THE ROLE OF TRANSPORTATION IN BUSINESS LOGISTICS MANAGEMENT IN NIGERIA

(A CASE STUDY OF NIGERIAN TOBACCO COMPANY PLC)

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ZARIA

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DIGITIZED

DECLARATION

I hereby declare that this dissertation is written by me and it is the product of my own research work. To the best of my knowledge, it has never been produced for a higher degree. However, I have relied on other sources which have been distinguished by way of quotation marks and also specifically acknowledged by means of references.

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CERTIFICATION

This thesis entitled "The role of transportation in Business Logistics Management in Nigeria. (A case study of Nigerian Tobacco Company Plc) by **BONAT, D. B. (G 93 BA 7026)** meets the regulations governing the award of a Master of Business Administration of Ahmadu Bello University, Zaria and is approved for its contribution to knowledge and literary presentation.

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DEDICATION

This work is dedicated to the memory of my Late Father, **MALLAM BONAT CHRISTOPHER BAMAI** for laying a good educational foundation for me. May his gentle soul rest in perfect peace. Amen.

APPROVAL SHEET

This project has been read and approved as having fulfilled the partial requirements for the award of the Degree of Master's of Business Administration (MBA) of the Ahmadu Bello University, Zaria.

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ABSTRACT

The thesis examines the role of transportation in business logistics Management in Nigeria, with special emphasis on the Nigerian Tobacco Company PLC (NTC) Zaria. The result of the study is presented in five Chapters.

Chapter one gives an insight into the necessary of Business Logistics Management (BLM),the impact of transportation on the economy and went on to state the problem that necessitated the study, its scope and limitation. The research methodology and the definition of technical terms is also treated.

Chapter two reviewed related literature in which the historical development of NTC PLC is discussed. The functional areas of the Company, its importance, tobacco farming and its handling process, business logistics activities organisational structure among others are discussed.

Analysis of Data and Information is done in chapter four. Trade-off, Total Cost Concept, Location of facilities, Multimodal transportation and Carrier selection decision are covered.

Finally, findings are enumerated and discussed in chapter five, some of they are; Nigerian firms (NTC) embraces the trade-off concept, accepts and practice the total cost concept, transportation no longer determines the location of manufacturing facilities, it however, does on finished products, the Company embraces multi-modalism. Relevant recommendations for improvement are proffered and summary and conclusion drawn.

The general conclusion of the study is that Nigerian firms (NTC) have embraced BLM as a Management tool with transportation as the focal point.

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LIST OF ABBREVIATIONS

B.A.T.C	-	British-American Tobacco Company
B.O.D	-	Board of Directors
B.L.M	-	Business Logistics Management
C.C.D	-	Custom Check Desk
C.L.M	-	Council for Logistics Management
C.M.D	-	Cigarettes Manufacturing Department
C.P.D	-	Cigarettes Packing Department
C.R.S	-	Classified Store Room
C.T.S	-	Cut Tobacco Store
E.O.R	-	Export Operation Room
E.S.O.P	-	Employee Ownwership Plans
F.C	-	Fixed Cost
F.O.B	-	Free on Board
G.L.D	-	Green Leaf Department
GLTP	-	Green Leaf Threshing Plant
L.B.O	-	Leverage Buy Outs
L.T.C	-	Logistics Total Cost
L.W.H	-	Leaf Ware House
M.M	-	Materials Management
NTC-PLC	-	Nigerian Tobacco Company-Public Liability Corporation
P.D.M	-	Physical Distribution Management
PSR	-	Park Store Room

PMD	-	Primary Manufacturing Department
R & D	-	Research and Development
RORO	-	Roll On - Roll Off
SAP	-	Structural Adjustment Programme

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CHAPTER ONE

INTRODUCTION

1. **GENERAL INTRODUCTION:**

'Transportation is one of the tools that civilised societies need to bring order out of chaos'

- Coyle, Bardi & Cavinato.

As far back as man can recall, the goods that he wanted were not produced where he wanted to consume them or they were not available at the time he desired to consume them. Food and other commodities were widely dispersed over the land and were in abundance only at certain times of the year. Early man had the option of consuming goods at their location where they were available or of moving them to a more preferred location and storing them for later use. Because of lack of well developed transportation system, the movement of goods was limited to what he could personally move. This limited movement system generally constrained him to live close to the sources of production and to consume a rather narrow range of goods. Even today, we still have examples of production and consumption taking place only within a very limited geographical area. More than 70% of Nigerians' population live in small, self-sufficient villages and most of the manufactured goods needed by the people are produced in the cities. So very few essential goods are imported into these areas. Consequently, production efficiency and standard of living are generally low. A major reason for this is the

Logistics activities, of which transportation is one, provides the bridge between the production activities and the markets that are specially and temporarily separated. The logistics activities of the firm involves transportation, inventory control, ware-housing, packaging, materials handling, product scheduling, and facility location. Generally therefore, the area of business logistics has to do with the "physical movement of goods from supply points to the final customers and the associated transfer and holding of such goods at various intermediate storage points, accomplished in such manner as to contribute to the explicit goals of the organisation" (Coyle and Bardi 1990).

As said earlier, transportation reaches to every sphere and facet of our existence. Viewed in historical, economic, environmental, social and political terms, it is "unquestionably the most important industry in the world" (Coyle et al 1990). Without transportation we cannot operate a tobacco shop talkless of a company or wage a war. The more complex life becomes, the more indispensable are the elements of transportation systems.

So transportation as a service could be viewed as the creation of place and time utility. When goods are moved to places where they have higher value they are said to have time utility. Place and time utilities are provided to passengers when they are moved from where they do not want to be, to places where they do want to be and at the demanded time.

lack of well developed and inexpensive logistics system that would encourage the exchange of goods with other producing areas of the country. Transportation as a component of the system was the worst culprit.

In Nigeria today logistics systems are gradually improving and consumption and production points are being further separated geographically. The role of transportation in this expansion has become paramount. Areas now specialise in those commodities which they can produce most efficiently. Excess production is economically moved to other areas. Needed goods not produced are imported. For instance, beans, cattle and other agricultural products produced in the northern part of this country are consumed in large quantities in other parts of the country. In the same manner, palm oil, plantain, fish and products produced in the Southern part of the country are consumed in other parts. Goods imported through the coastal city ports are found in almost all parts of the country. As we can see, an efficient and effective logistics system permits the specialisation of labour, geographically separate production from consumption and encourages competition in distant markets. Clearly, logistics management has a profound effect on the economic structure of a country such as Nigeria.

To the individual company (like NTC) operating in our economy, logistics activities are even international in scope, while production may be concentrated at only a few areas.

KASHIM IBRAHIM

Transportation in the most simplest terms involved the movement of people and goods from one location to another. That is, transportation, as said earlier, gives rise to the creation of place and time utility. The essence of these utilities is that transportation is an activity that should make goods available where and when they are needed. Goods should arrive where and when they are expected. In other words, transportation brings together resources (raw-materials) for manufacturing of products and provides access to marketing.

It is sometimes difficult to understand the nature of transportation because it is a service and not a physical, tangible product. As a service to the user, individual or organisation, it has the following characteristics:

(1) Speed, reliability, frequency;

(2) Equipment used as it affects comfort and safety, for freight, equipment affects shipment preparation, the size of the shipment and loading and unloading costs;

(3) Cost of the transportation service.

1.1 IMPORTANCE OF TRANSPORTATION:

The role of transportation could be viewed from different perspectives.

1.1.1 HISTORICAL IMPORTANCE:

The importance of transportation becomes more apparent when one understands its history making role. The growth of

civilisations is directly associated with the development of transportation systems. In Nigeria, the British and the Portuguese explorers first established contact with the coastal towns of Lagos, Calabar, Port-Harcourt, Warri among others. These cities are landmarks in Nigerian history since all of them are linked by all modes of transportation. The history of Nigeria would never be complete without mentioning Lagos and Calabar.

1.1.2 ECONOMIC IMPORTANCE:

Transportation systems have great impacts upon population patterns and economic development. That is why it does not take much imagination to understand why transportation is sometimes referred to as the life line of cities, These towns such as Lagos, Kano, Ibadan, Port-Harcourt, Uyo, Jos, Kaduna, just to mention a few, are serviced by thousands of vehicles either by land, sea or air, all moving people and goods from one point to another thereby enhancing economic activities. Furthermore, transportation helps determine the economic value of products. Efficient highway systems and modern modes of transportation allow geographical specialisation, large scale production, increased competition and increase land values.

1.1.3 ENVIRONMENTAL IMPACT:

Although transportation provides the economy with numerous benefits, these positive aspects are not without associated costs. Transport sometimes pollutes the environment and exploit natural resources, although most

citizens feel that the benefits provided by transportation far exceeds these costs. The environmental challenges of the future shall be to accurately assess the relationship between industrial benefits and their external societal costs.

Other environmental effects of concern to transportation are its consumption of scarce resources. It is estimated that 53% of refined petroleum is used in the transportation of passengers or goods. Cavinato et al, 1990.

1.1.4 SOCIAL IMPORTANCE:

Transportation provides employment and enhances travel. A good transportation system can also enhance the health and welfare of a population. Lack of proper transportation system hinders the effective movement of needed food and farm supplies; especially from the rural areas for the urban-centres. A good transportation system enhances in bound and outbound product flows.

1.1.5 POLITICAL IMPORTANCE:

The origin and maintenance of transportation systems depends on the government. Government intervention is needed to design feasible routes to cover the cost of building public highways, Airports, seaports and Waterways. Adequate transportation is needed to foster national unity. The transportation system of a nation must permit government officials and company executives alike, to travel rapidly so that they can supervise and see to the progress of their organisation.

It is in recognition of the importance of transportation that, Bill, Blackledge and Bowen (1983) concluded that "Transportation is a necessary concomitant of the exchange economy and is indispensable to economic growth. Where there is no transportation economic activity is restricted to hand-to-mouth subsistence levels."

1.2 OBJECTIVE OF THE STUDY:

In modern business a manufacturing company without a properly integrated logistics management system would be curting disaster, because it is an emerging concept in business management. It is in realisation of this that the research sought to establish the following:

i) How Nigerian firms (NTC) use transportation for trade-off in logistics activity.

ii) Whether Nigerian firms (NTC in particular) use the total cost concept.

iii) Role of transportation in the location of company facilities.

iv) Mode selection procedure.

v) The problems of transportation management in business logistics.

vi) Look into other relevant areas of transportation that have direct bearing on business logistics management.

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1.3 STATEMENT OF THE PROBLEM:

In a free enterprise economy like ours it is (supposed to be) the responsibility of business to provide logistical services such as transportation. Since firms have been able to produce and make available, their goods and services to the consumer via the market place through transportation, it could be said that business has met this responsibility with a remarkable degree of efficiency and effectiveness. Business today must continue with providing these services as an essential part of providing customers with the goods and services they desire. However, management thinking has always focused on managing and coordinating all logistical activities collectively. Transportation, which all logisticians and authors agree is the most important part of this activity is to be given adequate and separate focus in this research.

It is very common to find a lot of research work that has been done in the areas of inventory management and physical distribution without much on transportation. It is the desire to fill this vacuum that led to the examination of the role of transportation in Business logistics management in Nigeria, moreso that the field of business logistics it self is relatively new.

1.4 SIGNIFICANCE OF THE STUDY:

The significance of this research is to contribute to the upliftment of the role of transportation in business logistics management in particular and the development of an integrated

business logistics management system in Nigeria. And by no means to contribute to knowledge and advancement.

1.5 SCOPE OF THE STUDY:

Business Logistics Management (BLM) is as wide as the area of management itself. As we said in the general introduction. BLM consist of several components. Since it is not practically feasible to research into the entire components of BLM, the study is limited to only one component which is, transportation. The study shall examine only the role of transportation in BLM.

1.6 RESEARCH METHODOLOGY:

In order to confirm the question put forward, the information for the research was identified and collected by means of primary and secondary data sources.

The major mode of collection was through personal interviews. Initially, it started with a questionnaire but it was realised that most of the respondence preferred discussion to completion of questionnaire. This was probably due to the calibre of respondents, who were made up of top management staff, mostly from the marketing and production departments. They were consciously selected based on their experience and positions in the company. This approach was favoured because it was believed that only policy makers and top implementors of decisions could give the kind of information needed.

Unstructured interview was used based on a proforma to elicit the information needed (Appendix I). This was found to

be flexible and it allowed respondents to express their views freely. It also allowed for a close observation of what was said and how it was said. The instrument was also found useful in probing for further information which could not have been possible with another method. It made respondents to give maximum attention because they got motivated as the interview progressed. All in all, the survey instrument was found to be quite rewarding.

Another source of information included official handbooks, journals, magazines and newspapers. The data gathered has been collected synthesised and presented by way of statements, tables, figures and graphs where possible.

1.7 **LIMITATIONS:**

Despite the merits of the instrument mentioned above, some problems were encountered during the research. The technique was found to be time consuming. Also, Nigeria Tobacco Company (NTC) has a policy of giving limited information in order to guard against the actions of competitors. Infact, some questions that bordered on costs and price determination were out-rightly sidelined. The researcher had to resort to backdoor tactics to get the denied information.

However, personal weakness associated with the technique like, personal biases, values and beliefs were controlled as much as possible, when collecting the data.

1.8 **DEFINITION OF TECHNICAL TERMS:**

Artificial Intelligence- Understand and computerising the human thought process.

Average Cost (AC) - Total cost, fixed plus variable cost, divided by total output.

Basing-Point Pricing- A pricing system that includes a transportation cost from a particular city or town in a zone or region even though the shipment does not originate at the basing point.

Business Logistics - The process of planning, implementing, and controlling the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements.

Consignee - The receiver of a freight shipment, usually the buyer.

Consignor - The sender of a freight shipment, usually the seller.

Contract Carrier - A fore-hire carrier that does not serve the general public but serves shippers with whom the carrier has a continuing contract.

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Conveyor - A material handling device that moves freight from one warehouse area to another.

Cost Trade -Off - The Inter-relationship among system variables which indicates that a change in the variable affects other variables' costs. A cost reduction in one variable may increase costs for other variables and vice versa.

Exempt Carrier - A for-hire carrier that is exempt from economic regulations.

Finished Goods Inventory-The product completely manufactured, packaged, stored and ready for distribution.

Fixed Costs - Costs that do not fluctuate with the business volume in the short run.

For-hire Carrier- A carrier that provides transportation services to the public at a fee.

Forklift Truck - A machine powered device used to raise and lower freight and to move freight to different warehouse locations.

Form Utility - The value the production process creates in a good by changing the item's form.

Inventory - The number of units and/or value of the stock of goods a company holds.

Inventory Management- Inventory administration through planning, stock positioning, monitoring product age, and ensuring product availability.

Just-in-time Inventory System- Is an inventory control system that attempts to reduce levels by coordinating demand and supply to the point where the desired item arrives just in time for use.

Link - The transportation method a company uses to connect nodes (plants, warehouses) in a logistics system.

Locational determinant- The factors that determine a facility's location.

Logistics Channel- The network of intermediaries involved in transfer, storage, handling and communications functions that contribute to the efficient flow of goods and services.

Material Handling- Short distance movement of goods within a storage area.

Materials Management- The movement and storage functions associated with supplying goods to a firm.

Node- A fixed point in a firm's logistics system where goods come to rest; includes plants, warehouses, supply sources, and markets.

Physical Distribution- The movement and storage of finished goods from manufacturing plants to warehouses to customers, used synonymously with business logistics.

Place Utility - A value logistics creates in a product by changing the product's location.

Possession Utility - The value created by marketing's effort to increase the desire to possess a good or benefit from a service.

Private Carrier - A carrier that provides transportation service to the firm that owns or leases the vehicles and does not charge a fee.

Purchasing - The function of buying the goods and services that a firm requires.

Pure Raw-material - A raw material that does not lose weight in processing.

Strategy - A specific action to achieve an

objective.

System - A set of a interacting elements, variables, parts, or objects that are functionally related to each other and form a coherent whole.

Systems concept - A decision making strategy that emphasises overall system efficiency rather than the efficiency of each part.

Tapering rates - A rate that increases with distance but not in direct proportion to the distance the product is shipped.

Time Utility - A value created in a product by having it available at the time desired.

Total Cos Analysis - A decision making approach that considers total system cost maximisation and recognises the inter relationship among system variables. Such as transportation, warehousing, inventory, packaging and customer service.

Ubiquity - A raw material that is found at all locations.

Von Thunen's Belts - A series of concentric rings around a city to identify where

agricultural products would be produced according to Von Thunen's theory.

Warehousing - The storage (holding) of goods.

Zone Price - The constant price of a product at all geographic locations within a zone.

CHAPTER TWO

LITERATURE REVIEW

INTRODUCTION:

According to Ballou (1970) Business Logistics Management (BLM) "is the Planning, organising and controlling of all move store activities that facilitate product flow from the point of raw-material acquisition to the point of final consumption, and of the attendant information flows, for the purpose of providing a sufficient level of customer service (and associated revenues) consistent with the costs incured for overcoming the resistance of time and space in providing the service". Same Ballou in (1973) went further to quote Webster as saying that, "Business Logistics refers to products movement and storage".

Coyle and Bardi (1976) sees logistics as "the physical movement of goods from supply points to the final customers and the associated transfer and holding of such goods at various intermediate storage points, accomplished in such a manner as to contribute to the explicit goals of the organisation".

From the foregoing definitions one can easily see that the three writers are talking of movement and storage. This work is concerned with the movement aspect only.

Furthermore, Hapiro and Hesket (1985) in their seven RS definition see logistics as "ensuring the availability of the right product in the right quantity and the right condition,

at the right place at the right time, for the right customer, at the right cost.

The Council for logistics management defines logistics as "the process of Planning, implementing and controlling the efficient, effective flow and storage of raw materials, in-process inventory finished goods, services and related information from point of origin to point of consumption (including inbound, outbound, internal and external movements) for the purposes of conforming to customer requirements".

While the seven Rs definition seems to imply the essential activities of logistics, they also emphasise cost and service and the importance of meeting customer requirement. Whereas the Council for Logistics Management (CLM) definition indicates that materials (raw materials as well as semi-finished and finished goods) must be transported various distances between supply points, plants, storage areas (warehouses and markets (customers) and that the Company must arrange to hold these goods safely and in quantities sufficient to meet customer needs.

A further examination of this CLM definition will show that the focus is on two inter-related activities, movement and storage, just as we saw in Ballou (70), Webster (73) and Coyle and Bardi (1976). Movement requires the selection and use of transportation mode or modes. No wonder, then that Coyle and Bardi and Cavinato and Langley et al, agree that "selecting the best transportation alternative is often a

challenging task".

From the foregoing discussion and for the purpose of this writeup, one would deduce that business logistics is the study and management of goods and services flows and the associated information that sets these into motion. If it was practicable to produce goods and services at the point where they are to be consumed, or if people wished to live where raw materials and production are located, logistics management would be of little importance. But this is not the modern living pattern as earlier pointed out. Over-coming time and distance in moving goods or delivering services in an effective and efficient manner is the task of the logistician.

2.1 HISTORICAL DEVELOPMENT OF BUSINESS LOGISTICS

All authors agree that top management interest in logistics has been relatively recent one. Bowersox (1978) indicates that "logistics was born of a reaction to several marketing caused problems during the 1950s and early 1960s" Ballou (1978) agrees that "as recently as twenty years ago, top management had little or no interest in business logistics.

The development and growth of business logistics could be divided into four phases. 1940-1960, 1960-1970, 1970-1980, and 1980 to the present time.

2.2.1 1940 - 1960 SETTING THE STAGE

In the early 1960s, Peter Drucker, the renown author and Management consultant, identified the organisational structure

problem that helped companies to start focusing on the challenges and opportunities available in the field of logistics and distribution. Hence in 1962 he wrote:

> "We know little more today about distribution than Napoleon's contemporaries knew about the interior of Africa, We know it is there, and we know it is big and that's about all".

In the same write up Drucker argued that logistics was "a last frontier for top Management seeking Corporate efficiency". He indicated that business started" series of evolutionary steps in the 20th century". This was through the formation of logistical associations in companies. What remained was a need to solve distribution and logistics problem.

One other factor that encouraged logistics development during the period was the expertise in military logistics developed during the second world war. Evolution in industrial development and factors that increased logistics related losts in companies in the developed world.

In Nigeria at the problem of business logistics was almost non-existence because manufacturing was equally non existent, emphasis then was on importation and distribution was on a limited basis.

2.2.2 1960 -1970:- CONCEPTUALISATION AND CREDITABILITY

In the previous state, many factors increased logistics awareness; but the concept needed a theoritical basis.

According to Coyle et al, "the first step was to use total cost analysis studies to analyse landed costs and demonstrated that companies could reduce total cost in some instances by spending more money on transportation, thereby reducing costs on inventory and ware-housing. In essence, the trade-off perspective developed (note that this work would investigate the development of this perspective in Nigeria), during the era.

Another factor that developed was increased interest in customer service and also effective cost measurement for trade-off analysis. A final factor was the development in computer hardware and quantitative techniques or models for analysing logistics problems. This stage gave logistics more creditability.

In Nigeria a few manufacturing plants had started coming up. But the real need for logistics had not yet arisen.

2.2.3 **1970 - 1980:- ERA OF CHANGING PRIORITIES AND PATTERNS**

According to Bowersox, Business logistics as a field of management research and practice entering the 1970s could be described as "being in a state of semi-maturity" that is to say that the basic principles established in the previous era were beginning to yield some benefits.

A triggering event for change during this period was the oil embargo and the sudden, dramatic increase of grade oil prices by the OPEC nations, specifically in 1973. In the early stages of the energy crisis, prices increased significantly

and market growth began to slow, and inflation increased in the developed world, couple with shortage in raw-materials. All these factors combined forced companies to increase sales in selected markets and to reduced costs.

What appeared a serious problem to the developed world during this era was a blessing to Nigeria. As an OPEC member, Nigeria benefited significantly from the oil crisis. Nigeria's logistics system which was predominantly based on distributing imported products, had a first test, during the port congestion embroglio of the 1970s. Transportation management in particular, was put to test since the massively imported cement could not be evacuated when due, hence the port congestion.

2.2.4 **1980 - NEW ERA OF ECONOMIC AND TECHNICAL CHANGE**

The previous eras brought changes, adjustments, and of course, recognition of the importance of logistics.

2.2.4.1 **Globalisation of Business:-**

The globalisation of business in the 80s and 90s had a tremendous impact on the way companies operate. This globalisation runs from foreign sourcing in procurement or selective sales in international markets, to multifaceted international manufacturing and marketing strategies encompassing international production sites.

2.2.4.2 **Changing Government Infrastructure:-**

This has to do with the general deregulation of transportation. This transportation companies became like

other businesses, adjusting their prices more quickly in response to the market place and adjusting their service in terms of markets in which they wanted to operate.

2.2.4.3 **Structural Changes in Business:-**

These changes have been in form of "Mergers, Acquisitions, Leverage Buy Outs (LBO), Employee Stock Ownership Plans (ESOP), and Spin off". This goes to show that organisations, in general became leaner during the period. This organisational structuring has impacted on logistics area.

2.2.4.4 **Changing Technology:-**

Rapidly changing technology especially in the area of computer hardware and software, which are inexpensive now, in addition to logistics related hardware and software, have improved the logistics area alot. Publications in this area have greatly increased far more than what it was ten years ago, a council for logistics source said. In many instances companies advanced logistics organisations and established logistics General Manager and Directors. NTC has a marketing general manager based at their headquarters in Lagos. The department was established in the 80s.

In the 90s therefore, what Coyle et al call "level three logistics organisations" and Bowersox call them "leading edge logistics organisation" will emerge.

2.3 THE SCOPE OF BUSINESS LOGISTICS:

Companies have been carrying out logistical activities for many years. A modern view, according Ballou (1987) is to "rearrange existing activities of the firm in a more meaningful manner so that good management is more easily achieved. This means that some activities previously considered solely the responsibility of production or marketing have been regrouped. Marketing primary responsibility is revenue generation for the company. This is done through various promotional means product offerings and market research. Production on the other hand is mainly concerned with the formation of the product or service and the control of its out-going quality while minising the unit cost of formation.

Therefore since logistics, as we have seen in the introduction has the responsibility for product movement and storage, then its scope covers areas like, transportation, inventory control, order processing, ware housing and materials handling Ballou (1987).

According to Landley et al, the scope also includes, customer service levels, demands forecasting, procurement, distribution, communication, parts and service support, and salvage and scrap disposal.

What ever the content of this activity may be, Bowersox, Ballou, Shapiro and Hasket, Kelly and Lazor (1967), Mason, Ruth and Ross (1974), all agree that these activities (scope)

can be categorised into two groups namely; materials management and physical distribution. The two give rise to the field of business logistics. In a nutshell, the movement of raw-materials to the point of production is considered as materials management while the movement of finished products from company (warehouse) to customer is considered as physical distribution.

Out of the activities of Business logistics mentioned above, the following deserve some mention because they are the substances of this research.

2.3.1 **TRANSPORTATION:**

Transportation is a necessary part of the logistics system. A major focus in logistics is upon physical movement of or flow of goods or services or upon the network that moves the product. This network comprised of transportation agencies which provide the service to the company. As we shall see later in this chapter logistics area is usually responsible for selecting the mode or mode of transportation used in moving the firm's materials handling and physical distributions. At all levels of the logistical activity transportation is there because no firm can operate without providing for the movement of its raw-materials and finished products in some way. No wonder then that this research picks on it.

2.3.2 **STORAGE:**

This is an area that has a trade-off relationship with transportation. It involves two separate related activities. Inventory control and warehousing. A direct relationship exists between transportation and the number of ware houses required. For instance, if NTC uses a relatively slow means of transportation, they would have to keep higher inventory levels and would need more warehousing space for it. So, they may have to examine the possibility of using faster transport to eliminate some of these ware-houses and the inventory stored there. This calls to mind the just-on- time-delivery principle that is fast spreading. Ballou, Bowersox, Mason, Ruth & Ross, all agree that several firms have reduced their total logistics costs by spending more on transportation and reducing costs in inventory and warehousing i.e. effective trade-off.

2.3.4 **PACKAGING:**

The type of transport selected will affect both packaging requirements for moving the product to the market and for the way raw-materials are involved. With regards to the product, rail and water transportation will usually require additional packaging expenditure because of the greater possibility of damage. In analysing trade-offs for the proposed changes in transportation, logistics managers should look for how the change influence packaging costs.

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2.3.5 MATERIALS HANDLING:

The materials handling is important to the efficient warehouse operation. Logistics are concerned with the movement of goods in a ware-house and the movement of goods from storage to order picking areas and eventually to block areas for transportation out of the ware-house.

Materials handling is usually concerned with mechanical equipment for short distance movement or transportation. Such equipments include conveyor belts, fork lift trucks, over-head cranes and containers.

2.4 APPROACHES AND TECHNIQUES OF ANALYSING LOGISTICS SYSTEM:

The general tenet of the logistics systems concept is that we do not focus on individual variables but on how they interact as a whole. The objective is to operate the system effectively not just the individual part. For instance, if you want to know the logistics total cost (LTC) you can not calculate only transport and inventory costs, but you have to include the costs of other elements in the logistical activity. For according to Kelly and Lazor (1967) "a system is a set of interacting elements, variables, parts or objects that are fractionally related to each other and that form a coherent group".

2.4.1 APPROACHES:

The analysis and control of logistical activities requires grouping or classifying such activities in several different ways.

2.4.1.1: **Materials Management Vs.**

Physical distribution: Frequently the movement and storage of raw-materials and finished goods in a company is very different. For instance, NTC may have tobacco leaves (raw materials) by rail or trucks and storage may just require an open field, however, the finished cigarettes would be moved by car or well covered trucks for protection.

The different logistics requirements that may exist between materials management and physical distribution may have important implications for the design of an organisations logistics system. Kelly and Lazor Captures it this way. "Companies may find it convenient to view their logistics system from these two perspectives, and somewhat different management approaches for each may result". However, inspite of such differences, close coordination between Materials Management (MM) and Physical distribution (PD) is very important. From this perspective, Companies could be classified into five different types of logistic systems, namely: Balance System, Heavy Inbound, Heavy Outbound, Out-and-Back and Outbound Systems.

2.4.1.2 **Cost Centres:**

A second approach is to look at logistics activities as cost centres. It may be recalled that, the activities many companies include in their logistics areas are, transportation, inventory control and materials handling. The need to consider these activities as highly related has also

been traced. Examining these elements as Cost centres, one can analyse possible trade-offs between and among them that could result in lower overall cost and or better service. Bowersox sees it as "the basis of integrated logistics management".

For instance, shifting from rail to motor carrier may result, because of faster and more reliable service, in higher transportation cost, and also, a reduction in all other activities and consequently a lower total cost:-

COST CENTRE	TRANSPORT RAIL	MODE MOTOR
Transport	₦30	₦45
Inventory	₦50	₦35
Packaging	₦45	₦35
Ware housing	₦15	₦ 7
Cost of lost sales	₦20	₦10
Total Cost	₦160	₦132

Source: Hypothetical.

2.4.1.3 **Nodes Verses Links:-**

The third approach is in terms of nodes and links. The nodes establish spatial points where goods stop for storage or processing. In other words the nodes are plants and warehouses where the organisation stores material for conversion into finished goods for sale to customers. Hesket, Ivie and Glaskowsky (1973) refer to these nodes and links "as fixed points and transportation networks" in difference from Bardi et al. Lastly, Hesket and Lazor, said that " the node and link perspective in allowing analysis of a logistics system two basis elements, represents a convenient basis for seeking

possible system improvements". As already noted, a logistics system complexity often directly related to the various time and distance relationships between nodes and the links and the regularity, predictability and volume of flow of goods entering, leaving and moving within the system.

2.4.1 **LOGISTICS CHANNEL:-**

According to Bowersox, "this is the network of intermediaries engaged in transfer, storage, handling, communication and other functions that contribute to the efficient flow of goods" He went on to say that" we can view the logistics channel as part of the total distribution channel, which includes, in addition to the logistical flow, a transaction flow of specific interest to the marketing specialist". The logistics channel can be simple or complex. In a simple channel an individual producer can deal directly with the customer. However, as a complex channel has a multi-echelon channel with a market, ware-house and retailers. This could be more difficult because of additional storage and transportation.

2.4.2 **TECHNIQUES:-**

The following techniques are very popular in the logistics activity.

2.4.2.1 **The Total Cost Technique:-**

Central to the development of business logistics is the total cost concept (TCC). According to Ballou (1973) "the total cost concept is the recognition that the logistics

system should be defined broadly enough so that all the relevant costs to a decision process and are balanced at optimum". He, Ballou continue by saying that, "nearly every logistics problem involves a trade-off of conflicting costs.... and it should be made perfectly clear that balancing conflicting cost patterns is at the heart of our study of *logistics management*".

Therefore this technique utilizes two methods:

2.4.2.1.1. **Short-Run/Static Analysis:**

We can look at the short run situation and develop costs associated with the various logistics cost centres previously described. We would then select the system with the lowest overall cost, as long as it is consistent with the constraints the firm impose on the logistics area. Hesket, et al, refers to this short run as "Static analysis". Essentially, what the two schools are saying is that, cost associated with a logistics system's various components is analysed at one point in time or at one output level only.

2.4.2.1.2 **Long Run/Synamic Analysis:-**

This method tries to mathematically calculate the point of equality between the systems. For instance, if we have two systems, and for a mathematical solution, we would need to start with the equation of a straight line (Y = A+B+X). In this case 'A' would be the fixed costs (FC) and 'B' would be the variable cost (VC) per unit, the 'X' would be the out-put level. To solve for the points at which the two systems are

equal, we can set the two equations up as equal and bring in the cost information appropriate to solve the equations.

A particular company may consider more than two logistics systems at one time. Regardless of how many system we analyse we can use the same basic mathematical methodology to solve for the points of indifference.

From the foregoing, we can analyse the trade-offs in logistics systems with the same basic analysis tools using FC, VC, and TCs, associated with alternative systems.

2.5 LOGISTICS ENVIRONMENT:-

According to Ballou (1973) "Logistics decisions are made with due consideration to the constraints, relationships, forces and conditions that affect decision outcomes but are largely beyond the logisticians influence". It would be impracticable to discuss all the environmental factors that might, in some way, impinge on logistics decisions, the intention is to provide a background discussion on those environmental considerations most important to this research.

In this case we shall focus on what Coyle et al refers to as "Macro or (external) and Micro or (intra firm) environments of the logistics system. Given the scope of this research, the micro (intrafirm) environment seems more relevant, however, since the firm does not operate in a vacuum, the macro (external) environment would also be examined for a comparative analysis.

2.5.1 THE MACRO (EXTERNAL) ENVIRONMENT:-

As stated above, the typical analysis of logistics systems focuses on the micro (intra firm) environment, implying an examination from the perspective of the individual firm. Nevertheless, this part in contrast, looks at logistics as it relates to the entire economy. In that light therefore, the following factors come to mind.

2.5.1.1 Value-Added Role of Logistics:-

There are four principal types of economic utility that add value to a product or service. They are, "Form utility, time utility, place utility, and possession utility" Coyle et al (1996). Generally, we credit production activities with providing form utility and marketing activities with possession utility.

Form utility refers to the value added to goods through production process. For instance when NTC transform tobacco leaves by adding chemicals and other agents to product cigarettes, the process of adding these tobacco leaves with the other agents to produce cigarette represents a change in product form that adds value to the product. Place utility on the other hand takes place when goods are moved from surplus points to points of higher demand. Logistics extends the physical boundaries of the market area, this adding economic value to the goods. Not only must goods and services be available where consumers need them, but they must also be at that point when customers demand them, this is called time

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utility. Finally, possession utility is created through the marketing activities of promotion, i.e. the process of creating desire in a customer to possess a good or sense only if demand possession utility for the product or service exist.

2.5.1.2 **Economic Impacts:-** This are highlights four major issues:-

2.5.1.2.1 **Economic Developmenmt and Specialisation:-**

The emphasis on production efficiency in the early periods resulted in considerable economic development in the form of specialisation. Infact, during this period, distinct movements within the economy specialised in the production of certain output types in regions possessing particular economic advantages. This, logistics contributions to economic development by allowing firms to capitalise on comparative cost advantages in the production of goods and services by efficiently transportation goods to the market.

2.5.1.2.2 **Variety of Goods:-**

This is another area in which logistics has an impact on the macro environment. One such is the volume and variety of goods made available to consumers in areas far from production points, and frequently, long after the goods were manufactured. Satisfying this demand very much depends on firms in the economy effectively performing logistics functions (movement and storage).

2.5.1.2.3 **Impact on Prices:-**

By creating time and place utility, logistics activities in the economy may also contribute to lower prices. For

instance, if logistics extends markets for goods in both time and space transported goods may sell for prices lower than locally produced. To support this assertion, Coyle et al says that "Firms base lower prices upon the greater efficiency of large scale production and the increased opportunity for trade offs in the logistics system".

2.5.1.2.4 **Impact on Land Values:-**

Logistics also affects other aspects of the economic system. Transports as we have seen affect land values when technical improvements occur, so economic effects improve logistics systems in many other areas as already seen.

2.5.2 **THE MICRO (INTRA-FIRM) ENVIRONMENT:-**

In dealing with the micro environment which is very relevant to this research, emphasis shall be on.

2.5.2.1 **Competitive Advantage:-**

Langley et al (1990) said that Porter identified three generic strategies for achieving competitive advantage in the market place.

COST LEADERSHIPS:- This results from a firm being the low-cost producer or service. The second one is differentiation, in which case a firm establishes itself as unique in certain ways perceived by customers.

The third and last strategy is focus, here a firm attempts to achieve a competitive advantage in one or more market segments and thus strategically "Focuses" its efforts.

Each of these strategies can lead to competitive advantage in the market place, but not all competing firms would succeed in the efforts. Therefore individual firms continually search for new and innovative ways to successfully implement the strategies of cost leadership, differentiation and focus.

2.5.2.2 **Value Chain:-**

Porter further introduces the concept of a value chain as a basic tool that "disaggaretes a firm into its strategically relevant activities in order to understand the behaviour of costs and the existing and potential sources of differentiation". He suggests that a firm gains competitive advantage by performing these important activities either less expensively or better than its competitors.

The concept of value change divides afirm's activities into those which are primary (inbound logistics, operations, outbound logistics, marketing, sales and service) and those which are support (firm infrastructure, human resource management, technology development and procurement). Porter describes these activities as the "building blocks by which a firm creates a product valuable to its buyers" and he defines margin as "the difference between total value and the collective cost of performing the value activities".

In this context therefore, cost control in logistics and superior customer service levels may clearly add significant value for the higher profit margins for the business as a

whole.

2.6 LOGISTICS ORGANISATION:-

According to the council of logistics management (CLM) logistics management, "is that phase of administration responsible for the effect functioning of the overall logistics process". The logistics organisation/logistics management consist of the following:-

- The top logistics executive in the business unit.
- The managers of support services reporting through the logistics area.
- Logistics project service groups, which may or may not fall under one of the support service groups.
- Field operations management personnel, such as those responsible for distribution.

2.6.1 EVOLUTION OF LOGISTICS ORGANISATION:-

According to Farrel, logistics activities can be categories "according to the specific responsibilities for which they are accountable". He identified three phases in logistics organisation evolution. They are, traditional responsibilities, extended responsibilities and advanced responsibilities.

2.6.1.1 The phase 1 organisation, traditional responsibilities, typical involves activities that directly relate to finished goods out-bound movement and placement. It also includes activities such as logistics control and logistics systems planning. These activities strengthen the competitive

position of the firms product in the market place, either through improving its availability or through lowering traffic or warehousing costs, consequently a reduced price.

2.6.1.2 The phase II organisation, extend responsibilities, expands the scope of out-bound activities that logistics managers co-ordinate. In addition to the phase 1 activities, this second phase adds responsibility, for customer service, finished goods warehousing and finished goods inventory, management. Firms in this phase tend to include order processing and inbound transportation within their logistics function and place a priority on integrating the full range of out-bound logistics activities as well as on controlling inbound transportation.

2.6.1.3 The last phase III, advanced responsibilities, adds activities as logistics engineering, production planning, sourcing/purchasing, raw-materials/work in progress, sales forecasting and international logistics. Generally, these activities encompasses critical marketing and manufacturing function such as logistics. This function totally integrates the logistics process by joining the management responsibilities for both physical distribution and materials management.

2.7 THE ROLE OF TRANSPORTATION IN BUSINESS LOGISTICS MANAGEMENT

"Victory is the beautiful, bright coloured flower, Transport is the stem without which it could never have blossed. - Sir Winston Churchill.

According to Lazo (1962) transportation as used in modern marketing, means "handling, hauling, storing (which includes ware-housing and inventory control), shipping, physical transportation and delivery". Also, Coyle et al sees transportation as "the physical link connecting a Company's customers, raw-material supplies plants, ware-houses and channel members and modes".

The meaning of transportation in a customer oriented firm, as we have seen, encompasses so many variables. In such a firm transportation becomes virtually synonymous with distribution and embraces the management of control of order handling, finished goods inventory, warehousing, shipping, loading and unloading, plus the in and-out movement of raw-materials, supplies and finished goods as well as the handling of claims arising from damage in transit.

In agreement with the above, Faulks (1990) states that "transport is all-embracing in the widest possible sense, incorporating a multitude of different skills, systems and services". He went on to say that, the different modes have their different applications, and the common thread is the function of transportation, namely to move people and goods from where they are to where their relative values are greater.

The above goes to show that a company's logistics system is a series of nodes (fixed points where the goods come to rest) and links (transportation companies). The

transportation companies). The transportation link permit goods to flow between the various nodes and bridges the buyer/seller gap.

Transportation knowledge is fundamental to the efficient and economic operation of a company's logistics function. The role of transportation therefore, could be summarised in the following ways:-

Coyle et al:- the physical thread connecting the company's geographically dispersed operations". You may recall that we have said earlier that "transportation adds value to the company by creating time and place utility". The value added in the physical movement of goods to the place where it is desired a at the time it is desired.

Lazor:- "Transportation is a prime target for cost cutting and management economics".

Cavinato et al:- the basic function of transport is to provide the market with access to the resultant products". They went on to add that for a firm to function without the aid of transportation is virtually inconceivable in todays global economy.

Bell, Blackledge & Bowen:- "Transportation is a necessary concomitant of the exchange economy and is indispensable to economic growth. Where there is no transportation, economic activities are reduced to hand-to-month subsistence level so the demand for transport

services increases with extension of the imput-output relationship in economy".

We can go on and on, but from the foregoing, one can not fail to agree that transportation is definitely a concomitant element of a firm and the economy as a whole as we have seen in our discussion of the logistics environment.

A proper appreciation of the role of transportation in business logistics management comes to mind when we consider the historical, economic, environmental, societal and the political effects, already discussed in chapter one.

The above literature has helped in identifying the generally accepted roles of transportation. However, since the failed is said to encompass several variables, then the views expressed, would be by no means diverse. As you may recall, this research is to specifically find out what role transportation plays in the business logistics activity of NTC PLC.

2.7.1 THE TRANSPORT (MODES) SELECTION DECISION

As indicated earlier the transportation expenditures companies incur involve significant amounts, and the carrier's service quality affects other logistics operating costs and the demand for the company's product. For according to Woodward (1977) "One fact which must be clearly understood is that the transportation function is a burden of cost on the product or service".

The importance and difficulty involved in the transportation selection decision, would be better appreciated if the contribution of cost to the price of a product is known. Lazo, gives us an insight when he said that "transportation costs represent approximately 20% of the total cost of manufactured goods". Coyle et al supports this by saying that "in some companies, transportation accounts for between 20-25% total business cost" However, a company can equally control these expenditures and service levels through the transportation decision. So the carrier selection decision process provides the frame work for the discussion of the different types of transportation providers.

2.7.1.1 **The Link-Node Relationship:-**

The carrier selection decision is a specialised purchasing process whereby a firm purchases the service of a carrier to provide the necessary link among logistics nodes. The carrier selected directly affects the operation of the logistics node and other logistics system functions. The carrier selection decision, item, entails more than merely evaluating the prices different transportation methods charge. It must also consider the other costs associated with how the transport methods service affects the modal operation. A company's knowledge of carrier prices and pricing practices can simplify the carrier selection decision. However, basing transport method selection upon lowest transport costs, or direct link costs, does not guarantee the least-cost decision

for the whole logistics system of the company.

2.7.1.2 **Carrier Selection Decision:-**

As we have seen, the carrier selection is a specialised purchasing process whereby a firm selects a carrier to link its logistics nodes. The carrier rate is an important factor in the decision. But the firm must consider the quality of the link service and how this service affects nodal operation costs. According to Coyle et al, carrier selection is two-fold. First, the firm selects a transport mode. The second one is to select a specific carrier from within the chosen node.

2.7.1.3 **Carrier Selection Determination:-**

Coyle et al, consider the following as the salient determinants; carrier cost and service performance. The relevant service determinants are transit time, reliability, capability accessibility and safety.

2.7.3 **THE BASIC MODES OF TRANSPORTATION**

The basic modes of transportation available to the logistics manager are rail, motor, water, pipeline and air. Each mode has different economic and technical structures (link-way, automation and terminal) and each can provide different qualities of link service.

2.7.2.1 **Rail Carrier:-**

Rail carriers are primarily long-distance, longer-volume movers of low value, high-density goods. The reason for this long-distance, large-volume rail movement has to do with the

mode's economic and technical characteristics. The rail carriers decreasing cost structure suggests that large-volume, long-distance movements lower the average production cost by increasing out-put and thereby spreading the fixed costs over a greater out-put base.

2.7.2.2 **Motor Carrier:-**

The motor carrier is very much a part of a company's logistics system. Infact, this mode plays a predominant role in NTC's logistics activities as we shall see very soon. Almost every logistics operation utilities the motor truck, from the smallest pick up to the largest trailer. The ability of the motor carrier to reach every corner of the company and market makes it the easiest of all nodes.

2.7.2.3 **Water Carrier:-**

Water transportation is a major factor in a country's development. For instance, water transportation provided the only link between Nigeria and other parts of the World, especially Europe and America up to the 1970s. It was, and still plays a dorminant role in the export and import activities in Nigeria. No wonder then, that many industrial cities of Nigeria and indeed, the whole world are located along major water transport routes. Water carriers are primarily long-distance movers of low-value, high-density cargoes that mechanical devices easily load and off load.

This calls to mind, the containerisation and RO+RO operations. This mode seems the cheapest of all modes.

Internationally, transport by ship is by far the must widely used. According to Coyle et al, "In 1986, Ocean Carriage accounted for approximately 60% of world wide freight movements. Companies ship almost any conceivable cargo by sea, but most ocean consist of low weigh-to-value commodities such as petroleum minerals and dry bulk items. The types of ships used are, generally cargo ship, bulk carriers, tankers for carrying liquids, container ships, Roll-on Roll-off (RORO) vessels and a combination of RO-RO/containership bill-bulk-Ore used for carrying both dry and liquid cargoes.

2.7.2.4 **Air Carrier:-**

Passengers movement is the air carrier's principal business. Passenger revenue accounts for the majority of air carriers business, "In the movement of freight, air transport is some what nascent accounting for less than one percent of the total intercity ton-miles of freight". Coyle et al.

2.7.2.5 **Pipelines:-**

Pipeline transportation is not suitable for general commodity transportation, rather, its use is restricted mainly to the movement of petroleum, gas and water. Even though some firms have tried to move commodities such as Coal in a slurry form but moving such commodities by pipe line has not been a viable alternative to other modes like water and rail. However, the inability to transport solids limits its usefulness in the logistics system of a farm manufacturing solid goods like NTC.

2.7.3 **LEGAL CLASSIFICATION OF CARRIERS:-**

Accordingly to Cavinato et al and Coyle eta al transportation firms engaged in transportation of goods can be classified into four categories, common, constract, exempt and private. The first three are for-hire carriers, the last is not. A firm wishing to move products in its own vehicles provides private transportation.

2.7.3.1. **Common Carrier:-**

Is a for-hire carrier that serves he general public at reasonable charges and without discrimination. It is the most highly regulated of all the legal carrier types.

2.7.3.2. **Contract Carrier:-**

Is also a for-hire carrier that does not serve the general public, but rather serves one or a limited number of Shippers with whom it is under specific contract. He provides a specialised service to the Shippers' NTC engages in this kind of arrangement as we shall see later.

2.7.3.3. **Exempt Carrier:-**

It is for-hire carrier exempted from economic regulation regarding rates and services, unlike the types mentioned earlier. The laws of the market place determine the rates, services and supply of such carriers.

2.7.3.4. **Private Carrier:-**

Is essentially a firms own transportation. Is not for hire and therefore not subject to regulation. So a private carrier "is anybody who transports in interstate or foreigner

commerce, property of which such person is the owner, leasee or bailee, which such transportation is for sale, leasee or bailment.

2.7.4 **INTERMODAL TRANSPORTATION:-**

Intermodal transport services refers to "the use of two or more carriers of different modes in the through movement of a Shipment". Coyle et al (1993). In other words, logistician, through routing, uses different modes to get a product to its final destination.

The logistics manager often uses different transport modes to service a given link. Intermodal transportation is necessary for many reasons, the basic reasons, are the various modes' service characteristics and costs. For instance, the limited accessibility of air transport required coordination with a land carrier to make-up the pick-ups and deliveries. Similarly, applies to rails water and pipeline but not to motor. So by manipulating the modes, a logistics manager can overcome a given mode's service disadvantages and retain the mode's basic advantage, usually low cost. We shall also see how NTC engages in intermodal transportation.

2.7.5 **TRANSPORTATION PRICING SYSTEM**

According to Cavinato et al, "of the most difficult and confusing logistics manager's responsibilities is determining the prices of various transportation services available for a logistics system's use'. This relates to the "cost burden" we discussed above.

Bullou (1987), also agree with the above assertion by saying that "price is a complex decision problem involving economic theory, buyer behaviour and theory of distribution among others".

Therefore, the logistics relationship to pricing is in the cost of logistics. In the long run, the total logistics cost must be accounted for in the development of the product's price. Logistics costs vary by geography and product. The greater the distance for the source of supply and market, the greater the logistics costs, especially transportation costs which are related to the distance the shipment is moved. To sum it up in the words of Cavinato et al, "the product characteristics of density, susceptibility to damage, value, sub-stitutionability and demand features have a bearing on the cost of logistics and transportation and consequently, the price of the product".

2.7.5.1 **Pricing Methods:-**

Customers are not concentrated at a single point for most suppliers, rather they are often dispersed over wide area. This means that the total cost to distribute to individual customer varies with their location. No wonder then that pricing is complex as we have seen above. A company can have customers numbering in hundreds of thousands at different geographical locations.

The following geographic pricing methods exists.

2.7.5.1 **F.O.B. Pricing:-**

F.O.B. stands for Free on Board. It denotes the location at which the price is effective. E.G. F.O.B. Factory, F.O.B. destination. That is, property pass to the seller at the factor and at destination, respectively.

2.7.5.1.2 **Zone Pricing:-**

Is a situation where by a single price is established for a wide geographical area. This is always done in order to reduce the complexities of individual prices. A number of areas may be defined and prices set accordingly.

2.7.5.1.3 **Single or Uniform Pricing:-**

The ultimate in pricing simplicity is to have a single price for all customers regardless of their location. However, such a pricing policy does not consider the differences in cost of distributing to different customers.

2.7.5.1.4 **Freight Equalisation Pricing:-**

Competition has an impact or pricing strategy. If two firms have equal efficiency in production and distribution, which results in the same product cost at the factory location, the firm farthest from the market place may wish to absorb enough of the freight charges to meet the price of competition. This price is referred to as freight equalisation.

2.7.5.1.5 **Basing Point Pricing:-**

Just like in freight equalisation pricing, the purpose in basing point pricing is competitative. It establishes some

point other than the one from which the product is actually delivered as the point from which to compute price. Price is computed as if the product were delivered at that point. The new location for price computation is known on basing point.

2.8 LOCATION OF FACILITY AND THEORIES OF TRANSPORTATION:-

Accord ing to Cavinato et al "transportation has been a major determinant in the location of industrial facilities .....". We also know that the cost of transporting raw materials into a facility and the cost of transporting finished goods to market directly affect the profitability of a company.

Water transportation in particular has played an important role in the location of many major cities. Big cities like Lagos, Port-Harcourt, Warri and Calabar are located at the Coastal areas mainly because of accessibility to the sea. As rail road developed, cities and industrial facilities grew at locations that were not adjacent to water ways. Later, the automabile and truck enable the development of cities and industrial facilities at virtually any location.

2.8.1. THEORIES OF TRANSPORTATION:-

The importance of transportation cost as locational determinant can be seen through the examination of some facility location theories.

2.8.1.1. Von Thunen's Theories:-

Warnerbury and Hall (1966) refer to Johann Heinrich Von Thunen as one of the first writers to theories about the

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factors of production that affect the location of a facility". He was concerned with the Location of agricultural production facilities. His intention was to minimise transportation cost and maximise profits for a given product. He assumed that with complete mobility of production facilities agricultural production would occur at the location where the former would maximise the difference between the market price and costs, the profit maximising point. With a market price fixed and production costs not varying by location the transportation cost factor was the major locational determinant impacting profitability.

Also considered by Von Thunen was the importance of transit time for determining the location of perishable products such as fresh fruit and vegetables. In other words, perishable products should be produced near the market to minimise the transit time, thereby assuring delivery of the products in good condition. The time required to make delivery determines whether or not the commodity can be sold at the market.

He then developed the Von Thunen's belts, a series of concentric rings around the city. Within each ring, the agricultural product that should be produced at the location was identified so that profitability could be maximised and the transportation cost and transit time minimised. Perishables would be produced at the rings nearest to the market, while products with low-value-to weight relation would

also be produced in the first ring. Products of high-value-to weight ration would be produced in the more distant rings.

2.8.1.2 **Weber's Theories:-**

Alfred Weber was a German economist who developed a theory for the location of industrial plants. His theory is based upon total transportation cost minimisation. The least cost location is one that minimises the cost of moving raw-materials to the plant and finished goods to the market.

From a transportation point of view, raw-materials possess two distinct characteristics. First, raw-materials may lose weight in processing, thereby affecting the total transportation cost. Second, the supply source of raw-materials may be fixed to a specific location, thus affecting the distance that the raw-material must be moved. Weber classified raw-materials according to geographical availability and the weight lost in processing.

The geographic availability characteristics states that a raw-material is either ubiquitous, that is, its found everywhere, for instance, water, or is localised, for instance coal. While a localised raw-material requires transportational ubiquitous does not. Thus a company using an ubiquitous raw-material would be located at the source in order to minimise transportation cost.

Under weight lost in processing, a raw-material that does not lose weight in processing is termed pure, and one that does loss weight *in processing is a weight losing material.*

To minimise transportation cost a company using localised weight-losing materials. To minimise transportation cost a company using localised weight-losing material would locate at the supply source. Pure materials, either ubiquitous or localised will not bind production to their deposits, that is, the transportation cost will be the same regardless of the location.

2.8.1.3 **Hoover's Theories:-**

Edgar M. Hoover is an American theorist who developed a least-cost approach to facility location. Unlike Von Thunen and Weber, Hoover considered demand factors such as the effect of transportation costs upon the price of the product. He stated that transportation rules are not linear with regard to distance. This non linearity is known tapering rate principle. He also noted that carrier availability is not homogeneous throughout a country. Some locations have more while some less, hence their ability to meet shippers requirement would also differ. A location with fewer carriers would charge higher rates while location with more carriers would charge less.

2.9 **SUMMARY:-**

From the beginning of this chapter we saw the views of scholars on what necessitated the need for business logistics management. We went further to examined numerous definitions of business logistics management.

Scholars, like Bollou, Coyle and Bardi, Shapiro and Hesket, Bowersox amongst others. The historical development of BLM right from setting the stage in

1940-60, to 1960-70 the conceptional and creditability era during which the emphasis was on customer service and effective cost measurement. It was during this era that Computer hardware and quantitative techniques were developed for analysing BL problems. We went further to look at the 1970-80 era, it was the era of changing priorities and patterns. This era referred to as the semi-maturity period. We saw the oil crisis that took place during the period thereby triggering global economic crisis. However, developing countries like Nigeria benefited from it. The period referred to as the new era of Economic and Technical change falls between 1980 to the present. Development like globalisation of business, changing government infrastructure, changing technology and general changes in business have taken place to impact on the field of BLM.

We also went further to examined the scope of BLM. We discussed the following component, transportation, storage, packaging and materials handling.

We looked at the approaches and Techniques of analysing logistics systems. Among the approaches we discussed materials management vs physical distribution, cost centres, nodes verses links and logistics channels. Among the techniques we examined the total cost techniques (TCT), short run/static

analysis and long run/synamic analysis.

The logistics environment was not forgotten. Since the firm does not operate in a vacuum it became necessary to look at the macro and micro environments. We saw the macro Environment as it relates to the following factors. Valued-added role of logistics, economic impact. This impact was highlighted in the area of economic development and specialisation, variety of goods, impact on prices and impact on land values. The micro environment as we saw deals with the individual firm. Emphasis was on competitive advantage, cost leaderships, and the value chain it has on a firm.

We also looked at the logistics organisation. We saw that it is responsible for the effective functioning of the overall logistics process. We saw its evolution. We discussed the phase I organisation which has traditional responsibilities, the phase II organisation with its extended responsibilities of customer service and lastly phase III with advanced responsibilities like international logistics.

The literature also examined the role of transportation in BLM. We discussed various definitions of transportation. We also discussed the meaning of transportation in a customer oriented firm. We saw how important transportation is to the efficient and economic operation of a company's operations. The different transportation modes, road, Air, Water, Rail and pipeline are discussed and how their selection decision is made. We saw the link-node relationship and carrier selection

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determinants like, transit time, reliability and safety. Carriers are classified into four categories as we saw, common, contract, exempt and private.

Intermodal transportation which is considered as one of the functions of a logistician was examined also. Under it we saw the transportation pricing system and methods. The methods are F.O.B. Zone, Single or Uniform, Freight equalisation and Basing point pricing.

Lastly in the chapter we discussed the location of manufacturing facilities and some theories of transportation. We analysed the Von Thunen's theories, Weber's theories and Houver's theories.

CONCLUSION:

From the literature examined above it is evident that the role of transportation in any manufacturing concern is important, inrespective of the methods and techniques adopted.

A Nigerian firm (NTC) is not likely to adopt any thing very different from what we have seen. We shall see the true situation in the analysis

CHAPTER THREE

3.0 HISTORICAL DEVELOPMENT OF NTC PLC

Nigerian Tobacco Company PLC started business in Nigeria as a trading Company. From the early years of the century, the British-American Tobacco Company (B.A.T.C.) produced cigarettes and exported them into West Africa through various trading Companies, the most notable among them was the Royal Niger Company. However, noticing the tremendous sales of cigarettes in West-Africa, BATC in 1912, established a depot and a sales organisation in Nigeria to handle the distribution of its own products. In 1933, the Company set-up a pilot factory at Oshogbo to produce cigarettes from imported tobacco leaf. This proved successful. Therefore, in 1937, the first full scale factory was opened in Ibadan.

NTC Ltd. was incorporated in 1951 as successor of BATC Ltd. In 1960, some of the stock of NTC was offered for sale to the publicity quoted Nigerian Companies. In 1964, more shares were sold to the public. By December, 1980, the number of NTC share holders stood at about fifty thousand. And by 1989 its issued and paid up capital was ₦50m and its stock is dealth in on the Nigerian stock exchange, presently (1995) NTC was 50/55 share holders, ₦200m - issued and paid up capital. Of this shares BAT holds 5.86% and the rest is shared among Nigerians.

NTC's activities are spread over the whole of Nigeria. The Company used to have three modern factories at Ibadan (opened in 1937), Port-Harcourt (1956) and Zaria (1959). The Port-harcourt plant was later closed and in 1994, December the Ibadan factory which was completely modernised in 1973 was also closed.

3.1 **FUNCTIONAL AREAS OF NTC PLC.**

The Company has a unique organisational structure. It is headed by a Managing Director (MD) who is also the Chief Executive Officer and he reports to a Boar of Directors. Directly reporting to the MD are Diectors and heads of Departments of the Legal/Secretariat, Production, Corporate affairs, Human Resources, Marketing, Purchasing and Traffic, leaf and Finance Departments, who have equal status and all resident in Lagos. In addition NTC has over 25 offices and installations for its sales and leaf growing operations all over the country.

3.1.1. **MARKETING:**

The Department is responsible for generating revenue for the Company by selling the company products. This it has done with a very reasonable degree of success over the years. This could be seen in the following areas.

3.1.1.1 **SALES:** From inception there was a near consistent increase in sales over along period. But by 1973, the Company witnessed a depreciation in sales due to the change to decimal currency and smuggling. However, by 1975 due to the

cooperation of the disdistributors with the field sales force there was an equitable distribution of NTC's products in all parts of the Country. Efforts by the Law enforcement agencies in curbing smuggling also resulted in increased demand for the company's products.

Sales of NTC's products continued to increase thereafter.

From the mid 1980's to date, due to drastic economic reforms brought about through structural adjustment programme (SAP) the cost of production started going up while the spending power of the consumer nose dived. This led to decrease in sales in agregate terms. However, sales have continue to increase annually.

From 1991 gros sales are:-

TABLE 3.1

Gross Sales Increase from 1991 - 1995

1995 ₦,000	1994 ₦,000	1993 ₦,000	1992 ₦,000	1991 ₦,000
₦2,033.947	₦1,718,220	₦1,563.073	₦868,720	₦694,302

SOURCE: NTC

3.1.1.2 **PRICING POLICY:** As a marketing mix, pricing is used to compensate for high operating cost in inflationary situation. According to Bonat (1986) NTC, uses the following pricing policies. Cost based pricing policy, open market situation, and Margin of profit policy among others, to determine its price. The aim is to continue to take all possible measures to achieve stable prices.

3.1.1.3 **DISTRIBUTION POLICY:** As we have said, in the early days of BATC's activities in Nigeria, tobacco products were distributed through the big foreign trading companies, like the Niger Trading Company. Subsequently a system of distribution using indigenous and independent business men and women was adopted. They are the suppliers to the retail traders in their various areas. As at 1980 NTC had 68 distributors and presently the number is 49 all over Nigeria.

3.1.2 **PRODUCTION:**

NTC Plc. over the years has been faced with the problem of low productivity due to high turn over of staff. For instance in 1980 the Company had about 3,600 employees, by 1990 it had about 1,500 and presently 1995, it has only 847 employees, both management and staff.

This drastic decrease has been due to the harsh economic situation in the country. This has led to the recent closure in 1994 of the Ibadan factory. Despite the adverse economic conditions mentioned above the Company has continue to improve on its production facilities. NTC currently holds 49% of the issued capital of Niger Pack Limited, this helps to reduce the problem of packaging and wrapping materials. Factory conditions have been improved to enhance productivity, inconjuction with training programmes both at home and overseas. The chairman of the company summed up the production policy this way "our production processes are being re-configured to focus on consistently delivering the highest

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qualify products. This will eliminate any qualify-based preference for imported cigarettes and enhance our ability to complete effectively in the market place" (1995).

3.1.3 **HUMAN RESOURCES MANAGEMENT:**

We have seen that due to the traumatising trading conditions of the years, personnel has drastically reduce to the 1995 figure of 847. However, the company has been able to attract and retain very good employees. Employees are trained both locally and overseas in order to improve knowledge and skills.

The human resources policy is backed up with a generous compensation na incentive scheme. The Company uses the remuneration offered by similar companies as a base and then offers the same o higher pay to its employees. NTC also gives an across the board 13th month salary for both management and workers annually, double salary increments are awarded annually to exceptionally good employees. Long service awards are given annually in colourful and well covered price-giving ceremonies. The Company spent ₦79.9m and ₦107.5m in 1994 and 1995 respectively as employment cost, salaries and wages etc.

3.1.4 **FINANCE AND INVESTMENT:**

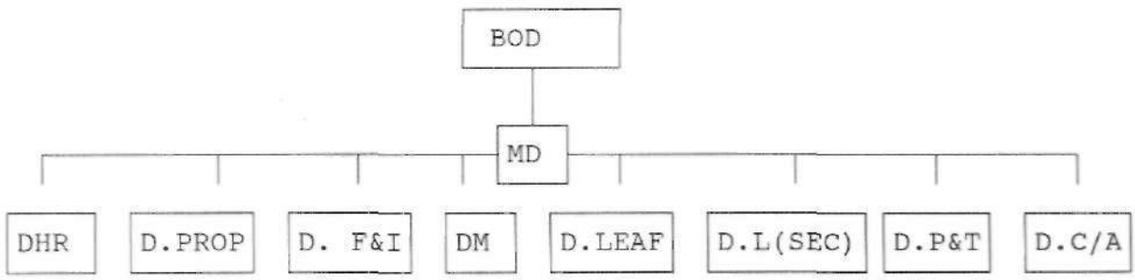
NTC believes in self-financing most of its projects from retaining-earnings. As at 1980 the company's issued and paid up capital was ₦25 million and as at 1986 it rose to ₦50m and as at 1995 it stood at ₦200m. Due to its self-financing policy the company did not declare any divident because every

earning was re-invested.

NTC has a policy of direct investment in other businesses through Marina Investment Limited, a subsidiary of the company. Apart of 49% shares of Niger Park Limited, it also has 31.8% in Biscuit Manufacturing Company (Nig) Ltd.

Fig. 3.1

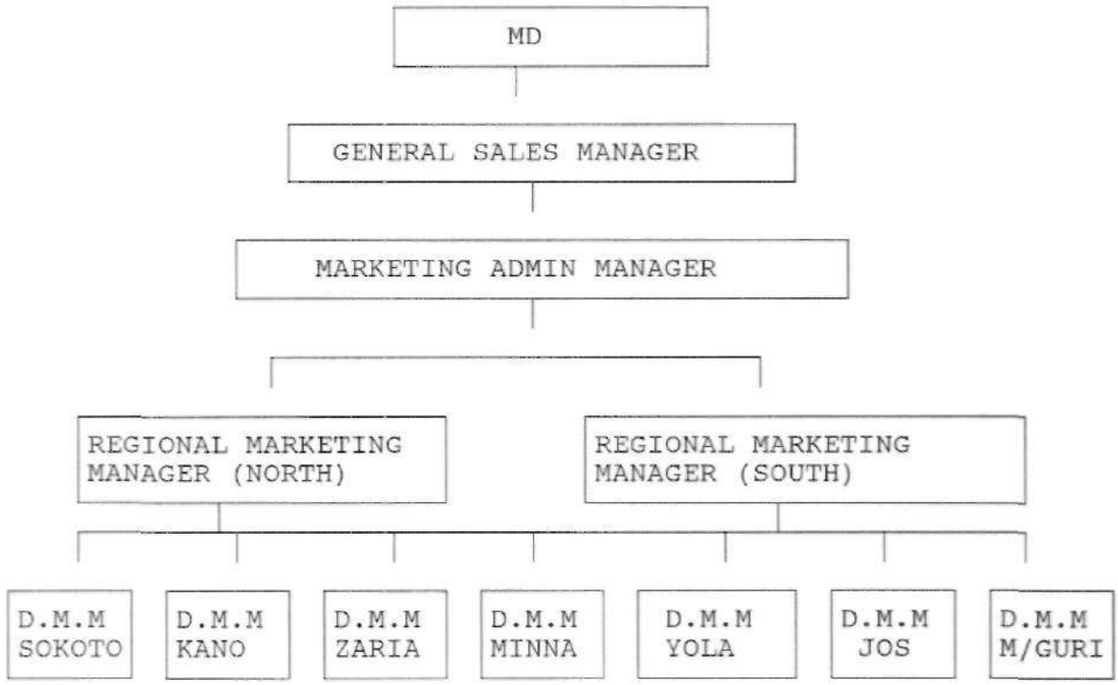
ORGANISATIONAL STRUCTURE



SOURCE: NTC

ORGANISATIONAL STRUCTURE OF THE MARKETING/LOGISTICS DEPARTMENT

Fig. 3.2



SOURCE: NTC

3.2 IMPORTANCE OF NTC TO THE NATI NAL ECONOMY -

By virtue of the long period during which NTC has operated in the economy, it has impacted on the economy in the following ways.

3.2.1 CONTRIBUTION TO AGRICULTURE:-

NTC pioneered Tobacco growing on a commercial scale in Nigeri in 1934. When, following the setting up of its pilot factory in Oshogbo as we have seen, the company did a survey

of likely areas to grow tobacco. With the rapid expansion of the cigarette industry, the tobacco growing area, once concentrated around Ogbomosho was later extended to other areas around Oyo State as well as in the north. The company also has very close association with farmers in Sokoto, Kaduna, Bauchi, Plateau, Benue, Edo and Delta States. For many years now the company has produced its tobacco locally, requiring only small quantities of special types of imported tobacco for use in the production of Benson and Hedges. Until recently, no other Company of NTC size in Nigeria had a record of such heavy reliance on local sources for such a large proportion of its principal raw material.

NTC operates what is easily the most effecient agricultural extension service in the country, with 45 management and about 296 non-management staff. The company's extension work among its 15,000:00 farmers has one important benefit, that of teaching the farmers correct cultural practices (mechanisation, crop rotation, use of fertilizers etc) which they apply not only to tobacco growing but also to the cultivation of food and other crops. These farmers are provided with free seeds and other agricultural inputs such s tractor services and fertilizers on credit. Through these farmers, NTC injects about ₦19m annually into the economy. NTC introduced a system of block farming into its tobacco growing area. This scheme facilitates mechanization, close supervision of the farmers, and the operation of a planned

programme of rotating tobacco with food crops.

About ten years back the company started a young farmer's training scheme which is designed to teach young school leavers the basic techniques and skills needed in modern farming. The desired goal is the gradual replacement of the aging traditional small scale farmers with a younger crop of farmers who understand the need for a more scientific approach to farming. The first young farmers' Training Centre took off in Iseyin, in Oyo State in early 1986, while the second took off in Maigana near Zaria in Kaduna State in 1987.

NTC also realised that trees are felled among the rural population for several purposes. An estimated 97% of these are felled for domestic purposes while 30% are felled for major construction work and for industrial uses. The tobacco industry too, uses wood fuel for the curing of some of its tobacco leaf. Realising the possible effects on the environment of not replacing the felled trees, NTC began a programme of re-afforestation in the early sixties by planning trees around its curing areas in parts of its tobacco growing areas. Today, that initial effect of the company's efford has blossomed into a full fletched afforestation programme. The company's investment in these programmes is in the neighbourhood of ₦1.5m. Such is the success story of NTC's Agricultural and Afforestation Programmes that the Company has received commendations from the Federal Government and some State Governments.

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3.2.2 **INDUSTRY EXPANSION:-**

NTC's remaining factory in Zaria (opened in 1957) currently (1995) manufacture seven brands of high quality cigrarettes, namely Bicycle, Excel, High society, John player Gold Leaf, Sweets menthol, Three rings and Wills Mars.

Through out its asociation with B.A.T.C, NTC is priviledged to have technical advice and assistance relating to the development of manufacturing technques, improvement in machinery training of management and technical staff. NTC also depends on BATC's Research and Development (R&D). The centre is a major source of technical and scientific information for all BATC operating companies. These knowledge and skills are spread to other areas of the economy.

3.2.3 **MANPOWER TRAINING AND DEVELOPMENT:-**

Presently 847 personnel are directly employed by NTC of its 118 management staff, 160 are Nigerians. NTC's 11 member board of directors has 7 Nigerians on it. All other grades are, of course Nigerianised.

In a highly mechanised industry as NTC, the development of supervisory and technical skills is very important staff training and development is therefore a major aspect of the company's policy. In that regard the company operates a Training Centre at Ibadan where most grades of staff are trained. Training exists for technicains at the training centre, while relevant formal courses are run for supervisory and management staff. Staff and management alike are

sometimes sent on courses organised by professional bodies and private training groups. Overseas training is now limited because of the high cost involved but African regional training is now frequently organised for NTC staff and other BATC associated companies.

The results of this programme of traning and development can be seen in the high calibre of manpower in the company and in the improvement in the effecient performance of its employees. This programme has also provided high level manpower for the public and private sectors of the economy.

3.2.4 **LINKAGE EFFECTS ON OTHER INDUSTRIES:-**

NTC has for a long time played a leading role in the development of the local Printing and Packaging Industry in the Country. In 1965, NTC in partnership with times Press Limited established Niger Pack Limited to produce packaging materials for NTC and other manufacturers. Since the, NTC has contributed to the development and expansion of similar companies in Lagos, Ogun, Kaduna and Plateau States by providing them with necessary incentives. Currently (1995) Rigid Pack, a Company based in Zaria, also provides NTC's packaging needs. NTC's purchases from these companies run into well over ₦360m annually.

Tobacco farming has also created a demand for certain goods and service leading to establishment of small-scale business in the rural areas. These include mechanised hand preparation by NTC sponsored tractor contractors and the

manufacture of simple farm equipment. These small businessmen and 15,000 farmers with about 50,000 dependents rely mainly on NTC's prosperity. How important can a company be to a nation?.

3.2.5 **CONTRIBUTION TO NATIONAL REVENUE:-**

NTC is a major contributor to the national revenue by way of import duty on materials, excise duty on finished goods and tax on company's profits. The Company paid about ₦625m in 1995 and ₦548m in 1994 in both taxes and excise duty to the government.

3.2.6 **GOOD CORPORATE CITIZEN:-**

NTC contributes to social development in the various communities in which it operates, the contributions range from sports promotion and participation in community affairs, to the award of scholarship for students in schools and universities. Notable among these efforts are the donations of an entire pathological laboratory to the college of medicine of the Lagos University Teaching Hospital for research into sickle cell anaemia, the donation of diagnostic clinic, to the Eastern Nigeria Medical Centre, Enugu and the donation of a demonstration farm, with complete irrigation dam, to the institute of Agriculture, Ahmadu Bello University Zaria. Have also spearheaded fund raising activities for Red Cross and the Nigerian Olympic commitee. Today NTC still supports a variety of sports like golf, horse racing and polo. In 1995 alone the company spent ₦323,293:00 in sponsorship and

assistance.

3.3 **TOBACCO FARMING AND HANDLING PROCESS:-**

Growing tobacco requires specialised skill and knowledge in order to field the right crop required or suitable for cigaretee production.

Tobacco seeds are usually sown making sure that the ridges (8 inches wide) are well spaced and the seeds per ridge are uniformly planted so that they uniformly ripe and are uniformly harvested. The tobacco leaves are only harvested when they have gone through the process of Genesis (that is, when the green leaves are all changed into all round yellow colour). The leaves on the tobacco plant are harvested at different periods starting from the bottom leaves.

When harvested, the leaves must undergo a curing process before being sent to the factory. Curing is the process of drying out the tobacco leaves so as to reduce the moisture content to a particular level necessary to prevent the leaves from decaying or moulding tobacco leaves could be cured through, air curing or Flue curing.

3.3.1 **AIR CURING:-**

This means that tobacco leaves are grouped and hung on strings on housetops or in barns so that the air can systematically dry the leaves. This process takes a long time (ranging between 6 days to 6 weeks) depending on the climatic condition of the area where the curing is done. The basic ingredients of tobacco leaves are sugar and Nicotine. Every

leaf is classified according to its sugar and Nicotine content. Thus, the air-cured tobacco leaves are usually groupe into three grades. The groups constitute the bottom leaves, middle leaves and the top leaves which are internationally classified symbolically as X, C and T, respectively. These are futher subdivided into three grades as following:-

TABLE 3.2

Tobacco leaves grades:-

1.	X gives X1, X2, X3
2.	C gives C1, C2, C3
3.	T gives TI, T2, TC

Source: NTC

Generally, the X grade have no sugar and no Nicotine; the C grade have the highest Sugar and little or no nicotine, but the T grade have the highest nicotine but no sugar. The different grades per group vary in the amount of sugar or nicotine content, for instance, C1 is richer in sugar than C2 etc.

3.3.2 **FLUE-CURING:**

This is more sophisticated then the air-curing method. IT is an art that requires considerable skill, for not only that the leaves should be correctly picked, but they must be heated in barns at specified temperatures for varying carefreely defined periods, a tax requiring constant attention under wood firing. It also requires considerable capital to construct the barns. The flue curing process takes fever days

(say 3) non stop heating to dry out the leaves to degree required before being sold.

Unlike the air-cured tobacco leaves, the flue cured tobacco leaves are classified into two groups; Top and Bottom. Within each group there are seven grades. They are bright, mature, over riped, greenwish, green, non-discript and mottled. The flue-cured tobacco are of higher quality than the air-cured ones. Quality is usually measured in terms of elasticity of the leaves, density, texture, lenght of leaves and colour. Elasticity has to do with how phable the leaves are; density denotes how long it takes the leaves to burn out; texture means degree of coarseness or fineness or smoothness of the leaf surface; lenght means how long the eaves are; colour denotes whether the leaves are yellow, dark, green etc. Flue-cured tobacco is lighter in colour, wilder in flavour than air-cured variety.

From the air-cured tobacco leaves about 27 grades can be obtained. While in the flue-cured 14 grades can be obtained. Thus, every leave is different from the other. So, the handling (harvesting and curing) process must be properly done to prevent adding more variations to the leaves.

3.3.3 **TYPES OF TOBACCO USED:-**

The farmers that grow tobacco for NTC employ air-curing and/or flue curing method on their harvested tobacco leaves.

Farmers in Zaria, Sokoto, Ogbomosho and Gboko apply the air-curing method due to the different climatic conditions in

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their places, the quality of there leaves differ. For instance, Sokoto produces light air cured tobacco, which is more pliable and richer in nutrients, while Zaria produces medium air cured tobacco and Ogbomosho and Gboko produces dark air-cured tobacco leaves. The flue cured tobacco is often grown in the south and middle-belt regions where humidity is relatively high and thus very unsuitable for air-curing.

However, NTC maintains four types of tobacco which the identify as:-

T. 3.3 **TYPES OF TOBACCO LEAVES USED IN NTC**

1.	N N B	- Northern Nigeria Bright Tobacco
2.	S N D	- Southern Nigeria Dark Tobacco
3.	S A B	- Zaria Air Bright Tobacco
4.	N F C	- Nigeria Flue Cured Tobacco

SOURCE: NTC.

4.0 BUSINESS LOGISTICS ACTIVITIES IN NTC:-

We have seen in the introduction that logistics activities comprises of components like, Transportation, Inventory management, Packaging, Ware housing among others.

4.1 TRANSPORTATION:-

To move raw-materials and finished goods from one area to another NTC employs the services of various forms of transportation. The major raw-material which is tobacco leaf is transported from the farm to the leaf buying centres through motor truck. The responsibility of transporting the

tobacco leafs is saddled on the farmer. The cost of the transportation is also inbuild into the cost of the tobacco leaf. However, where NTC has to transport these leafs itself the company employs the services of a fore-hire contract carrier, LALUCO Transport services. For the movement of finished goods that is, Cigarettes, the company has its own private carrier which is used for the movement of cigarettes from the ware houses to either zonal sales offices or to distributors. Where it becomes necessary to hire a carrier the same contract carrier mentioned above is used. The role of transportation shall be properly analysed when we come to data analysis.

4.2 **INVENTORY MANAGEMENT:-**

In order to ensure proper control of finished products, distributors are supplied on a weekly basis and they are given stock that can be sold within a week. This is to ensure that suppliers do not keep stock longer than necessary, as it is company's objective that the product gets to the consumers factory fresh. Besides it reduces the problem of stock management on the part of the distributors and the company alike. A weeks' supply occupies little floor space and there is no need for large ware houses for finished products.

4.3 **PACKAGING:-**

Packaging as we have seen, is one area where NTC spends alot of money. Packaging is handled entirely by the production department no distributor is allowed to do any

packaging or extensive handling of the company's products this is to eliminate any possibility of adulteration. Packaging enhances proper positioning of the product.

4.4 **WAREHOUSING:-**

NTC has modern ware houses located within the premises of the remaining factory at Zaria, they stock mainly processed tobacco leaves. However unprocessed tobacco leaves are easily stored in open stores or spaces. The need for warehousing activity also arises because the company guarantees ready market for tobacco leaf even if there is no immediate use for it. In any case processed tobacco is used after staying series of treatments which last up to five years. As we shall see later, NTC has different types of ware houses, like the Cut Tobacco Store (CTS), Leaf Ware House (LWH) and the Green Leaf Warehouse (GLW).

SUMMARY:-

We started the chapter by looking at the historical development of the company right from when it came into Nigeria as a subsidiary of the British-American Tobacco Company (B.A.T.C) in the year 1912. We saw how the activities of the Company spread over the whole of Nigeria. We also saw how it has closed down its factories to only one remaining in Zaria.

The company has the following functional areas. Marketing, Production, Human resources, Finance and Investment leave department among others.

In discussing the importance of the company to the Nigerian economy, we saw its contribution to agriculture, industrial expansion, manpower training and development, its linkage effects on other industries and the company's contribution to National revenue by way of taxes which run into millions of naira.

We discussed the tobacco farming and handling process. This is done through air curing and flue curing processes. We went on to discuss the type of tobacco used by the company.

The business logistics activities in NTC are also examined. The role that transportation, inventory management, packaging and ware housing is playing.

In conclusion therefore, one would say that the company has solid materials on ground to operate and also to implement the principle of business logistics management.

CHAPTER FOUR

4.0 DATA ANALYSIS AND PRESENTATION

Generally speaking the purpose of engaging in Business Logistics Management is to ensure a reduced total cost of production at the end of the day. This is done by integrating the logistical activities in such a way that the company operates with the least cost. At the centre of these activities is transportation. The relationship between transportation and other logistics activities is examined in order to answer the research questions. The intention is that at the end of it all we should be able to know whether Nigerian Firms (NTC) have embraced the principle of integrated business logistics management using transportation as the focal point.

4.1 TRADE-OFF

The aim here is to find out whether NTC embraces the trade-off principle. About 95% of staff interviewed said that the company operates the trade-off concept.

Transportation was found to be of great significance in trading-off cost centres. It was found that the company does not have ware-houses for unprocessed raw-material outside its immediate area of operation. What they do is that, raw-materials, mainly tobacco leaves are transported to the leaf buying centres by the farmers. After buying, they are piled up in open spaces around the leaf buying centre. This does not give a clear picture of trade-off. But when it comes to

finished product (cigarrettes). Transportation is used for moving the product straight to the distributors. The ware housing responsibility is left for the distributors. So, the cost of building, maintaining and staffing the ware-houses is avoided by the company. Consequently, if there is no warehouse there certainly can't be any inventory to manage. So the costs of warehousing and inventory management is avoided. Ordinarily, transportation cost may appear high, but if the cost of warehousing and inventory management were to be incurred, certainly it would amount to a higher total cost. But since the use of transportation has eliminated the need for warehousing and inventory, total cost is reduced. However, this is not to say that the company does not have warehouses. It has a lot of warehouses and inventory as we shall see later.

1.2 TOTAL COST OF CONCEPT

The total cost concept is closely related to the trade-off principle. Actually, the intention of using trade-off is to reduce the total cost of production. The overall budget of the company is based on the total cost concept. This is determined by the input from the cost centres. In NTC all departments are considered as cost centres. The responsibility to incure cost as well as that of controlling it lies with departments. The responsibily of monitoring these cost centres lies with the directors who inturn report to the directors usually meet to approve the budget of the

company. Subsequently meetings are held to review the performance of the company. Any cost centre that exceeds the amount budgeted for, has to explain why. If the increase is not in the overall interest of the company, such costs are not approved.

The total cost concept is a very good guiding principle in the company. As one manager puts in "to ignore overall cost of production is to breed disaster". It is cost that brings revenue. You have to buy before you can sell. If you ignore cost what else can you consider? One manage asked. Therefore to talk of cost is talking of the obvious.

4.3 LOCATION OF FACILITIES

The role of transportation in the location manufacturing facilities is an important economic consideration. Before transportation systems improved to present day level, the practice was for facilities to be located either at the source of raw-materials or near the market. But with modern transportation that has changed.

In NTC, raw-materials are transported hundreds of kilometres before getting to the plant in Zaria. Locally, tobacco leaves are cultivated all over Nigeria. Most of it is used for local production while some are exported. It is transportation that makes it possible. So, transportation makes it possible for farms to be located anywhere. Also for the finished product (cigarette) transportation equally plays an important role, especially in the area of distribution. A

good transportation goes a long way in determining the effectiveness of the distribution network.

The location of facilities is concentrated around Zaria because it is central to both sources of raw-materials and the consumers. Zaria is well linked by both road and rail transportation and is not too far from the Kaduna and Kano intenational Airports. As it is now, NTC is treaming its operations nationwide and Zaria seems to be the focal point.

4.4 CARRIER SELECTION DECISION

The Carrier selection decision is taken at three levels. For the movement of raw-materials the decision is taken by the leaf department.

For production purposes all transportation decisions are taken by the production department. And the marketing department takes decisions that has to do with (distribution).

The carrier selection decision at the leaf department is very flexible. This is because farmers and other suppliers are responsible for transporting their cargoes to the leaf buying centres. However, in the production department the situation is different. Since different types of materials are used for production the type of carrier depends on the type of material. Irrespective of the type of material, the carrier must be a contract carrier. For the marketing department they use a private carrier and sometimes a contract carrier is used only when the need arises.

For international movement, the company uses only suitable afore hire carrier. The selection decision at the above stated levels lies with the heads of departments. However, the factory manager coordinates all transportation needs of the company.

4.5 MULTI-MODAL TRANSPORTATION

When the question was asked whether NTC engages in any form of multi-modal transportation, the Marketing Manager retorted with a question thus, do you know that we have foreign partners and also import some of our raw-materials? When answered in the affirmative, he said, that shows we engage in multi-modal transportation. Almost all modes of transportation are used by NTC, water transportation is mostly used for imports while road and rail are used for transporting the imports from the ports. Air transportation is sometimes used for selected materials. Very little of pipe lines is used. We can safely conclude that NTC uses multi-modal transportation, but it is not integrated.

4.6 PROBLEMS OF TRANSPORTATION

The role of transportation, particularly in manufacturing concern like NTC, cannot be completely assessed without looking into the grey areas. Some of them are:-

4.6.1 The company have had to face the vagaries of the weather that have hampered smooth movement. Persistant rain fall or lack of it, have affected the production of raw-materials and distribution of cigarettes. Wide range

distribution is hampered especially in rural areas where roads are bad.

4.6.2 Another problem the company sometimes face is that of shortage of petroleum products, especially diesel, petrol and engine oil. Since power supply is sometimes erratic the company most of the time falls back on generating sets, but shortage of the above stated petroleum products present a big problem.

4.6.3 INFLATION:

General spiral inflation and the unstable foreign exchange situation has combined to create a very big problem for the company. The cost of vehicles and other machineries has been on the increase. The multi-plier effect of all these forces is a higher price which is passed on to the ultimate consumer. And since cigarrete is a luxury good some consumers are forces to drop it in place of other competing necessities.

4.7 **MOVEMENT (TRANSPORTATION) DURING PRODUCTION PROCESS**

The role of transportation would seems to have been underated if it is limited only to the movement of raw-materials and finished products.

It was found that a lot of movement takes place between departments and within departments. These movements are very important to the production process, so much so that, we feel it should not be ignored.

The raw-material NTC uses is leaf tobacco. Farmers are responsible for transporting the tobacco to designated leaf

buying centres. After buying from the farmers, registered for-hire carriers are used to move them to the company where they are received at the Green Leaf Department (GLD). They are checked and moved to the Green Leaf Threshing Plant (GLTP) by casual labourers. At the GLTP the leaves are pocessed and the stem is separated from the Lamina. From the GLTP the leaves are moved by conveyor belt to Leaf Ware House (LWH). From the LWH they are moved by fold lift truck to Primary Manufacturing Department (PMD). At the PMD the stem and lamina that were separated at the GLTP are then moved to the Cut Tobacco Store (CTS) by labourers. At the CTS tobacco is stored at controlled temperature to avoid moisture. The CTS serves as a reservoir where tobacco is kept for cigarrette production.

Any time tobacco is moved from the CTS it goes straight to the Cigarrete Production Department (CPD). The tobacco is moved through pipes by pumping. The purpose is to produce cigarettes into sticks. From the CPD it is moved by conveyor belt to the cigarrette Packing Department (CPD). At the CPD completely produced cigarrette are parked into parkets, bundles, rolls or cartons. They are then moved by conveyor belt to the Custom Check Desk (CCD) for check-up by men of the Custom and Excise Department. From the CCD the product is moved by fork-lift truck to the Pack Store Room (PSR). The PSR is the final resting place for the product pending distribution. It is at the PSR that distributors collect their allocation.

4.8 MOVEMENT OF EXPORTS

Tobacco leaves meant for export are sent to the Export Operation Room (EOR). At the EOR the leaves are processed to separate the stem from the lamina. NTC exports only the lamina on customer's request, while the stem is retained in the factory for internal use. The movement starts with a folk lift truck, road or rail is the case may be and finally sea.

Tobacco that does not meet company specification for export is reclassified. For that to be done the tobacco is moved by either manual labour or folk lift truck to the classified store room (CSR). From the CSR the process mentioned above, beginning from the GLTP, is repeated. However, the GLTP tobacco is transported by conveyor belts or pumped through pipes to different pressing machines which bag and bale them into 20kg and 100kg weights. The moisture content of the lamina and the stem at this stage are 12.5%-13% and 11% to 20% respectively. These bags and bales are transported via conveyor belts to the Leaf Ware House (LWH).

4.10 SUMMARY

We have seen that the trade off and total cost concepts go hand in hand. The total cost concept as we have seen, is the recognition that conflicting cost patterns should be examined collectively and balanced at optium. Both concepts are instruments in deciding which activities of the firm should be grouped together. Further more, the concepts providing the basic reason for the collective management of

the logistics activities in NTC.

We have also seen the role that transportation play in the location of manufacturing facilities. Carrier selection was found to be very important in the company. We saw the private and contract carriers are used. Since the company uses almost all modes of transportation, it could be safely concluded that it engages in multi-modal transportation.

As important as transportation is to the company's operations, it is equally beset by some problems. From the shortage of petroleum products to vagaries of the weather. We also discussed the internal movement of both raw-materials and finished goods. Various forms of equipment are used for the movement. Varying from folk-lift trucks to conveyor belts, pipes and manual labour.

CHAPTER FIVE

FINDINGS, RECOMMENDATIONS, SUMMARY AND CONCLUSION

"Viewed from every stand point Economic, Political, Military transportation is unquestionably the most important industry in the World" U.S. Congress.

In the last chapter we analysed the issues concerning the role of transportation in business logistics management in Nigeria with special emphasis on Nigerian Tobacco Company PLC. We tried to point out the relationships that exist between transportation and other logistical activities in the company. In that light, we examine specific areas in the business logistics management which are crucial to a successful implementation of the concept. The emphasis in this chapter, therefore, is to pin point the findings in the analysis, discuss them and proffer recommendations for improvement.

1 FINDINGS

From the study, it is confirmed that it is impossible to practice the art and science of business logistic without some basic concepts and activities. That is to say, for any company to practice business logistics, concepts and activities must be available in the company's set up. In order to answer the research questions the research came up with the following findings on the concepts and activities examined.

5.1.1. **TRADE-OFF**

The question here was to find out whether Nigerian firms (NTC) embraces the trade-off concept. It was found that NTC operates the trade-off principle, but, in specific sections only, that is, in warehousing and inventory management of finished products, transportation is crucial in doing that.

5.1.2 **TOTAL COST CONCEPT:**

The concept which is tied to the trade-off principle helps in identifying cost centres. The company uses the concept for its annual budget planning and implementation. This is done by considering all the relevant cost factors in a particular cost centre which are then added to form the total cost and then a search is done to identify the minimum total cost alternative.

5.1.3 **LOCATION OF FACILITIES**

Transportation might have played a major role in the location of manufacturing facilities in NTC, but presently, with modern development in transportation, that is not given a serious consideration. But in the area of distribution, transportation takes the front seat.

5.1.4 **CARRIER SELECTION DECISION**

Sufficient evidence compiled in the preceeding chapter shows that the carrier selection decision is taken at three levels. The leaf department, production and marketing take decisions that concern their departments. Howevr, all transportation issues are coordinated by the factory manager. The company

uses only two forms of carrier the private contract.

5.1.4 **MULTI-MODEL TRANSPORTATION**

It was found that the company uses almost all modes of transportation. So it could be safely concluded that it engages in multi-modalism. However, the most prominent modes are road and sea.

5.1.5 **SPECIFIC (TRANSPORTATION) PROBLEMS**

Transportation, no doubt, plays a crucial role in the management of business logistics as we have seen so far. It would have been a surprise if it were problems free. But, just like any other field of human endeavour, it is be set by its peculia problems.

5.1.6.1

Wheather conditions like persistent rain fall affects effective distribution due to bad roads that worsen up during the rainy season.

5.1.6.2

It was also found that the company sometimes experience shortage of petroleum products. This might not have been peculiar to NTC alone such instances normally occur during national or regional shortage.

5.1.6.3

Unstable Foreign Exchange regimes have affected the acquisition of vehicles by the company. This is due to the fact the cost of vehicles keeps rising. The situation is further worsened by the general spiral inflation in the

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economy.

5.1.7 **THE ROLE OF TRANSPORTATION DURING PRODUCTION PROCESS**

As said earlier, we would seem to down play the role of transportation if we limit it only to the movement of raw-materials and finished products in and out of the company. It was found that there is a lot of mobility in the company's operations. There is movement by fork lift trucks, conveyor belts, pipes and manual labour.

There is continuous movement between the factory and numerous warehouses located at different parts of the company premises. Some of these warehouses are leaf warehouse (LWA), out Tobacco Store (CTS), Pack Store Room (PST), Export Operation Room (EOR) and the classified store room (CRS).

It was also found that the movement of exports is not quite different from what obtains locally. The major difference is in the packaging.

5.1 DISCUSSIONS

From the opening quotation in this chapter and the findings enumerated above, we can boldly say that the role of transportation is irreplaceable in the manufacturing industry inparticular and the economy in general.

The general purpose of a company, like NTC, engaging in business logistics is to ensure a minimum total cost of production at the end of the financial year. This of course cannot be achieved without proper trade-off of cost centres. Even though NTC does it on a haphazard basis, we would want to

believe that it still pays off. An integrated system involving logistical activities could still give a better result by way of further reduction in cost. That is why as we said in the last chapter, the trade-off and total cost concepts are introduced. You trade-off in order to reduce the total cost of production. Transportation is the bridge for this. We have seen the role of transportation as far as trade-off in NTC is concerned. Increase the cost of transportation and the cost of warehousing and inventory management will come crashing.

Location of facilities does not seems to be tied to transportation, it might have been, but not is not. Transportation seems to have outgrown the location of facilities as a focal point. Carrier selection decision is flexible in the company, which, we feel is good for proper management. But for the coordination by one single manager, one would have had cause for fear of abuse. The singular decision to have one contract carrier LALUCO Nigeria Limited, is not a too good management decision. Multi-model transportation, eventhough not intergrated, is a plus for the company.

The specific transportation problems listed above do not seems to pose any serious challenge to the role transportation plays in the company because some of them rarely occur.

If the experience of Nigeria Tobacco Company PLC is any thing to go by, one can safely say that Nigerian companies are

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overcoming the teething problems of implementing an integrated business logistics systems as a tool of management.

Transportation is playing a very significant role. But one would be quick to caution that a good transport system cannot be created in a vaccum. The national transport system would have to take the lead in that direction. It would seems to be out of the scope of this write-up to say that our transport system still leaves much to be desired. But it is the truth going by the experience of NTC.

The competition in the manufacturing sector is increasingly becoming global. Except Nigerian Firms breast up to the challenge by articulating their logistics management skills they may have more worries to handle.

5.3 RECOMMENDATIONS

Judging by the theoritical and practical issues involved in the management of business logistics in Nigeria, of which transportation takes the centre stage, the future propects look bright and encouraging. This is born out of the findings of this study. It is on this basis that the following recommendations are made.

5.3.1 INTERGRATION OF LOGISTICAL ACTIVITIES

In order to improve reduction in the total cost of production. Nigerian Firms (NTC) should intergrate their logistical activities. When this is done areas that were hithto neglected and considered insignificant, which may be incurring unnecessary cost would be explored.

5.3.2 **COMPUTERISATION**

The world is increasingly becoming a global village. This is made possible by the use of Computer Technology. Such items as Robotics, laser beams systems, fiser optics, artificial intelligence, expert systems, micro-wave and communication satellites easily come to mind.

The computer is already having great impacts in other areas of economic activities. Infact alot of computers are being used in transportation, inventory management, warehousing and other logistics activities. Since the computer is applied in the solving of every imaginable problem. The Nigerian Firms (NTC) have no alternative than to embrace this trend.

5.3.3 **JUST-IN-TIME PHILOSOPHY**

This is of Japanese Origin. It is closely associated with advances in computer technology and constitudes good management practice. The idea is to avoid maintaining inventorie with all their attendant problems by supplying a manufacturing concern frequently and in small quantities to meet the requirement of present production. This will completely cut off the need for warehousing. However, the cost of transportation would increase. For this to work very well there must be an efficient transport set-up. When raw materials are picked up they should be supplied straight to the factory where they are put to use almost immediately. If a company can put this philosphy into use, it would improve

efficiency and also cut down total cost.

5.3.4 **TRAINING AND DEVELOPMENT**

The field of business logistics management is at its development stages. So there is need for continuous training and re-training of professionals to handle the intricacies of the job. This should be supported by continuous research which will help in breaking raw grounds in the fields.

5.3.4 **ENCOURAGE THE ESTABLISHMENT OF PROFESSIONAL BODIES**

Companies should encourage the establishment of professional bodies and forums where ideas relating to the field could be exchanged. We all know how important bodies like, the Nigerian Marketing Association, Chartered Institute of Transport, Nigerian Chartered Institude of Purchasing and Supplying (just to mention a few) are playing in the training of manpower and professionalism in their fields.

We believe that the above recommendations, if carefully studied and implemented could go along way in improving the development of business logistics management in Nigeria.

5.4 SUMMARY AND CONCLUSION

5.4.1 SUMMARY

In chapter one we saw how the need to satisfy human needs necessitated, not just production, but the ways through which the products could get to the customer. We also saw the impact that transportation could have in the distribution function of a company.

Related literature was examined in chapter two in which a conceptual view of the area of study was made. While chapter three dealt with the historical development of Nigerian Tobacco Company PLC. An overview of the past and present activities of the company was made in order to give an idea of the set of a typical Nigerian Firm.

An analysis of the research data was presented in chapter four. The intention was to try and answer ther research questions put forward in chapter one.

Chapter five dealt with the findings, their discussions and recommendations for improvement. The following facts were established:-

1) That Nigerian Firms use transportation for effective trade-off, however it is not integrated.
2) That the total cost concept is in practice and is tied to cost centres.
3) That transportation does not really determine the location of manufacturing facilities at the moment.
4) That the company uses Multi-modalism, although in an unintegrated fashion.

Problems that militate against a smooth operation have also been highlighted and recommendations proferred accordingly.

5.4.2 **CONCLUSION**

Any discussion on the role of transportation in business logistics management would definitely have to begin by looking at the field of business logistics itself. Since transportation is only one component of the system, it then calls for an examination of the other components. We have therefore discussed the part played by inventory management, warehousing, packaging, materials handling among others.

Since the field of business logistics management is newly emerging, especially in this country, one thought that much would not be available to write on. However, one was able to find that Nigerian firms, using NTC as our case study, have started very well in the use of this new management tool. Eventhough it may be said that nothing short of a completely integrated system is acceptable. One would venture to say, in the light of these findings, that Nigerian firms have embraced the management tool. It is believed that in no distance future the field of business logistics management would become as popular as other fields of management like, personnel management and financial management, in Nigeria.

With this study it is hoped that many more studies would be build on it because it is by no means exhaustive.

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APPENDIX 1 (a)

TO WHOM IT MAY CONCERN

I am an MBA Student at the Ahmadu Bello University (A.B.U) Zaria. I am conducting a research on the topics, "The Role of Transportation in Business Logistics Management - (A Case Study of NTC PLC Zaria)."

Your company has been selected as the Case Study. I would therefore solicit your assistance by way of granting me an interview. Could you please study these attached questions and give me a date for an interview?

Please be rest-assured that the information given shall be treated in strict confidence.

Thank you.

D. B. BONAT

APPENDIX 1 (b)

UNSTRUCTURED INTERVIEW SAMPLE PROFORMA

1. How does your company acquire its raw-materials.....
2. How is it moved from the source to the plant?.....
3. When the raw-material is received how does it move from section to section?.....
4. How does the Marketing Department organised its distribution function?.....
5. What is the role of transportation in the distribution? .....
6. Who bears the cost of transportation?.....
7. Could you please give me an estimate of the cost of transportation incurred in a year?.....
8. What is the per centage of transportation cost in your total distribution cost?.....
9. What is the relationship between your Department and other Departments as far as transportation decisions are concerned? .....
10. What would you say are the problems your department face in the area of transportation? Any difference from the entire company?.....
11. Do you use transportation for trade-off?.....
12. Between transportation, inventory control, warehousing, and packaging, which one constitute the highest cost in your physical distribution function?.....

13. Generally, how would you describe the impact of transportation on the operations of your department?.....

14. How would you describe the Nigerian transport system, especially as it concerns the manufacturing sector. (Problems and suggestions).....

15. Who is responsible for inventory control, transportation, packaging and materials handling in your company?.....
.....

16. Do you have a way of harmonising these activities?
....

17. In a nutshell, how would you describe the logistics activities of NTC?.....

18. Do you use the Cost Centres Concept?.....

19. Is logistics a part of Marketing Function?.....

20. How do you see the development of business logistics in Nigeria? Are companies embracing it?.....

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