0.253 is the correlation coefficient between water transport and the productivity of economic activities. This therefore indicates a weak significant positive relationship between the two variables.

4.6 Challenges facing the development of water transport in Ggaba region

Table 10

	Mean	Std. Deviation	Interpretation
Inadequate government support	1.63	.624	Very high
Limited number of standard boats and ferries	1.65	.638	Very high
Corruption and embezzlement of funds allocated for water transport	1.71	.679	Very high
Limited investment in water transport by travel agencies	1.78	.656	Very high
People are not interested in using it	2.06	.932	High
Mean value	1.766		Very high

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 10 indicates the findings on the challenges facing the development of water transport in Ggaba region. The findings reveal that inadequate government support is one of the challenges facing development of water transport in Ggaba region (mean=1.63, std.dev=0.624), the findings reveal another problem as limited number of standard boats and ferries(mean=1.65,std.dev=0.638), the findings further indicate that corruption and embezzlement of funds allocated for water transport is also a challenge that face water transport in Ggaba region(mean=1.71,std.dev=0.638), the findings also agreed that there is limited investment in water transport by travel agencies(mean=1.78,std.dev=0.656), lastly, table 10 also indicates that people are not interested in using water transport as a means of transport(mean=2.06,std.dev=0.932)

Table 11; Interpretation of mean values for table 10

Minimum	Maximum	Scale rating	Interpretation
1.00	1.80	Strongly agree	Very high
1.81	2.61	Agree	High
2.62	3.41	Not sure	Medium
3.42	4.21	Disagree	Low
4.22	5	Strongly disagree	Very low

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

4.7 Examining the relationship between water transport and economic development

Table 12; correlation between water transport and economic development

		ECO-DEV	WTP
	Pearson Correlation	1	.301**
	Sig. (2-tailed)	.007	.007
	N	80	80
**. Correlation is significant at the 0.01 level (2-tailed).			

Source: IBM SPSS STATISTICS 20 output (primary data, 2015)

Table 12 shows the correlation between water transport and economic development. The dependent variable is economic development (ECO-DEV) and the independent variable is water transport (WTP). Findings reveal that all variables are significant at

1% level of significance. 0.301 is the correlation coefficient between water transport and economic development. This indicates a weak significant positive relationship between water transport and economic development.

CHAPTER FIVE

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

5.0 introduction

This chapter presents the discussion of the findings, conclusions and recommendations of the study.

5.1 discussions of findings of the study

The findings of the study were presented in line with the specific objectives that included; (i) to find out the influence of water transport on employment level, (ii) to find out the impact of water transport on the productivity of economic activities, (iii) to identify the challenges facing water transport in promoting economic development in Ggaba region and (iv) identifying the relationship between water transport and economic development in Ggaba region.

5.1.1 Influence of water transport on employment level

Research findings indicated that there is a positive influence of water transport on economic development. This was indicated by a contribution of 20.1% (calculated from a 0.201 correlation coefficient) towards the level of employment. This aligns with item analyses on employment level in table 5 that there is an increased income level among individuals, increased purchasing power and reduced poverty levels

5.1.2 Impact of water transport on the productivity of economic activities

The findings of the study revealed that there is a positive impact of water transport on the productivity of economic activities. This was indicated by a contribution of 25.3% (calculated from a 0.253 correlation coefficient) towards the productivity of economic activities. This aligns with item analyses on the productivity of economic activities in table 6 that there is an increase in the volume of sales of goods and services, variety of quality goods, services in the market and the profits being

realized from the economic activities and that the degree of productivity of economic activity is high(indicated by a high mean=).

5.1.3 Challenges facing the development of water transport

The findings indicate that there is inadequate govern support towards the development of water transport as the biggest problem, followed by limited number of standard boats and ferries, followed by corruption and embezzlement of funds allocated for water transport, followed by limited investment in water transport by travel agencies and the last problem was that people are not interested in using water transport as their means of transport.

5.1.4 Relationship between water transport and economic development

This study established that water transport is significantly correlated with economic development. The findings reveal that there is a weak significant positive relationship between water transport and economic development which is represented by a 30.1% contribution of water transport on economic development (calculated from a 0.301 correlation coefficient in table 12). Therefore the findings also agree with the literature advanced by Todd Litman(Aug 2010) on how transport affects economic development.

5.2 Conclusions

In summary, water transport is also a major determinant of the lavel of economic development. As the degree of water transportation increases, economic development is promoted. Also Increasing transport system efficiency would provide productivity gains that are essential in promoting economic development. For example, reduced shipping costs may increase business profits, reduce retail prices, improve service quality, allow tax increases or a combination of these.

5.3 Recommendations

Basing on the conclusion and the findings of this study, the researcher recommends the government to create a conducive investment atmosphere in water transport to

attract foreign investors, to give support inform of funds and also ensuring that the funds have been put to proper use as directed. The government should also ensure provision of public transport by providing public boats, ferries and other water transport facilities.

The researcher also recommends that the study should be carried out using a larger sample and using other methodologies that have not been used in this research.

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APPENDIX I: QUESTIONNAIRE

SELF-ADMINISTERED QUESTIONNAIRE ON WATER TRANSPORT AND ECONOMIC DEVELOPMENT IN GGABA REGION

Dear respondent,

SAQ NO. _____

This questionnaire is intended to facilitate the study on “water transport and economic development”. The study is for academic purposes and is carried out as a partial fulfillment of the award of degree in Economics and Applied Statistics of Kampala international university. Your responses will be treated with utmost confidentiality. In order to accomplish the study, you are requested to complete this questionnaire. Thank you very much for your valuable time.

SECTION A: DEMOGRAPHIC PROFILE OF RESPONDENTS

For this section, please tick the response category that applies to you,

Gender

Male ☐ Female ☐

Age group

Years old	20-29	30-39	40-49	50 and above
Tick				

Marital status

Status	Single	Married	Divorced/separated	Widowed
Tick				

Highest level of education attained

Level	Completed PLE	Completed O-Level	Completed A-Level	Certificate/Diploma	Degree and above
Tick					

Occupation

Occupation	Fishing and related activities	Civil servant	Business trader	Farming
Tick				

SECTION B:

Questionnaire to measure the degree of water transportation in Ggaba region

Instruction: please rate in the space provided after each question by ticking in the space corresponding to your best choice.

Response mode: 1=strongly agree, 2=agree, 3=not sure, 4=disagree, 5=strongly disagree.

Reliability

Responses	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1.Transportation of goods and people involves less/no damages/accidents					
2.Purchase and acquisition of business goods is most aided by water transport					
3.The available water boats adequate/sufficient for transportation					

Efficiency and effectiveness

Responses	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1. Usage of water transport involves less money costs compared to other means.					
2. There is punctuality in using water transport.					

3. Water transport is the most widely used means by people in Ggaba.					
4. There is evidence that the majority are satisfied by services of water transport.					

SECTION B

Questionnaire to measure the level of economic development in Ggaba region

Instruction: please rate in the space provided after each question by ticking in the space corresponding to your best choice.

Response mode: 1=strongly agree, 2=agree, 3=not sure, 4=disagree, 5=strongly disagree

Measurement of employment level

Responses	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
2. There is increased income levels among individuals in Ggaba region					
3. There is evidence of higher purchasing power of people in Ggaba					
4. There is reduced poverty					

levels among individuals					
5. There is increased consumption of goods and services					
6. There is a reduced number of idlers					

Measurement of productivity of economic activities

Responses	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1. Increased volume of sales of goods and services in the market					
2. Variety of quality goods and services in the market					
3. Profits are being realized from the economic activities carried out					

SECTION C:

Questionnaire to identify the challenges facing development water transport in Ggaba region

Instruction: please rate in the space provided after each question by ticking in the space corresponding to your best choice.

Response mode: 1=strongly agree, 2=agree, 3=not sure, 4=disagree, 5=strongly disagree

What are the challenges facing the development of water transport

Responses	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1.Limited investment in water transport by travel agencies					
2.Inadequate government support					
3.Corruption and embezzlement of funds allocated for water transport					
4.Limited number of standard boats and ferries					
5.People are not interested in using it					

May God Bless You