

Reducing logistics costs to improve the competitiveness of an industry - The case of the Horticulture sector in KwaZulu-Natal

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ABSTRACT

Moving products is a costly exercise for most companies in South Africa. These high logistics costs impede the country from achieving some developmental goals such as creating more jobs and growing the economy. The horticulture sector is particularly ham-strung by this. Small business is more severely affected than big business. There are numerous, multi-faceted reasons for these high costs. The analysis and potential solutions are drawn from New Institutional Economics theory, political economy thinking, business process applications and economic geography thinking. It is clear that the solution goes beyond what is normally advocated by institutions that have done work in this area, e.g. the World Bank, which tends to focus on infrastructure investment. Issues typically overlooked that need greater attention include improving competition in the logistics sector and firm collaboration. Policy choices would have to be based on an understanding of the cyclical nature of some cost drivers (e.g. fuel costs) and the structural nature of some cost drivers (e.g. infrastructure).

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PREFACE

The work described in this dissertation was carried out in the School of Development Studies, University of KwaZulu-Natal, Howard College Campus, under the supervision of Glen Robbins.

These studies represent original work by the author and have not otherwise been submitted in any form for any degree or diploma to any tertiary institution. Where use has been made of the work of others it is duly acknowledged in the text.

Signature

Date

LIST OF ACRONYMS

CSIR – Council for Scientific and Industrial Research

DTI – Department of Trade and Industry

FDI – Foreign Direct Investment

GDP – Gross Domestic Product

GNP – Gross National Product

KZN – KwaZulu-Natal

ICT – Information Computer Technology

LPI - Logistics Performance Index

NDA - National Department of Agriculture

NDOT - National Department of Transport

NIE – New Institutional Economics

OECD – Organisation for Economic Cooperation and Development

SMME – Small Medium and Micro Enterprises

TNC – Transnational Corporation TISA - Trade and Investment South Africa

SA – South Africa

SADC - Southern African Development Community

SARB – South African Reserve Bank

SOL - State of Logistics Survey

WTO – World Trade Organisation

CONTENTS

ABSTRACT	I
ACKNOWLEDGEMENTS	II
PREFACE	III
LIST OF ACRONYMS	IV
1. CHAPTER 1: INTRODUCTION	1
1.1 Research problem	2
1.2 Hypothesis	3
1.3 Research problems and objectives: Key questions to be asked	3
1.4 Research problems and objectives: Broader issues to be investigated	4
1.5 Outline of Dissertation	4
2. CHAPTER 2: BRIEF BACKGROUND ON LOGISTICS AND BRIEF BACKGROUND ON HORTICULTURE IN KWAZULU-NATAL	6
2.1 Background - Definition of Logistics and related terminology	6
2.1.1 Origin of logistics	6
2.1.2 Common Definition of Logistics	7
2.1.3 Other Logistics Terms	8
2.2 Overview of the Horticulture sector in KwaZulu-Natal	8
2.3 Overview of the horticulture sector in KZN	11

2.4 Logistics Sector in KZN	11
3. CHAPTER 3 - LITERATURE REVIEW	12
Introduction	12
3.1 The role of logistics in Economic Development	13
3.2 Logistics at a country level – findings	14
3.3 Logistics Costs a challenge over and above trade barriers	16
3.4. Logistics and New Economic Geography	18
3.4.1 Firm Location	18
3.4.2 Regional Economic Integration	20
3.5 Impact on Structure of production and Growth in Value Added Segments	20
3.6 Country Competitiveness & Firm Competitiveness	21
3.7 Country Level – Logistics Costs in South Africa	22
3.7.1 Moving South Africa	22
3.7.2 State of Logistics Surveys	25
3.7.3 Logistics Performance Index	27
3.8 National Freight Logistics Strategy	28
3.9 Logistics at a Sector Level - Horticulture case	29
3.10 Determinants of Transport Costs	32
3.10.1 Infrastructure	32
3.10.2 Distance	33
3.10.3 Time	33
3.10.4 Productivity	35
3.11 Theoretical foundations and analytical tools	35

3.11.1 New Institutional Economics and Transaction Cost Analysis	36
3.11.2 Value Chain Analysis	37
3.11.3 Types of Value Chains	38
4. CHAPTER 4: RESEARCH METHODOLOGY	41
Introduction	41
4.1 Study Design	41
4.2 Sampling Methods	41
4.3 Data Collection	41
4.3.1 Primary Data	42
4.3.2 Secondary Data	42
4.4 Form of analysis	43
4.4.1 Thematic Analysis	43
4.4.2 Transaction Cost Analysis	43
4.5 Strengths and limitations of the research design	43
5. CHAPTER 5: DESCRIPTIVE STATISTICS	45
6. CHAPTER 6: DATA ANALYSIS – KEY FINDINGS	60
6.1 Logistics is a Major Challenge	60
6.2 Logistics Costs in Relation to other challenges	62
6.3 Determinants of logistics Costs	63
6.3.1 Does Infrastructure matter?	63
6.3.2 Price of fuel	65
6.2.3 Volumes – Size Matters	66
6.2.3.1 Seasonality	66

6.2.4 Distance	67
6.2.5 Type of Product	69
6.2.6 Port Costs	69
6.2.7 Type of Vehicle Used	69
6.2.8 Other issues	70
6.3 Cost Structure of Logistics Operations	72
6.4 The effect of Delays	73
6.5 Modal Choices	73
6.6 Does Location Still Matter	75
6.7 Challenges that prevent producers from improving their system	76
6.8 Seeking Alternatives	76
6.10 Measuring, Monitoring and benchmarking Costs	78
6.10 What is the impact of High Logistics costs in Horticulture?	79
6.10.1 Fewer Producers	79
6.10.2 High food prices	79
6.10.3 Hinders efforts to create a new farming class	80
6.10.4 Employment Creation Capacity is constrained	80
6.10.5 It limits markets	80
6.11 Proposed Solutions	81
6.11.1 Is lowering cost all that matters?	81
6.11.2 Regulating Fuel prices	82
6.11.3 Transport Subsidies for farmers – Power Dynamics in Public Policy	83

6.11.4 Co-ordination and Consolidation of Loads	83
6.11.5 Investment in Infrastructure	84
6.11.5.1 Post Harvest infrastructure & equipment	85
6.5.12 Beyond Physical Infrastructure	86
7. CHAPTER 7: CONCLUSION	88
8. REFERENCES	90
9. ANNEXURES	99
Appendix 1: overview of horticulture in KwaZulu-Natal	99
Appendix 2 - Logistics Infrastructure and System in KZN	109
List of Tables	
Table: 3.1 Cost of Logistics over 4 years	25
Table 3.2 Elements of Different Value Chains	39
Table 4.1 Break down of Interviews Conducted	42
Table 5.1 Profile Interviews Conducted	45
Table 5.2 Drivers of Logistics Costs	53
Table 5.3 Modal Costs for Exporters	52
Table 5.4 Constraints to System Improvements	54
Table 5.5 Possible Solutions	55
Table 5.6 Logistics Costs and Firm Location	57
Table 5.7 Logistics Costs and Production Choices	58
Table 6.1 Comparison of Rail network	64
Table 6.2 Summary of potential solutions	87

List of Graphics

Graphic 2.1 Evolution of Logistics	10
Graphic 3.1 Relationship between Logistics Costs and Economic Development	13
Graphic 3.2 Key Challenges facing Transport Sector	23
Graphic 3.3 The Logistics Divide	26
Graphic 3.4 Processing Imports and GDP	34
Graphic 5.1 Logistics as a challenge	46
Graphic 5.2 Determinants of Logistics Costs	48
Graphic 5.3 Logistics Cost Structure for Exporters	49
Graphic 5.5 Logistics Cost Structure for Exporters	50
Graphic 5.6 Possible Solutions	56
Graphic 6.1 Fuel as a percentage of Freight Rates	65
Graphic 6.2 Fresh Produce Volumes exported from Cape Town and OR Tambo Airport	66
Graphic 6.3 Vicious Cycle Trapping Small Producers	77
Graphic 6.4 Composition of the Fuel Price	82

CHAPTER 1: INTRODUCTION

South Africa has to reduce the cost of logistics if it is to meet some of its economic development objectives, such as halving unemployment by 2014 as envisaged in the country's Accelerated and Shared Growth Strategy document (2006).

In a trade-intensive world the economic performance of countries, and therefore their ability to reduce poverty and generate employment, is closely connected with both an ability to produce goods in a competitive manner and also being able to move such goods and their related inputs efficiently and at reasonable cost to the required destinations.

Advances in transport and logistics – the process, activities, equipment, facilities and information used in moving goods from one point to another- have been integral in making it possible for many countries to have access to increased trade opportunities. Many developing countries have adopted economic growth strategies based on exporting to wealthier developed countries.

This is best demonstrated by countries in Asia where export performance dominates national economic agendas. South Africa is no different. Its reintegration to world markets since the advent of democratic rule has opened up many trade opportunities.

However, exploiting these opportunities is made difficult by, among other things, the high costs of logistics in the country. South Africa's situation is exacerbated by its geographic position as it is located far from its major trading partners. The Council for Scientific and Industrial Research (CSIR) has been conducting surveys on Logistics costs over the past five years and these have consistently shown that South Africa has comparatively higher logistics costs than many developed countries and in some cases twice as high (CSIR, 2006; CSIR 2007; CSIR 2008). This limits access to markets and trade opportunities internationally. More specifically, high logistics costs lead to the following problems:

- Local companies have to pay more for imported intermediate goods and receive less for their exports
- Difficulties in attracting foreign and domestic investment in export-related activities/sectors
- Less competitive products in international markets
- Increased prices of imported capital goods

Reducing the costs of logistics and generally improving the cost-effectiveness of the economy is important in efforts to grow the economy and reduce unemployment. The challenge is simple, i.e. “SA needs to reduce

logistics costs by one third to sustain ... competitiveness.” (Transnet, 2004). The solutions are complex. Finding them is even more important in sectors like horticulture where growth and job creating capacities are impeded by high logistics costs.

This research is an attempt to understand the nature and impacts of costs of logistics in the horticulture sector. It demonstrates that logistics costs are high and restrict expansion of the sector. It also considers why costs are high and assesses and proposes various solutions for reducing these costs. Cost is not looked at simply as a function of direct charges that might be paid for moving goods but is also closely associated with indirect costs related to the reliability and quality of logistics services – a matter of particular importance in the horticulture sector.

Horticulture is a sub-sector of agriculture that deals with the production of vegetables, fruits, flowers and ornamental plants. This has been chosen because of increasing efforts in KwaZulu-Natal to develop this sector and also because it is a growing sector that has contributed to the development of a number of developing countries. KwaZulu-Natal is also suitable for many horticulture products due to the climate. Finally, it is a sector that is labour intensive, which makes it relevant for consideration in a country with a high unemployment rate as has it has been used to create employment in many other developing countries .

To illustrate the importance of the horticulture sector and its appropriateness for many developing countries, the research draws on Labste (2005) which shows that horticulture has been used by many African countries to increase their trade and export earnings and employment through expanding this sector. Numerous studies by agencies such as the United Nations Conference on Trade and Development and the World Bank demonstrate the importance of addressing logistics costs as part of improving overall competitiveness or as part of sector development strategies.

1.1 Research problem

The issue of logistics has not received a significant amount of attention in processes related to development of various sectors. It is often treated as something of a fixed factor and attention is more often focused on production dynamics in understanding the ability of producers to compete. While there has been some work done on understanding the cost of logistics for certain economies, few *detailed* sector-specific studies exist and very few studies focus on both the causes of inefficiencies and potential solutions. Furthermore, there are few such studies in the South African context if any.

Without this better understanding, it is difficult to develop policies and strategies that can reduce the costs. This is also the case for the horticulture sector. This sector has received little attention from researchers and policy makers. The norm is to focus on grain crops and on production issues. This is despite being responsible for “Africa’s Unfunded revolution” (Labaste, 2005). One may add that this has also been an unreported revolution. Not as well documented as the “Green Revolution” of the 1950’s and 1960s. Thus, the problem relates to fields that are known but could play a tremendous role to countries such as South Africa.

1.2 Hypothesis

Horticulture Producers in KwaZulu-Natal face high costs of logistics. This affects the growth of the sector and its potential socio-economic impact.

1.3 Research problems and objectives: Key questions to be asked

Is the cost of logistics a serious problem for horticulture businesses in KZN? If so, what is the seriousness or nature of the problem?

The research assumes that logistics is a serious problem for horticulture exporters in KZN. This is based on information obtained from work done on the sector by institutions such as the National Department of Agriculture. The study seeks to investigate whether this is indeed the case. It is a problem that has to be better understood and addressed according to secondary research documents. It deserves attention because there is scope to make improvements and also because there have been limited efforts thus far to understand and implement these.

What is the cost structure of the horticulture logistics system in South Africa?

This will entail understanding how the various components of the broad logistics system. To understand costs associated with various components. This was has to be broken down into administrative costs, packaging costs, transportation costs, inventory costs and other components.

Where are the inefficiencies in the system?

It is important to understand which part of the logistics system role players feel is not efficient. Is it the port container terminals, road network, cargo clearance process, IT systems used, etc?

What is the impact of high costs?

This seeks to understand the effects of high logistics costs on areas such as enterprise formation, sector growth, job creation, poverty reduction, business location etc.

What steps can be undertaken to reduce logistics costs for horticulture producers in KZN?

This seeks to use the expertise of the interviewees and their understanding of the problem and the cause of the problem in making suggestions of ways to reduce the costs of logistics for horticulture exporters in the region.

What gains would accrue to the horticulture sector in KZN?

This seeks to understand what kind of benefits would be gained by the sector, participants in the sector and society in general if costs were to be lowered. These could be direct gains such as monetary gains, increased employment, gains to emerging farmers and land reform or indirect gains.

1.4 Research problems and objectives: Broader issues to be investigated

Broader issues that were investigated are outlined below:

- How efficient or inefficient is the logistics system in South Africa and KZN in particular?
- What are the key drivers of logistics costs in the country – e.g. labour costs, other labour market issues such as impact of HIV/AIDS, fuel prices, inflation, regulatory issues & permits, etc
- How does KZN compare with other regions in logistics costs?
- What are the various role players in the sector doing to reduce the cost of logistics?
- Can logistics be a significant competitive differentiator or a source of competitive advantage in export sector development strategies.

1.5 Outline of Dissertation

The Dissertation is structured as follows:

- Chapter 1 introduces the study and gives a definition of key terms used in logistics

- Chapter 2 gives a brief overview of the horticulture sector and logistics in KwaZulu-Natal.
- Chapter 3 discusses relevant literature for the study. It draws on experiences of other countries, outlines importance of logistics in economic development and outlines key determinants of logistics costs based on these studies.
- Chapter 4 gives an overview of the Methodology used to conduct the research.
- Chapter 5 outlines the results of the field research.
- Chapter 6 gives an analysis of the results.
- Chapter 7 is a conclusion of the study.

Below it is first established what we mean by logistics and related terminology.

CHAPTER 2: BRIEF BACKGROUND ON LOGISTICS AND HORTICULTURE IN KWAZULU-NATAL

Introduction

This chapter explains the meaning of logistics and associated terminology. It outlines the state of the industry in KwaZulu-Natal. It also gives a brief overview of the horticulture sector in KwaZulu-Natal. In essence, it gives a base of key background information for the rest of the study¹.

2.1 Background - Definition of Logistics and related terminology

2.1.1 Origin of logistics

It is widely reported and accepted that logistics as a practice evolved from military activities in 19th Century Europe (Bredell, 2004; Fourie, 2006). In its initial period of application, logistics management was primarily about the management of the process involved in procuring, transporting and maintaining various components of the military i.e. equipment / machinery, personnel and facilities (Fourie, 2006). According to Fourie (2006), the term originates from a Greek word, *Logistikos* which means calculating. It is reported (CuvIELLO, 2005 and Fourie, 2006) that when the term was first used in the military, an administrative person responsible for the management of equipment, facilities and personnel was given the title *Logistos*. Its importance in the military is best captured by the maxim: “Tactics may win battles, but logistics wins wars” and in the recognition that wars are won through strategy, tactics and logistics (CuvIELLO, 2005).

Since its early use in the military, it has developed into a concept that is now being used to win competitive wars in business between companies and in trade between regions. Thus, it has become a widely used concept found in many business management fields and various industries and sectors. More recently, the term is increasingly found in economic development discourse in the past two decades or so. This came with the recognition of logistics as one of the key sources of competitive gains for individual countries, businesses and industries / sectors since the advent of modern globalisation. Testament to the increasing importance of logistics is the entry of magazines, journals, professional institutions, accreditation bodies, conferences, etc largely dedicated to logistics issues. However, as the term has become ubiquitous, it has been used in different ways by the various sectors and now carries a variety of meanings.

¹ This chapter should be read in conjunction with Appendix 1 and Appendix 2

Therefore, it is important to outline the definition of logistics and what it means in the context of this research. The important thing is to show what it means in the context of this study i.e. in the field of economic development. Furthermore, the term is often used interchangeably with terms such as supply chain management and transport management. Below the meaning of these terms is explained.

2.1.2 Common Definition of Logistics

While there are various definitions of logistics, the definitions seem to have some common features. These are listed below:

- Logistics is essentially about physically moving goods from one point to another.
- It is about organising, arranging and coordinating various activities.
- It also about the information required to perform the activities and in performing the activities.

Below some definitions of logistics as put forward by different authors and organisations are provided.

The US Council of Supply Management Professionals defines logistics as

“ the process of planning, implementing and controlling the efficient, cost-effective flow and storage of raw materials, in-process inventory, finished goods, and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements.” (www.cscmp.org)

This definition encapsulates the key aspects often mentioned in defining logistics i.e. the flow of information and goods (raw materials, finished goods) from one end to the other. The key thing to point out is the emphasis that this is done with the purpose of conforming to customers' requirements. Very often this is left out of definitions, yet it is the essential driver of logistics processes. These, as outlined by the US Council of Supply Management Professionals (2008), processes comprise of a number of components. These are outlined below:

- Physical Distribution. This is the physical tangible part of logistics such as transport (e.g. through trains, trucks and aircraft), warehouses where goods are kept, terminals (e.g. container, air cargo, rail, etc), factories, etc.
- Systems. This is the part that links the different players or parts of the logistics process. These systems process data, relay information, keep records and perform other related functions.

- People. The two elements outlined above are managed and operated by human beings. The competency and decisions of people greatly determine the way the system works.

Furthermore, there are participants with a supporting role to the logistics process. The key support service providers are the following:

- Finance – this entails making payment, receiving orders, etc.
- Administration – This normally entails record keeping, making bookings, managing the flow of information and generally administering the process.
- Insurance – It is the norm to insure any goods in transit.
- Information management – this is a way of managing all information used in the process. This may be done in electronic or manual form or through a combination thereof.

Very often people focus on the physical infrastructure part of logistics, i.e. roads, rail, ports, airports, warehouses, etc. This limited or apparent understanding may lead to a limited response as sorting out bricks and mortar issues may be easier than dealing with “softer” people and systems issues.

2.1.3 Other Logistics Terms

There is a myriad of other terms that are often used in the logistics sector that may be useful for this study. The box below provides a definition of these terms.

Box2.1: Definition of Logistics Terms

3PL – Third Party Logistics Service Provider – An outside party that is used to take care of company's distribution of its products fully or partly. Barloworld is an example of a well known 3PL.

4PL Fourth Party Logistics Service Provider - An integrator that designs and manages a company's supply chain from end-to-end, often hiring sub-contractors. DHL and FedEx are some examples of well known companies that operate as 4PLs.

Break-bulk vs. Bulk Cargo - Break-bulk refers to cargo that is packaged or unitised, while bulk cargo is neither containerised nor unitised.

CIF - Cost, Insurance and Freight - The cargo insurance and delivery of goods to the named port of destination (discharge) at the seller's expense. Buyer is responsible for the import customs clearance and other costs and risks.

FOB - Free On Board - The delivery of goods on board the vessel at the named port of origin (loading), at seller's expense. Buyer is responsible for the main carriage/freight, cargo insurance and other costs and risks.

Freight forwarder – Companies that normally provide one or more of the following services - Booking freight space, Managing selection of modes and carriers, Tracking and tracing of progress and Management of payments on behalf of their clients.

Handling Costs - The cost involved in moving, transferring, preparing, and otherwise handling inventory.

Logistics Management - Logistics Management is that part of supply chain management that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.

Inbound Logistics - The movement of materials from suppliers and vendors into production processes or storage facilities.

Inventory Carrying Costs - A financial measurement that calculates all the costs associated with holding goods in storage, usually expressed as a percentage of the inventory value. It includes inventory-in-storage, warehousing, obsolescence, deterioration or spoilage, insurance, taxes, depreciation, and handling costs.

Intermodal Transport - An intermodal transport system is a transport system which permits the interchange of transport units and unit load devices between compatible modes of transport like trucks, trains, ships and aircrafts.

Just-In-Time (JIT) - An inventory control system that controls material flow into assembly and manufacturing plants by coordinating demand and supply to the point where desired materials arrive just in time for use.

Outbound Logistics - The process related to the movement and storage of products from the end of the production line to the end user.

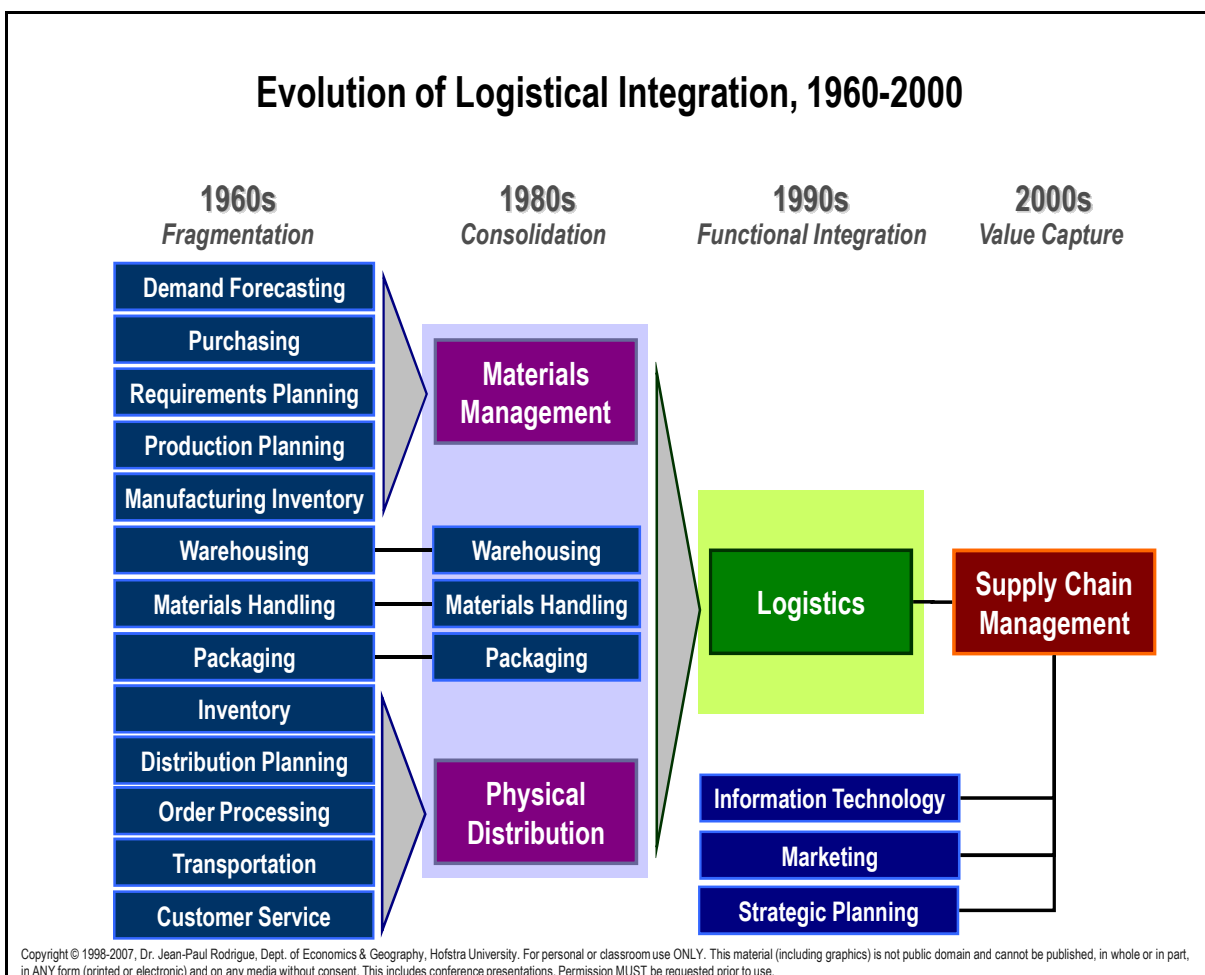
Supply Chain - The physical, financial, and information networks that involve the movement of materials, funds, and related information through the full logistics process, from the acquisition of raw materials to delivery of finished products to the end user. The supply chain includes all vendors, service providers, customers, and intermediaries. It also includes strategy formulation and continuous measures to reduce costs of moving products. It is often seen as one level beyond logistics as it covers a wider breadth of issues.

Sources: US Council of Supply Management Professionals, 2007 SA Institute For Chartered Logistics, 2007, KZN Department of Economic Development, 2007, National Department of Transport, 2006

It is important to point out that there is no unanimity on the meaning of some of these terms. For instance, a review of literature shows at least five definitions of Supply Chain. However, there are standard or widely used definitions. The table above seeks to show these terms as they are defined in most of the literature used for this research.

It is also important that some of these terms have taken different meanings over time. More importantly, logistics has evolved into a term encompassing a range of activities that had been previously seen as separate activities in line with business practices of integrating these functions. The table below shows how logistics and related activities that now fall under logistics have evolved over four decades.

Graphic 2.1 Evolution of Logistics



Rodrigue et al, 2005

The diagram encapsulates most of the aspects covered in most definitions of logistics. Now that logistics has been defined, a brief overview of the logistics sector and the horticulture sector in the study area is given in the next section.

2.3 Overview of the horticulture sector in KZN

A detailed overview of the horticulture sector is contained in Appendix 1. Key points made in this include:

- Horticulture is a growing sector internationally and offers opportunities for many developing countries to supply developed countries with positive developmental impacts.
- KZN has a comparative advantage in horticulture production largely due to climatic conditions
- The changing nature of the supply chain relationships and influence of consumers on these
- That the structure of the sector is such that this may limit developmental goals especially with regards to sustaining smaller and new operations.

2.4 Logistics Sector in KZN

The logistics sector is a significant part of KZN's economy. In fact, it has been argued that the *raison d'être* for some big urban centres in the province, ie, Durban and Richards Bay is the movement of goods into the country and out of the country (McCarthy, 2004). The province has a substantial presence of logistics infrastructure facilities, logistics service providers and experienced logistics professionals. The detailed information across infrastructure spheres and key agencies is on Appendix 2.

CHAPTER 3 - LITERATURE REVIEW

Introduction

This chapter outlines the relevant literature for this study. It consists of findings, arguments and key issues related to the following issues:

- The generic role of logistics in economic development / growth
- The findings of various studies on cost of logistics in South Africa
- The importance of decreasing logistics costs for improving competitiveness in the horticulture sector
- The main drivers of logistics costs

It is necessary to start by making the following observations about literature in this field:

- Whilst there are many studies focusing on trade barriers in general and on competitiveness, there are relatively few studies on logistics costs and development issues.
- The few studies that exist are largely recent studies as most were published or conducted in the last 8 years or so.
- The studies on logistics costs tend to focus on macro level issues.
- These studies tend to focus on one element of logistics e.g. port efficiency or transport costs in general. Very little has been done which looks at the entire logistics system.

Nonetheless, there is sufficient data that can be useful for this study. This data can be classified as follows.

- Data dealing with logistics and trade issues at a country level.
- Data dealing with logistics and sector development strategies at a sectoral or industry level e.g. automotive sector or manufacturing sector in general.
- Data dealing with logistics at an individual firm level.

Thus, this section is organised in this format. Firstly, the broad role played by logistics in Economic Development and what relevant literature tells us is outlined.

3.1 The role of logistics in Economic Development

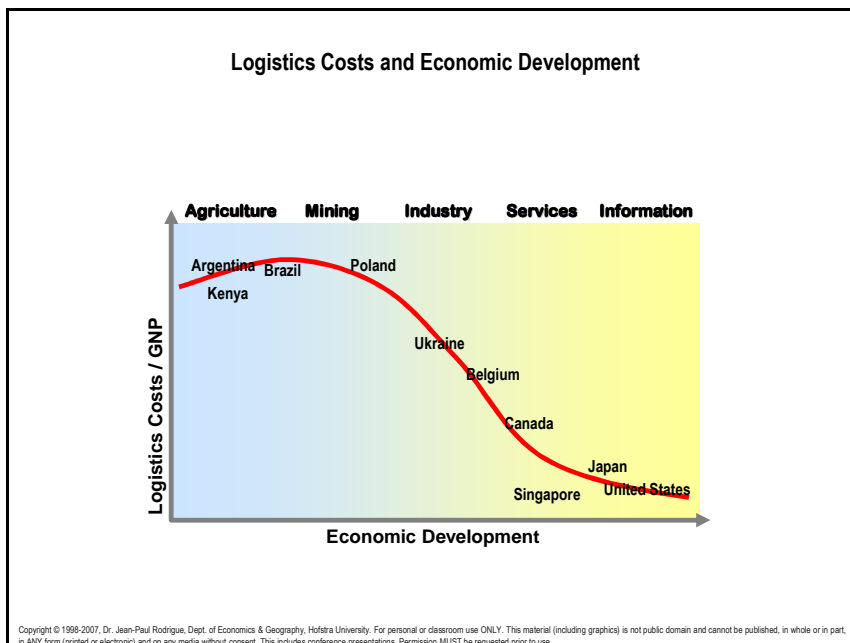
There is a growing body of literature dealing with the importance of logistics in economic development issues, especially as it relates to being competitive in the global economy. Many studies have focused on the impact of high logistics costs on a country's ability to take part in international trade.

The World Bank has done many studies illustrating this point. Initially their studies focused on the infrastructure component of logistics as their funding was geared towards transport infrastructure or “bricks and mortar” areas. In recent times, they have taken a holistic view of logistics to include people, systems and processes involved in logistics.

There is strong support to the idea that lower logistics costs support economic development. Literature dealing with this topic has largely increased since the 1990s. Prior to the 1990s, trade theory had largely ignored the role of logistics issues in influencing trade patterns (Fujiumura, 2004).

There is a correlation between economic development levels, logistics costs and key sectors that develop in countries. This is presented in graph 3.1.

Graphic 3.1 Relationship between Logistics Costs and Economic Development



Rodrigue, 2007

The graph shows that in the most developed countries, logistics costs make a small percentage of the Gross National Product (GNP).

Due to this recognition, the role of logistics has been studied using different units of analysis i.e. country level, sector level and at a firm level. These are looked at below, starting with logistics at a country level.

The basis of logistic infrastructure's importance is captured by the 2009 World Competitiveness report:

“Well-developed transport and communications infrastructure network is a prerequisite for the ability of less-developed communities to connect to core economic activities and basic services. Effective modes of transport for goods, people, and services - such as quality roads, railroads, ports, and air transport - enable entrepreneurs to get their goods and services to market in a secure and timely manner, and facilitate the movement of workers to the most suitable jobs” (World Economic Forum, 2009 – 2010: 4).

The report captures transport as belonging to one of the four key pillars of competitiveness. But the statement above links developed logistics capability from basic services that require roads to developed economic activities requiring ports and airports. Many African countries fare badly in the competitiveness rankings, according to the report with one of the key contributors being undeveloped transport infrastructure. As an example, the Review of Maritime transport report (2008) states that in Africa:

“Existing gaps in the roads and road transport sub sector reveal low network connectivity leading to high transport costs, as well as poor quality of services compared to the best practices in other regions of the world.” (UNCTAD, 2008:102)

This report captures the lack of sufficient capacity at different levels of the chain in Africa, especially road rail links and port links. Although not explicitly stated, the report mentions the developmental implications of these, such as high unemployment.

3.2 Logistics at a country level – findings

An important starting point for understanding the role of logistic costs in a country's economic development is to perhaps point out that there seems to be general consensus that much of the growth of international trade which is a key part of today's global economy can be attributed to falling transportation costs. Notwithstanding that there seems to be no consensus in literature on the role played by trade in growth, together with falling communication costs, falling transportation costs are often cited as a key driver of

global trade growth which has enabled many countries to increase trade and, more importantly, to grow their wealth through trade (Hummels, 2006).

A number of empirical studies have been done to demonstrate the role logistics plays in a country's ability to benefit from international trade. The general finding of these studies is that higher logistics costs impede a country's competitiveness. In particular the work of Limao and Venables (2001) is important. In their study using three data sets and different measures they find that there is a strong statistical link between transport costs of international trade flows. They also found that 10% increase in transport costs leads to a 20% decrease of trade volumes. This supported findings of a study they had conducted earlier. In this study they had found that a 50% decrease in logistics costs improves trade flows by a factor of five (Limao & Venables, 2001). Naude & Matthee (2007) also found a strong relationship between logistics costs and trade volumes. They found that a 50% increase in transport costs reduces annual growth by 1.5 %.

This reduction in trade relates to a simple factor, i.e. a country has difficulty in accessing and expanding international markets if logistics costs are high. This is supported by the findings of Hummels (1999) which shows that choosing the source of imported goods are essentially "...*made to minimise transport costs*" (Hummels, 1999: 4). Hummels' key point is that countries pay considerable attention to logistics costs in order to keep their costs as low as possible.

This supports the point that is made by some trade economists that trade is often greater amongst nations that share borders. Hummels (2006) estimates that approximately 23% of world trade by value takes place amongst countries sharing a land border. He further states that this figure has remained largely unchanged for "*recent decades*" (Hummels, 2006:3). Furthermore, he also states that about 50% of world trade occurs amongst countries that are less than 3,000 kilometres apart.

This may be due to a number of other factors that improve trade relations, such as a common language, historical reasons, etc (Hummels, 1999 and UNCTAD, 2003). However, it is also largely because logistics costs are likely to be lower over short distances (Hummels, 1999). This is because transport costs generally increase as the distance between trade partners increases (Hummels, 1999). Hence a significant amount of trade takes place between neighbouring countries.

This has particular implications for countries in the South seeking to use an export led strategy primarily targeting countries of the North in order to achieve economic growth. Thus, a cost competitive logistics system is regarded as a prerequisite to participating in global supply chains (Hausman, et al, 2005). Countries, mostly in the developing world, that cannot participate in global supply chains risk being

marginalised (some even further) from the global economy. According to Hausman and Lee (2005), participating in global supply chains "...can improve countries' access to markets and stimulate investment, enhancing employment opportunities" (Hausman & Lee 2005:2)

Slow export growth in some developing regions has been attributed to high logistics costs. One such study was conducted by the Secretariat for United Nations Conference on Trade and Development in 2003. This study shows that while the world average for transport costs was 6.1 % of GDP, many African countries have transport costs as high as 12.6% of GDP or simply more than double the world average. Other people put the figure at 16% (CSIR, 2005)

Thus, it is stated that this may explain the fact that many developing regions such as East Asia and Latin America have grown their share of exports significantly in the past few decades whilst Africa has largely lagged especially in manufactured goods. Of course there are other factors that this can be attributed to, but according to the UNCTAD study, high transport costs is certainly one of these reasons (UNCTAD, 2003).

Further supporting literature is contained in Redding and Venables (2000 in Micco & Perez, 2001) whose work seeks to prove that idea that logistics costs have a direct bearing on socio-economic issues of a country. They state that a large part (more than 70%) differences in per capita incomes can be attributed to transport costs. Furthermore, they claim that more than 50% of cross country differences in wages in the manufacturing sector can also be attributed to logistics costs. Part of the explanation of why high logistics costs have a negative impact on trade are also found on the next section.

3.3 Logistics Costs a challenge over and above trade barriers

Very often in debates about trade and development, the focus is on direct trade barriers such as tariffs, quotas, etc. in other words, the focus of academics / researchers and policy makers tends to be on openness vs. protection or level of these.

However, over the past decade or so, there has been an emergence of literature that shows that trade policy should go beyond focusing on these often-contested issues and holistically look at trade facilitation measures and trade costs. This often includes a strong focus on logistics. To this end, a number of studies have shown that some countries which have addressed issues such as tariffs without a focus on logistics costs have not seen much positive change as result. Hummels (2006) captures the main issues

“...studies examining customs data consistently find that transportation costs pose a barrier to trade at least as large as and frequently larger than tariffs. Trade negotiations have steadily reduced tariff rates, with average U.S. import tariffs dropping from 6 to 1.5 % since 1950 (US International Trade Commission) and worldwide average import tariffs dropping from 8.6 to 3.2 % between 1960 and 1995 (Clemens & Williamson, 2002). As tariffs become a less important barrier to trade, the contribution of transportation to total trade costs – shipping plus tariffs – is rising. (Hummels, 2006:6)

As is commonly known, multi lateral trade forums, key among these World Trade Organisation meetings, and bilateral trade forums have led to a decrease of many tariff barriers. However, despite this many countries have not improved their trade due to high logistics costs. This is because high logistics costs can be equated with effective protection.

They can act as non tariff trade barriers when tariff barriers have been reduced. As an example, a research project by the Centre for Research in Economic Development and International Trade at the University of Nottingham found that, in a number of East African Countries, trade openness has not yielded positive results on their trade performance, largely due to the fact that transport costs have offset any potential impacts of openness. For instance, the study finds that in Uganda high transportation costs can be equated with an effective protection rate of over 20% and a tax rate of 25% on exports (Rudaheranwa, 2006).

Thus, logistics costs can be regarded as a natural barrier to trade (Kiringai, 2006). A second example from another East African country can be found in Kiringai (2006) who found that in Kenya during the early 90s, transport costs could be equated to an effective protection rate of 50%. This decreased to 20% by 2003. Notwithstanding the decline over a period of 10 years, the impact of additional protection over and above tariffs negatively impacted on the country's trade growth during that period.

Another example of this is found in a study conducted by Clark, Dollar and Micco (2004) which shows that the greatest barrier faced by Latin American countries in seeking to export to the United States of America is transport costs rather than import tariffs imposed on goods from these countries. As they observe

“... it is striking to realize that for some countries, such as Chile and Ecuador, transport costs exceed by more than twenty times the average tariffs they face in the US market. Consequently, any additional effort to integrate a country into the trading system should consider and analyze the effect of transport costs and its determinants.” (Clark, Dollar & Micco, 2004:2)

There are studies by Amjadi & Yeats 1995 and Yeats 1994 (in Kiringai, 2006) that state that transport costs are a bigger barrier to the competitiveness of African exports than tariff barriers. These studies argue that Africa's hitherto mentioned decline in world trade can be attributed to high logistics costs compared to other regions (Kiringai, 2006).

The realisation made in such and similar studies has led to policy makers paying more attention to the determinants of transport costs and finding appropriate policy measures to reduce logistics costs in order to increase exports. This shows the difficulties experienced by countries that have pursued export led growth strategies located within the export growth theory model without addressing logistics issues. This failure has been attributed to a number of reasons, but primarily because export growth theory does not take into account the role played by new economic geography issues such as transport and time (Krugman & Venables, 1995a, 1995b, 1996; Porter, 1994; 1996; Limão & Venables, 2000).

3.4 Logistics and New Economic Geography

The relationship between geographic location and trade goes back a long way. Adam Smith in the *Wealth of Nations* places a lot of emphasis on this. In his seminal work, he referred to advantages of being close to navigable rivers & the sea which offered low transport costs.

He even attributed some historical trade patterns around civilizations of yesteryear to proximity to the sea and rivers. However, a lot of work on developing a theoretical model has largely been done in the past two decades. One of the theoretical constructs that have contributed to creating a framework for understanding the role of logistics and geographic location in economic development is New Economic Geography. One of the most prominent New Economic Geography proponents, Paul Krugman sought to explain business and human location decisions and trade. Often referred to as the founder of the field, his central thesis was around the impact of scale economies and transport costs in global trade. In developing New Economic Geography, he brought together somewhat disparate research fields such as urbanisation, location theory and trade theory (Krugman, 1996).

Many writings within New Economic Geography have built on the framework developed by Krugman. However, its use has been used to explain a range of other issues. It has since been used to explain "regional economic integration, location of firms as well as the international business cycle" (Naude, 2001:123).

One of the issues that come up in a few readings in the field is how firm location is influenced by logistics costs.

3.4.1 Firm Location

Logistics costs have been mentioned in a range of literature (Naude, 2001 Porter, 1994) as a key determinant of firm location. Businesses consider the costs of moving goods and services between the key points of an organisation's activity. This has been cited as a key tenet of location theory. Practical Examples of projects premised on the notion of using transport infrastructure to attract investment, e.g. through ports associated with export processing zones / industrial zones, as these often sell their attractiveness using potential logistics costs savings.

Local Examples of these include the Coega Industrial Development Zone in Port Elizabeth, the East London Industrial Development Zone and the Richards Bay Industrial Development Zone. International Examples of these can be found in a number of Asian countries e.g. Shenzhen Economic Zone in China and the Navi Mumbai Special Economic Zone in India.

A common characteristic of these is that they are based on the provision of logistics infrastructure and/services to attract investment (mostly foreign). As Radelat (1998) states,

“...countries with higher shipping costs would be less likely to attract foreign investment in export activities. and their domestic firms would tend to be less competitive on international markets. (Radelet & Sachs,1998:7).

Naude states that in such scenarios, shipping costs would increase the price of all imported capital goods, thus decreasing investment and the rate of technological transfer. This all fits within New Economic Geography thinking. It has also been incorporated into policy documents in many countries seeking to attract Foreign Direct Investment.

Krugman shows that the relationship between firm location and transport costs can work in different ways. While his central thesis was that firm location decisions reflect a consideration by companies, he believes that it is not always the case as the relationship can be altered by other factors.

Eventually, however, sufficiently low transport costs (even at small scale of transportation) can lead to a spread of industry: once it is inexpensive to transport inputs to wherever they are needed and export products from any location, the lower factor costs of the periphery become increasingly significant. (Krugman, 1996).

This reveals that the relationship is not static. Many writings seem to be based on recognising one association between the two issues.

3.4.2 Regional Economic Integration

A number of people have written about the obstacles posed by high logistics costs in efforts to increase integration of countries in some parts of the world. This is also often mentioned as part of a broader set of issues related to trade transaction costs. Naude (2001) notes that this is one of the key issues that has to be addressed by SADC countries. Lower logistics costs between regions can stimulate economic activity. It is now widely believed that to give meaning to regional bodies, transaction costs (which often includes logistics costs) should not be prohibitive. Political Barriers to integration are often considered the key obstacles to integration. However, it has been shown that the removal of political barriers has not been sufficient to ensure economic integration, partly due to logistics barriers. (Hummels, 2001)

3.5 Impact on Structure of production and Growth in Value Added Segments

There is limited literature which shows that logistics costs have different implications for different product segments / economic sectors. Radelat and Sachs (1998) conducted a survey which showed that logistics costs affect a country's ability to move up the value chain ladder, i.e. move up from primary commodities to producing goods that have a higher value.

Their survey results show that countries which have had low transport costs have grown faster in the export of manufactured goods and in their Gross Domestic Product (GDP) per capita when compared to countries with a higher transport costs.

That logistics has a bigger impact on the competitiveness of higher value sectors can be found in this example of the Kenyan situation.

“In rose marketing transport to market accounts for 69% of total costs translating to Kshs 6.16 per stem; estimating the price of a stem at Kshs. 17 in the international market then the transport component translates to an ad valorem rate or an implicit tax of 35%. For coffee, transport costs account for 6-7% of value.” (Kiringai, 2006:12)

The difference between the importance of logistics for high value crops when compared to commodities is captured in that example. But a better explanation of how logistics supports value adding is found in Raballand, et al, (2006) who state that

‘...Logistics create value added in two ways. Supply Chain Management Allows (SCM) companies to move up the value chain and thus to increase value added. Furthermore, modern logistics generates employment thanks to the creation of new services essential to the expansion of national and multinational firms.’ (Raballand, et al, 2006:1)

The first point is even more important for many countries that are attempting to shift from traditional primary sectors to higher value added segments. The second point is also important as it can show an understanding that logistics, while a service to companies in the tradable economy, it is a generator of employment in its own right.

The point also relates to the importance of logistics in multinational decision making. This means that the performance of the logistics system can affect a country’s attractiveness as an investment location. An example of this is found in Duranton & Storper (2005) who found that a decrease in transport and communication costs stimulates an interest for machinery exporters to develop higher quality machinery that would require more collaboration between manufacturers and their clients.

3.6 Country Competitiveness & Firm Competitiveness

The importance of logistics is now so well recognised that many reports assessing countries’ overall economic competitiveness include logistics costs. For instance, The World Economic Forum’s Global Competitiveness Report and the International Institute For Management Development’s World Competitiveness Yearbook, which are amongst the most comprehensive annual reports on competitiveness, have sections that assess countries on basic logistics infrastructure i.e. Road, Rail, Airports and Sea Ports. (www.imd.ch and www.wef.org).

The work of Venables (2001, 2003) is very important in understanding the key issue related to logistics and a country’s competitiveness. This statement on South Africa captures the challenge facing some exporters:

“ If you are a South African exporter where 50% of the final product you manufacture is intermediate inputs that are imported from Europe and you are exporting the final product back to the Europe, then with trade costs (defined as difference between CIF and FOB, but essentially composed of transport and tariffs) of 30% (note: this is very low), your labour wages would need to be 1/10th that of European wages in order to remain competitive. ...it has also been determined that each extra days’ travel time adds costs equivalent 0.5% of the value of the good shipped (this is equivalent to 30 times the interest value). So

fundamentally, reducing transport costs and time has a direct and substantial impact on wages and competitiveness.”³ (Venables, 2001)

If the implications of high costs were understood in such a broad sense rather than in generic terms, lowered logistics would form the core of any economic development strategy. Naude’s paper (1999) also emphasises the importance of addressing these issues in developing countries. In addition, there have been studies focusing on particular elements of the logistics chain spanning various countries and transport modes. In particular, Dollar (2002) and Chasomeris’ (2003) work on maritime costs is very important.

It has now been widely accepted at a global level that logistics is a key source in competitive differentiation for countries. This is aptly captured by Metzger, et al, (2001).

“Logistics excellence has become a powerful source of competitive differentiation. In the 1980s and 1990s, companies began to view logistics as more than simply a source of cost savings and recognize it as a source of enhancing product or service offerings as part of the broader supply chain process to create competitive advantage.” (Metzger, et al, 1990:1)

This shows the view that companies no longer compete on traditional items such as price, but also on logistics & supply chains. This is because supply chains can determine a number of things such as:

- Turnover levels
- Responsiveness to Customer and Suppliers’ Demand
- Ability to adapt to market changes

This has seen more companies investing resources in their logistics. These can only be more effective if the country also has an environment supportive to this.

3.7 Country Level – Logistics Costs in South Africa

3.7.1 Moving South Africa

Now that to the importance of logistics in development and for individual firm competitiveness has been established, the South African case is examined. The importance of logistics in South Africa’s economic development seems to be a recent recognition by policy makers. This can be seen in the fact that South Africa only developed a National Freight Logistics Strategy in 2006. Prior to that logistics issues were only dealt with narrowly as part of transport policy, with the Moving South Africa document (National

Department of Transport, 1998) regarded as perhaps the most comprehensive document dealing with transport issues. But this document conflated passenger and freight transport issues.

Nonetheless, Moving South Africa developed a blue print for South Africa's transport sector for a period exceeding 20 years. The strategy is based on the premise that

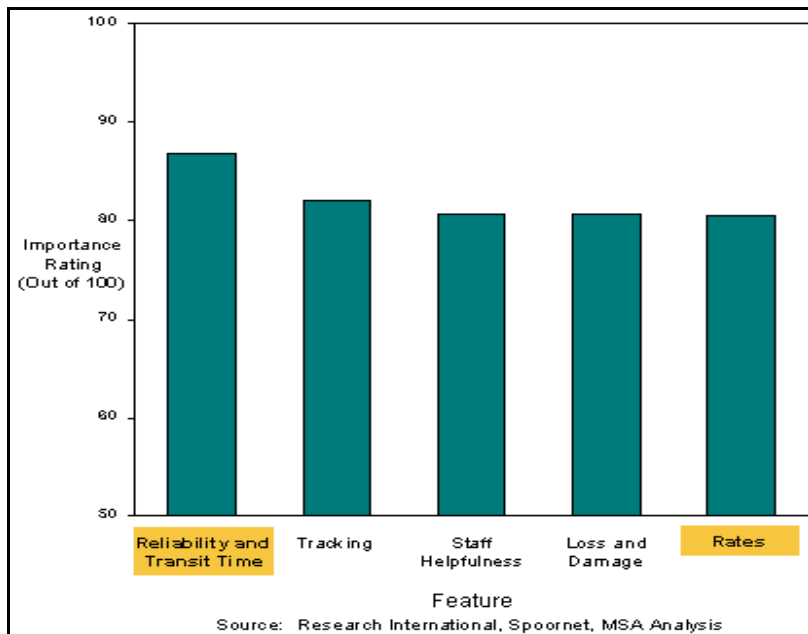
“Transport is a critical input to other industries, and the goals of the sector should be to meet the national and social (non-transport) objectives of the nation.” (NDOT, 1998:5)

The document was premised on the understanding expressed in the statement below

“Classic macroeconomic theory suggests that productive infrastructure, including transport assets, is one of several key preconditions for national economic growth. The theory holds that by investing in assets like bridges, roads, ports, or even telephone lines, a nation can structure development by reducing transport and communications costs, thereby facilitating further trade and creation of wealth.” (NDOT, 1998:5)

The document further noted that the country has high transport costs which could potentially reduce potential role in enabling export led growth. A key point that was highlighted in the document is that investment in transport infrastructure has positive implications for meeting non-economic development objectives or social development objectives. This is in contrast with the norm of only concentrating on highlighting economic objectives. Moving South Africa also highlighted the key challenges facing the freight transport sector. The key issues identified by the study are shown in the graphic 3.2.

Graphic 3.2 Key Challenges facing Transport Sector



NDOT, 1998

As can be seen, rates (or direct costs) were identified as the least important point by users out of four other factors. Nonetheless its rating was still almost equal to that of the other factors. Not much separated the issues.

Despite rates not being the most important transport factor, the document still concluded that costs are high and action needs to be put in place to reduce them. Thus it recommended the following actions should be implemented to reduce the costs

“ Building density in the transport system; Building economies of scale in the different parts of the transport system and Improving firm-level competitiveness by raising productivity and through removing obstacles to their improvement” (NDOT, 1998:36).

Subsequently, some research dealing with logistics costs and a myriad of economic development issues such as trade. The most notable of these are addressed below.

3.7.2 State of Logistics Surveys

More detail on the costs of logistics in South Africa can be found in a number of surveys carried out by the Council for Scientific & Industrial Research (CSIR) over the past 5 years (CSIR, 2004, 2005, 2006, 2007). These studies have consistently found that South Africa has high logistics costs in comparison with countries with a similar income (CSIR, 2003). However, an important issue that can be observed from these studies is that, while logistics costs as a percentage of GDP are high, they have been generally declining.

Table: 3.1 Cost of Logistics over 4 years

Year	Cost	Percentage of GDP
2003	R210 billion	16,7
2004	R230 billion	16,5
2005	R250 billion	16,2
2006	R273 billion	15,7

CSIR, 2007

Interestingly this decline is not attributed to improvements in the logistics system (i.e. a possible area for policy intervention), but rather attributed to:

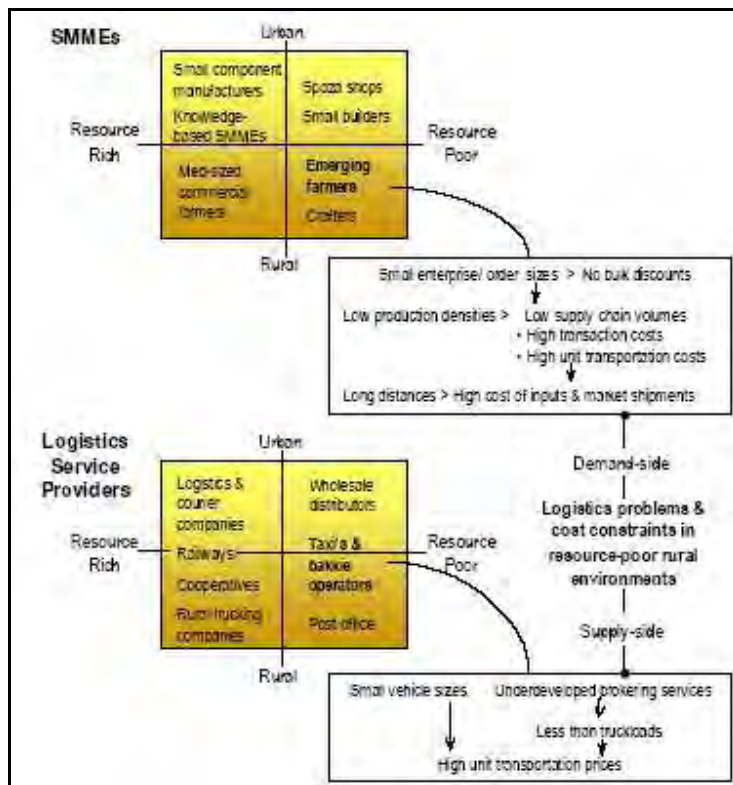
“better use of available spare capacity in an environment where the GDP has increased substantially. Logistics costs will have to be tracked over a much longer period to draw any definite conclusions in this regard. Improvements in the structural efficiency of the logistics system will also show up only over a much longer timeframe.” (CSIR SOL, 2007:6)

The 2007 CSIR SOL report also highlighted that the decrease occurred during a period in which the GDP grew substantially. Therefore the decrease may mask the impact of a bigger economy and be construed as being due to logistics efficiency gains making it a relative shift due to other costs growing faster.

Furthermore, The CSIR SOL survey has also highlighted certain challenges in various components of total logistics costs. The report in 2006 highlighted the increase of transport costs as a component of total logistics costs from 2003 to 2006. Transport’s contribution increased from 62.5% in 2003 to 63.1% in 2005 (SOL, 2007) despite an overall trend of decline. This is partly attributed to a negative investment in infrastructure in real terms according to one of the authors (Van Dyk, 2005).

Of particular relevance for this research is the emphasis that was placed on rural and small businesses. This emphasises prioritising issues such as “Reducing the logistics divide” referring to the notion of a dual economy. It essentially means that there is a logistics gap between small and big business and rural and urban enterprises. According to this notion, small businesses incurring high logistics costs struggle to grow.

Graphic 3.3 The Logistics Divide



CSIR, 2004

The study also highlights that the starting point for developmental logistics is addressing structural inefficiencies in the logistics system. Key among these is improving the road system in rural areas and underdeveloped parts of the country.

The usefulness of the CSIR SOL survey is in tracking trends and in highlighting specific challenges such as the one in the last paragraph.

3.7.3 Logistics Performance Index

One of the most recent and comprehensive studies on the performance of the logistics system in the country outside the CSIR was performed by the World Bank (2007). Logistics Performance Index was formulated using over 5,000 country evaluations done by logistics professionals worldwide. This cross country study used the following criteria to rank the performance of the logistics system:

- Efficiency of the clearance process by customs and other border agencies
- Quality of transport and information technology infrastructure for logistics
- Ease and affordability of arranging international shipments
- Competence of the local logistics industry
- Ability to track and trace international shipments
- Domestic logistics costs
- Timeliness of shipments in reaching destinations.

Countries were rated using a scale of 1 to 5. This was formulated. It was found that many developing countries suffer from high costs and low levels of service which inhibits Foreign Direct Investments. South Africa fared relatively well, scoring 3.53 and attaining a ranking of 24 out of 150 countries. This shows that, when the 7 performance areas are aggregated overall, South Africa has a relatively good logistics system. However, when the various performance areas are looked at separately, it is clear that serious challenges remain in the area of domestic costs. In this area South Africa scored 2.61 out of 5 and a ranking of 124th out of 150 countries.

This is consistent with the findings of a DTI study which found that SA has relatively high inland transport costs (TISA, 2001). This is important as it is one of the areas that are largely within the realm of national governments and national policy making. In addition, the TISA study also mentions

“operational inefficiencies at ports and the absence of rail facilities at ports as contributing to high Total Logistics Costs for many exporters and importers.” (Van Dyk & Maspero, 2004:4).

The study is interesting in that it goes beyond mentioning the usual issues in seeking solutions i.e. physical infrastructure by alluding to technology systems as being at the centre of gaining competitive advantage. It also mentions logistics services as being critical to this quest to be competitive (Van Dyk & Maspero, 2004).

This is also the approach taken by Hall & Robbins (2006). They argue that the key issue for the Durban auto industry is supply chain coordination seems to fall within the framework of the Logistics Performance Index.

Van Dyk & Maspero also identified capacity problems at the Port of Durban.

“ The capacity and suitability of cold-storage facilities in the greater Durban area have been a problem for a number of years. The cold stores were designed, before deregulation, for the need of the single-exporter system, namely large volumes of identical pallets (same brand and packaging). This makes it difficult to cope with the needs of the large number of exporters who have numerous brands and different cartons to satisfy the ever-increasing demands of retailers and other clients. During the peak season some of the cold stores are not always able to load the vehicles within the time frame and in the sequence required to supply the conventional terminals with a continuous supply of the right fruit for a particular vessel, hatch and deck at the time needed, resulting in delays in vessel loading.” (Van Dyk & Maspero, 2004: 7)

This has serious implications for the cost of doing business as the port carries SA's most general cargo goods. This emerges clearly in a strategy document aimed at addressing Freight Logistics challenges in South Africa. This strategy is discussed briefly below.

3.8 National Freight Logistics Strategy

The National Freight Logistics Strategy (DOT, 2006) is the most comprehensive policy document developed in South Africa to deal with logistics issues. Whereas, Moving South Africa conflated passenger and cargo transport issues, the National Freight Logistics Strategy was developed only with a focus on Freight issues. It deals with a wide range of issues (not only costs) including:

- Operational inefficiencies
- The Institutional Environment
- Financial issues relating to transport Infrastructure
- The quality and operational standards of SA's transport Infrastructure

The premise of the policy is that South Africa's geographic position puts it at a disadvantage as it is quite a distance from most developed countries or the country's target markets in many sectors.

It highlights the following problems:

- High Sea Port and Airport charges
- Inadequate infrastructure for handling freight traffic volumes.
- Inefficient Rail System that is losing customers to road

A problem with the Strategy in relation to this study is that it does not seem to have any focus on addressing challenges for particular sectors. It is based on providing cross cutting infrastructure and creating the right institutional and regulatory environment to assist all sectors of the economy. Whilst this cannot be regarded as wrong, more specific sector plans would arguably be of great value. However, the approach of the strategy is understood as it based on a recognition that transport is an enabler of economic activity for all sectors. It is identified as such in documents such as the Microeconomic Reform Strategy (Department of Trade and Industry, 2002) and the National Industrial Strategy Policy Framework (Department of Trade and Industry, 2006).

Below research conducted on logistics costs in the horticulture sector is discussed.

3.9 Logistics at a Sector Level - Horticulture case – key studies and findings in the case of South Africa

It is important to note that there are is no detailed literature on horticulture and logistics costs in South Africa. The studies referred to below often mention relevant results in a few sentences or paragraphs as part of bigger studies. Nonetheless, there are useful reference points relevant for this study. The FAO provides an interesting statement about horticulture and logistics that is of relevance to South Africa. In this aptly titled manual, “*Production is only half the battle*” (Harris, 1998) the organisation states that half the battle in horticulture has to do with logistics issues i.e. storage, handling, administration, transport, etc. The report identifies transport as:

“ ...often the most costly factor in the marketing channel, and for air freighted export crops the cost of transportation may exceed the cost of production.” (Harris, 1988:20)

The requirements differ according to product type. Issues such as weight, refrigeration requirements and handling requirements also play a role in determining the complexity and cost of the logistics chain. The FAO report is based on the experiences of many developing countries. South Africa is no different. The challenges were identified in the document that has been identified as being the blueprint for agriculture

policy in South Africa, The Strategic Plan for South African Agriculture (National Department of Agriculture, 2002). This was meant to be a document that outlines the major challenges facing Agriculture and appropriate strategies to address these. In identifying the major challenges, it states that

“...Of specific importance are ... transport costs. Transport costs are influenced largely by inadequate and poorly managed transport infrastructure. Examples of these include the unavailability of railcars for bulk transport, lack of internal competition in rail and port services that result in unreliable and expensive services, limited and costly air freight for agricultural produce, damaged and inadequate national road infrastructure and poor communication infrastructure. These factors alone make production costs in agriculture on the African continent four times more expensive than in Asia, America and Europe.”
(NDOT, 2002: 10)

This is in line with findings contained in Kaiser Associates (2006) which found that logistics costs can account for 40 – 50% of operational costs. In some cases, logistics costs can even account for 69% of operational costs, as previously stated (Kiringai, 2006). This makes logistics one area where producers can look for increasing efficiencies and improving profitability.

As the issues highlighted above regarding the importance of low logistics costs for countries to grow their economies through trade have gained more widespread recognition, there have been responses from researchers and policy makers to look at logistics issues relating to certain sectors of the economy. This is due to the realisation that different sectors might have different logistics processes, costs, players, challenges, etc. This is notwithstanding the fact that there may be cross cutting issues that affect various sectors as well.

Louw et. al (2006) studied the constraints faced by small farmers in Limpopo, a province which has a substantial presence of horticulture producers. One of their findings was that persistent transport problems hindered market access. Transport was cited to be problematic in two ways i.e. availability and cost (Louw, et al, 2006).

According to the National Department of Agriculture (NDA) inefficiencies in what they term agro logistics system have led to shifts from rail to road over the years. This is despite the fact that rail is about R60 to R 70/ton more expensive than rail (Ngambu, 2008).

Further problems identified by the NDA include the growth of agricultural cargo in the country. Agricultural cargo is said to be growing at 17% per year and is projected to grow between 11% and 13% over the next 7

years. They express concern that the system might not be able to accommodate this growth in the long run unless major investments in logistics infrastructure are made.

A study conducted by Siyazama Consulting that was commissioned by the KZN Department of Economic Development in 2007 aimed at developing a logistics strategy for rural businesses (mostly in agribusiness) in the province found that some parts of the province have relatively high logistics costs (e.g. transport accounting for more than 10% of retail price). A large part of this could be attributed to low volumes. The study found that producers serving bigger centres, rather than more rural centres, had lower logistics costs when they are compared to more densely populated centres. This is also attributed to “*long distances, poor roads, and no or limited storage*” (Siyazama Consulting, 2007:4).

Notwithstanding these challenges, the study found that the main problem facing small producers in KwaZulu-Natal was low productivity. This means that there is insufficient production to make the transporting of goods viable. Based on this, it was recommended that measures aimed at increasing volumes should be given attention. Thus, it identifies transport infrastructure’s necessity as part of a broader set of support services required to assist these businesses. This is important as transport is almost at the end of the production chain. Thus, emerging farmers need support from the production end to the transport end.

The same thread of challenges for small farmers can be found in a report by the OECD in 2006. The report was produced after conducting a review of the South Africa’s Agricultural policies. The Land reform was given particular attention. The report highlighted the now widely recognised need to provide post settlement support to land reform beneficiaries. The report stated that in order to support the new farming class:

“Attention is needed to ensure the availability of appropriate support services at the right place, time and cost e.g. financial services, market information and access, purchased inputs, research, and **transportation infrastructure**” (OECD, 2006:22).

However, as with a number of other documents, the OECD report merely mentions transport without being specific about the transport issues that have to be addressed. Most of these documents state that investment in transport infrastructure is necessary. However, very few specify what areas in transport infrastructure require investment (e.g. port facilities, road vs rail, cold storage facilities). There seems to be insufficient detailed work done on how transport costs can be reduced. They also focus on “hard” infrastructure and not the “soft” part which may be more challenging to solve.

However, there is a different view that contrasts the dominant view of many people who have looked at transport infrastructure adequacy for the horticulture sector. An interesting finding by Van Dyk & Maspero (2004) in the area of road and rail capacity is at odds with dominant literature on the adequacy of road and rail infrastructure in the country. They find that there are no capacity constraints for fresh produce in road transportation. Their study, however, excluded an analysis of the road network around the port although they acknowledge previous reports on the problem. They also find no capacity problems with regards to fruit exports using rail to connect to ports. This is in contrast to findings of NDA (2002) and the NDOT (2006).

3.10 Determinants of Transport Costs

As it has been established, South Africa and many other developing countries exhibit high logistics costs. What does literature tell us about the causes of this? In this section the determinants of logistics costs are looked at.

Literature tells us that logistics competitiveness is determined by a myriad of complex and at times interdependent reasons. A number of studies have been done to establish the key factors determining logistics costs. The following issues have been identified in various studies – Infrastructure, distance Regulations, Time , Structure of logistics industry and Productivity. These are discussed below.

3.10.1 Infrastructure

The UNCTAD Study (2003) largely attributes the high logistics costs to undeveloped transport infrastructure i.e. roads, rail, ports, air. Furthermore, issues such as lack of competition in infrastructure provision sector and regulatory procedures such as Customs & Excise are also often cited as other contributing factors.

This is in line with the findings of Naude & Matthee (2007). Their paper points out the under developed state of Africa's infrastructure. There is also a mutually reinforcing relationship between transport costs and trade volumes. Some trade literature shows that countries that produce high volumes of tradable goods see a reduction of transport costs. This is achieved through economies of scale.

“... the strong observed negative correlations between trade and transport costs reflect not only the elasticity of trade towards transport costs, but also the economies of scale through which higher volumes lead to lower costs of transport.” (UNCTAD, 2003 : 5)

In trying to understand the determinants of logistics costs, the work of Limao and Venables (2001) is important. In their study, they largely attribute transport costs to distance from transport infrastructure and

the quality of infrastructure. Their empirical study found that approximately 40% of transport costs can be attributed to poor infrastructure in coastal economies. This figure goes up to 60% for landlocked countries².

3.10.2 Distance

Distance can be understood in two dimensions. i.e. distance from transport infrastructure and distance from between production and consumption/delivery point. However, it is generally used to refer to distance over which goods are transported. According to Naudé & Matthee (2007)

“Studies have found that a 1 per cent increase in distance increases transport costs by approximately 0.25 per cent” (Naudé & Matthee, 2007:2).

In assessment of the relationship between transport infrastructure and trade, the two authors also find that largest volume (between 70% and 98%) of exports from South African urban centres is generated within 100 km from export points such as ports. Hence it is generally believed that KwaZulu-Natal companies have a competitive advantage by being home to the ports of Richards Bay and Durban.

It is already well understood that South Africa suffers from being far from many of its trading partners. Naudé (2001) states that South Africa’s export industries suffer from being far from points of export which increases logistics costs. Domestic Transport costs play a significant role as well. An efficient domestic transport system may partly off set some high sea / air prices.

Long distance from transport infrastructure adversely affects logistics costs. The extent to which this affects transport is also affected by the condition of the transport infrastructure mode used to transport the goods.

3.10.3 Time

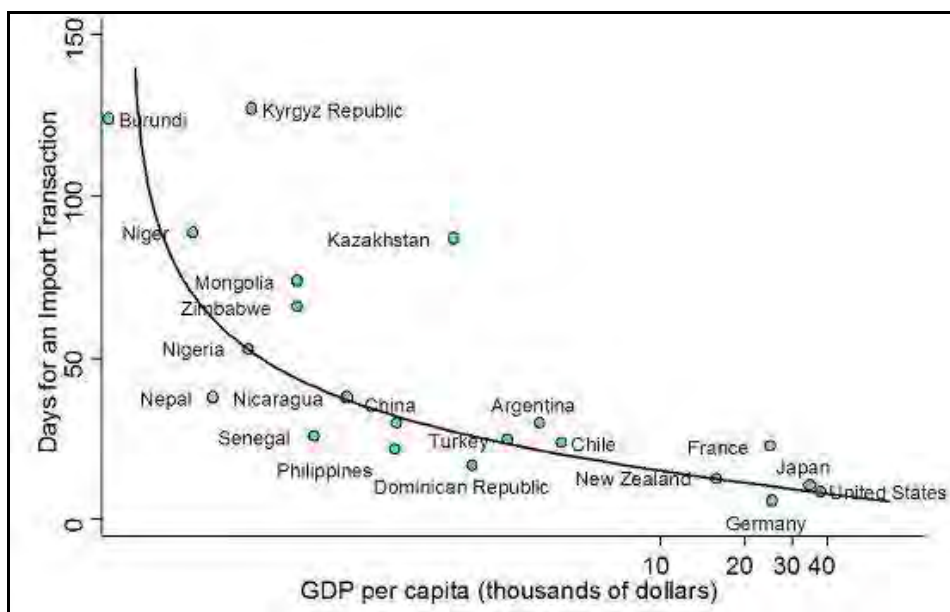
As the maxim goes, “*time is money*”. Logistics chain issues have a huge bearing on the time involved in moving goods. It is generally assumed that the more time is taken to move products from point to point, the more expensive it becomes. Hummels (2000) has found time to be quite a significant trade barrier and that time saved in logistics processes has a significant economic value. In his observation of over 25 million shipments into the US through different transport modes, he estimates the value of time gained by using air instead of sea. He found that an extra day for shipping costs about 0.3% of the value of goods on average. For manufactured goods, an extra day costs about 0.5% of the value of the goods. According to Venables

² Africa is the most landlocked continent. This partly explains why, on aggregate, it has the highest logistics costs in the world.

(2001), these costs are approximately 30 % higher than interest charged on the value of the goods being shipped. Due to these costs, companies are willing to pay a premium for faster delivery (Hummels 2001).

Time is one of the most common ways of measuring logistics efficiency. Research shows that there is a strong correlation between time taken to process export /import transactions and GDP per capita. Wealthier countries have far quicker and efficient systems, whilst poorer countries have slower turn-around times. This difference is often (e.g. by Hausman 2007, Venables 2001) largely attributed to differences in infrastructure and procedures.

Graphic 3.4 Processing Imports and GDP



Hummels, 2001

Hummels (2001) also identifies time as a major trade barrier. According to him, time is determined not only by distance between trading partners but also by regulatory issues and efficiency of participants in the logistics chain. There is a lot that many developing countries could do to streamline their export-import procedures to allow a faster flow of goods. This could have a positive impact on trade volumes. As Hummels’ estimations show,

“ each additional day spent in transport reduces the probability that the US will source from that country by 1 – 1.5 %.” (Hummels, 2001:4).

Hummels' study was based on analysis of about 25 million goods shipped into the US in a period spanning 25 years. One of his findings was that

“...if a country experiences long shipping lags to the United States it is much less likely to ship to the US. This may lead to general equilibrium effects in which countries that are long shipping lags away from large markets simply do not produce time sensitive goods.” (Hummels,2001:18).

This has serious implications as time sensitive goods typically relate to value-added products. This means that the results of such studies could mean that time is one of the key issues that could be regarded as a barrier for some countries' ability to produce more value added goods or upgrade into value added global supply chains.

Because of this relationship between time and logistics costs, many companies have introduced a number of time-saving technologies and processes as part of their logistics chains (Venables, 2001). However, the tendency of state regulatory procedures to add time in processing cargo reduces the impact of some of these private sector measures. Time is affected by things such as productivity, which is another determinant of logistics costs according to literature.

3.10.4 Productivity

Total Factor Productivity has been cited by Adamopoulo (2006) as another cause of high cost of moving produce. An example of this is the often-cited problem at the Durban Container Terminal where gantry crane moves per hour are said to be below international standards. While the global average is 35 moves per hour, the average in Durban is 17 moves per hour (National Freight Logistics Strategy, 2006). This has cost implications as it has time implications. It adds to the congestion prevalent in the port which has previously resulted in a surcharge thus increasing goods coming in through the port. Although this is for import shipments, it illustrates the cost implications of time.

3.11 Theoretical foundations and analytical tools

The theoretical foundation of the importance of logistics in modern economies is found in many forms of logistics theory. A number of logistics theories have emerged over time. These have evolved greatly over time. As Scott et.al (2002) notes, the first set of logistics theory placed a huge emphasis on using tools such as econometrics, simulation modeling and management science analytical techniques in order to understand and respond to logistics functions. Using this theory as our guide would mean that our focus should be on

issues such as inventory holding costs, facilities design, facilities location, and business logistics network designs. This appeared to be a narrow interpretation of logistics. As Scott further notes, influences from various fields (such as social sciences and management) has seen logistics theory expand to looking at a bigger theoretical construct. This is what this study utilises. This is so because this expanded view enables one to view logistics issues in a political economy context and expands the focus to wider societal issues especially when dealing with cause and effect issues. Thus, below the focus is on theories and theoretical tools that provide a wide lens to view cause and effect logistics issues.

3.11.1 New Institutional Economics and Transaction Cost Analysis

One of these key theories is New Institutional Economics. New Institutional Economics stresses that institutions matter, i.e. different institutions affect economic outcomes such as transaction costs. The theory also stresses the importance of a hierarchy of institutions affecting economic exchange. It also highlights the importance of path dependency to explain the actions or behaviour or form of certain institutions i.e. understanding the history of the institutions and how that history affects current and future actions or behaviour. The theory also asserts that the formal procedures and rules (as contained legally) and the informal networks and rules also determine economic outcomes. It builds on neoclassical economics and adds the element of institutions.

In developing the theory, Williamson and others borrowed from a number of other disciplines including law, politics and history. It is a very broad and multidisciplinary approach that has spanned social capital, information economics, new economic history, theory of collective action and others (Olivier, 2000). This study focuses on only the approaches relevant for the research.

The most relevant among these is Transaction Cost Economics. It is also one of the main branches of New Institutional Economics. According to Williamson, North and other proponents of the theory, institutions are put in place to ensure that people can transact. As North explains it:

“ The costs of transacting arise because information is costly and asymmetrically held by the parties to exchange. The costs of measuring the multiple valuable dimensions of the goods or services exchanged or of the performance of agents, and the costs of enforcing agreements determine transaction costs. Institutions are formed to reduce uncertainty in human exchange. Together with the technology employed they determine the costs of transacting (and producing). It was Ronald Coase (1937 & 1960) who made the crucial connection between institutions, transaction costs and neo-classical theory; a connection which even now has not been completely understood by the economics profession. Let me state it baldly. The

neoclassical result of efficient markets only obtains when it is costless to transact. When it is costly to transact, institutions matter. And because a large part of our national income is devoted to transacting, institutions and specifically property rights are crucial determinants of the efficiency of markets (North, 1993:2)

Transaction costs are a result of the need for different institutions to transact and also an outcome of these different role players (or institutions). This involves seeing any economic system as having a series of transactions at its core. The main economic actors in the system try to act as efficiently as possible in making those transactions. These may be done through formal (legal contracts) and informal means (e.g. verbal agreements). The focus of this study is on the formal sphere of transactions. However, according to the theory, it is both types that determine the economic outcomes. This theory is no different from neoclassical economic theory that sees firms as profit maximizing agents. However, its prominence is derived from placing transaction costs rather than production costs at the core of its thesis, as is the case with much neoclassical economics (Williamson, 1993). It also recognises market failure whereas neoclassical economics tends to view markets as being efficient allocator of resources.

In this study New Institutional Economics can aid in bringing certain issues to the fore, most importantly the following:

- Are there any institutional issues affecting logistics costs? E.g. how the public sector is organised
- Regulatory issues – legal sphere affecting cost and efficiency outcomes
- Any historical or path dependency issues affecting policy and actions of various stakeholders in relation to logistics and horticulture
- Identify areas where there has been a market failure which has adversely affected costs.

3.11.2 Value Chain Analysis

Part of the literature above shows that a country's ability to produce items with a higher value is greatly affected by its logistics capability and efficiency. The theoretical base for this can be found in Value Chain theory which was pioneered by Michael Porter.

The theory is that value creation is dependent on the series of different activities that link a company's supply chain such as raw materials / inputs and its demand side such as sales (Porter, 1985). It shows how these activities link to ultimately create value for the end user of products i.e. the customer. The central thesis

is that superior performance is essentially doing the tasks along the value chain better than competitors. This applies to companies and sectors within a country's economy.

This is important especially since various activities in the logistics chain and Porter presents both inbound logistics and outbound logistics as key components of the value chain. This means that logistics should be seen as a potential source of competitive advantages. The key issue for the study would be to address the extent to which the high costs of logistics is decreasing South Africa's competitive advantages, particularly in the horticulture sector.

It is important to note that this concept is used differently by different people. Porter largely uses it as an analytical tool to explain a theory. Other people use it as an analytical tool . At times, writers obfuscate these two uses. Furthermore, people use value chain concepts in a manner that seems to miss that there are different types of value chains.

3.11.2.1 Types of Value Chains

While Porter is recognised as the pioneering figure in value chain thinking, there has been further development of the concept by others such as Gereffi and Humphrey. Essentially, a distinction between types of chains has emerged.

Traditionally, global trade was primarily done through producer driven chains. These effectively had multinational corporations at their centre. As vertically integrated producers they controlled the value chain and the organisation of various process for trade including the transportation process.

However, the further development of world trade saw a shift towards buyer driven chains. These chains essentially had large wholesalers and retailers such as Wal-Mart and Tesco at their centre. These have become very big companies in the past three to four decades. For a long time they relied on multiple sources but have changed towards reducing their sources, leading to a consolidation of export agents or a "middle man" in some cases and producers / manufacturers in others.

Multinational corporations and retailers have evolved quite significantly from the first time Value Chain concepts were first developed both as theoretical constructs and as analytical tools. This necessitated a different understanding of global value chains, which led to the development of intermediate chains. Gereffi also played a role in expanding this stream of research beyond producer-driven and buyer-driven chains.

Intermediate chains are a hybrid of producer-driven and buyer-driven chains. These are chains that contain elements of both.

Their key distinguishing feature is the much greater importance of electronic trading tools (Gerrefi, 2001). The Internet has created a platform for information exchange and marketing for both ends of the chain. This is obviously more prevalent in certain sectors than others. Some sectors still operate in traditional ways due to the nature of the products being traded. For instance, it may be easier to sell books through an electronic platform (Business to Consumer) than selling flowers through the same means, as flower buyers prefer to see the product (if consumers) and rely on trust and established relationships (for Business to Business transactions). Flower buyers still prefer the normal auction system where they can see the quality of the product being sold.

The types of chains and their elements are shown on the table below

Table 3.2 Elements of Different Value Chains

Value Chain	Main Drivers	Forms and dominant principles of value chain integration	Institutional & organizational Innovation
Producer-driven	Transnational Corporations	Vertical integration (ownership & control)	Vertically Integrated TNCs with international production networks.
Buyer Driven	Retailers and Marketers	Network integration (logistics & trust)	<ul style="list-style-type: none"> • Global Sourcing by retailers • Lean retailing • Growth of private labels (store brands) • Speciality retailers • Rise of pure marketers
Intermediate	Internet intermediaries (B2C market) and established manufacturers (BSB Market)	Virtual Integration (Information and Access)	<ul style="list-style-type: none"> • E commerce • Mass customisation • Direct Sales

Gerrefi, 2001

As can be seen producer-driven would theoretically be the most suitable for producing nations. Such chains have largely become obsolete in horticulture. This is not the only change that has occurred in horticulture

chains. A key change is that the competencies required to participate in different chains has increased, especially in buyer-driven chains. It requires adherence to standards set by the buyers. These include production standards, packaging standards, transport procedures and equipment used, etc. In many cases, these standards are normally a departure from standards used in the domestic market. An inability to comply with these prevents a value chain upgrade for producers in many parts of the world.

For this study it is important to link this value chain theoretical framework and value chain tools to the following:

- How can the logistics part of the chain be done better by local producers to be more competitive?
- Understanding the types of value chain for different producers and how these affect logistics costs.

These issues are within the methodological framework of the study.

CHAPTER 4: RESEARCH METHODOLOGY

Introduction

This brief chapter explains the methodology used to undertake the research. It outlines the justification for choosing certain methods. Embedded in this discussion is an explanation of the strengths and weaknesses of the methodology.

4.1 Study Design

The study was largely be done through a qualitative method. Qualitative Information has been supplemented by some quantitative data.

Case Study

A case study approach has been used. The case study focused on KwaZulu-Natal's horticulture exporters.

4.2 Sampling Methods

The study used purposive judgement sampling. Participants in the study were drawn from people directly involved in the logistics of horticulture produce in South Africa. They were chosen on the basis that their experience and intrinsic knowledge of the system will be very important in understanding the cost components and efficiencies/inefficiencies in the system. Furthermore, the views of people responsible for policy making and implementation from government and state agencies were sought, although not much information was solicited. This was done be primarily to understand the potential solutions to the challenge and to understand work being done to address some of these challenges. Expert sampling methods were also used, i.e. sampling people regarded as experts in the filed. In this regard, the study sought input from academics and researchers who have been involved in related research and in highlighting the developmental challenges posed by high logistics costs.

4.3 Data Collection

Face to face interviews were held with participants. These were in depth interviews tailored to the designation of the participant. Qualitative and quantitative responses were sought from the interviewees.

4.3.1 Primary Data

Twenty interviews were conducted. These interviews covered people in the following fields:

Table 4.1 Interviews Conducted

Interviewees	Number of interviews
Horticulture producers	16
Freight Forwarders / Logistics Company	2
Academic	1
Researcher	1

There was an intention to conduct interviews with retailers. This did not take place due to their unwillingness to share information.

4.3.2 Secondary data

Primary information was supplemented by secondary data sources. A lot of the information related to cost components is available from the University of Stellenbosch's Centre for Logistics and the CSIR's built environment unit. This includes documents that are already in the public domain and some documents used in the State of logistics Survey.

Other secondary data sources include:

- National Freight Transport Logistics Strategy
- *Moving South Africa* document from the NDOT which provides analysis of the key transport and logistics challenges and proposed interventions in 1996.
- The National and KZN departments of Transport have some useful secondary information.
- International case studies – such as Australia's Perishables Logistics Strategy and studies by institutions such as the World Bank.
- Extensive literature is available on the success of East African countries in the export of fresh produce. If sufficient information is available, these can be used to benchmark KZN with an east African country (e.g. Kenya)
- Chartered Institute of Logistics in South Africa documents

- Industry Journals (Fresh Produce and logistics)

4.4 Form of analysis

4.4.1 Thematic Analysis

Thematic analysis was used to analyse the data. Key points / issues emanating from the interviews, literature, etc were classified into themes for analysis. These key issues first have to be coded according to theme before analysis can take place.

4.4.2 Transaction Cost Analysis

A generic transaction cost analysis of the sector was developed using interview responses and secondary data. This gave us a framework for analysing various logistics processes and in which part of the supply chain most costs are incurred. This will assist us in analysing whether there is scope to reduce costs at some parts the supply chain. This can be developed with the assistance of the interviewees and through using some of the aforementioned information sources.

4.5 Strengths and limitations of the research design

Strengths

The research done is in a manner that will ensure that a wide spectrum of views is captured. However, this creates its own challenges. A key challenge is getting uniform information from participants. The questions might lead to a lack of uniformity due to the fact that the main participants (i.e. logistics companies and producers) may have more information and insights on their own operations and focus areas. For instance, one product line uses a different logistics chain from another. This means that while the information will be useful, generalisations about the logistics chain of the horticulture sector might be difficult to make. Nonetheless, the key research questions of the study would be addressed. The study also balances qualitative information with quantitative information wherever it was possible to do so. This means that some responses obtained through interviews could be reinforced with quantitative info.

Limitations

The study does not address many logistics service quality issues, but largely deals with logistics cost issues. Other issues are largely only included insofar as they influence logistics costs.

The study also does not include the views of retailers. This means the research might be weak in giving the perspective of a buyer.

This study does not give an in depth analysis of current horticulture supply chain flows in KZN but gives an overview on appendix 1.

Lastly, only two logistics firms were interviewed. This means the views of a wide spectrum of companies in the freight forwarding business were not captured as there is great diversity in size and service amongst freight forwarders. However, the intention of the research is to let the voice of producers be louder than that of other participants.

CHAPTER 5: DESCRIPTIVE STATISTICS

Introduction

The results of the interviews are outlined in this chapter. This is largely done in a descriptive manner with key patterns highlighted and analysis taking place in the next chapter.

Profile of interviewees

The interviewees were selected from different role players in the logistics industry.

The composition is outlined below:

Table 5.1 Break down of Interviews Conducted

Interviewees		Number of interviews	
Horticulture producers	Large	12	16
	Small	4	
Freight Forwarders / Logistics Company		2	
Academic		1	
Researcher		1	

The majority of interviewees were drawn from producers. This was based on the understanding that they are the best placed people to explain logistics costs and implications for their businesses and the sector in general. Four small companies were interviewed. In this study small producers are defined as those with 10 hectares or less under production.

Twelve large producers were interviewed. From the twelve large companies, four of these were exporters whilst the rest sold their produce locally.

Two freight forwarders were interviewed. They were included in the study in order to give the perspective of service providers in the supply chain. One academic was interviewed to understand some conceptual issues,

previous research and theoretical issues related to the study. A researcher who has participated in one of the comprehensive studies on logistics costs was interviewed.

Both logistics companies serve clients who export and those that sell only in domestic markets.

Key Questions and Results

The results of the interviews are outlined below. A number of issues that were initially included in the questions are not included as sufficient information could not be obtained due to very few responses. Furthermore, questions that were asked for background information purposes to gain more information about the producers (e.g. on what crops they produce) are not included here. The key questions outlined below relate to the main research questions of the study.

1. Is the cost of logistics a challenge for horticulture Producers in KZN?

Graphic 5.1 Logistics as a challenge



As can be seen from the graph above, an overwhelming number of respondents answered that logistics is serious challenge for their businesses. A smaller percentage (6) state that it is a problem although not a serious one. Only 6% of respondents did not find it a problem.

All those that do not regard it a problem or a problem but not a serious one are large companies.

For all small producers, logistics is regarded as a challenge. One producer quipped that “*we can produce good crops, but we don’t have enough markets for selling these because we have problems with transport costs.*”

2. Logistics costs in relation to other challenges

46% of respondents cited the cost of logistics it as the biggest problem facing them. One respondent said “*it is the biggest operational cost item, therefore it is the biggest challenge*”. Another said it is the biggest problem “*because it is increasing rapidly*”

54% of respondents stated that it is the second most important challenge after input costs. Input costs refers to the costs of fertilizers, seeds, machinery, pesticides and other items that are used in the production process. These costs, especially fertilizers, have risen sharply over the past year³. One interviewee stated that his fertilizer costs have more than doubled over the past year. There is no pattern that can be distinguished about responses to this question. Logistics costs and input costs were cited as key challenges across the board.

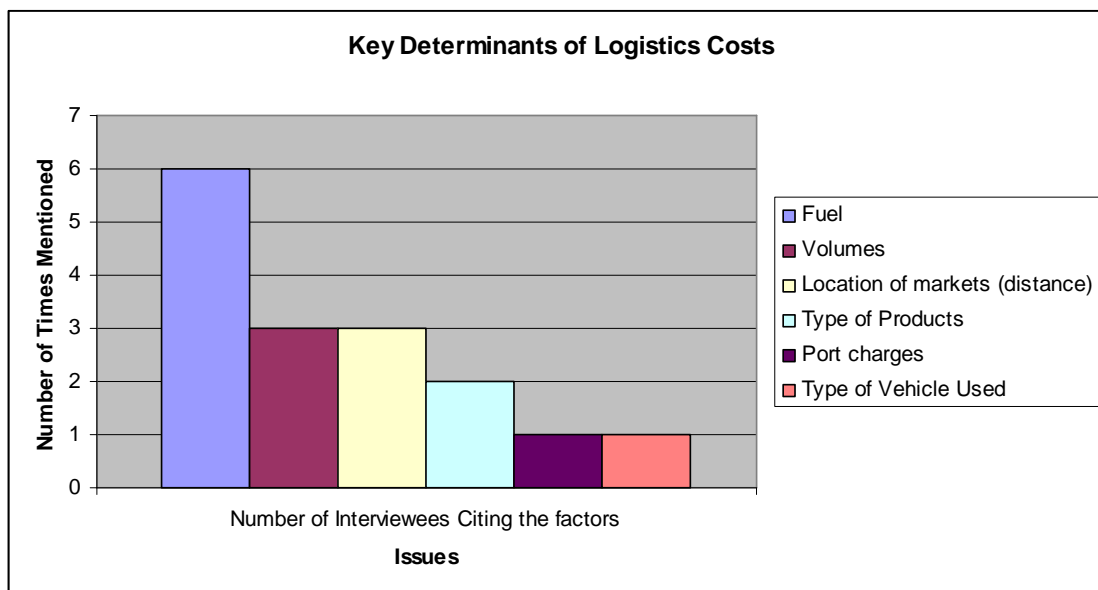
3. Main Drivers of Logistics costs

Ranking of Issues according to Number of times they were cited.

1. Fuel
2. Distance
3. Volumes
4. Type of Products

³ SASOL was fined R250,68 million in May 2009 for its involvement in fixing the price of fertiliser and phosphoric acid (www.sasol.com) and resulted in farmers considering instituting civil action against SASOL <http://www.busrep.co.za/index.php?fArticleId=4990537>

Graphic 5.2 Determinants of Logistics Costs



Fuel was identified by most interviewees as the main driver of their logistics costs. The increases in fuel prices between 2007 and 2008 were reported to have had a dramatic impact of the cost of logistics. Some producers stated that it has had such an adverse effect on their business that they have considered reducing their operations or changing their markets.

The amount of produce transported was cited as the second most important driver of logistics costs. This is based on economies of scale factor. Most producers stated that if they produced more, their average costs per kilogram would drop.

The location of markets (or distance over which produce is transported) was mentioned as the 3rd most important factor. A number of producers stated that the high costs always lead to them considering selling produce in nearer markets. However, the problem of limited markets prevents some of these producers from doing so. Exporting firms said they are far from their main import markets in comparison with other African countries, leading to higher costs for our producers.

The type of products being transported was mentioned as another important determinant of logistics cost. Interviewees mentioning this stated that more valuable produce attracted lower costs if logistics costs are taken as a percentage of price to buyer.

Port charges were mentioned by a few respondents as drivers of costs. This refers to costs charged by the port operator, Transnet Ports. These are charges for handling, storage, loading and use of facilities.

4. Trends in logistics costs over the past years and drivers of trends

All interviewees stated that logistics costs have increased over the past 5 years. They attributed this to an increase in the price of fuel. There was unanimity in that costs have been and are still increasing. There was also agreement on the role the fuel price played in this trend.

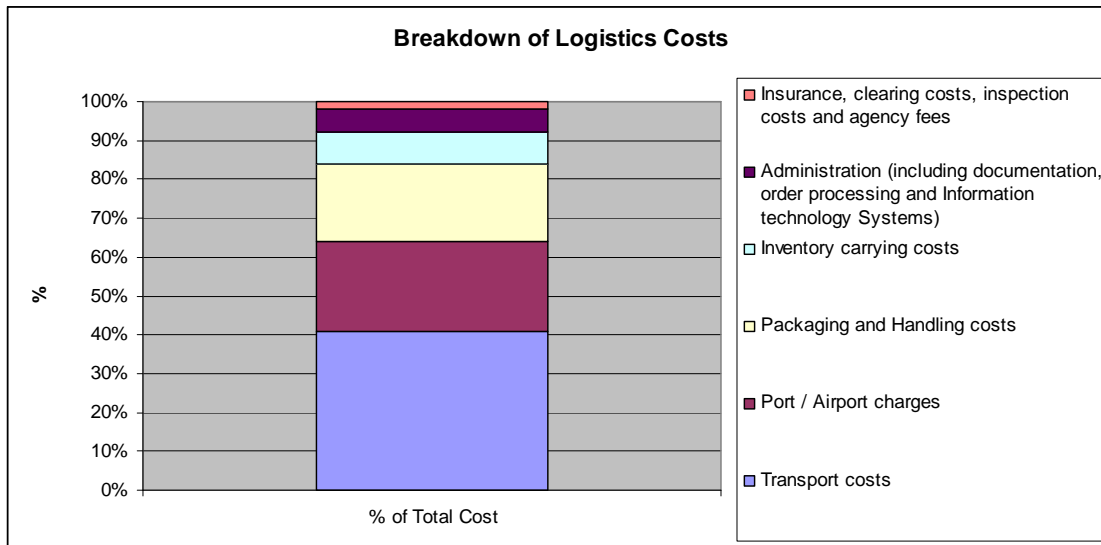
5. Logistics System Cost Structure

It was very difficult to understand the logistics costs structure of the respondents. Only 4 people indicated that they have an understanding of their logistics cost structure. Some interviewees stated that this kind of information is not available and it would take a while to compile it in this manner. It could be that the information was viewed as being sensitive. Nonetheless, a generic representation based on averages is shown on the table. The respondents had what looked like a very similar structure. A generalised pattern, albeit limited, can be shown from the information provided by the four interviewees. This is shown in table 5.3

For Exporters

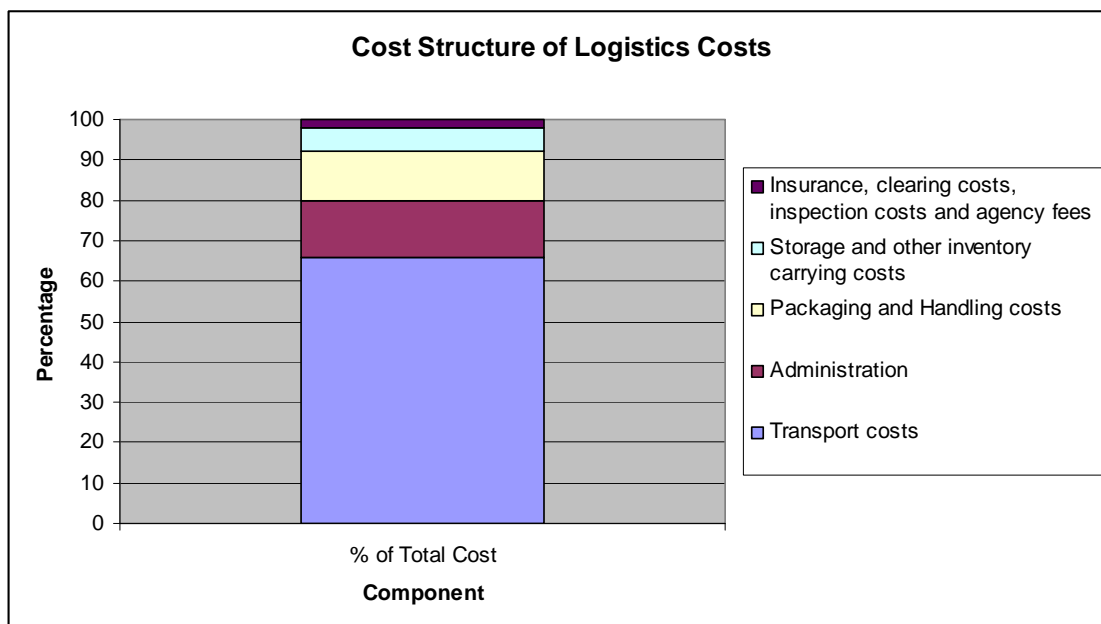
Transport is by far the biggest cost component, accounting for 40% of average costs. It is followed by port and airport charges which account for 23% of average costs. Not far behind in importance is packaging and handling costs which account for 20% of average costs. This is followed by administration related expenses. Lastly, regulatory procedures account only for 2% of average logistics costs.

Graphic 5.4 Logistics Cost Structure for Exporters



For non exporters

Graphic 5.4 Logistics Cost Structure for Non Exporters



Non exporting producers have a cost structure that is slightly different from their exporting counterparts. The biggest component for non exporters is also transport costs at 66% total logistics costs. This is followed by administrative costs which make up 14% of total costs. Packaging and handling costs make up the third

biggest component (12%). This is followed by storage costs. Lastly, insurance clearing and inspection costs only make up 2% of costs, making it the smallest cost component for these producers as well.

6. Mode in which most transport costs are incurred:

- Road
- Rail
- Sea
- Air

For Exporting Firms

Two companies provided information on the modal split of their transport operations.

Table 5.3 Modal Costs for Exporters

Mode	%
Road	28
Rail	0
Sea	44
Air	28

The driver to modal choice was found to be the following:

- Cost
- Speed
- Reliability
- Value of shipments

The percentage for air is lower than road and sea, but it is important to point out that small volumes were transported by air compared to sea. The air freighted products were of higher value than the sea freighted products.

For Non Exporters

The information below was aggregated from information obtained from a freight forwarder and two companies.

Table 5.3 Modal Costs for Exporters

Mode	%
Road	98%
Rail	0
Sea	0
Air	2%

Unsurprisingly, local companies use only road to transport their goods. Only 2% of costs is incurred in other modes i.e. air. This 2% represents exceptionally rare circumstances where produce has had to be flown to areas far from KZN, such as Cape Town. Rail and Sea are virtually not used. What is clear with this question is that rail is of no use to horticulture firms. While it is understandable why sea is not used as it does not lend itself to transport from farms to local retailers or markets, rail is not used for reasons relating to its inefficiency. It should also be stated that most interviewees believe that horticultural products lend themselves more to road transportation over rail. This is due to the flexibility of road which allows “door to door” deliveries.

7. The effect of delays in using any of these modes

Small – 82%

Substantial – 18%

82% indicated that the effect of delays is negligible or very small. Only 17% indicated that the effect of delays is substantial. This 18% is made up of only exporting companies. It is important to indicate that although the majority indicated the effect of delays is small or negligible, it can be substantial for particular shipments. It is the frequency of delays that is rare.

8. Testing of different logistics systems / chain

Yes – 81% %

No –19% %

Most interviewees (81%) stated that they have tried different measures to bring down logistics costs over the past few measures.. Measures that have been used include:

4. Using different vehicles
5. Changing Service Providers
6. Changing the logistics process and reducing the number of actors in the chain.

However 19% of producers have not put any measures in place to reduce their logistics costs. It is only small producers who are in this category. Big firms are constantly looking for ways to improve their logistics systems to bring costs down and to improve effectiveness.

9. Conducting of research to measure, compare, monitor or benchmark logistics costs

Yes – 4%

No – 96 %

Only 4% have used activities/ tools such as benchmarking, monitoring as a way of seeking solutions to their logistics challenges. Those that have trained are also big firms involved in export.

These companies had largely done this through informal means. Small companies haven't attempted this. A few respondents indicated that the reason most companies have not been involved in such activities is due partly to lack of time and resources. Some respondents also attributed this to a lack of understanding of the potential gains that could be obtained from such tools / activities. Some also indicated that they didn't think this would produce fruitful lessons because of the unique nature of their businesses.

10. Key attributes of good logistics system

Ranking

For small producers

Cost

Flexibility (e.g. small consignments, consolidating, etc)

Reliability

Speed

For large producers

Speed

Reliability

Cost

Flexibility

11. What are the main challenges that prevent you from improving your logistics system?

Table 5.4 Constraints to System Improvements

Issue	No. of times mentioned
Finance	12
Buyer requirements	6
Supplier requirements	1
Human Resources	1

The majority of respondents cited finance as the main problem hindering their ability to change their logistics systems. Finance was cited by both large and small firms but more so by the latter category with almost all small firms citing finance as a constraint. The second issue that was mentioned by most interviewees is the

requirements of buyers. This was largely an issue for exporting firms. Human resources and supplier requirements were both mentioned once.

12. What can be done to reduce logistics costs by the following stakeholders?

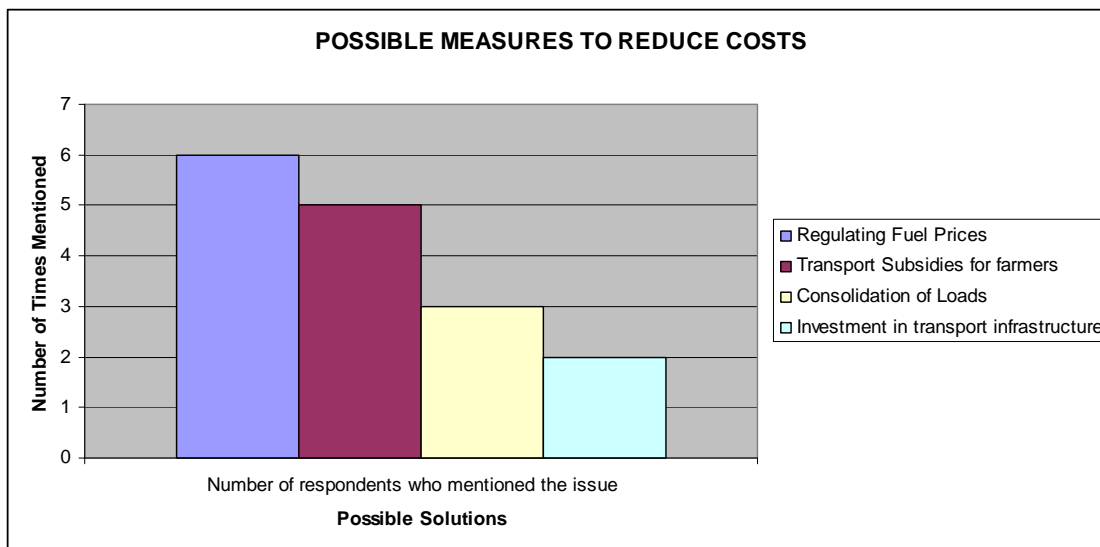
- Individual Companies
- The Horticulture Sector (through industry associations, sub product clusters and any other cooperative means)
- Government
- Logistics Firms

Table 5.5 Possible Solutions

Possible Solutions	Number of respondents who mentioned the issue
Regulating Fuel Prices	6
Transport Subsidies for farmers	5
Consolidation of Loads	3
Investment in transport infrastructure	2

Regulating fuel prices was mentioned by most interviewees as a possible solution to high logistics costs. Providing subsidies for the transporting of produce was the second most favoured option amongst the interviewees. This was favoured by both small and big producers. Consolidation of loads was mentioned by 3 of the respondents. The pattern that could have been expected is that consolidation of volumes would be an issue for small producers with smaller volumes as they incur bigger unit costs. Bigger producers can also negotiate discounts based on providing certain guaranteed minimum volumes. Consolidation (of volumes) or of entire operations by smaller growers would also give them this ability.

Graphic 5.6 Possible Solutions



13. What impact would a reduction in logistics costs have on the industry and benefits to the region?

When quizzed about the potential impact of a reduction in logistics costs, there were varied responses. It was also pointed out that any potential impact would depend on issues as:

- The extent of the decrease (e.g. a 5% decrease versus a 15%)
- On which part of the supply chain this decrease occurs.

However, it was recognised that there are certain key areas of potential impact.

Firstly, it is widely believed that a decrease in logistics costs would lead to increased turnover and profitability for local producers. Both small and big firms cited this as a potential benefit to their business.

Secondly, producers would be able to expand their markets. They could get into previously untapped geographic markets hitherto difficult to reach. The province could become more competitive in international markets and the natural advantages of the province in horticulture would be exploited. Most small firms selling only to local markets cited this.

Thirdly, it was strongly suggested by almost all interviewees that more employment in the sector would be created. They all linked new employment to the idea that new markets would be obtained, leading to more

demand for their products which would necessitate hiring more people for production and post harvest handling. This is due to the fact that the sector is labour intensive.

Another point that was mentioned is a potential impact on poverty in rural areas. It was felt that many regions could become more food secure and earn extra income.

Small producers believe that their ability to progress from limited markets is largely inhibited by the cost of moving products. Thus, they state that lowered costs would enable them to progress to being at the same level as commercial farmers.

An interesting point that was mentioned by one of the interviewees is that lower costs would create more farmers. This producer believes that “... *it would reverse the trend of farmers abandoning farming. Right now farmers are squeezed by high oil prices and cannot continue farming in the face of such high operational costs.*”

14. Do you think logistics costs influence the location of producers? If not, what are the key factors that influence producer location?

Table 5.6 Logistics Costs and Firm Location

Responses	Percentage
Yes	12
No	88

It is largely felt that the location of producers is not influenced location of producers. It is historical factors that influence the location of producers according to all the interviewees. This refers to the historical location of farms.

Location of farms – the bio resources profile (soil, climate, vegetation, terrain etc) and climatic conditions have a big influence on the crop choices of farmers. KwaZulu-Natal has a diverse bio resources profile which allow for the growing of a range of crops. It is one of the natural advantages for the sector in KwaZulu-Natal. However, individual producers in different parts of the province are limited in their choices due to their specific locations.

15. Do you think logistics costs influences the decisions of producers in choosing crops? If not, what are the key factors that influence producer location?

Table 5.7 Logistics Costs and Production Choices

Response	Percentage
Yes	38
No	62

Only 38% of interviewees said logistics costs determine growing choices. These stated that they largely preferred to stay away from crops that have special transportation requirements. Transportation Requirements mentioned include the following:

- Cooling
- Handling
- Inspection
- Transportation Equipment & packaging.

The majority of respondents (62%) answered that logistics costs could not be associated with decisions to grow particular products. They stated that the following reasons were their main considerations in deciding what crops to grow:

- Ease of growing – most producers prefer to produce crops they are accustomed to. They become accustomed to certain crops through having inherited farming enterprises based on certain crops or through having previously worked with a farming operation involved in certain crops.
- Market Demand – a number of producers stated that their crop choices are made with one thing in mind, i.e. to satisfy certain market needs. Some of these producers get into agreements with their buyers to produce certain crops. Others have done research to determine unmet market demand. However, the number of people who expressed this thinking was small. According to an interviewee, many producers largely view themselves as farmers and not as business people. Some of these people make for “*good farmers, but bad business people*”. This interviewee stated that this is perhaps a remnant of the previous agricultural marketing system in South Africa where ??? [text missing]

- Location of farms – the bio resources profile (soil, climate, vegetation, etc) and climatic conditions have a big influence on the crop choices of farmers. KwaZulu-Natal has a diverse bio resources profile which allow for the growing of a range of crops. It is one of the natural advantages for the sector in KwaZulu-Natal. However, individual producers in different parts of the province are limited in their choices due to their specific locations.

The majority of those that said their production choices were influenced by logistics issues were small growers. This means that they are locked into certain product types due to their ability to fund advanced logistics equipment e.g. cooling units or refrigerated vehicles. Bigger producers can expand their logistics capability which expands their production choices.

CHAPTER 6: DATA ANALYSIS - KEY FINDINGS

Introduction

The data analysis chapter below looks at the key issues emerging from the results presented in the previous chapter. It compares and contrasts the findings to the key ideas contained in the literature review on Chapter 3. It also looks at the findings within some theoretical constructs contained in the same chapter. The focus of this chapter is only on areas where sufficient information was obtained to conduct a meaningful analysis based on the research methodology

6.1 Logistics is a Major Challenge

It is not surprising that an overwhelming number of interviewees stated that logistics is a major challenge for their businesses. Their views are supplemented by the views held by the researcher, other academics and even logistics companies. They also confirm what literature shows about developing countries in general and specific studies related to South Africa. The most recent and extensive of this literature, the State of Logistics Survey (CSIR, 2007) contains overwhelming evidence that logistics is a major challenge.

An interesting result which indicates a few things is the response by 6% who did not find a problem and the 6% who said it is a problem but not a serious one. All these companies are relatively large. This may show that bigger companies may have logistics cost advantages. This perhaps indicates that bigger companies benefit from lower costs per unit derived from economies of scale. As shown in the literature review, such companies have greater power in the logistics chain. They can negotiate better contracts and arrangements.

All small producers stated that it is a serious problem. One even stated that it is the biggest challenge facing his company. Their views indicate that they cannot expand their size and find new markets unless they find ways of decreasing logistics costs. Again, this is consistent with the literature review which shows that small companies have little negotiating power. Very often they are price takers and have limited options.

Large producers use their size as leverage for favourable rates and services from logistics companies. Logistics companies are prepared to understand market fluctuations experienced by large producers who have been their customers for a while in respect to issues such as payment for services. This helps large producers in dealing with unfavourable market conditions. In return, they don't move around their businesses to competitors. This type of cooperation also helps producers to adapt by switching markets, if there is a need to. Small producers do not get that treatment.

Nonetheless, the number of companies who don't find it a serious challenge or a challenge at all are low, as the majority of large companies still stated that it is a serious problem. The difference between large companies who regard it as a problem and those that don't could be explained by a number of reasons. Firstly, the type of crops each producer grows could be a factor. Companies that found it a problem largely produce crops that have more complex handling and storage requirements. Particular handling requirements add more costs to logistics chains and increase the risk of losses.

A relevant case for this study is the issue of specialist niche crops. Their specialist nature (often delicate) means that they require the specialised attention that can be given by small growers. However, their post harvest and transport requirements are resource intensive and more suited for bigger producers, as they often have a very short shelf life. The volumes might be too small to justify investment in the appropriate transport and logistics infrastructure and systems. However, this may be addressed through processing equipment to make the shelf life longer, which would mean less resource intensive crops. This again, highlights that investment in other parts of the value chain may be required to alleviate what might appear to be largely logistics problems.

Secondly, the difference can also be explained in the relationship between producer and market. One producer who was interviewed stated that he only works on production and leaves logistics, marketing, etc to a marketing agent or a "middleman". The agent arranges transport and ensures whatever he produces reaches the market. Therefore, this producer does not incur much outbound logistics costs.

This also explains the costs incurred by other large producers and smaller producers. Some large producers would rather incur high logistics costs with the understanding that they will get better prices if they sell to retailers rather than marketing agents. Smaller producers have a huge task of trying to arrange transport, buyers whilst looking after production related issues.

The differences partly show risk aversion. Producers who choose to handle the entire chain are essentially choosing a high risk – high reward strategy. Producers who choose to use the middle man indicated that they would rather have guaranteed income for their produce and miss market highs than be exposed to all market fluctuations. Others choose focusing on production simply because that is what they know. This is captured by this comment from one of these producers: *"I'm a grower, not a marketer. I know growing the best products. This is what I have grown up doing"*.

On the other end of the spectrum, larger integrated producers may be benefiting through getting more contracts / buyers and thus limiting the entry of new and smaller producers. In the end, it seems that small

producers use their logistics chain structure due to limited alternatives caused by their size and their risk appetite.

The fact that it has been identified as a challenge also justifies the premise of the National Freight Logistics Strategy (DOT, 2006). This strategy is based on evidence that the problem is so big that it requires its own strategic intervention.

One of the key issues highlighted by the study is that whilst everyone recognises that it's a major challenge, there is little understanding of the complexity of the issue and there is need for more research by both government and the private sector.

6.2 Logistics Costs in Relation to other challenges

While high logistics costs are considered a challenge by many, it is not the biggest challenge facing the industry. High input costs present a greater challenge to most producers than high logistics costs. This result perhaps reflects the impact of recent increases in the price of fertilisers. This can be attributed to the increase of the price of gas, oil and increased demand for fertilisers. Oil and gas are used as inputs in making fertilisers such as nitrogen fertilisers which are widely used in agricultural production. Other input costs (e.g. cost of machinery and seeds) have also increased in recent years, but a slower pace than fertiliser costs.

Nonetheless, all the increases add up. When the cost of seeds, machinery is added to the cost of fertilisers, input costs become far higher than normal in overall production costs for producers. It is quite plausible that some responses were a reflection of the time the interviews were carried out. This thinking comes from a statement that by an interviewee that input costs have doubled in the past year or so and adding that a year ago, the producer would not consider input costs as such important a challenge.

Reports by the National Agricultural Marketing Council confirms this (NAMC, 2007 & NAMC 2008) . While logistics costs have risen, input costs have risen at a faster pace and in a shorter period of time according to a source at the National Agricultural Marketing Council. Whilst transport costs increased significantly, these costs did not double as was the case with some fertilisers.

Seeing logistics in relation to other issues makes one use a value chain approach as espoused by Michael Porter. However, some issues in the value chain may relate to logistics. For instance high input costs may also reflect high inbound costs for the inputs. Very often the focus of logistics debates is on the cost of moving the final product and ignores the cost of moving the various inputs used in its production.

6.3 Determinants of logistics Costs

6.3.1 Does Infrastructure matter?

While the issues cited as the main drivers of logistics costs are not surprising, what is surprising is the list of issues not mentioned. Literature tells us that the main cause of high logistics costs is poor infrastructure. Yet the findings of this study go against the central thesis of Limao and Venables (2001) who conducted one of the most comprehensive study in this field. It's also against the findings of the UNCTAD study in 2003 which cited rail, ports and road infrastructure as the main determinants of logistics costs. However, it is important to point out that Limao and Venables found while poor infrastructure accounted for 60% of high logistics costs in landlocked countries, it accounts for 40% in coastal economies. This may mean that coastal economies may have a competitive advantage in international logistics costs. This is in line with other studies by Limao & Venables (2001) that show landlocked countries have far higher logistics costs than coastal countries.

The fact that transport infrastructure is not regarded as a key driver of their costs may also show that South Africa has relatively well-developed infrastructure compared to other developing regions such as most parts of Sub-Saharan Africa. It is important to note that some African countries export high value produce in areas with undeveloped infrastructure and just provide air strips for the landing and taking off of freighters. This may have some pointers for the sector in KZN as the road infrastructure found in smaller centres in parts of KwaZulu-Natal is perhaps on par with what is found in main centres in some Sub-Saharan African countries. However the driver in these African countries is sufficient volumes. Furthermore, this approach has little linkages to the wider rural areas and serve as resource extraction means with no far reaching development impact.

Another example of underdeveloped infrastructure can be found within rail transportation where South Africa has a far more extensive network than most African countries. Data shows that South Africa's rail network is equivalent to 26% of Africa's entire rail network (see table 6.1).

Table 6.1 Comparison of Rail network

OFF THE TRACK				
Africa's rail networks lag behind				
Rank	Country	Route km	% of world network	% of African network
1	United States	194 731	17,54	–
2	Russia	87 157	7,85	–
3	China	71 600	6,45	–
4	India	63 518	5,72	–
5	Canada	49 422	4,45	–
6	Germany	45 514	4,10	–
7	Australia	41 588	3,75	–
8	Argentina	34 463	3,10	–
9	France	32 682	2,94	–
10	Brazil	31 543	2,84	–
15	South Africa	22 298	2,01	26,50
31	Sudan	5 978	0,54	7,10
35	Egypt	5 105	0,46	6,07
36	DR Congo	4 772	0,43	5,67
42	Algeria	3 973	0,36	4,72
46	Tanzania	3 690	0,33	4,38
48	Nigeria	3 557	0,32	4,23
57	Mozambique	3 123	0,28	3,71
58	Zimbabwe	3 077	0,28	3,66
61	Kenya	2 778	0,25	3,30

Source: SPOORNET

Financial Mail, 11 June 2004

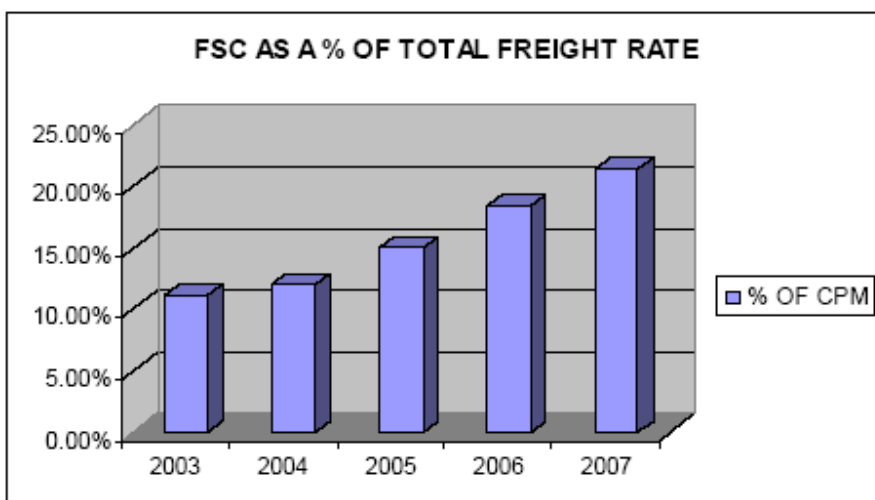
In the example above, South Africa is ranked amongst the top 15 in rail network. However, the extent of particular infrastructure does not automatically translate into benefits as the infrastructure may not be operated efficiently and optimally. It is the quality of the infrastructure that matters. For instance, South Africa has extensive rail network as shown above, but it has been so badly maintained that the country cannot be said to be benefiting optimally from its existence. Nonetheless, the presence of that particular infrastructure is a base from which lower costs and high levels of service can be built on. In other words, without the infrastructure in place, the cost of moving goods is likely to be high or impossible. An example of this is Kenya and to a lesser extent Tanzania and recently Ethiopia which export niche low weight products through because they lack adequate facilities to enable the export of bigger products such as fruits which require big refrigerated container terminals. It is easier for the country to use freighter aircraft landing in remote parts of the country to pick up beans and flowers but more difficult to export oranges which would require extensive road haulage and sea freight facilities.

6.3.2 Price of Fuel

While the absence of infrastructure from the responses of interviewees is surprising, the same cannot be said for what most cited as the main driver of costs, i.e. the price of fuel. A key issue that needs emphasis is that oil movements can be cyclical. This means that they can follow normal business and economic cycles of booms and busts. Based on the fact that the interviews were conducted at a time when oil was priced at \$125 a barrel, this could be expected as the high oil price was passed on to users, such as transport operators.

Graphic 6.2 provides an example of the impact of rising fuel costs on overall freight rates.

Graphic 6.2 Fuel as a percentage of Freight Rates



United Fresh Produce Association, 2008

As can be seen, fuel costs as a percentage of freight rates have doubled in 5 years from over 10% in 2003 to just over 20% in 2007.

Adding credence to this is a statement by a producer that “*We have never seen such high prices in all our time in the industry.*” The significance of this challenge is also because it is an area that is largely outside the direct control of industry players such as logistics companies and producers.

The problem and possible responses to the global oil price hike can be understood with a New Institutional Economics lens. It was a result of factors external to the areas of our concern. The global economic situation and geopolitics have much more to do with it than any local actors, highlighting the hierarchy of institutions

that affect economic exchange. This means this is an area where uncertainty is likely to be prevalent and policy makers have limited or no direct influence. The key issue for local policy makers is how to take local action in response to a global phenomenon.

6.2.3 Volumes – Size Matters

A running thread in this research is the importance of size. The amount of volumes transported was cited by many producers as a key factor. This confirms the importance of achieving economies of scale as also identified by Naude & Matthee (2007) as a key contributor to high logistics costs. This is easy to understand. The cost of hiring a 16 ton vehicle is fixed whether one is using a quarter of the space or all of the space. However, to fill such vehicles consistently, one needs big farms or yield-enhancing technology. Small producers usually lack both. Large producers rarely experience low volumes. This happens in cases such as crop losses due to factors such as pests, heavy rainfalls and fires. But generally they spread their logistics costs over large quantities which reduces per unit costs.

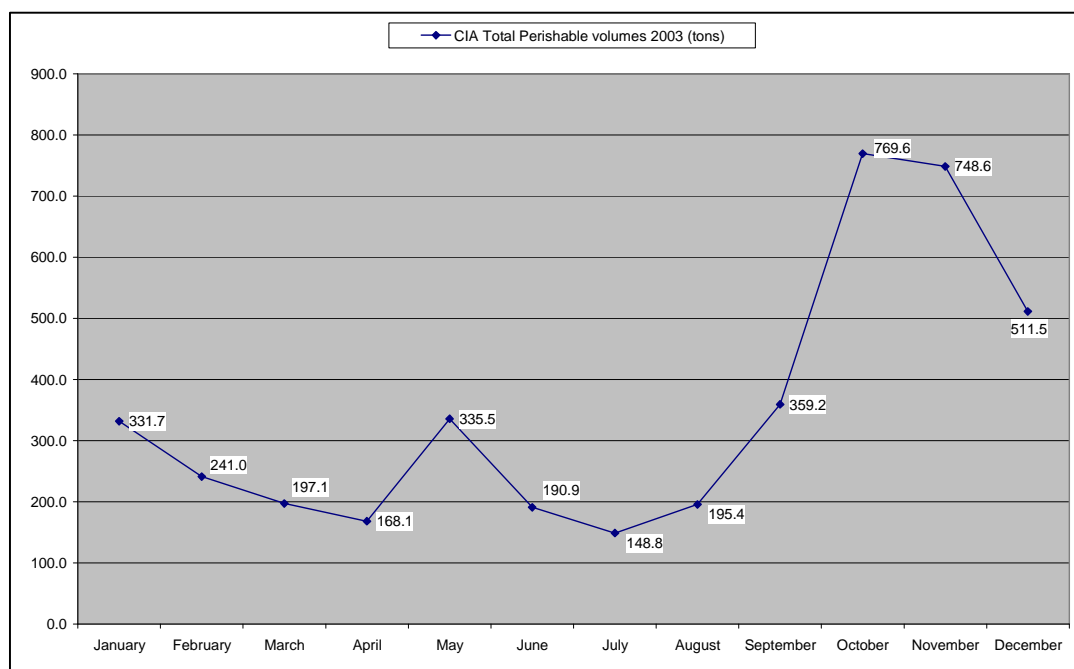
Another issue related to volumes is the cost of insurance for products being transported. The higher the volume the lower it becomes to insure the products. High volumes also enable the use of specialised transport means. For instance high airfreight volumes (say 20 tons per day) make it attractive for dedicated air freighters. An example of this can be found in Kenya where approximately 90 tons of cargo (Kaiser Associates, 2006) is air freighted every night at a lower cost per unit than KZN which produces far less than that and has no freighters.

6.2.3.1 Seasonality

Furthermore, seasonal fluctuations in supply can be a cost problem. There are certain peak periods which suit local exporters, i.e. when exporting products that are not available in European markets due to the season. Much pressure is exerted on logistics infrastructure at these particular times.

An example of the seasonality issue is shown in graphic 6.3. PPECB data shows that there is a sharp spike in fresh produce volume at Johannesburg and Cape Town airports between September and January.

Graphic 6.2 Fresh Produce Volumes exported from Cape Town and OR Tambo Airport



Kaiser Associates, 2003

This pattern affects freight rates. Rates are likely to be low when the demand for freight transportation services are low and high at peaks. These hikes may be offset by the higher prices producers may earn for supplying products off season in the destination markets where prices are usually high for off season products. However, at times producers get minimal additional benefits as they may be locked in long term contracts. There might be additional volume sold which would increase turnover but any price increase benefits may depend on the nature of agreement each producer has with the buying entity.

6.2.4 Distance

A number of producers referred to the location of their markets as a major determinant of their logistics costs. This essentially means distance. Distance is indeed widely regarded as a major determinant of logistics costs, as demonstrated in Chapter 3 by (Hummels, 1999, Naude & Mathee, 2007, and Venables, 2001). The fact that number of producers cited this issue reflects that production areas are located far from the main market outlets (retailers, fresh produce markets) in the province for local producers. For exporters, it is merely a confirmation of South Africa's location in relation to its main export destinations for horticulture produce in Europe and the United States of America. This is what Limao and Venables (2001) refer to as

geographical disadvantage. Geographical disadvantage relates to exports. It is common for people to refer to SA's location in relation to its trading partners. This shows an understanding of sea / air distance costs. However, domestic transport costs are rarely mentioned. This research shows that this is a challenge as companies that sell only in local markets highlighted distance as a challenge. This also confirms the recent World Bank Logistics Performance Index (LPI) study discussed in Chapter 3. The importance of distance in modern economies is captured in this statement

“In the 20th Century, it was said, ‘distance was conquered.’ In the 21st Century, distance shall have her revenge, and the world will become a much bigger place” (Rodrigue, 2006)

Whilst this might be the case, the revenge has been exerted more on small producers. Small producers can only sell to nearby centres as they cannot send their products over long distances. This means that their markets are limited by logistics costs. The implication of this is substantial. It essentially means that they are forced to forego more lucrative markets found in main centres. Thus they receive low prices in the areas around their locations. It is important to state that they cannot access these markets for other reasons other than logistics costs. These include sub-standard quality produce, low volumes, insufficient understanding of buyer requirements and not being part of certain industry networks. These may even be bigger challenges for market entry than logistics costs. Nevertheless, this study confirms that logistics costs is one of the issues that have to be addressed for market access. In all policy documents related to support land reform and emerging farmers (e.g. AgriBEE Charter), there is little reference to domestic transport costs. The assumption of these documents seems to be that producers must be helped with on farm activities to increase output of farms.

The importance of distance is also important when considered in light of one of the often mentioned advantages of KZN as a horticulture producing region, i.e. the climate and bio-diversity of the province. Distance shows that an area can be suitable but its location *vis a vis* markets can make that advantage difficult to exploit. This fits with one of the ideas of Fairbanks and Lindsay (1997) who argue that reliance on factor advantages such as climate can be enough to start an industry but insufficient to sustain it and its competitiveness. They argue that countries that want growth should seek to create advantages that are not easily replicable or found elsewhere. The KZN horticulture sector may be in the trap of being based on factor advantages rather than more sophisticated tenets of competitive advantage.

6.2.5 Type of Product

This issue relates to what is contained in the FAO report titled “production is only half the battle” as referred to in Chapter 3. The interviews confirmed that the particular features of a product affect the freight rate given by freight forwarders. For instance, insurance costs also differ depending on what type of product is being transported. According to logistics companies, temperature sensitive and valuable products attract higher insurance charges. In most cases, they also attract higher handling fees.

In line with the point about basing the industry on factor advantages, the types of crops being produced in KZN seem to be determined by weather and soil conditions. As Fairbanks and Lindsay (1997) argue, these are easy to replicate especially as technology has reduced distance between countries. In horticulture, technological developments have made it possible for countries to produce crops that would not normally be grown in those areas. There is little of such activity in KZN. Crop decisions don't seem to have been made with the objective of targeting certain market segments. This can be observed in the fact that there are few products that can be regarded as “unique”. Instead the industry is dominated by few crops e.g. bananas in the case of fruit and peppers in the case of vegetables.

6.2.6 Port Costs

The results also show that a small percentage of exporters consider port/airport costs as key drivers of their logistics costs. However, the percentage of respondents mentioning this is low, even amongst the exporters. However this does not mean port charges are not important. It may merely be a reflection that producers do not find them too high or unreasonably high. This is consistent with statements contained in the National Freight Strategy (2006) which ascribed this to the lack of regulation and limited or no competition in different parts of the port system (handling, terminal operations, etc) . This could be linked to the views held by some New Institutional Economics proponents who recognise the power of institutions. This is especially true as it relates to competition issues and regulation. This link is explored in more detail in one of the sections below.

6.2.7 Type of Vehicle Used

This was another issue highlighted by a small percentage of respondents. This is understandable since the industry has standardised the vehicle types used and the equipment used to transport the produce. Only one small producer cited this. Perhaps this reflects that some small producers use ways outside the formal market to transport their produce. This producer did confirm that at times he relies on someone else's vehicle to

transport his products to the Durban fresh produce market. At times he hires a bakkie for a small fee. Thus, his costs differ depending on which method he uses.

6.2.8 Other issues

There are a number of other issues that were not mentioned in the interviews that could be a determinant of transport costs. These include:

- Trade balance
- Structure of industry and competition
- Parastatal inefficiency

Trade balance – The nature of trade between regions should be a key issue in determining costs. Unbalanced trade may increase costs. Unbalanced trade, e.g. where a lot of containers leave full and return not even a quarter full, lead to high costs for exporters on that route and possibly low costs for importers on that trade route. However, South Africa seems to enjoy a fairly balanced trade with its main trading partners such as the United Kingdom, Germany and the USA (South African Reserve Bank, 2007).

Structure of logistics industry - The manner in which the logistics industry is organised and operates has significant implications for logistics costs. This also relates to the number of players and the competition between these players. However, the presence of many operators does not necessarily mean high levels of competition. High numbers may mask some uncompetitive practices by service providers.

Competition - It has been recently reported that a number of South African logistics firms are being investigated for possible uncompetitive practices. This is despite the existence of so many firms. This challenges the notion that many participants lead to competitive outcomes.

Parastatal Inefficiency - The inefficiency of South Africa's parastatal within the logistics sector was cited as a challenge by some interviewees. This inefficiency manifests itself in a number of ways.

Firstly, congestion at ports increases the costs of outbound cargo. This congestion also creates problems and extra costs for inbound cargo. At some point inbound cargo incurred a surcharge of US\$ 100 per day. These costs had a knock-on effect on the economy as such charges are eventually transferred onto intermediate users of goods or final users of the goods in the case of finished products.

Secondly, the practice of cross subsidising infrastructure by Transnet may have negative consequences. It has been reported that Transnet puts money from its profitable ports operations into lagging rail infrastructure. This may be to the detriment of port users who would like to see more investment in port facilities and in resolving problems around the port. Cross subsidizing also means that modal efficiencies, with each mode capitalizing on its strengths, are not pursued.

Monopolies have little incentive to reduce costs as they get users regardless of prices they offer. The government seems to have dropped the privatization of any transport infrastructure. This essentially entrenches state monopolies. If government has made this choice, it should put measures in place to ensure that these monopolies don't hinder trade through high costs. In cases like these where competition is low, it becomes important to establish economic regulators to ensure that monopolies don't abuse their positions to the detriment of the economy. Thus, the recently established Ports Economic Regulator could be a positive step for port users.

This also links back to New Institutional Economics thinking as alluded to above. The impact Transnet has on logistics costs is a direct outcome of historical decisions, power dynamics surrounding parastatals and public policy choices (e.g. on issues such as competition in port services). The key issue is the relative power of the company in determining its own investment decisions, timelines and priorities which may not be consonant with what stakeholders in port regions may want. This is certainly the case in KwaZulu-Natal. The way the municipality, provincial government and Transnet divisions relate has perhaps adversely affected efforts to improve the efficiency of port logistics (Arkin, 2006). This is also addressed in Hall & Robbins as they state that there is a disjuncture between port management and city planning and economic development programmes (Hall & Robbins 2002).

There are a number of areas where greater cooperation would address some of the main determinants or main problems as identified with the interviews. These include the persistent problem of failing to deal with port congestion. This is an area where there is an interface between different institutions (port operators, cargo companies and the municipalities). Thus, far reaching action can only be taken with full cooperation of the stakeholder.

6.3 Cost Structure of Logistics Operations

For Exporters

Transport is the biggest cost component of logistics costs.. It is this part of the chain that includes fuel prices. It also relates to distance referred to previously. Its importance does seem to be in line with what has been found elsewhere in literature (e.g. State of Logistics Survey, 2004). However, in other studies transport costs are mentioned as accounting for a higher percentage of logistics costs. For instance according CSIR's State of Logistics Survey (2004), transport costs accounted for 75% of logistics costs. It is important to make a clear distinction between this research and the State of Logistics Survey, as the survey was done on an aggregate basis whereas this reflects a sectoral view. This may explain the discrepancies between the findings regarding transport costs. Furthermore, the classification of transport costs may differ with more activities identified as transport costs in the SOL survey.

It is important to point out that earlier studies had shown transport costs to account for less than ocean haulage costs. Although it is important to note that ocean transport rates have historically fallen over time in real terms, the difference cannot be merely explained by changes over time. This is also because road freight rates have also fallen over time in Real terms (National Freight Logistics Strategy, 2006). The difference may be a result of the type of export method predominantly used, i.e. the grower would have sold the product to a export agent by the time it has reached ocean haulage. On average, it seems there are more producers who do this rather than controlling the chain until produce reaches the end buyer.

Insurance, clearing, inspection and agency fees make up for less than what one would have expected based on literature (e.g. SOL, 2004). This is also surprising considering the complaints from the fresh produce industry after the country's main inspection agency, the Perishables Produce Export Control Board produce, raised its inspection fees at above inflation rates (Freight and Trading Weekly, Various editions in 2007).

For Non Exporters

The importance of transport costs is highlighted once again in the case of non exporters. They make up more than they do for exporters. These companies spend less on packaging and handling. This reflects that local markets have less stringent packaging requirements than overseas buyers. Handling of the packaged products also makes a smaller contribution to domestic logistics costs. This is also the case with insurance, inspection and agency fees. This is understandable as local consignments don't get inspected by state agencies. It is

also understandable because insurance costs are decreased if one transports produce over shorter distances and within one country or customs area.

What does the cost structure tell us?

The key issue to draw from the cost structure is that the area where there is biggest scope for reductions is domestic transport costs. Although it is not always good to assume that the component with the highest costs shows inefficiency in that area, in the case of transport costs, there is sufficient evidence that this is indeed the inefficient part of the logistics chain. This is based on evidence contained in *Moving South Africa*, the World Bank's Logistics Performance Index (2007), the National Freight Logistics Strategy and various editions of the State of Logistics Survey by CSIR.

6.4 The effect of delays

Nowhere is Just In Time (JIT) production more prevalent than in horticulture. Many horticulture products are, by nature, time sensitive. They have to be delivered in time to fetch high prices or maintain quality. Therefore, the effect of delays is one of the key issues affecting logistics chain effectiveness.

The results show that delays have a negligible effect on many producers. However, it is identified as a problem for a few exporting firms. These delays are often experienced at the port. Trucks have to wait in lines before delivering produce destined for export. The average waiting time is four hours for both picking up and delivering containers (*Business Report*, 26 July 2007). This is due to the previously-mentioned issue of parastatal inefficiency. It is also due to a backlog of ports issues. The roads serving the Durban Container Terminal are insufficient leading to costly delays in many cases especially at peak traffic times (*Business Report*, 26 July 2007).

It is important to point out that, while delays for non exporters are rare, the effect of few delays could be substantial due to the time sensitive nature of many horticulture products. A delay of few hours can severely affect shelf life of products in a consignment and may even lead to losses effectively turning the product from being valuable to waste in a short space of time.

6.5 Modal Choices

The result on the use of various modes confirms that rail is indeed under-utilised. While it can be said that this is understandable and should be expected due to rail being unsuitable for the types of shipments that producers make, the point should not mask the fact that rail is generally reported to be underperforming.

Road is more flexible and quicker and is more suited than rail to moving smaller consignments. While road enables point to point movement, rail routes are fixed and normally involve stops delaying transit times. This means it is unlikely to be used by producers selling their products locally as most interviewees stated. Does this also apply for exporters? Most interviewees said they had not considered it given that rail is not suitable for horticulture crops. Is this indeed the case? Can a case be made for transporting fresh produce destined for ports using rail if the system was effective? It might be argued that this would be an option for consideration for exporters if rail was effective. The fact that many are accustomed to an inefficient rail service means that they don't even consider it. However, it can be stated that efficiency improvements in rail would make it possible for some to consider it. This is based on the assumption that it would be cheaper than using road if the normal cost structure of the two modes is in place (i.e., rail is cheaper than road).

Perhaps the fragmentation of the two transport modes contributes to the fact that the inherent advantages of rail are not realised. This lack of integrated transport planning is identified in many policy documents such as *Moving South Africa* and the National Freight Logistics Strategy. Explaining how intermodalism in such cases may work, Negota states that:

Intermodalism as an element of freight transport strategy can be effected where goods are conveyed by rail up to certain designated points and then moved to road freight for final delivery to end points in the form of factories, warehouses or wholesalers (Negota 2003:6).

He goes on to explain that the situation he paints above is common in many countries. Thus, it can partly explain why the role of rail is changing internationally according to a report by the National Department of Transport (2004). The report states that rail is increasingly moving more containers in addition to its traditional market in other parts of the world. However, it is not possible in South Africa at the moment due to the fact that the two modes have largely been established to operate as individual modes with little articulation between them.

Indirect Costs / Externalities related to modal choices

The other issue that has to be factored in to policy decisions on which modes to support has to do with the indirect costs. Road might be the most effective means of transportation of unitized cargo, but has high externalities. These externalities include accidents and pollution. These would be less if an effective rail system that carries goods that should naturally be appropriate for rail.

Very often these are left out of debates on freight logistics. For instance, the National Freight Logistics Strategy does not include a recognition of some of these costs. As with many documents it is based on the dominant paradigm where economic issues override social and environmental issues.

The reality is that they should be factored into policy not because they are “nice to have” or to satisfy the “green lobbyists” but as part of a strategy to increase market access. It is highly likely that countries that don’t / are not seen to be utilising environmentally friendly transportation systems will have reduced markets in future. In fact, this may represent the emergence of a consumer driven chain.

Consumer driven chain - Emerging Chain?

The point made above and the rise of food air miles and organic agriculture may point towards the emergence of consumer driven chains. This can be labelled as such due to the following:

- Consumer preference on sources of products (e.g. preference of local producers or small producers)
- Consumer preference on packaging types and labelling of products

This shows the increasing power of consumers to influence decisions of where to source and how to source hitherto unseen in the industry. However, this industry is still relatively small in market terms. E.g. produce marketed under “green labels” are still far outnumbered by conventional products on shelves. Nonetheless, this may show an expansion of the buyer chain concept discussed in Chapter 3.

6.6 Does Location Still Matter

The results show that locational decisions in horticulture (for both exporters and non exporters) are not influenced by a consideration of logistics costs, but rather historical farming patterns. This is against one of the central tenets of new economic geography.

It could be that this reflects differences in sectors. The horticulture sector seems to be driven by a different set of operational imperatives than manufacturing which is what New Economic Geography models are largely based on. The sectors require different infrastructure and human resources and that could explain this finding. Understandably, horticulture has historically been seen as a rural activity and manufacturing as an urban activity. However, other forms of horticulture which have higher levels of value adding and processing and intensive use of technology may have similar drivers than some manufacturing sectors.

However, this does not negate Economic Geography theories completely as it is possible that the initial locational decisions were based on consideration of those issues but those issues no longer hold the same importance due to the changed nature of the industry. Hence one can't say location does not matter but current patterns are driven by other factors.

6.7 Challenges that prevent producers from improving their logistics system

Finance is the biggest constraint for implementing measures to improve logistics system efficiencies. This shows that they believe that investment is required in capital intensive areas. These include acquiring new vehicles that may be more fuel efficient and require less maintenance. This may also reflect a perception that gaining new efficiencies requires extensive investment. However, examples from elsewhere have shown that there are low cost measures such as utilizing software that reduces administration costs.

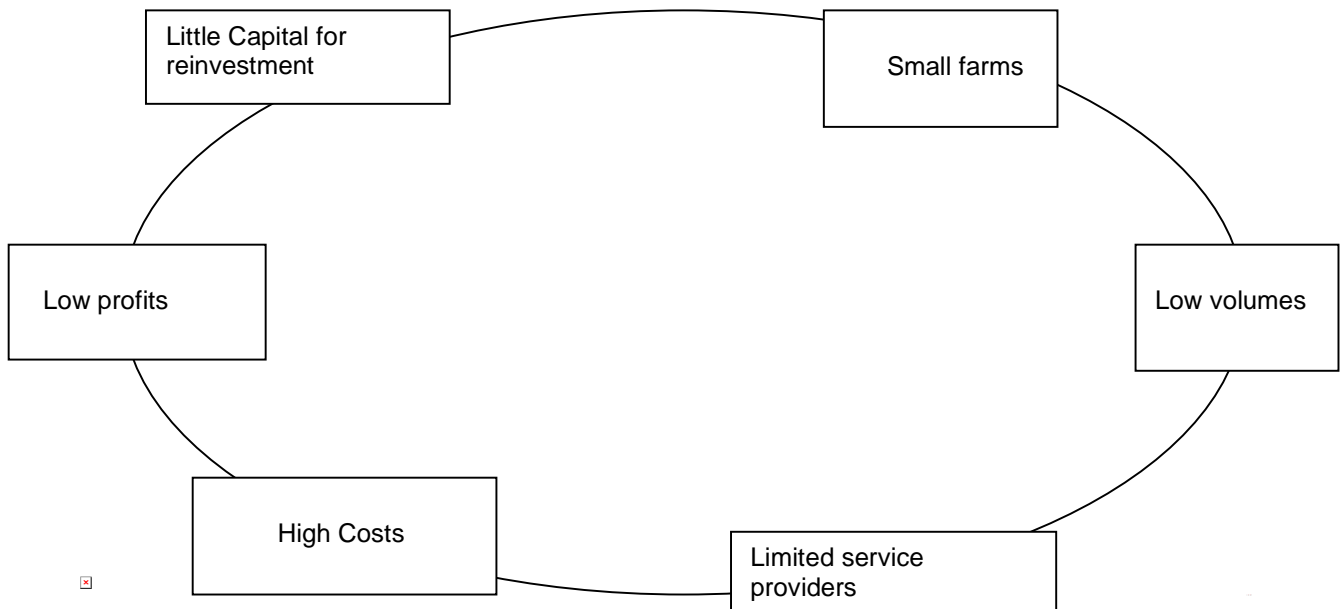
The second biggest constraint is the set of requirements of buyers of produce. This especially relates to retailers. Retailers have specific food safety standards that they set for any suppliers. These standards regulate both the production and the post harvest handling of goods, including logistics activities such as transporting and storage. Whilst, theoretically these are put in place to ensure that the quality of produce is maintained, in developed countries they can also be construed as non tariff barriers that also impose extra transaction costs. This is an issue that can be seen in light of protectionism offered by developed countries on their markets. If seen in this light, it is an issue that can be addressed with other multi-lateral trade issues.

6.8 Seeking Alternatives

Despite the fact that no producer has considered rail as a possibility as explained, most producers are generally open to trying different ways of reducing their costs. As the results showed, more than 80% had tried some things in efforts to cut down costs. This shows willingness to innovate and to seek continuous improvement.

However, it is worrying that the 19% of producers who had not tried something different is made up entirely of small producers. One would have thought that these would be the people in desperate search for alternatives since high logistics costs affect them more severely due to their size. However, it is their size that limits their ability to seek alternatives. The results can be explained by through graphic 6.4.

Graphic 6.3 Vicious Cycle Trapping Small Producers



Many emerging farmers have small farms (e.g. obtained through Land Reform projects where farmers have to sub divide farms amongst themselves). Small farms using conventional farming methods leads to low volumes being produced. This limits the number of service providers they can get. Fewer service providers keeps costs high. High costs erode the profits the producers make. This means little capital is available for them to reinvest into their businesses for expansion or increasing yields, either through their own profits or through debt, as banks would be reluctant to lend to a low returns business by what they consider inexperienced people. This is a simplified circle. Reality is much more complex with many factors at play. However, as it relates to this particular study, the key factors are highlighted.

6.9 Measuring, Monitoring and benchmarking Costs

Related to the point about seeking continuous improvement, very few producers have used any particular measuring tools to measure their costs to get a better understanding of their costs or to compare their costs against other companies. This problem affects both small and large producers.

With regards to measuring it can be stated that producers in our study are merely research on information that classifies costs according to broad categories (e.g. administration, transport, etc) without looking at what those categories actually consist of i.e. measuring the costs. The importance of measuring costs is often stated as the first key step to take when seeking solutions. It is through measuring that one gets a good understanding of where the challenges lie. Measurement over time also allows tracking of trends or behaviour of particular cost items. This is not done by most producers due to time and resource constraints. Other tools such as benchmarking may not be used due to the historical nature of the sector.

For a long time in SA agriculture cooperation was not commonplace due to the fact that markets were limited during the apartheid era. Therefore, farmers rightly saw other farmers as competitors. Therefore no information could be exchanged amongst these companies. Anecdotal evidence suggests that the sector is now opening up. Information exchange is crucial for improvements, not just in logistics but in production and business aspects as well.

This was confirmed through informal discussions with producers from outside South Africa. One grower went to the extent of stating that he meets his counterparts at least twice a month and they give each other advice wherever possible. This becomes even more useful in cases where industry organisations such as Growers Associations are weak as is said to be the case in the Horticulture Sector. Ideally, Industry organisations would exist together with cooperation between producers.

Failure to cooperate also means that issues that would be best addressed through collaboration e.g. in negotiating with service providers and buyers, are not adequately dealt with. This maintains the current structure which does not suit producers and seems to benefit other players in the chain more than them.

The impact of these high costs on the producers and broadly on the socio-economic environment is discussed below.

6.10 What is the impact of High Logistics costs in Horticulture?

6.10.1 Fewer Producers

When one adds the impact of high input costs to the situation outlined above, one gets a picture of how farmers are squeezed on many fronts. It is no wonder that some have indicated that if current trends prevail, they will go out of business. It is already widely known that the number of farmers in the country is steadily decreasing. This is due to various factors. Key among these is reduced profitability. As we can see, logistics costs have a huge bearing on the ability to run a production enterprise viably.

6.10.2 High food prices

The widely reported global food crisis (shortage and high cost) has been attributed to a number of reasons. The most common of these in reports is the use of land for biofuels. However, it is clear that high transport costs are also a big, if not bigger contributor to the crisis. The relationship between high logistics costs and food prices prompted the statement

“The world's food crisis will not be solved until there is greater recognition that transport policy is inextricably linked to food policy.” (Edwards & Philips, 2008:1661).

High logistics have contributed to high food prices in two ways. The most obvious impact is that logistics costs have been passed onto consumer prices. Yet producers don't benefit as much from higher consumer prices as retailers exert their influence to play producers against each other and keep their buying costs low. This is linked to the second way in which high cost of logistics increase food prices as these high costs have reduced the number of producers as explained above. Fewer producers push prices up through limited competition.

The National Agricultural Marketing Council has also found that high food prices affect rural people more than urban people (Tema & Nyhodo, 2007). They also believe that this is due to high transport costs and other costs of doing business in rural areas. The processing of produce in urban areas before it is sold in rural areas also increases costs as the product has to move from farms in rural areas to processing facilities in urban areas and is then distributed to stores in rural and urban areas. This is also compounded by the fact that rural areas are sparsely populated and products have to be transported over greater distances, increasing the cost.

All this means that the high logistics costs create high social costs. This is looking beyond the often mentioned business / economic impacts.

6.10.3 Hinders efforts to create a new farming class

Government's stated intentions of creating a black commercial farming class are unlikely to succeed if attention is not paid to logistics challenges. As already shown, small producers face an even bigger challenge than established commercial farmers in dealing with high logistics costs. The number of new entrants succeeding without assistance in logistics issues (and other issues) is likely to be very low.

Land Reform projects should be conceptualised with clear thought given as to how productivity will be maintained or raised, how produce will be sold and how products will be moved to markets at a low price. At the moment, this is not happening. This puts new farmers in a very difficult position. As a result many don't rise from their position of being beneficiaries to one where they are enterprise owners.

6.10.3.1 Employment Creation Capacity is constrained

Agricultural sectors are one of the most labour intensive sectors of the economy. It is regarded as one of the sectors with the highest investment to jobs return (Global Insight, 2006). Within agriculture, horticulture is generally regarded as one of the most labour intensive in production, packaging and transporting of goods. However, for the sector to realise its employment creating capacity, industry constraints have to be removed. An environment that allows business to thrive should be created. The current logistics environment is one of the key obstacles in the value chain.

6.10.3.2 It limits markets

Not only does it limit the number of new markets that can be accessed, it also puts existing markets at risk as some producers are not sure whether to continue transporting their output over long distances for low / stagnant prices. Although products fetch higher prices in foreign markets, high transaction costs make it less profitable or unprofitable. This may have a far reaching impact globalisation or at least on global trade.

6.10.3.3 Impact on Globalisation?

What happens at a global level has tremendous impact on local issues. As falling transport costs have been one of the drivers of economic integration, it remains to be seen whether high and rising costs seen in 2007 and 2008 will play a role or even spark the disintegration of countries. Although not far reaching, there was a

marked decline in international trade over this period. This followed high oil prices when it reached more than \$140 a barrel. This, added with recession in many developed economies, has led to many countries adopting protectionist measures.

Issues like the oil price and global trade issues leave relatively little scope for intervention for local players. In the next section solutions that could assist producers in reducing their logistics costs are considered.

6.11 Proposed Solutions

A number of issues that could be possible solutions have emerged from interviews and literature. Below look some of these are looked at and their suitability for the horticulture sector in KZN is considered.

6.11.1 Is lowering cost all that matters?

Firstly, it is important to ask whether lowering logistics costs is all that matters for improving the competitiveness of the sector. While this research is about logistics costs, it is important to acknowledge that lower costs may not necessarily be the answer to industry competitiveness. Some companies do not base their competitiveness on lower costs but on other factors, most commonly, differentiation. Could it be that producers in our study area could be better served by pursuing this strategy? It is hard to tell. However, from the products being grown by the majority, it is clear that they are in areas where there are many growers producing them. They could still seek differentiation in such segments, however chances of success are higher if they are in niche market product segments. This means that, as there is no differentiation, microeconomic conditions such as logistics costs become very important. In short, the answer to the question is that logistics costs matter more because of the fact that the sector in KZN is built on factor advantages. However, seeking solutions to logistics costs should not mean that the sector should not seek competitiveness based on issues such as product differentiation.

In fact, a strategy of differentiation based on logistics efficiencies could be pursued. This is in recognition of a key idea contained in Mentzer et. al (2001) that excellence in logistics has become an important differentiator.

Nonetheless, this would not mean it is no longer necessary to find ways of reducing food prices. Below possible solutions identified by the producers are looked at and assessed.

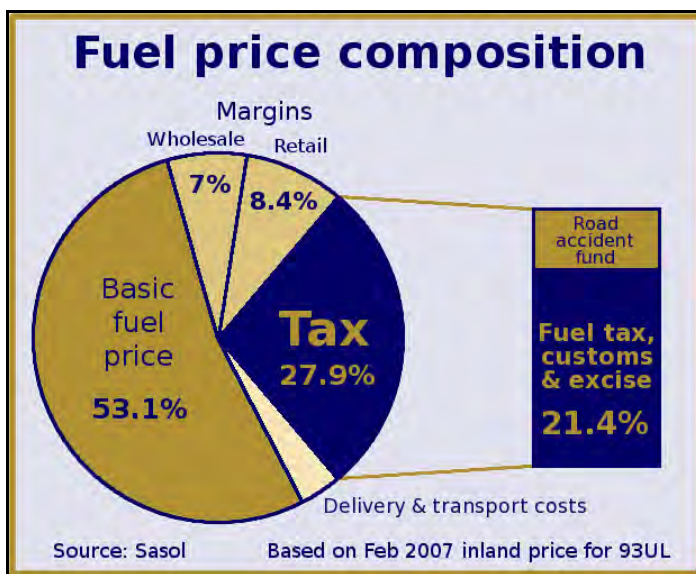
6.11.2 Regulating Fuel prices

Whilst many interviewees referred to capping of fuel price especially petrol and diesel, this does not accord with reality. The reality is that the fuel market is heavily regulated (department of Minerals and Energy, 2008). Government regulates the industry from safety to operations and, more importantly for this study, price. The sector has been regulated for a long time. During the apartheid era, regulation was seen as a way ensuring continuous supply in a “siege” economy.

When assessing the feasibility of this proposal it is important to look at the composition of the price. A key thing to keep in mind is that while the global oil price is outside the influence of government, retail fuel prices are partly influenced by government costs. These include levies and taxes paid by sellers of fuel.

However, these comprise a small component of the total costs compared to the basic fuel price as shown in graphic 6.4. Some of these taxes play an important role as they provide resources for issues such as the maintenance of infrastructure like pipelines and roads and some costs related to road accidents.

Graphic 6.4 Composition of the Fuel Price



Sasol, 2008

What the graph demonstrates is that the retail and wholesale segments account for little of the total price composition. This means there is little scope for intervention at this end under the current scenario.

Nonetheless, there might be a scope for creating further competition. The current wholesale and retail market is that of an oligopoly. Government could look at creating more competition at this end. Furthermore, more competition could be created at other ends of the chain such as refining and transporting.

Furthermore, while market failure came out as a possibility in the theory, a point to keep in mind in relation to any policy to regulate market processes, is that state failure is also a distinct possibility especially in light of weak state institutions as alluded by some components of New Institutional Economics .

6.11.3 Transport Subsidies for farmers – Power Dynamics in Public Policy

This is another controversial proposal that was favoured by a number of producers. This would entail government establishing across the board or conditional subsidies for qualifying producers. This may have implications for exporting companies as it might be a contravention of World Trade Organisation rules. However, experience in other countries and in some sectors has shown that countries can work around WTO rules to support their industries. Indeed there are other sectors where government has stepped in to provide support in the form of subsidies. One of the most noteworthy is the Motor Industry Development Programme.

Elsewhere, the agriculture industry in a number of developed countries receive heavy subsidies. There are also other protectionist measures in place to protect the interests of local farmers in some developed countries such as the US.

These two examples (Agriculture in countries like the USA and the MIDP in SA) reflect not only decisions made for economic reasons to support certain industries. They also reflect the influence of certain interest groups in policy formulation. In South Africa, the horticulture sector is small, fragmented and has no voice in policy debates. Therefore, the likelihood of radical and far-reaching decisions being made to support them is low.

6.11.4 Co-ordination and Consolidation of Loads

This is one of the more plausible solutions mentioned by the interviewees. This is within the direct realm of both provincial government and producers. It is also something that would achieve immediate impact at a relatively low cost compared to others. The only cost would be in the human resources and the time required for building relationships, developing a model and implementing it. Nonetheless, despite the potential impact

of this suggestion, it is important to note that its success may partly depend on interventions elsewhere e.g. in infrastructure.

KZN has the advantage of having various micro-climates allowing it to supply different products in different seasons. This comparative advantage needs to be utilised if role players want to establish the province as a significant supplier of horticultural crops to local and international markets. One of the ways of doing this is through having a coordinated export programme for certain markets based on what can be supplied where and when.

Co-ordination may also be helpful in cases where small producers are involved in niche products which have resource intensive transport requirements.

This should be pursued by small growers as it indirectly solves the issue of economies of scale. This could be done through the use of a marketing and logistics firm with the necessary coordinating capability or through an industry association. Countries such as Kenya have enabled small producers to supply lucrative EU markets through the efforts of exporters who handle logistics, marketing, packaging activities in the value chain on behalf of the growers.

However, this has some demerits as the export agent may be getting a disproportionate amount of the benefit. This may be happening whilst small growers are trapped in small scale production with little value added benefits. Thus, in deciding whether one pursues this route it would be important to heed the advice of Fairbanks and Lindsay (1997) who argue that producers should look at whether the export agent is adding any real value or performing tasks that they would not be able to do without the agent.

6.11.5 Investment in Infrastructure

This is another more plausible potential solution. It is also a standard response of many policy makers when asked about what needs to be done to create a more efficient system. The importance of this is also reinforced by research conducted as part of the State of Logistics Surveys over various years and the National Freight Logistics Strategy. Although the National Freight Logistics System places more emphasis on operational issues and the institutional environment, it is clear that there are areas that require investment in infrastructure. These can be split into postharvest infrastructure and transport infrastructure.

6.11.5.1 Post Harvest infrastructure & equipment

Post harvest infrastructure and equipment refers to transport and logistics facilities and equipment required after the harvest of produce. These include:

- Cold rooms
- Refrigerated Trucks
- Cooling equipment prior to shipping of some goods
- Pallets or cartons

When producers refer to finance as a constraint for improving their logistics systems and achieving efficiencies, they allude to the capital required to acquire such post harvest infrastructure and facilities. Investing in such facilities could assist in dealing with increasing the shelf life of products and thus the need for faster and thus more expensive logistics chains. The perishable nature of many horticulture crops means that producers have limited time for “search” operations before transacting. Freight Forwarding firms have the power at this stage as producers have to dispatch goods with speed to ensure that they reach their destination in a good state to ensure better prices.

This infrastructure would also reduce post harvest losses that often occur in transit. These don't directly increase costs but effectively increase cost per unit as damaged products are often not sold or sold at very low prices.

6.11.5.2 Transport Infrastructure

This refers to roads, air and sea port infrastructure. While there might not be such a great need for this, there are areas requiring investment. Road infrastructure is only required in some rural areas. As the Siyazama report asserts, some parts of province have no market access chances due to, among other issues, lack of appropriate infrastructure connections. Bad roads make the areas inaccessible by many vehicle types and thus limit choice and increases costs.

Sea Port and Airport infrastructure suffers from capacity constraints and inefficiencies that affect the entire provincial and, to some extent, national economy (more so in the case of seaports). The capacity constraints are being addressed. However, this does not mean that the operational efficiency challenges will be resolved as they require more radical and long term action which may include introducing more competition in the port logistics system or strong regulatory control, depending on the nature of the problem.

6.5.12 Beyond Physical Infrastructure

It is also evident that whilst the stock response from policy makers is physical infrastructure, there is a need to deal with “soft” infrastructure. Soft Infrastructure includes:

- Telecommunications systems
- Information technology systems & networks
- Temperature management systems
- Knowledge of personnel dealing with logistics

This is what offers many companies competitive advantage. Any company can utilise common infrastructure or “public goods” but how it maximises its internal processes to exploit this is where the real competitive edge lies. Because logistics processes involve many steps and many players, soft infrastructure measures can play a role in keeping the information search and exchange low.

More attention to soft infrastructure would address issues such as :

- Inventory levels
- Supply chain planning
- Information Gaps

For instance, seasonality requires the ability to use both demand and supply information. There seems to be an asymmetry of information at the moment. This might be addressed through the development of software that allows potential suppliers (or market agents) to access information on both ends and plan supply chain responses depending on what the situation requires.

Table 6.2 summarises the advantages and disadvantages of the solutions from the research.

Table 6.2 Summary of potential solutions

Possible Solutions from Interviewees	Advantages	Disadvantages
Fuel Subsidies	Provides Direct Support	Likely to be high cost. Difficult to monitor use of subsidy. Producers may not become cost effective in logistics chains. May create problems with trade partners and competitors.
Regulating Fuel prices	Addresses the most serious driver of cost in recent times.	Likely to be expensive. May not be practical. Does not encourage efficiencies.
Consolidation of loads	Likely to bring smaller growers into mainstream markets through providing economies of scale.	Requires great coordination.
Investment in transport infrastructure	Likely to have a long term and sustainable impact. Has also broader impact for other sectors. Low Cost (in case of “soft” infrastructure)	Likely to be High Cost depending on required investment. Operational Efficiencies may still be lacking which means less impact.

Further to the points highlighted above, it is important to recognise that these are broad ideas that would require more detail before they are included in policy or strategies. Nonetheless, they demonstrate that there is scope for action to reduce costs.

CHAPTER 7: CONCLUSION

This dissertation hypothesised that the horticulture sector in KwaZulu-Natal is experiencing the high cost of logistics and this impedes the potential of the sector for socio-economic development. The dissertation set out to investigate whether this was the case or not. It also sought to find possible solutions if the hypothesis is correct.

In order to do this, the first chapter gave an overview of the horticulture sector and logistics industry in KwaZulu-Natal. This gave a contextual view of the study.

The key literature was discussed in Chapter 3. It showed that logistics cost is a key issue affecting the competitiveness of countries and logistics affects the wealth of nations. The theoretical foundations were explored in this chapter. The key tools chosen i.e. Value Chain Analysis and Transaction Cost analysis outlined key tools which have been used as basis for analysing the causes and effects of some cost issues. The research methodology was explained in Chapter 4. Primary research was used to supplement secondary information sources.

The results of the research are contained in Chapter 5. Indeed, the hypothesis was proved right. Horticulture Producers in KwaZulu-Natal face high costs of logistics. The analysis of the results in Chapter 6 showed that these high costs have many negative consequences and reduce the socio-economic development potential of the sector. Potential Solutions were also explored in this chapter. The research has shown that there are other factors that constrain the potential of the sector. Whilst reducing logistics costs is important, it is not a silver bullet that would address all the competitiveness issues. However, it is one of the most important issues. In dealing with the challenges a holistic and long term view should be taken. It is important not to fall into the trap suggested by many interviewees of addressing what may be short term cyclical issues, such as measures to deal with high fuel price caused by oil price hikes and rather focus on long term structural issues. Key among these is investment in infrastructure and improving the management of existing physical infrastructure.

Targeted support should be given to smaller firms and producers. These require interventions beyond logistics issues. One of the key issues is investment that would assist these farmers in achieving sufficient economies of scale to lower their costs and increase their bargaining power when making transactions with other role players in the supply and value chain.

An environment where innovation is encouraged must be created. Small firms currently lack the resources to try different arrangements and systems. If their risk was covered or shared by some role players tasked with sector development, this would change. It is through trying different systems that countries such as Kenya managed to find sustainable solutions for exporting their products competitively.

Another key finding is that what appear to be logistics problems may require solutions that are not logistics related. Thus, sector development is best understood when viewed through a value chain approach. It is called a value chain for a reason, i.e. it is ultimately linked up.

It is clear that KZN has a comparative advantage in horticulture. The region should create competitive advantage through improvements in logistics efficiencies. This would create a thriving sector that could play a role in achieving some of the countries developmental objectives. This requires a departure from path dependencies and addressing the institutional environment that hinders cost reduction and perpetuates high logistics costs.

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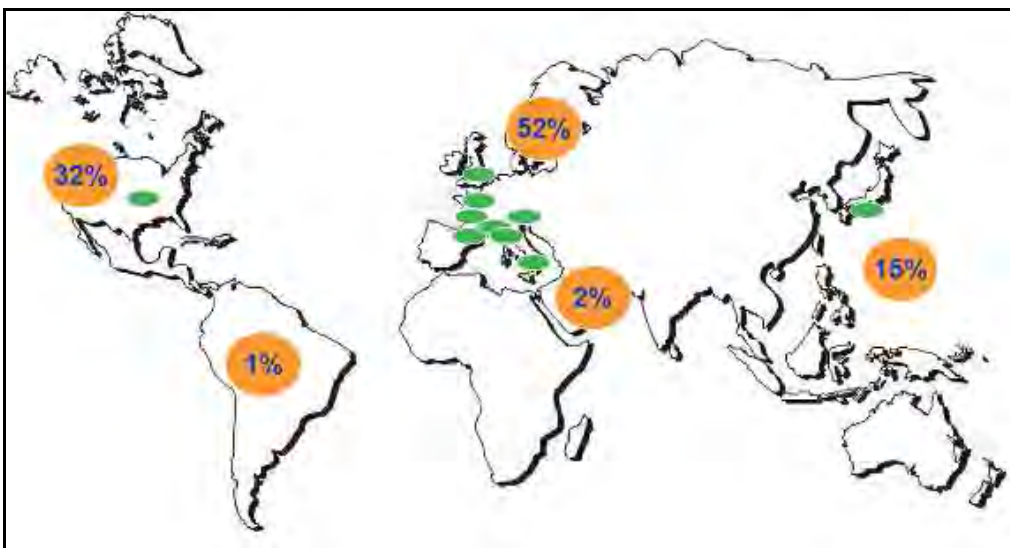
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Appendix 1: Overview of Horticulture in KwaZulu-Natal

Brief International Context

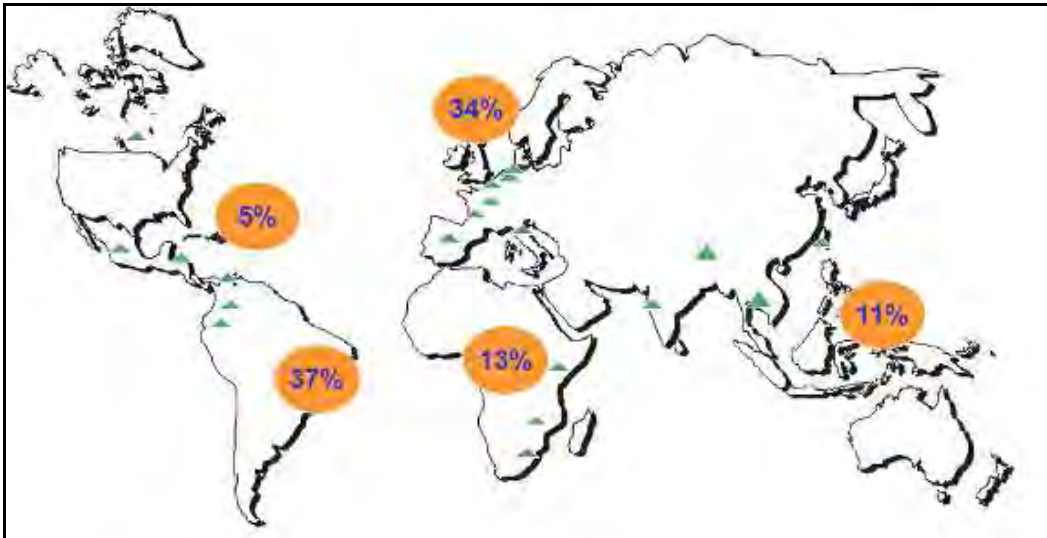
Horticulture is a growing sector that provides opportunities for diversifying and reducing reliance on traditional commodity sectors. Internationally the sector has changed rapidly over the past two decades. Globalisation has been at the heart of these changes. What used to be disparate markets in various countries has effectively become a global market with an ever more defined pattern of supplier nations and consuming nations. This is consistent with the well established trend of developed countries becoming more service and knowledge intensive economies. High incomes and the drive towards healthier living has created a large demand for horticulture products. This demand has necessitated the importation of producers from other parts of the world. As a result, developing countries supply at least 20% of developing countries' fresh produce, from a base of almost zero in 1983 (Kaiser , 2003). The Diagrams below illustrate the global supply / consumption situation in a particular sub sector.

Graphic A2.2 Flower Importers (2003)



Dubai Flower Centre (2003)

Graphic 2.3 Flower Exporters (2003)



Dubai Flower Centre (2003)

This situation has been enabled by falling transport costs and rapid improvements in transport technologies as products were increased traded over long distance.

Other key changes include:

- Significant growth of Asian Markets. As growth has stabilised in European Union (EU) countries and in North America, growth has picked up in Asian countries such as India and China. This has been fuelled by changing consumer tastes of the growing middle class in these countries (Cook, 2007).
- In season products have become a thing of the past. Consumers want variety and want it all year round.
- Environmentally consciousness – consumers have become more environmentally conscious. This influences the type of product and the transport method, e.g., air freighting products has been questioned by many environmental lobby groups as it is seen as having a significant carbon footprint.
- Growth of direct sales. Retailers have been increasingly sourcing directly from producers in an effort to reduce costs. The multitude of intermediaries common in many supply chains is decreasing. This has led to the diminishing role for wholesalers and fresh produce markets as the “middle man” leads to double handling and higher costs (NAMC, 2007).

This growth should be seen as good for developing countries as it offers a number of advantages for countries such as South Africa. Firstly, it is a labour intensive sector and has a potential to support many semi-skilled people. Secondly, it has a number of linkages with non-farm sectors creating high multiplier effects (Ali & Abedullah, 2002). Furthermore, horticulture farms have proved to be profitable business for producers in many developing countries, at times being twice as profitable as traditional agricultural commodities (Weinberger & Lumpkin, 2005).

Perhaps this may explain why the area under horticulture increased substantially and output has increased from 45 million tons to 1,379 million tons (an increase of more than 170%) between 1970 and 2004 (Weinberger & Lumpkin, 2005). The growth of the sector is contained in a report by Weingerger and Lumpkin (2005) aptly titled 'Horticulture for Poverty Alleviation - The *Unfunded Revolution* to capture the socio-economic impact of the sector's growth'. It is one of the world's fastest growing tradable sectors (Labsate, 2005).

International Demand for horticulture products has been growing steadily over the past 3 decades. Thus, the sector has created many jobs and earned significant export earnings for a number of developing countries, especially in East Africa and South America.

It is important to assess whether this generally positive growth story needs to be viewed with caution in some regions attempting to enter the markets due to value chain constraints such as logistics. Whether the optimism is well placed or not depends on the structure of the sector in these emerging producer nations and whether appropriate steps are taken to address these value chain constraints. KZN's case is assessed below.

Overview of Horticulture in KwaZulu-Natal

Just as the international market has changed in the past two decades or so, the local market has also changed quite considerably. Firstly, local retailers have improved their product offering. Top retailers now offer higher quality and diverse product. This trend obviously benefits from better logistics services. Secondly, the traditional Fresh Produce Markets have experienced a decline as supermarkets and retailers have increased their share of horticulture products (NAMC, 2005). This means that the logistics system has also changed in tandem.

Theoretically KZN is well placed to take advantage of this. However, in examining the sector in KZN, it is found that it is a relatively small sector in compared to other agriculture sub sectors in the province. With the overall agriculture sector contributing a total of R6.5 billion to the province's GDP, horticulture makes up only 11% of the agriculture sector (KZN Department of Agriculture, 2006). KwaZulu-Natal is largely developed in traditional commodities such as sugar which are the biggest contributors to overall agricultural output of the province. However, the contribution of horticulture is growing. (KZN Department of Agriculture, 2006).

It is important to grow this segment especially when one considers that KZN has an unemployment rate of 19% (Statistics South Africa, Labour Force Survey . The low skills base of the province also make this an important sector in KwaZulu-Natal as it can absorb many unskilled and semi-skilled people, especially in rural areas with limited economic opportunities.

The importance of agriculture for the province can be seen in that in 2007, KZN had the second highest number of people (66 685) employed full time in the formal agriculture and the second highest expenditure (R968 million) on salaries in the sector (Statistics South Africa, Census on Commercial Agriculture, 2007). Its importance remains even in light of efforts to promote other sectors with higher skills requirements. Thus, horticulture growth is important in light of the challenges of unemployment and a low skills base.

What makes it even more attractive is that KwaZulu-Natal is regarded as possessing natural attributes that make it supportive to the development of horticulture and other agricultural sub sectors. This is due to the following factors:

- A relatively high rainfall ranging from averages of 600mm to > 1100mm.
- Diverse bio-resource regions with diverse soils, vegetation and bio diversity
- A range of micro climatic zones that include cold regions, cool regions, warm subtropical, cool subtropical and warm.

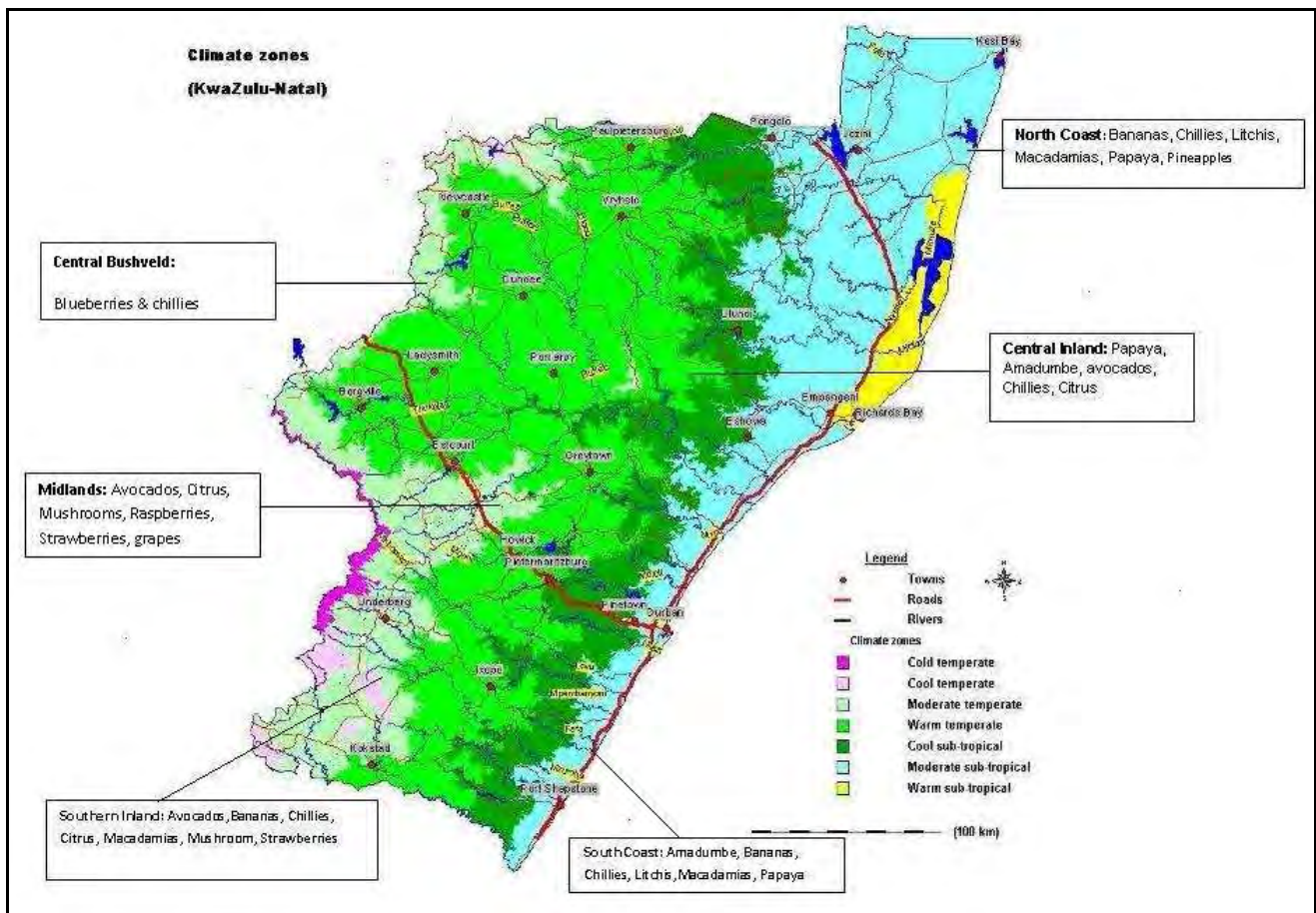
These factors give KwaZulu-Natal a natural comparative advantage over many other horticulture producing regions in South Africa and in other parts of the world. Thus, it is not surprising that the horticulture sector is regarded as a key sector in the province.

It makes an estimated contribution of R614 million per annum to the Provincial Gross Geographic Product (KZN Department of Agriculture, 2006). The biggest product cluster in horticulture is vegetables (generating R280 million or 46%), followed by subtropical fruits (generating R155 million or 25%) and citrus

(generating R98 million or 16%). Cut Flowers is another important category. Products that are grown at a smaller scale include some berries and some herbs.

Production is distributed throughout the province with different product clusters concentrated in different regions. Citrus production is mainly concentrated in the Northern part of the province in the Nkwalini Valley and in the South Eastern region in the Richmond area. Subtropical crops are produced mainly along the coastal areas. The North Coast area produces one of the province's biggest export crops i.e. pineapples. Vegetables are produced throughout the province. The main vegetable crops include lettuce, tomatoes, cucumbers and peppers. The map below shows the various climate zones of the province and where some of the crops are grown and could be grown.

Graphic a2.4 Map Showing Climate Zones and Suitable Products



Department of Agriculture, 2007

Production is mainly in the hands of a multitude of individual growers. There are few large horticultural production companies operating in KwaZulu-Natal. This is more prevalent in vegetables than in other horticulture product groupings (Van der Larsee , 2008). Citrus and deciduous fruit productions tend to lend themselves to bigger farming units, when compared to vegetables. This is because citrus and deciduous farms tend to require relatively big tracts of land for production in order to meet economies of scale (KZN Department of Agriculture, 2006).

Key Trends influencing the development of the sector:

- Land Reform - huge tracts of land are under land claims. Affected farmers are hesitant to invest while facing an uncertain future. Furthermore, support for Land Reform beneficiaries has been relatively low, as will be shown later.

- Changing local market - as explained above, the local market is constantly evolving as the economy changes and more choices are offered to locals.
- Institutional Failure - this could be perceived or real. The key agencies / organisations tasked with developing the agribusiness sector in the province are viewed as failing. These include the National Land Bank which has been involved in controversies over some non agricultural projects and has become insolvent and the provincial Department of Agriculture which has been adversely affected by leadership changes and capacity shortages which have hamstrung its ability to deliver and the provincial Development Bank, Ithala, which has funded many failed ventures in the province (off the record views of some people in Grower Associations). These trends have indirect and direct implications for the study. These will come out in different parts of the document, particularly in the chapter dealing with research findings.

2.3 Logistics Chains in the Horticulture Sector in KZN

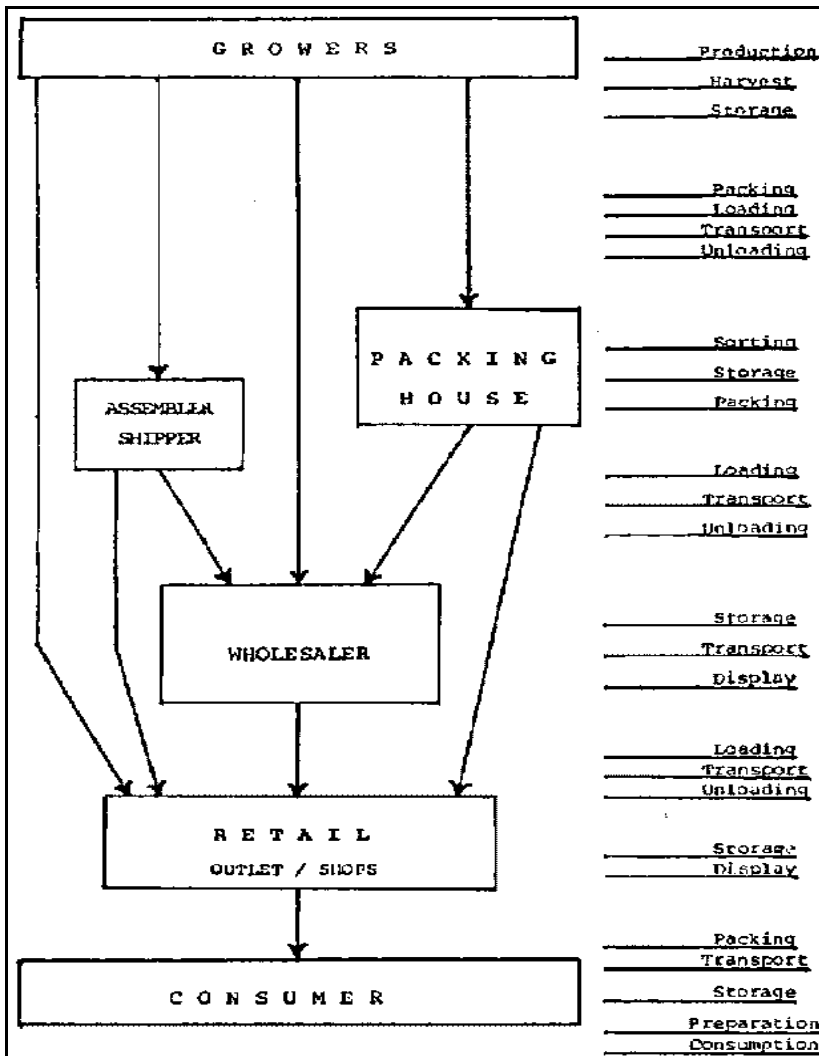
The products mentioned above are transported in various ways throughout the province and beyond. While different products have different logistics chains, as each product has its own requirements, there are common features of horticulture logistics chains. Firstly, the following are the key players in the chain. The main participants are listed below:

- Producers / growers - These may be big or small. They may own vehicles for transporting produce and have their own logistics officials / staff. KZN has few big production companies such as Hans Merensky Holdings
- Marketing agents / “middleman” – these are companies which link growers to their markets. There are few small operators in KZN. For local markets, these people largely act through Fresh Produce Markets such as Pietermaritzburg and Durban, which is the biggest in the Province.
- Wholesalers / retailers – this represents the buying end of the chain. They may collect produce at their distribution centres or use Third Part Service Providers (3PLs). Some of these have distribution centres where their products are sent for onward distribution (e.g. Spar).

- Logistics companies / freight forwarders / transportation companies - these are companies that actually carry out most logistics processes. Normally, these companies own / lease appropriate vehicles and equipment to carry goods.
- Regulatory Agencies – These include Customs & Excise, inspection at points of exit / entry. The Perishables Export Control Board approves all export shipments. The agency has inspection officers at ports and also visits farms throughout the province whenever requested by farmers.

Producers have different logistics arrangements with other participants in the chain. Examples of these are shown below. The starting point of the logistics chain is at the farm where a grower has to move products to the next part of the chain.¹ chain. This could be a pack house, a freight forwarder or wholesaler or to a retail outlet². This is done in a number of ways. Some producers outsource logistics functions to logistics firms and freight forwarding firms. These are normally companies without the capital / willingness to invest in logistics infrastructure and equipment. Other companies invest in the infrastructure and equipment needed for logistics operations and thus use their own vehicles, employees, etc to handle the logistics functions. Some of these companies have logistics divisions.

Graphic a2.5 Typical Logistics Chains



Obtained from interviews with Producers & Logistics Companies

This shows the actors and activities in the chain which differ from case to case. The design of the logistics chain depends on a number of factors. Key among these are the following:

- Size of producer
- Product type
- Requirements of buyers
- Handling and Transportation requirements of Products
- Marketing Channel being used (Retail / wholesale / direct marketing)
- Quantity of produce

What is shown above is a simplistic activity flow diagram structure that does not tell us about the drivers of the system. With globalisation, increasing competition, changing technologies and changing consumer demands and the need for consistent supply, logistics systems are nothing but simple.

Changing market power is also making the system change. It cannot be over emphasised that the design of the system is often an expression of market power. Retailers generally have strong power (as buyers) of producers. They wield their power to determine what they want, how they want it and when they want it. These are obviously designed to be favourable to the procurement / supply chain managers working for retailers. On the other end, producers often have to respond to the requirements (and demands) of retailers or buyers. For instance, retailers / wholesalers have preferred logistics partners and producers are required to use these. This is despite the fact that there might be better service providers (in cost and quality of service) for the producer. These requirements also add to the complexity of the chain for producers, as they might have different clients with different needs. Other players are also influenced by this dynamic.

Retailer choices may also be related to their structure (e.g) whether they are vertically integrated or not. They are also influenced by the number of sourcing destinations and the produce they source from these destinations. The consolidation of retailers has also meant that there is a lot more uniformity on the buyer side of the chain. A lot of processes have been standardised by the consolidated retailers.

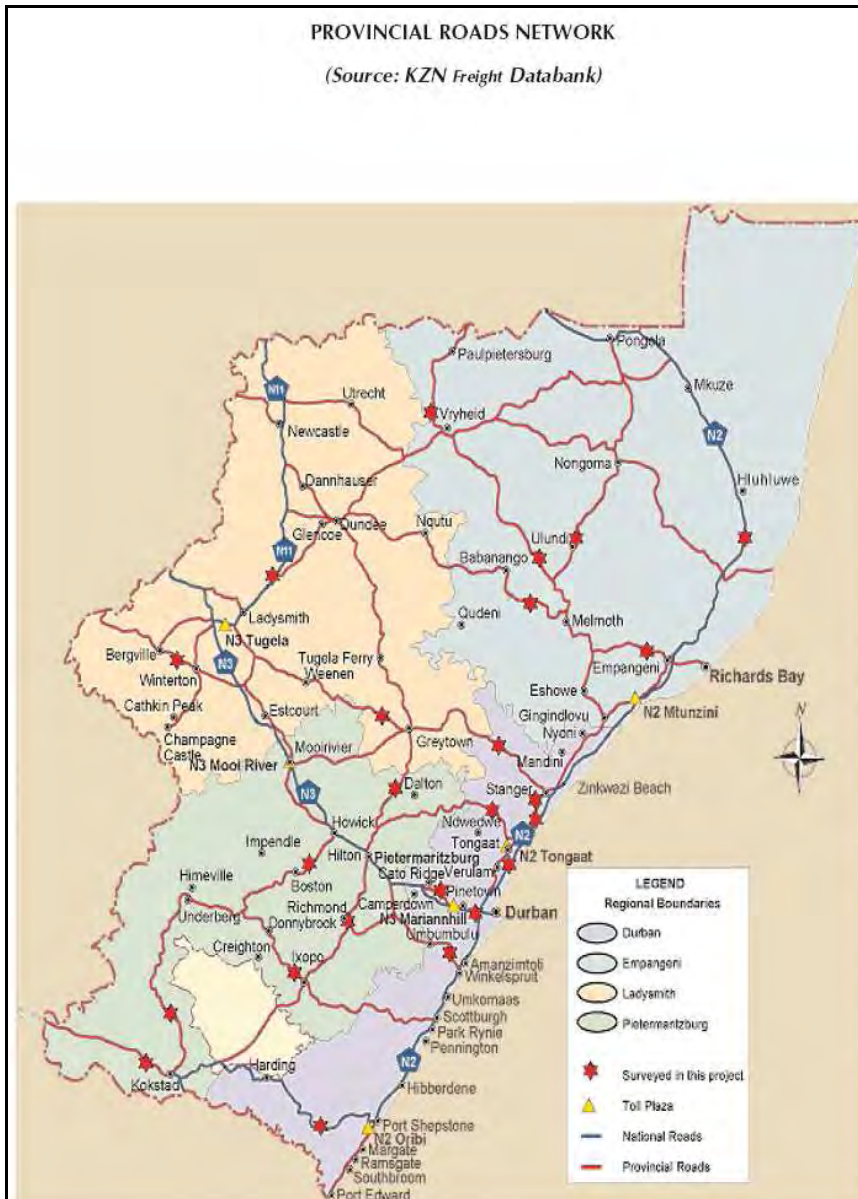
Appendix 2 - Logistics Infrastructure and System in KZN

Logistics Infrastructure

Roads

KwaZulu Natal is well served by a hierarchy of roads. The most relevant for freight is the N2 and the N3. The N3 freeway to Johannesburg handles the bulk of freight from and to the province. It has been estimated that it carries more than 40% of road freight in South Africa, making it the biggest cargo transport corridor in the country (NDOT, 2006)

Graphic a2.6 KZN Roads Network



KZN Freight Databank, 2006

While it is generally recognised that the road network is fairly adequate, some challenges remain. These are captured in the National Freight Logistics Strategy (NDOT, 2006) which identifies the following:

- National roads are generally better than provincial roads
- Roads being used for unsuitable vehicles to avoid paying toll fees.
- Inadequate maintenance

The challenges outlined above are also prevalent in KwaZulu Natal. Some of these may have to do with the fact that the road freight transport sector is deregulated. The sector is only regulated through applications for permits and various regulations (e.g. relating to loads). However, the enforcement of these regulations is weak (NDOT, 2006). The fact that it is a deregulated industry and the relatively low barriers to entry have resulted in the existence of many operators ranging from micro enterprises to big operations with sizeable fleets. Further to this, 30% of vehicles are overloaded putting significant strain on the road infrastructure (Van Dyk, 2005). Further to this, 30% of vehicles are overloaded putting significant strain on the road infrastructure (Van Dyk, 2005). There are big differences in service levels as well. How these issues affect logistics costs, if at all, will be addressed through looking at the main drivers of logistics costs for horticulture producers.

Rail

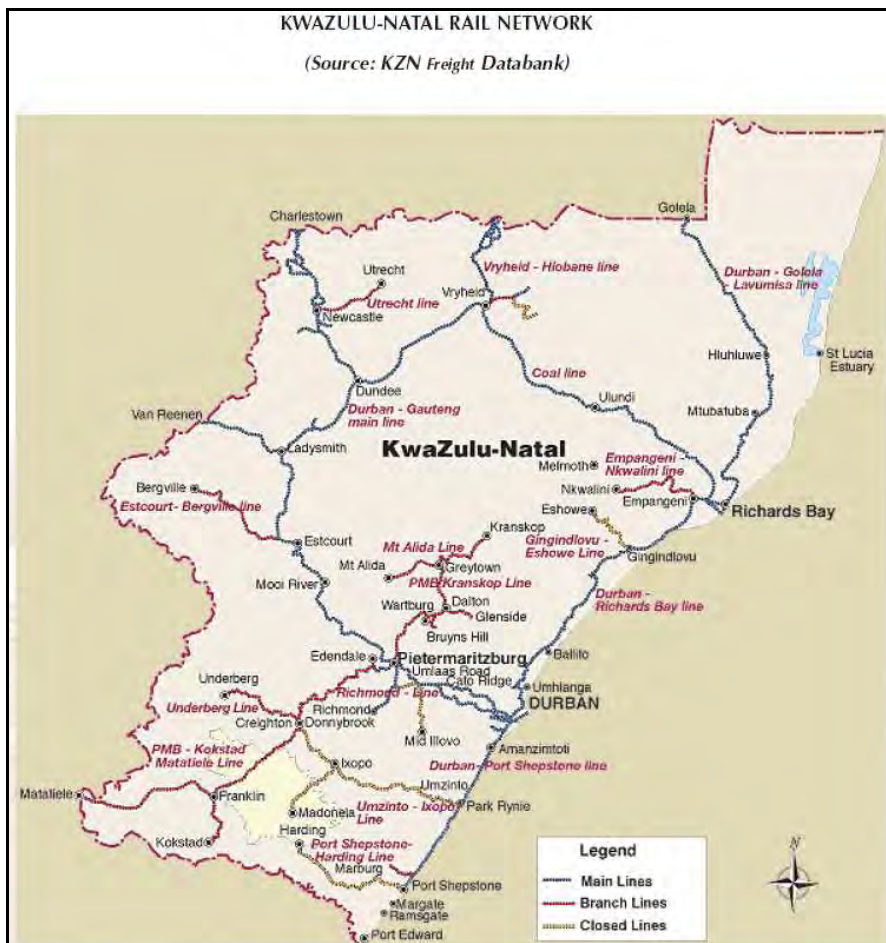
KwaZulu Natal has a rail network that connects it to the rest of the country. The Durban to Johannesburg line is perhaps one of the most important. It passes by a number of other key urban centres in the province. It is performing at least 40% below capacity (Siyazama, 2007).

Another key rail line runs between Richards Bay and Mpumalanga, Witbank for Coal exports. This line is said to be operating at 85% of its capacity (Siyazama, 2007).

A number of other smaller lines are underutilized. These include branch lines. These have suffered the same fate as other rail lines in the country i.e. years of neglect and investment. This has led to more products moving from rail to road, noteworthy trend for KwaZulu Natal.

Rail has significant challenges relating to underinvestment in rolling stock and infrastructure. It cannot meet the needs of 20% of its customers (Van Dyk, 2005). As a result a lot of cargo that would normally move by rail has migrated to road.

Graphic a2.7 KZN Rail Network



KZN Freight Databank, 2006

A key point to highlight regarding the rail network is its institutional environment. The sector is dominated by one player, Transnet Rail (formerly Spoornet) in all key areas i.e. infrastructure provision, infrastructure maintenance and operations. Rail's importance has declined over the years as road has eroded into its market share (NDOT, 2004).

Airports

KZN is served by a number of small domestic airports. The main airport is Durban International Airport which has a few international connections to neighbouring states. The airport largely handles domestic traffic and is a feeder to the country's main hub airport i.e. Oliver Reginald Tambo International Airport (ORTIA).

DIA has no capacity to handle a range of Fast Moving Consumer Goods including fresh produce. As a result local producers using airfreight have to incur extra costs of moving products by road to ORTIA. DIA will be replaced by a new International Airport in La Mercy in 2010. The new airport has been conceptualised as an international airport with more international connections and will be designed for both passengers and cargo. At approximately 16 000 tons per annum, DIA has low cargo volumes but is growing quite rapidly in passenger numbers and currently handles 3,7million passengers per year (Airports Company of South Africa, 2008).

The main commercial airport in the province is owned and operated by the Airports Company of South Africa which owns and operates all major airports in the country. Economic Regulation is provided by the Airports Regulator who has jurisdiction over the setting of issues such as landing and take-off fees, airport taxes and rental fees.

Sea Ports

Two major ports serve KwaZulu Natal i.e. Durban and Richards Bay. Richards Bay is a bulk cargo port handling a range of products such as coal, steel, chrome ore and ferrochrome. It is the biggest bulk port on the continent. Durban is a container and break bulk port, handling close to 2 million Twenty Foot Equivalents (TEUs) per year making it the biggest in Sub Saharan Africa (Transnet, 2008). It handles approximately 65% of South Africa's container traffic (Business Report, 26 July 2007). The Port of Durban is currently going through capacity expansions. The entrance channel is being widened and the berths are being deepened and widened in order to enable the port to accommodate bigger ships (Transnet, 2008).

The institutional environment for sea ports is different from roads, rail and airports. Infrastructure and operations are separated falling into the hands of Transnet National Ports Authority (formerly National Ports Authority) and Transnet Port Terminals (formerly South African Ports Operations) respectively. A ports regulator has recently been established to provide economic regulation for the ports.

Private sector facilities

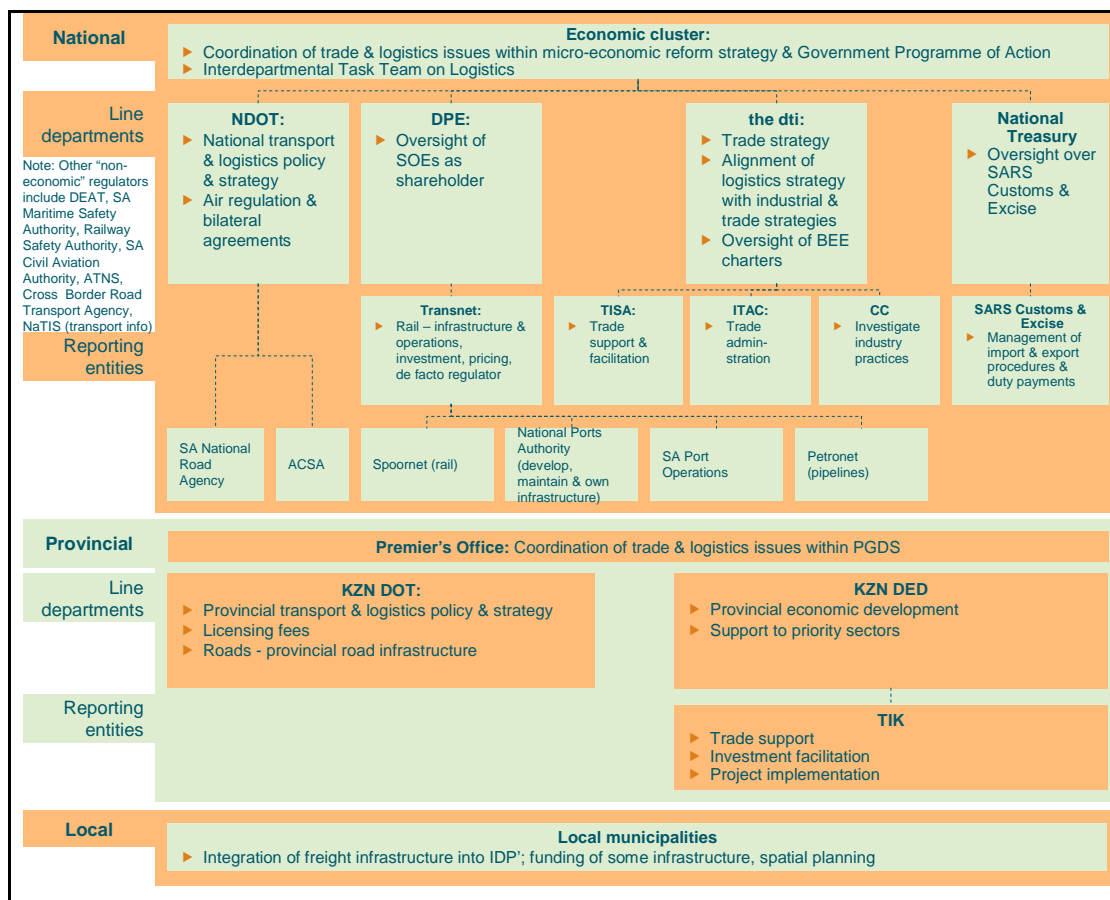
In addition to the above government owned and operated infrastructure, the private sector provides many facilities for performing logistics functions. These include:

- Packhouses – These are largely based on farms of large producers. There are few that are in central locations drawing produce from various producers.
- Warehouses – these are mostly found in urban centres of the province particularly around the two seaports.
- Cold Storage Areas – These are largely found in Durban around the port and are designed to handle produce that require cold storage to maintain their quality and increase shelf life.
- Terminals – One of the main terminals in the Port of Durban (Fresh Produce Terminals) is privately owned. While it is owned by a company that is involved in fruit production, Capespan, it is a multi-user facility mainly handling fruit from different parts of the country.

Regulatory Institutions

Players in the Logistics Industry are regulated by a number of regulatory agencies. The different players of the system are shown below.

Graphic a2.8 Key Stakeholders in the Logistics Sector



Kaiser Associates, 2006

Although there are a number of regulatory agencies, policy makers and government stakeholders, the main operators i.e. logistics providers in the country are largely unregulated. In effect, there are no major *formal* regulatory barriers to entry. Theoretically this should create a competitive market. However, there is indirect regulation. For instance, Transnet Ports can only give port access to companies that meet certain requirements (e.g. quality of vehicle). Compliance with these is costly, meaning that it is predisposed towards bigger firms.

Furthermore, there is generic cross cutting regulation that affects the sector. This relates to labour laws, transport laws, company law, etc. Thus, the regulatory environment may look small, but it is actually significant. However, it is not impermeable. This can be demonstrated by the presence of hundreds of operators in freight forwarding, 3PLs, and warehousing companies.

Logistics Service Providers

Logistics providers in the province can be classified as follows:

- Specialised - e.g. by type of goods, by type of services (e.g. handling hazardous or perishables cargo)
- General – companies that offer a range of services to a range of clients. These range from small to big multinational firms.