CONSTRUCTION INDUSTRY IN NIGERIA

A Special Research Problem

Presented to

The Faculty of the School of

Civil Engineering

By

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CHAPTER 1

INTRODUCTION

The role Construction could play in a nation's transitional process from a typical agrarian to an urban industrial society is undoubtedly significant. Being the world's largest industry and greatest employer and consumer of money, steel, aluminum, copper, cement rubber, lumber, paint and other products and services, construction could markedly have an impact on the lifestyle of people in a developing country like Nigeria.

Construction is a highly regulated industry. Put in a simple terms, Dan Alexander calls it a "jungle" full of unknowns, unpredictables and uncontrollables. It is a high wage and growth oriented industry. Irrespective of being a highly competitive business, it offers a great potential for the improvement of the economic status of people in Nigeria.

Information about the construction industry in Nigeria is very sketchy, since no work has ever been done before in this area. In an area where there is no information and data, no one is quite certain what actually is happening on the scenes. Just how many companies there are has long been a matter of uncertainty. No one really knows how much work nationwide is performed by these companies. No one really knows whether this Industry exists or whether a collection of corporations, partners, and proprietors are teaming up to provide the government and public custom design

products.

Unquestionably good management is the lifeline of any successful construction company, and whether Nigerian construction companies have the good management skills, tools, techniques remains questionable. Exactly how many contractors have gone out of business is unknown. Rushing into contracting with its lure for quick fortune does not provide the basis for a stable construction industry; but whether there has been a substantial technological transfer is what remains to be found out.

The indigenous contractors claim that incompetent contractors are taking an undue advantage of the economic situation to make "inroads" into construction while the "Johnny-Come-Lately" argues that free enterprise and competition can only have a healthy effect the nation's economy. Exactly what these companies are doing remains to be determined.

In order to establish a representative data base upon which to evaluate the underlying assumptions, three basic choices were required:

1. Choice of those specific cities which best represent the potential markets for construction.
2. Selection of those companies which are solely engaged in construction.
3. Choice of a sample which best represents the national cross-section.

It was then necessary to define the purpose, objectives and methodology of this study and in the final analysis conclude whether there are "problem-generating structures" in the Nigeria construction

industry.

This project was geared towards using mail survey techniques to collect the information from this industry. This paper seeks to analyze and interpret this survey result and correlate it with the various types of services provided by these companies.

Purpose and Objectives of the Study

The purpose of this investigation by the author was to compile factual information for the first time about the construction industry in Nigeria. The guiding principle is to focus attention on those specific subjects which might throw some light on the state of the industry.

It was the intent of the study to determine existing profiles and trends in the industry; to quantify the management and organizational philosophies of these companies; and to qualitatively assess the overall impact of the industry in Nigeria. A third objective was to prove the assertion that the problems indigenous contractors face are simply problems faced by all small business people. That is, problems that arise from being small rather than problems of underdevelopment.

Methodology

The pilot phase of this project consisted of designing and pretesting a questionnaire titled, "Nigeria Construction Industry Survey 1977" in the Atlanta, Georgia, area. Five copies of the questionnaire were mailed to Atlanta area construction companies, 3 copies to Georgia Institute of Technology professors, and 10 copies to Nigerian students in the Atlanta area. The objective was to predetermine whether the questionnaire was fit to be mailed

abroad. A letter informing the sample population of the survey was nailed out at a very early stage of the project.

The second phase consisted of determining the size of the sample, selecting the cities, locating the companies, and choosing the sample companies to be surveyed.

Sample Population

A sample population of 125 Nigerian construction firms was selected nationwide with a view of obtaining a complete cross-section of the industry. To randomly generate a national sample in accordance with the requirements of statistical method is extremely difficult if not practically impossible with the limited resources available for this study. Nonetheless, attempts were made to come as close as possible by trying to make the selection as unbiased as possible. The four parameters considered in the choice being the type of company, location, type of work and volume of work. However, the variability in the industry itself makes it impossible to obtain a truly unbiased sample population.

Selection of the City

Geographical location has a major effect on the characteristics of a construction company. As such the size of the town and region were the prime criteria in selecting the geographical location for this study.

All State capitals and large cities were considered strategic locations and important markets for construction, and so were subject to first choice. Very small towns had no exsiting registered companies and little attention was paid to them. Each city chosen had a significant number of indigenous construction companies.

Lagos, the largest city in population, had the greatest number of companies. Two out of every 10 construction activities occur in Lagos. Lagos is a center of various labor unions and is where various programs originate to upgrade the industry, so these factors were considered in choosing a representative sample from this city.

Locating the Companies

Upon selecting the major towns and cities, the task of identifying which firm was a construction company began. The strategy was to develop a master list of all construction firms from whatever source of information available. These sources inculded the National Telephone Directory, all utility companies in Nigeria, all construction material manufacturers and dealers, construction companies listed in the Barclays Bank Directory of West Africa, and all State and Federal Ministries that register construction companies. The master list was compiled after cross-checking all lists developed to date.

Of the 125 companies surveyed, 1 contractor was reported dead, 1 company was not a construction company, the mails of 26 companies or 20.8% of the sample were returned untraced, 2 companies had gone out of business and 71 contractors returned their questionnaires. Out of these 71 companies, 7 contractors completed only section one of this survey and their questionnaires were not included in the analysis.

Nonresponsiveness on the part of some company officials reflected their fear of this study's prying into their business affairs.

This study relies heavily on the information supplied by all the contractors surveyed. In general the survey covered the following areas:

1. Profile of the firm
2. Contract procedures
3. Management techniques
4. Problems of these companies
5. How the contractor thinks he could be helped

To supplement the information gathered, data were collected from international organizations such as the Federal Office of Statistics in Lagos, the United Nations, and the World Bank in New York. Table 1 shows the schedule of persons or agencies contacted in this survey.

Schedule

This project covered a period of seven (7) months as shown in the Appendix. The project starting date was November 11, 1977 and it was scheduled for completion on May 15, 1978. All critical activities are indicated in the remarks.

Analytical Approach

Analysis of this project falls into the following headings:

1. Industry Profiles
2. Management Techniques
3. Industry Outputs
4. Technological Impact

The information collected from this survey are quantified and analyzed statistically.

Table 1. Schedule of Persons and Agencies Contacted

Classification	Location	Total Number
Nigeria Construction Firms	Nigeria	125
Altanta Construction Firms	U.S.A.	5
Georgia Tech Professors	U.S.A.	3
Nigerian Students in Atlanta	U.S.A.	10
Utility Companies	Nigeria	16
Material Dealers	Nigeria	11
Cement Factories	Nigeria	6
Equipment Dealers	Nigeria	9
Federal Ministries	Nigeria	3
State Ministries	Nigeria	19
World Bank	U.S.A.	1
Standard Bank	England	1
Central Bank	Nigeria	1
United Nations	U.S.A.	1

Questions 1 through 7 from Chapter 3 on Nigeria Construction Industry Profile, while questions 8 through 47 are discussed in Chapter 4. Construction outputs are graphically presented and analyzed in Chapter 5 attempting to predict the trends of the Industry. The technological impact of the industry is examined in Chapter 6.

CHAPTER 2

CONSTRUCTION INDUSTRY IN NIGERIA
STATE-OF-THE-ART

Introduction

Nigeria is a West African country located between the Bight of Benin and Bight of Biafra. She became independent in 1960 after more than half a century of British rule. In 1963 she became a Republic but retained her membership in the British Commonwealth. Her official language is English. Nigeria has a land are of 356,700 square miles (990,833 km^2) about four times the size of the United Kingdom and roughly the size of Texas and Oklahoma combined.

Nigeria has a population 80 million (1977) and is the most densely populated country in Africa. Over 4 million (1977) people live in the capital city of Lagos. There are 19 states in Nigeria with a new Federal territory planned for Abuja in the central part of the country. The Federal Republic of Nigeria is presently governed by a military government. A multi-party democratic government is planned to replace the military in 1979. The states are subdivided into local government areas each with its own government. The federal government of Nigeria has legal responsibility for national and regional planning, compulsory acquisition of land and regulations. Planning of national projects like transportation, communication, electricity generation and distribution are the responsibilities of the central planning office and the various ministries in Lagos. These responsibilities are frequently delegated to public corporations, e.g., the railway corporation.

The state government is responsible for state and town planning. The local government prepares and administers its own development plans and is responsible for approving private construction.

Revenues from local authorities come from general taxation. The building and construction industry pays income tax and a 2½% value added tax. The land tenure system in Nigeria makes acquisition of land for construction difficult. In the South, land is commonly family owned under native laws and customs. The law does not favor alienation of an individual's share. Approval of the government is required before a Nigerian can alienate land to non-natives of Nigeria or companies consisting of such persons. Approval from the government can take a long time. In the North, no title to occupy any land is valid without the consent of the Governor. To overcome these difficulties, all lands are to be nationalized in Nigeria. Inspection and regulation are carried out by authorized government officials.

For the past five years Nigeria has been enjoying a measure of financial buoyancy, economic boom and industrial expansion unparalleled before in its history. This arises from escalated earnings from crude oil of which she is world's sixth largest producer. However, the country has been hit by Inflation which is the worst in many years. Unemployment is at 21% in 1975 as compared to 13.5% in 1970. Prices rose at 16.5% rate in 1975 and shows no sign of declining (see Table 2).

The export market including ground nuts (peanut), cocoa, palm produce, rubber, petroleum, tin and natural gas continues to be strong. However construction has moved to the forefront of the economy and is helping reduce unemployment.

Development of the Industry

Construction is a high risk industry. The risk is even higher in a developing country like Nigeria, coup d'etats, fuel and power shortages, congestion on transport facilities, nonavailability of skilled labor, lack of capital, construction technology, material and equipment complicate the construction environment.

Table 2. Price Fluctuations by April to June 1975

Material	April	May	June
Cement per bag	3.20	4.40	5.50
Nails per box	30.00	33.50	35.50
Flat sheet gravel per lorry load	45.00	55.50	70.00
Building wire per bundle	18.00	26.00	30.00
Sand per lorry load	30.00	38.50	45.00
Iron rod (per ton)	372.00	400.00	430.00
Plank (Afara white wood) 1x12x12	2.50	4.50	5.50
Solignum	6.00	16.00	20.00

Source: Third development plan

Construction in Nigeria is very profitable to the contractor who organizes well, chooses his staff with good judgement, deals fairly, looks ahead and is ready to take the risk. The competition is tough and hot. It is one place an inexperienced contractor gets injured.

Nigeria is one country where oil revenues have provided the means of turning economic potential into the reality of all-a-round development. Beginning in the early sixties there were scattered construction activities all over Nigeria. There were attempts by

some politicians and businessmen to undertake some "turnkey projects," in which the seller of machinery arranges to have the plant built and management provided "so that the factory is ready to come in operation at the turn of a key."

Intensive construction activities began during the first six year National Development Plan 1962-1968. This plan envisaged investment of*2400 million over the period of which 50% was expected to come from foreign sources. Under this plan several development projects were undertaken. The most noteworthy construction contracts were:

1. Kainji Hydroelectric Dam
2. Eko Bridge at Lagos
3. All Trunk "A" Roads
4. The Expansion of Lagos, Kaduna, and Eastern Region Water Supplies
5. Educational Projects in all the Regions
6. Construction of Gas Turbine Plants at Afam and Ughelli
7. Power Lines Construction
8. Asaba-Onitsha Bridge (over the Niger)

The most ambitious project in Nigeria's history was the construction of*175.2 million Kaiji Dam which attracted foreign assistance. As much as*50 million was loaned by the World Bank, 19 million from the Italian government,*10 million for the United States,*6 million for the United Kingdom, and*4 million for the Netherlands. The Italian Engineering Contractor, Impregilo SPA of Milan (Impresit), was the prime contractor with the Dutch NEDECO and Britain's Balfour Beatty & Co., Ltd., doing the design and studies. Impresit is the Italian firm which built the Kariba Dam

*Naira

on the border of Zambia and Rhodesia. This dam project was envisaged to have a revolutionary impact on the economy and social life of the nation. All previous loans since Independence in 1960 were used for port installation and development, roads, railways extension electicity development, water supplies, health and education. The *18 million Eko Bridge in Lagos was build with a*13 million loan from the West German Government. A*20 million loan from Japanese government was for importation of machinery and heavy equipment.

From 1967-1970 Nigeria was engaged in a political crisis which began on May 30, 1967, when Eastern Nigeria decided to secede from Nigeria to become Biafra. This forced the nation into war and economic sanctions were imposed against Biafra. Construction went through a recession during this period. These difficulties together with the added burden of arms purchases caused a rapid decline in foreign exchange reserves from*168.8 million in 1966 to*55.4 million in 1968, The political disturbance brought the First National Development Plan of 1962-68 to a premature end. A sample survey in 1967 indicated that 75% of firms in the country were operating below capacity and several construction projects were abandoned. In an attempt to prevent investment decline, Eastern European countries provided some industrial loans. A variety of industries developing chemical, iron and steel, and railroad equipment industries were planned. The Soviet Union provided*30 million, Poland*20 million, Czechoslovakia and Yugoslavia*17 million in aid toward these projects.

Once peace was restored the task of post-war reconstruction was formidable. The government quickly reopened all its oil wells for production. The country's position with regards to changes

*Naira

in foreign reserve assets improved rapidly, 17.6 million in 1966 to 15.2 million in 1969 to 58.6 million in 1970 and 119.4 million in 1971. This being due to a major contribution from the oil sector. The available funds were used in carrying out major reconstruction projects. Several contracts were awarded for the reconstruction of war damaged oil pipe lines and pumping stations, industries, transportation facilities, schools and cities. These were mostly located in the war-torn regions of Nigeria. One major reconstruction project was the rehabilitation of about 2000 miles of road valued at 100 million in all parts of the country.

A Second National Development Plan was launched for the period 1970-1974. The plan envisaged a total planned expenditure of 319.6 million over the four years. The plan contained the framework for the reconstruction of the war damages and the revival of the development of the post war economy. The underlying aim was to provide for "economic take-off in later years and establish a united strong and self reliant nation." When the plan was launched many offers of aid were made by international organizations and bilateral agencies including the World Bank, USA, UK, West Germany, Netherlands, Canada, Poland, Norway and Japan. Concurrently, a 10 year National Road Development Scheme 1970-1980 at an estimated cost of about 460 million was launched. Its aim was the creation of a national road network of primary and secondary arterials, an important part being the new north-south highway to link Warri and Calabar wiht their hinterland. Nigeria Railway Corporation operating on a six year plan, budgeted the sum of 43.6 million for railway modernization. A total of 354.9 million was invested in building and construction in 1971-1972.

Note all sums of money are in Naira.

All local construction material industries were operating at full capacity. Some undertook expansion. Cement and paint consumption in 1972 increased by 12.2% and 11.7% respectively. Many of these construction projects were virtual vacuums and needed competent construction firms. Major construction projects completed during 1972-73 included the 145 km Lokoja/Kari road, the 106 km Shintaku/Otukpa road, Apapa road/Ijora causeway complex, the University Teaching Hospital at Benin and the National Sports Stadium at Surulere near Lagos. Government contracts awarded during 1973 included various road reconstruction projects and the construction of the largest single building complex commissioned by the Federal Government, which was to proved official accommodation in Lagos, Most projects were delayed as a result of cement shortages. The World Bank granted the Nigeria National Electric Power Authority a 50 million loan to improve electricity supply. Highway construction during 1972-73 included 855 miles of road finished, 2225 miles under construction, and 900 miles to be started later, all at an estimated cost of 348 million.

Nigeria was faced with port, road and airports congestion, shortages of food and fuel supplies, shortages of housing in the 19 newly created states and increased enrollment in schools. This necessitated the launching of the Third National Development Plan 1975-80 criticized as too ambitious (see Table 3). It was estimated to cost 30,000 million.

Contracts were awarded for the construction of new interstate highways, a new railroad, 19 new airports, 6 ports, irrigation and hydroprojects, major industries, e.g., steel and natural gas, pipelines, 2 refineries at Warri and Kaduna, power projects, military

Note all sums of money in Naira

projects, a new capital territory at Abuja, development of 19 new state capitals, housing schemes, schools and universities, medical

Table 3. Second and Third National Development Plans

Area	Third Plan Allocation (in million Naira)	Second Plan Revised Allocation (in million Naira)
Industry, Mining, Manufacture	6,000	36.7
Transport	4,100	885.6
Regional Development	3,200	59.0
Defence and Security	2,200	349.0
Education	2,000	300.0
Agriculture	1,400	304.9
General Administration	854	266.6
Communication	774	112.9
Health	659	138.8
Information	201	85.3
Power	163	90.6
Labor and Social Welfare	152	16.1

Source: African Development, February 1975.

facilities, rural electrification and water schemes.

High on the list was the construction of Lagos-Ibadan expressway at a cost of 88 million. A road program estimated at

3,400 million was envisaged in the Third plan. Universal Primary Education, which started in 1976, generated much building activity. Apart from 62 additional teachers training colleges, about 36,000 classrooms were required for 1976-77. The Lagos skyline was constantly changing. A National Theatre was built in 1976-77. Private developments were undertaken in all towns and cities in the country. About 90% of these projects were crash or constructed on fast rack. Tables 4, 5, and 6 summarize some of the programs.

General Industry Overview

The Nigeria construction industry consists of many companies and public organizations engaged in a variety of activities. These companies range in size from those engaged in multi-million Naira constracts to the small indigenous contractor undertaking house repairs and maintenance.

Construction has pushed to the forefront of the Nigerian economy in the last few years. It is now a major contributor to the economy in terms of output and employment. Nigeria had a 821.4 million construction volume during 1974, up 60% from 1970 figures, and 8 times the construction volume generated in 1960. The contribution of the industry itself to the gross national product in 1974 was 6.8%. In 1970 this was 3%. From recent statistics its relation to other national acitivities is shown in Figure 1. The distribution of construction between the various sectors of the industry is shown in Figure 2.

Between fiscal year 1970-61 and 1974-75 its contribution to the total domestic output is estimated to have at an average annual rate of between 12 and 20%. In the three component

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All sums in Naira

Table 4. Federal Road Projects

Phase I

Road Projects: Total length, 2,993 kilometers
Value, 133.6 million Naira

1. Ilorin-Bakari-Kaduna
2. Warri-Benin-Okene
3. Benin-Asaba
4. Kaduna-Zaria-Kano
5. Nine Mile Corner-Oturkpo-Aliade-Markurdi-Jos
6. Onitsha-Owerri

Phase II

Roads Projects: Total length, 3,678
Value, 3,405 million Naira

7. Ode Rema-Ibadan
8. Kontagora-Koko-Jaredi
9. Road Bridge at Jebba and Markundi
10. Lagos-Ibadan Expressway
11. Lagos-Ewekoro-Abeokuta
12. Okene-Lakoja-Kaduna
13. Imo River Bridge
14. Shagamu-Benin
15. Nine Mile Corner-Otukpo
16. Girni-Jos.
17. Benin Sheik-Maiduguri

Phase III

Road Projects: Total length 6,195 kilometers
Value, 2.05 billion Naira

18. Badagari-Ilara-Abeokuta-Iseyin-Kaiama-New Busa-Birnin Yauri
19. Kano-Daura-Kongolam
20. Lagos Island Ring Road
21. Third axial road and bridge in Lagos
22. Agwu-Oji River
23. Gembu-Warwar-Jamtari-Mayo Belwa-Yola
24. Port Harcourt-Aba-Umuahia-Enugu

Table 5. Airport Plan

Phase I to begin 1973/74
1. Lagos (Ikeja) International
2. Calabar
3. Jos
4. Kano (International)
5. Ilorin (International)
6. Enugu
Phase II
7. Port Harcourt (International)
8. Sokoto
9. Kaduna
10. Maiduguri (International)
11. Benin
12. Ibadan
Phase III
13. Warri
14. Zaria
15. Gasau
16. Makurdi
17. Yola

Table 6. Port Projects

	Project	Estimated Cost (million Naira)
1.	Lagos/Apapa Wharf Extension	84.4
2.	Warri Port Development	29
3.	Calabar Port Development	17.4
4.	Port Harcourt Development	69
5.	Koko Port	15
6.	New Ocean Terminal	42.2
7.	Dockyard Program	19
8.	Petroleum Jetties	24.3
9.	Bonded Warehouse/Container Freight Station at Apapa	5.3

subsectors (mining, manufacturing, building and construction), construction recorded an increase of about 25%. About 20% of the total labor are engaged in construction and related industries. Of this, approximately 14% of the total labor force or about 4.1 million persons are involved in the construction industry. Of this number 2,740,000 are directly involved in construction production or placement. About 970,000 are involved in administratives and support functions. This gives a ratio of productive labor to administrative support of approximately 3 to 1.

There are two types of construction companies in Nigeria. There are foreign and indigenous construction companies. Construction activities in Nigeria can be broadly divided into four categories, namely:

1. Federal construction projects
2. State construction projects
3. Commercial and industrial construction

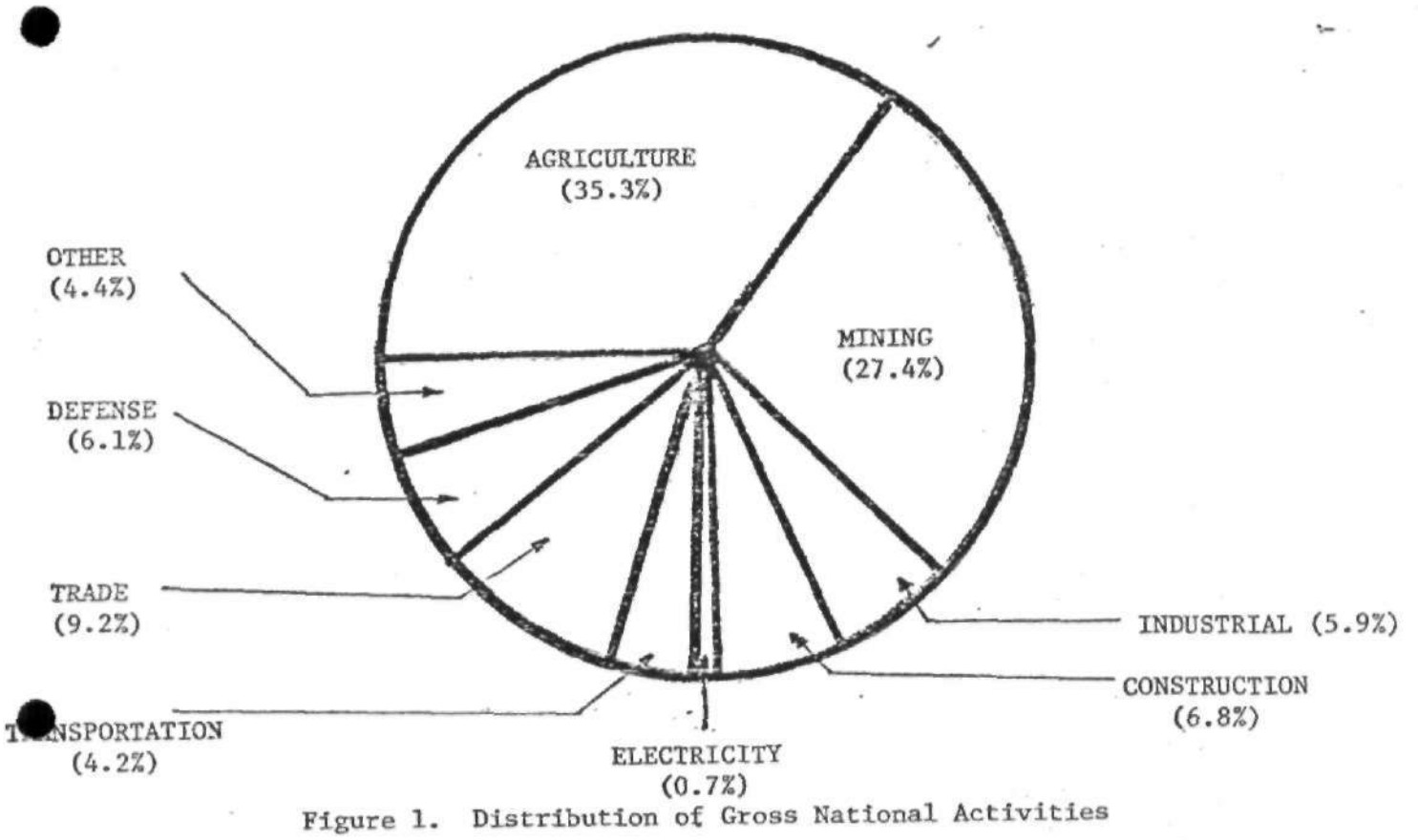


Figure 1. Distribution of Gross National Activities

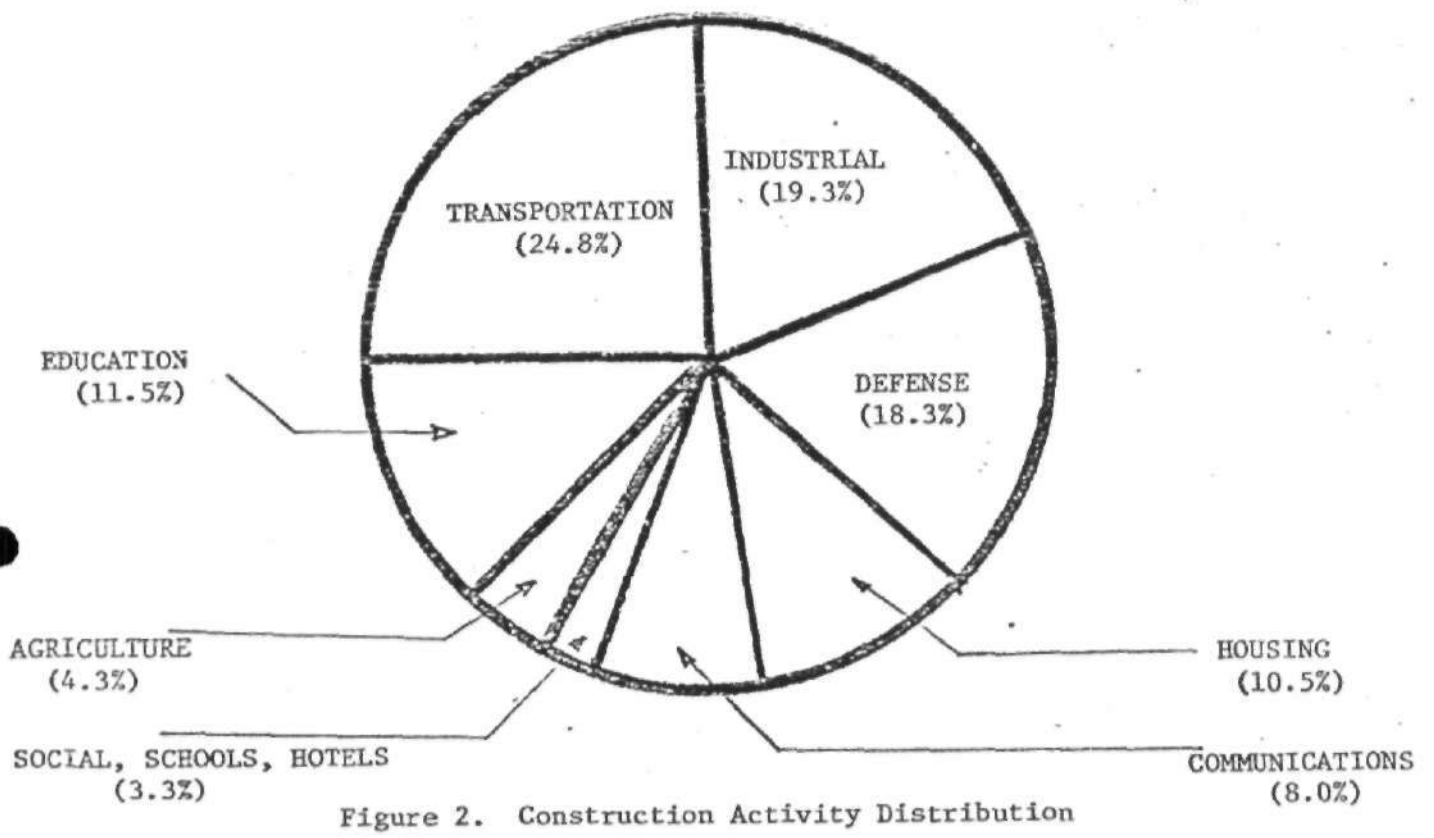


Figure 2. Construction Activity Distribution

4. Private construction

Federal construction projects are the multi-million naira construction having overall impact on national development. These include transportation, telecommunication, education, industrial, military, power projects, etc.

State construction projects include state roads, hotels, housing estates, schools, etc.

Commercial and industrial include stores, shops, supermarkets, banks and factories.

Private construction include residential construction and community development projects.

Most federal projects involve heavy construction and are handled by foreign contractors. Indigenous contractors with the know-how and capital are encouraged to bid on federal projects. State contracts involve heavy and light construction. About 60% of these projects are handled by the indigenous contractors. The State Ministry of Works and Housing undertake projects not let out on contracts. Commercial construction are mostly handled by small to medium size indigenous construction companies. Major industrial and "turnkey" projects are contracted to the foreign companies. Small cottage industries are built by indigenous constractors. Community development projects and residential construction are exclusively for medium and small size indigenous contractors.

Organization of Industry

All construction companies register their companies and Nigerian head offices with the Federal Ministry of Trade, Industry and Cooperatives, Lagos. The foreign contractor maintains his

Nigerian head office in Lagos (the Capital) and sets up branch offices in any of the 19 states of the country. The indigenous contractor usually locates his company head office in the town and state of his origin. His work is limited to his state and region. The smallest indigenous contractor confines his activities to his own town of origin and neighboring villages. Table 7 shows the type and size of Nigerian construction companies.

Table 7. Type and Size of Nigeria Construction Companies

Type of Company	Size		
	Large	Medium	Small
Foreign	X	X	
Indigenous		X	X

In order to bid on state projects constractors are required by law to register their companies with the State Government. If a constractor intends to perform work for an agency, local government, or University, he may be required to register with this agency. At the Federal, State and local levels, all registrations are classified as General Contractors or Speciality Contractors as explained below and further grouped into categories. The categories are basically groupings based on financial capabilities of the company. Category F-G means those companies that could handle multi-million dollar projects, while Category A are the smallest contractors performing jobs in the range of 1-10,000 as shown in Table 8.

Table 8. Regional Government Registration Categories for Contractors*

Category	Eastern Nigeria 1965	Northern Nigeria 1962	Western Nigeria 1968
A	2,002-10,000	2,000-12,000	1002-6,000
B	10,002-20,000	12,002-24,000	6,002-12,000
C	20,002-40,000	24,002-50,000	12,002-40,000
D	40,002-100,000	50,002-100,000	20,002-40,000
E	100,002-200,000	100,002-200,000	40,002,100,000
F	200,002-and over	200,002-and over	100,002-200,000
G			200,002-and over

*Values in Niara

Source: Eastern Nigeria, Ministry of Works, "Rules for the Registration of Contractors in Eastern Nigeria" pg. 1 (no date)

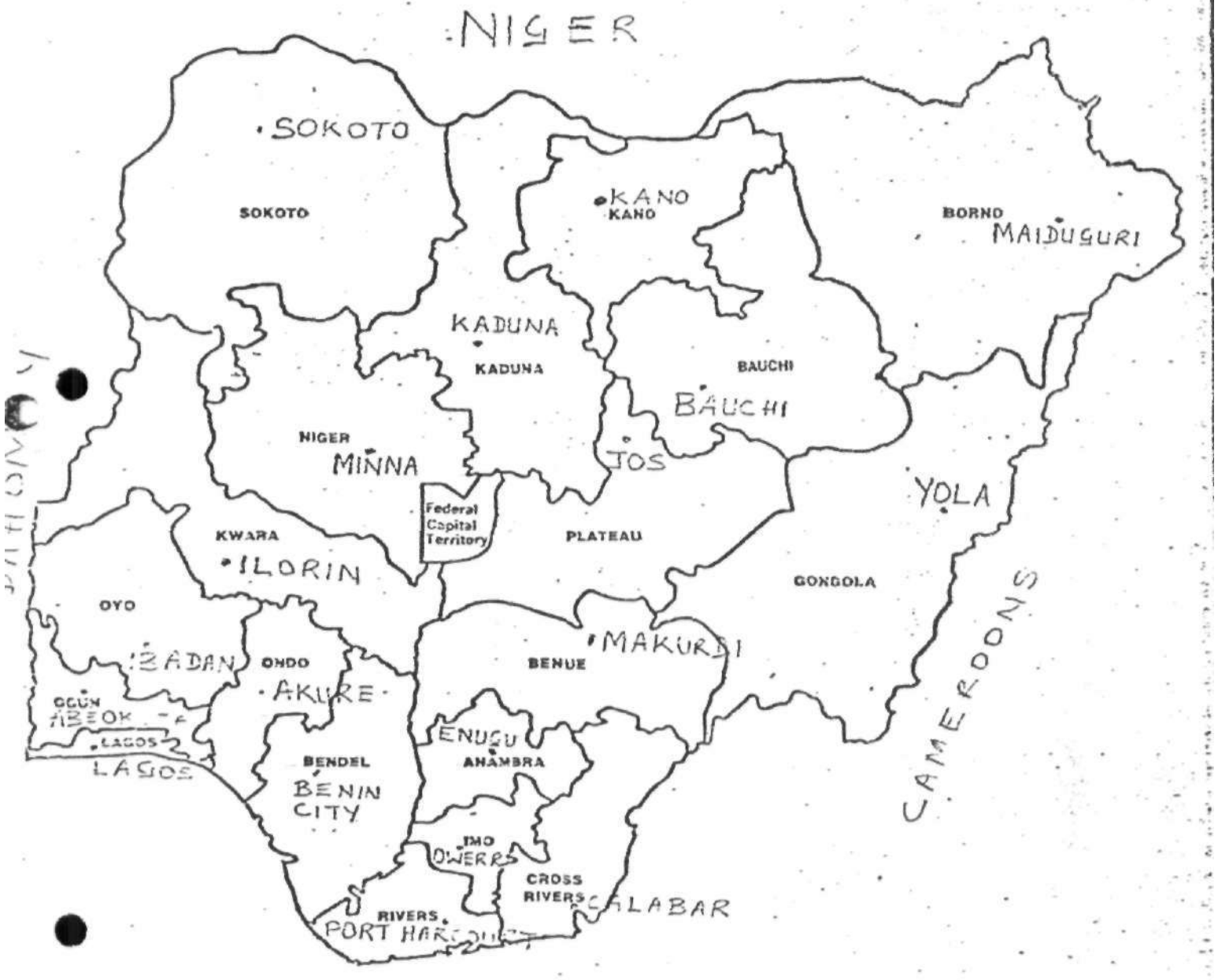
Northern Nigeria, Report on Building Costs., pg. 28, Ogumpola, "Pattern of Organization" p. 347

General contractors are authorized to act as prime contractors. Each general contractor operates within the geographical area in which his registration permits him to, but opportunities exist for bidding on a project in an adjacent area. Specialty contractors are mostly subcontractors. They confine their work to some speciality area, e.g., Mechanical and Plumbing, Electrical, Pile Driving, etc.

In 1974 there were 500 construction companies whose addresses were published in the National Telephone Directory. Of these, 325 were indigenous contractors. Figure 3 shows the geographical distribution of these company headquarters and their area of operations.

FIGURE 3

Map of the Federal Republic of Nigeria showing the states



LEGEND

. Location of Company Branches

~ State Boundaries

In addition to these construction companies, the Ministry of Works and Housing in each State and local government area maintains their own task force and construction units which perform some design and construction of government buildings and road repairs. Maintenance units belonging to the town council in certain localities perform maintenance and small construction projects for the city or town. Nigerian Army Engineers undertake similar construction projects when need arises.

Indigenous contractors operate thier companies as sole proprietorships or partnerships. Under this arrangement, illustrated by Figure 4, the owner or managing director assumes the duties of president, work promoter and salesman, negotiator with the bank and bonding company and makes all company decisions. In the office he maintains a bookkeeper and a typist. The bookkeeper performs the duties of treasurer, accountant, purchasing agent, expediter. The typist performs the duties of a secretary, typist, and general office help. The managing director occasionally does the supervision of work and hiring of office help while the superintendent is usually his partner or right-hand man. He helps the director in estimating and job planning and acts as a project engineer, equipment superintendent, job organizer and general supervisor. The illiterate contractor may not have any organized office but works directly with the job superintendent who takes care of most of the organizing functions. Most successful indigenous contractors are engineers, business majors, businessmen or experienced craftsmen who withdrew from government jobs to enter construction. About 50% of the indigenous contractors start out with lack of finance and experience.

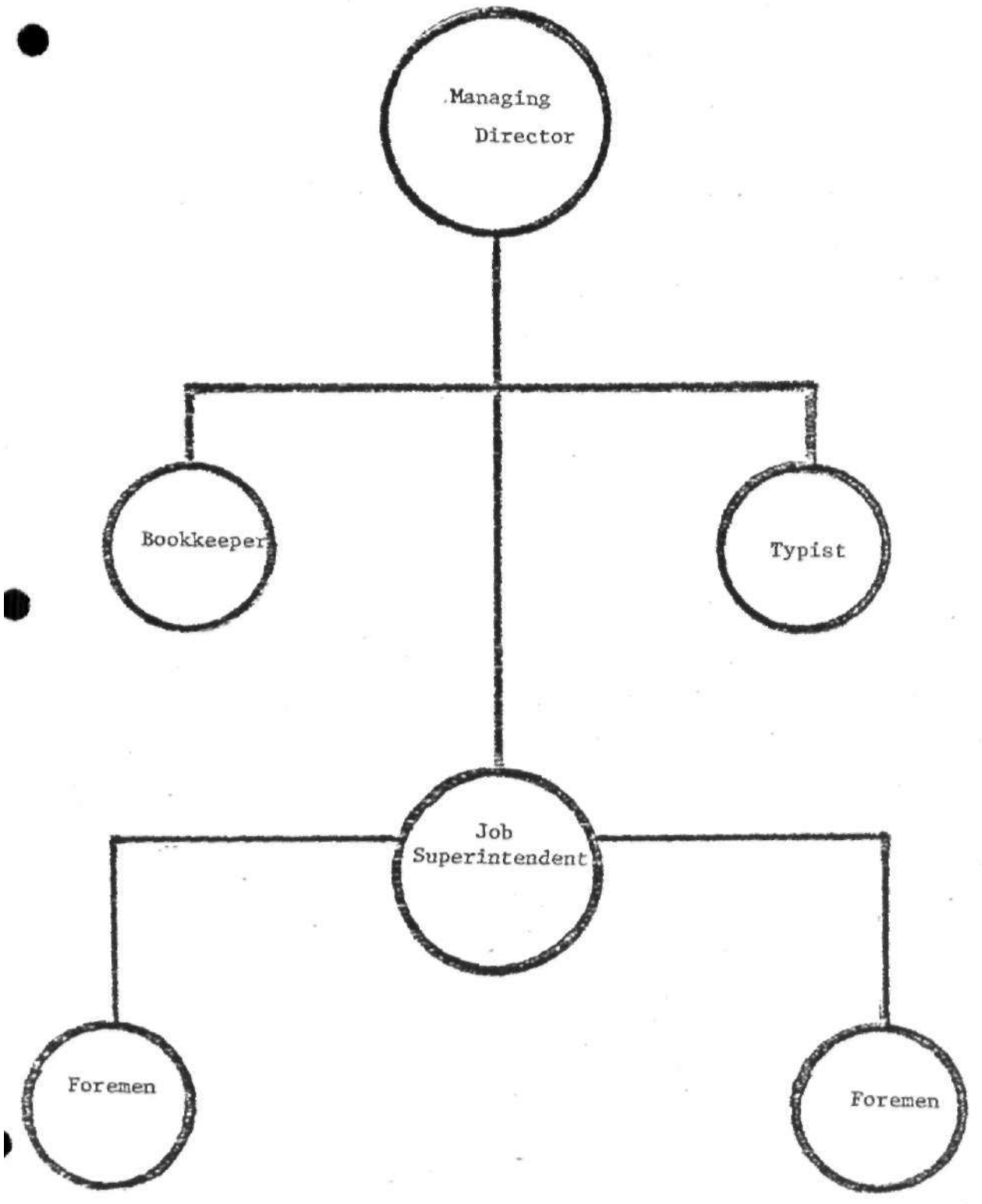


Figure 4. Organization of Indigenous Contractors in Nigeria

Foreign contractors willing to abide by the Nigerian indigenization decree operate their companies as corporations or consortiums (joint ventures) with a Nigerian national. About 60% of these companies use the vertical reporting organization in their set-up (Figure 5). The structure of the larger companies is very complex, because of the many smaller subsidiaries they require. These larger companies operate their own asphalt plant, quarry, concrete industry and even engage in building construction.

Their national headquarters in Lagos sets up branch offices in the States. There are headed by branch managers who are granted a considerable degree of regional autonomy. They usually estimate and bid independently except on very large projects. The branch manager reports to the Lagos head office which then cables the information to the home office. Major policy matters are dictated by the home office management or referred to the home office for final decisions. Engineering forms and operating procedures are consistent with home office practices. All monthly production reports are sent to the home office and at times weekly or daily reports when requested. The Lagos managing director maintains constant contact by radio, phone or visit with the branch managers and the major jobs. Recruitment of local personnel is done by the personnel department usually headed by Nigerians. Figure 6 shows a representation of the Nigerian construction industry schematically.

The Federation of Building and Civil Engineering Contractors in Nigeria exists as a body similar to the American Associated General Contractors (AGC). There is presently no construction research institute in Nigeria.

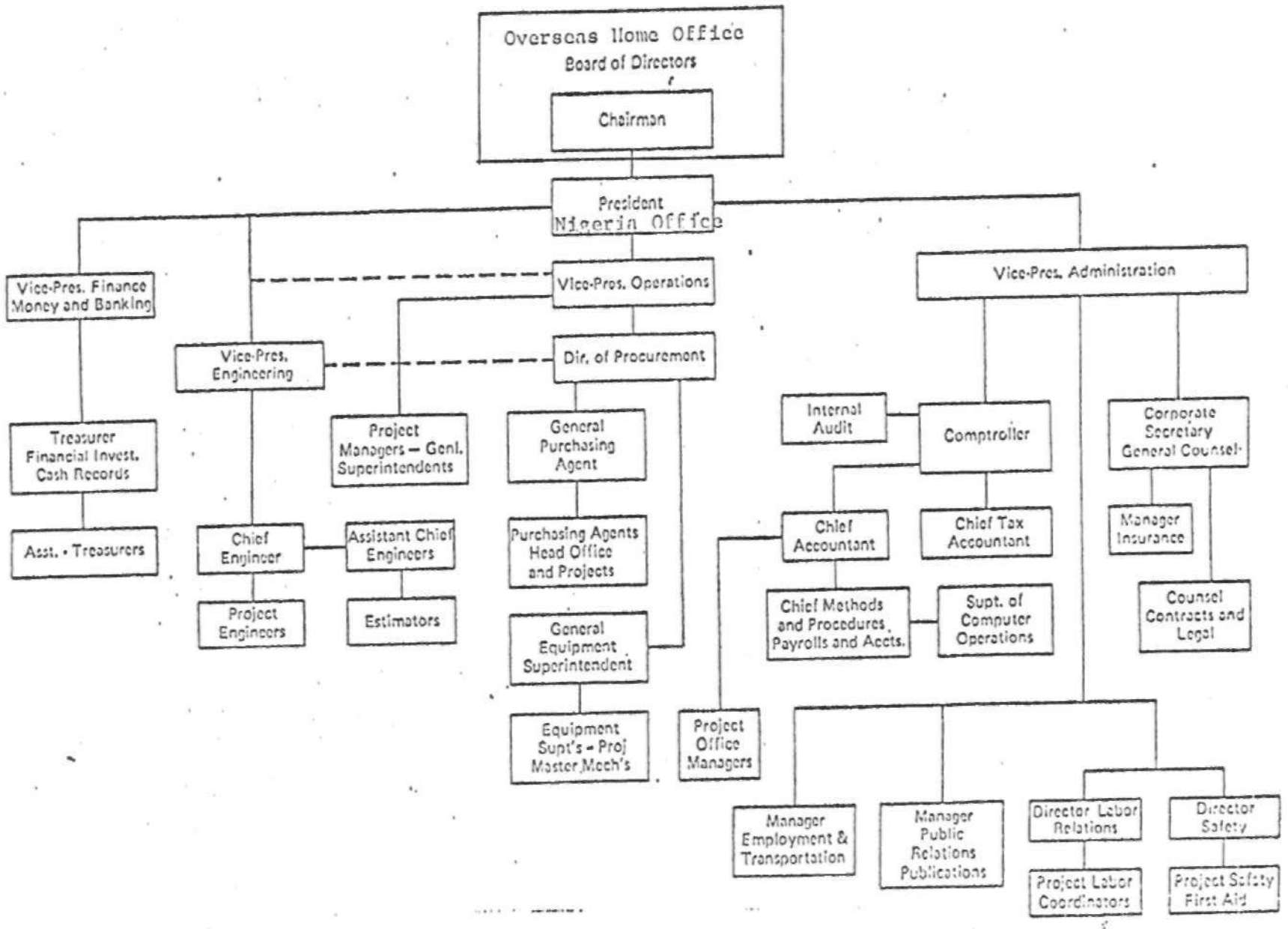


FIGURE 5 NIGERIA CONSTRUCTION INDUSTRY--VERTICAL REPORTING ORGANIZATION

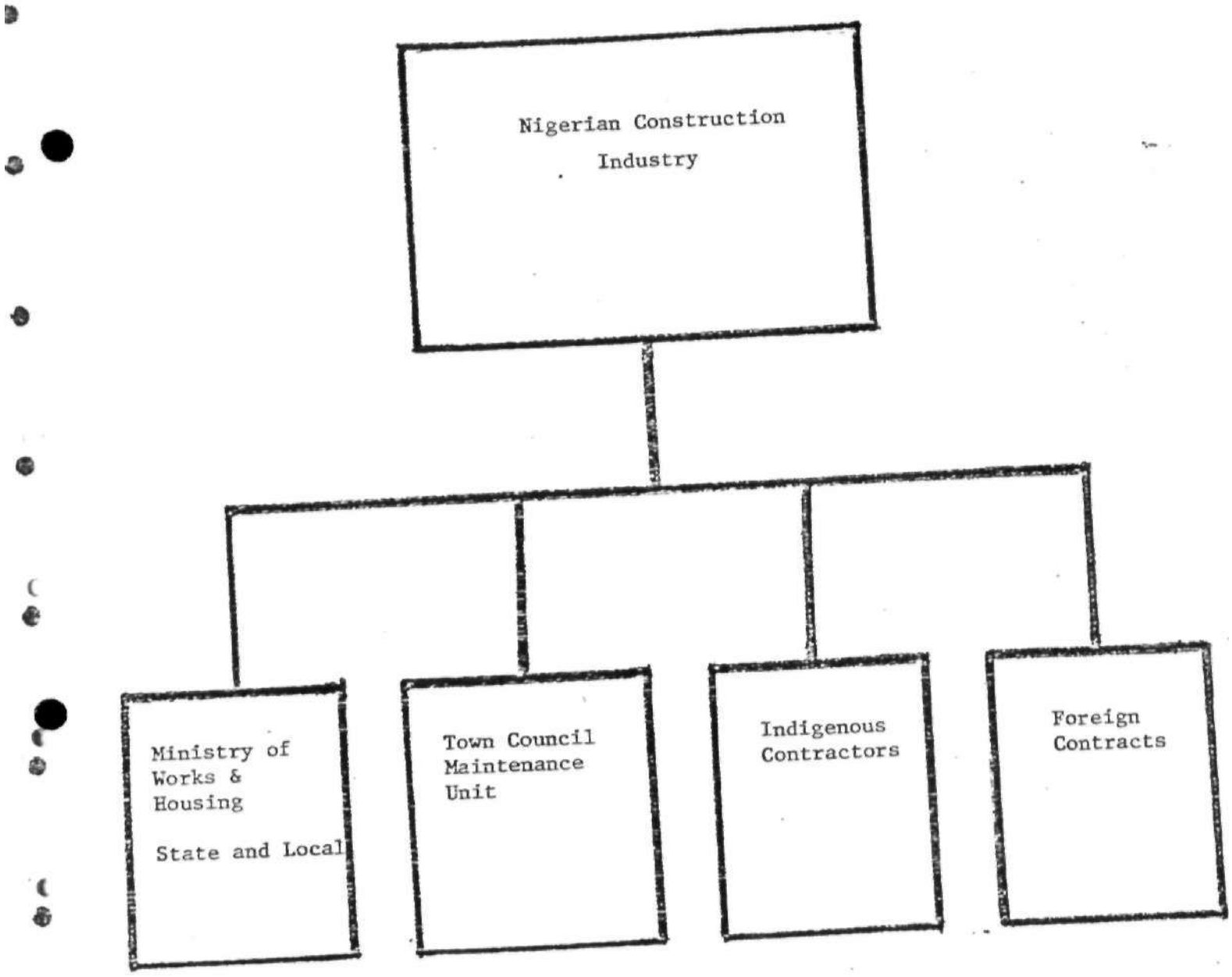


Figure 6. Schematic Diagram of Nigerian Construction Industry

Construction Unit Organization

In well organized companies, several units make up the various operational levels of the construction hierarchy. Within any organized construction company there is usually a head office with branches. The branch is administratively self-contained and operates as a separate unit under the head office. Within any branch there are two types of subunits; the Camp and Sub-branch. A branch organization is located where it can control one or more construction sites or camp and it functions as a regional office. The Sub-branch is similar to the Camp. The difference is that it is located in the same city as the branch to take care of jobs in the city. Next to the branch the operational unit is called the Camp. The Camp is the project site proper and usually consists of field offices and residential buildings. The government resident engineer's offices is usually located at the Camp. The Camps vary in size and normally consist of 10-100 workers. They are managed by junior managers or engineers and foremen depending on the type of job undertaken. The Camp consists of crews which are under the control of a crew foreman. Crew sizes range from 7 to 10 men. Figure 7 shows the lines of control and communications between the various units of the Nigerian construction company hierarchy.

Project Development Process

The classification of contracts in Nigeria can fall within two headings: private and public contracts. There are oral and written contracts in Nigeria. Every agreement transmitted and agreed upon is enforceable. Virtually all public construction contracts in Nigera are subject to competitive bidding requirements.

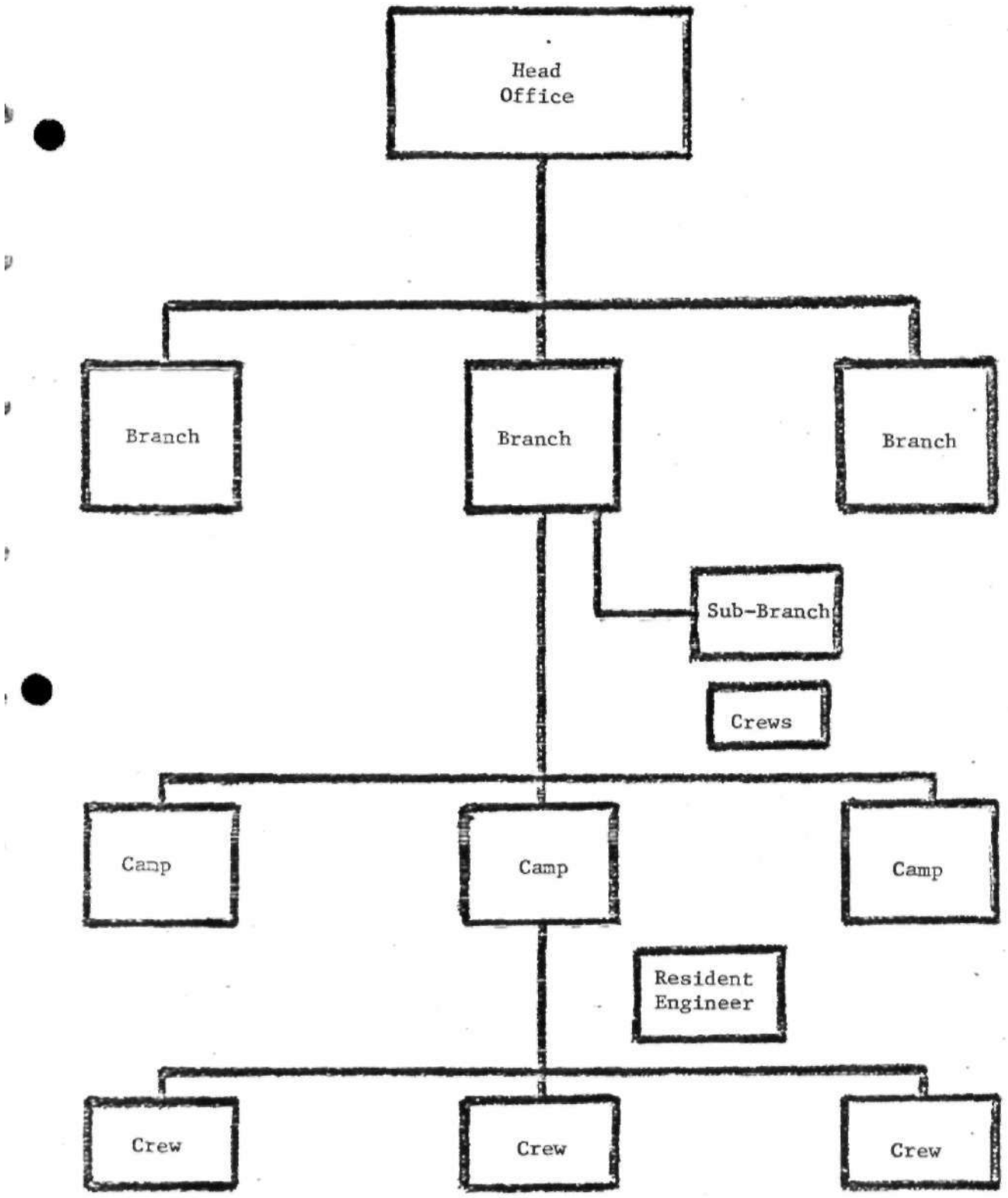


Figure 7. Nigeria Construction Unit Hierarchy

Some large projects require prequalifying bids to weed out incompetent and unqualified constractors. Private and public contracts in Nigeria are let as cost plus, unit price, or lump sum contracts depending on the company or government agency and the unforeseeable difficulties the contractor might encounter. These might include soil conditions, weather, increase in material prices, delays at the ports, unavailability of local craftsmen. The contract is normally awarded to the lowest and best qualified bidder and the owner enters into contract with the successful bidder. The owner is represented by an architect-engineer and on government work by the Federal Ministry of Works--Chief Resident Engineer. Contracts are prepared using non-standard contract forms. There are put out by the Ministry of Works and Housing. On minor jobs, the State Attorney prepares the contract document to be used. A feasibility study is normally carried out at the concept stage of project devleopment, to investigate and establish capital investment cost, procurement and other special problems relating to the project. On public works this is undertaken by the planning unit of the Ministry of Works and Housing. A report is forwarded to the Federal or State Executive Council, which upon approving the project, the detail design phase beings. The design is handled by the Ministry of Work and Housing (federal or state) or an Architectural-Engineering Consulting firm in Nigeria or overseas. On major design and construction projects, foreign contractors make their drawings from abroad. Eighty percent of these construction companies have no design department. Some general contractors maintain draftsmen and workshops capable of

generating working and shop drawings as well as the design of support facilities.

The Architect-Engineer calculates the quantities to be used by the contractors in figuring their bids. The estimated cost of the project is calculated using historical data as well as material and equipment cost data compiled and kept by the ministry. Advertisements are run in newspapers and the Engineering News Record seeking tender (bids) for the project. The contractor collects the tender documents after paying a fee, calculates his contract price and submits it back to the owner on or before the closing date. Prequalifying bids may be required on some jobs. The contractor shows up at the bid opening date and place, and the bids are opened and contracts awarded to the lowest and most capable contractor. On negotiated contracts, the procedure is different. After the closing date of the tender, a screening board meets to select contractors whose estimates come close to the price of the project. These contractors would be selected and called for further interviews and negotiations. The contract board meets behind closed doors and selects the successful contractor for the job. The name of the successful contractor is then officially published in the newspapers and work begins on the project.

Project Cost Determination

On private jobs as well as preparing all drawings, the architect prepares specifications, and also produces approximate estimates, exercises cost control during the contract period and agrees the final accounts with the contractor. The Ministry of Works and Housing on public work compiles a list of quantities based on the

drawings and makes an estimate of required manhours and costs based on historical cost data compiled by the Ministry. There are no standard handbooks, e.g., Means and Dodge, for estimating in Nigeria.

The estimate summary sheet contains the sum of direct, indirect plus 10% of the sum as markup. The sum of all these is then the project price. During construction if differences versus the estimates occur, change orders are issued.

Cash Flow and Progress Payments

Calculation of the quantities and value of construction placed is done monthly, based on the unit prices in the estimate and field measurement of quantities. Reports on cost and quantities of construction, on a cumulative basis from the beginning of the project are made at the end of each quarter. The progress payment request specifying the quantities placed and the reimbursement due to contractor is verified and signed by the architect or resident engineer and funds transferred to the contractor's account. There is 10% retainage in all Nigerian contracts. The resident engineer or architect reserves the right to reject any calculations accompanied with insufficient proof of quantities or if quality work is unsatisfactory. The quantities and other aspects of the progress payment request are frequently subjects of dispute between the contractor and owner. These differences are usually settled by negotiation.

Labor Cost and Pay Scales

Table 9 shows the government recommended salary grades for use in the construction industry. Table 10 serves as a comparison

to the public sector. Salary group 1 is for the lowest unskilled laborer. Group 4 is the salary of an engineer's assistant. Salary group 17 is for the highest paid Nigerian executive in the office. All craft workers are paid on a daily rather than an hourly basis. Eight hours work is considered to be a day and any work in excess of eight hours is on an overtime basis. Salaries are paid once a month. The government fixes the salary grades and regulates wages. In order to retain their craftsment most construction companies allow them to work overtime to increase their paycheck. Typical line items in a construction company would appear as follows:

Description of Work	Crew	Hours Worked	Daily Rate	Daily Pay
Scaffolding	1 carpenter	10	3.25	32.50
Hand Excavation	1 laborer	8	1.87	14.96

The salary grouping of all skilled workers in construction except operating engineers who have a fixed scale is based on four speciality level and subdivided into four pay steps. This scale is shown in Table 11. Promotion to any specialty level and pay step depended on skill, willingness to work, dependable attendance and experience. The promotion from one class to another depends on the time spent in a class, and experience. Class 1 is the specialists class. Promotion from one pay step to another requires 4-6 months from entry level to Step 1 and 30-36 months from Step 2-3. Unskilled laborers scales consist of only two specialty levels, the headman and ordinary laborer and 3 pay steps. The scale for mechanic and truck drivers are similar to that of skilled workers.

Table 9. Nigeria Construction Industry

Salary Group	Government-Recommended Salary Grades			
	Old Grades≠		New Salary Grades≠	
	Min	Max	Min	Max
1.....	312	612	720	870
2.....	336	878	800	980
3.....	336	1.016	900	1.280
4.....	406	1.950	1.100	1.380
5.....	492	2.040	1.370	1.810
6.....	516	2.592	1.630	2.310
7.....	848	2.688	2.000	3.000
8.....	452	2.988	2.780	3.980
9.....	3.090	4.140	3.980	5.340
10.....	3.900	4.140	5.350	6.430
11 [Sm 1]	5.054	5.472	5.445	6.905
12 [Sm 2]			6.129	7.749
13 [Sm 3]	5.064	6.480	6.895	8.730
14 [Sm 4]	5.472	7.320	7.760	9.810
15 [Sm 5]	6.240	6.450	8.730	11.025
16 [Sm 6]	6.480	6.961	9.819	12.411
17 [Sm 7]	6.480	7.860	11.043	13.959

Source: Daily Times, December 28, 1974, pp. 10, 11, 12.

Table 10. Public Service Salary Scales

Rank	Old Scale Salary	Udoji Scale Salary
Professor	6.600	8.730-11.025
Lecturer II		9.819-12.411
Permanent Secretary..	2.760-3.660	5.350-6.430
Lowest Paid Worker...	312	720-870

Source: Daily Times, December 28, 1974.

Table 11

Pay Step	Class			
	Learner	3rd Class	2nd Class	1st Class
Entry	3.00	4.00	5.00	6.00
1	3.25	4.25	5.25	6.25
2	3.50	4.50	5.50	6.50
3	3.75	4.75	5.75	6.75

Construction Worker Pay Scale - Daily in Nigerian Niara

Pay Step	Class	
	Laborer	Head Man
1	1.75	3.25
2	2.25	3.75
3	2.75	4.25

Unskilled Labor Pay Scale - Daily Nigerian Niara

NOTE: 1 Niara = $1.66

Government Incentive Programs

The Nigerian Government has impressively tried to encourage the construction industry. The government has established two banks, the Nigeria Industrial Development Bank (N.I.D.B.) and the Nigeria Bank for Commerce and Industry (N.B.C.I.). They finance new industrial projects and also provide construction loans. The Federal Mortgage Bank of Nigeria has been set up to give loans to companies engaged in the manufacture of production of building materials and the granting of long-term loans to Nigerians desiring to build or buy houses of their own. The operation of these banks is similar to the American REITS and Mortgage Companies. The Commercial and Merchant banks are required by law to provide at least 5% of their total loans and advances to the residential building construction subsector. Companies are also allowed higher depreciation allowance for their capital assets in the early years of operation. The initial percentage for the depreciation allowance for capital assets in the case of machinery is now 20%. This is in addition to the annual depreciation allowance of 12½%. The government provides income tax relief for three years to all investors engaged in pioneer industries. This period may be extended for a couple or more years. Another incentive is the "Approved User Scheme" which allows exemption from duty or granting of low rate duty on materials brought into the country for use in the provision of services. Industrial estates are set up in all towns to attract investors. Housing estates are zoned in all towns to attract developers. Small construction jobs are exclusively reserved for the indigenous contractor. Those indigenous contractors with technical know-how are encouraged to bid on the heavy

construction contracts. Construction firms pay very little tax in Nigeria.

Labor Incentive Programs

For early completion of work phases ahead of schedule and within budget, craftsmen and management personnel are paid bonuses. These funds accrue from the economic efficiency in completing the project. Most of the companies finance cars and motorcylces for their employees at low interest rates.

Emphasis on Resource Control

Due to frequent litigation against contractors for delays and default and the blame on scarcity of resources including material, equipment and skilled labor, the introduction of resource control is deemed necessary. This indicates a need for the use of charting, programming and network analysis to monitor progress on field activities. In industrial nations it is possible to quickly order for or call for backup resources when shortages arise. But this is not true in Nigeria where most materials and equipment are imported from overseas and it requires months to order and deliver them to the contractor. Even materials manufactured locally, e.g., concrete, cement, paint, are in short supply because demand far exceeds supply. This creates a resource allocation problem. The assistance of computer consultancy services at Yaba, Lagos are used to design and implement data processing systems to control "allocation of resources." This is limited to the large foreign countries. Presently there is not direct field management-computer interaction. Computer facilities are also available at Ibadan, Benin, Zaria,

Port Harcourt, Kano and Enugu.

Expanding Labor Requirements

About 87% of Nigerian contractors are open shop contractors. There are a few construction hiring halls or labor unions. The Nigerian construction industry is labor intensive. This means there is a tendency to overschedule crew sizes due to availability of inexpensive labor. The large population furnished the construction industry with a very productive labor force that is reputed for being responsible and easy to train.

The law specifies the number of Managers, Engineers and technicians a foreign conrractor has to bring to Nigeria. Most unfilled posts are required by law to be filled by Nigerians. This entails training of local-hire personnel to acquire the skills comparable to the union craftsmen of the United States. Upon completing their courses most of these locals become very proficient on their jobs.

These companies retain them as permanent employees except when fired or when they quit. Indigenous contractors hire their craftsmen from Nigerian trade and technical schools and by referrals. There are no specialized training programs undertaken by these indigenous constractors.

The rate at which the construction labor requirements are expanding is relatively high. Most small scale farmers quit their work to join the construction companies. This is reflected in Table 12 showing a drop in agricultural working population from 71% in 1960 to 67% in 1970. In order to meet these requirements the government has established construction training centers which are capable of producing different categories of tradesmen

including bricklayers, excavator operators, and steel workers. Intensive training programs are evident throughout the construction industry. Most craftsmen work their way to the top rapidly. For instance, a high school graduate would start out in a survey party as a rodman and move up the ladder to become instrument man and eventually company surveyor. The industry is still short of highly skilled construction workers, and craftsmen tend to move from one company to another in search of better pay.

Table 12. Employment

Item	Year 1960	1970
Total Labor Force (1000's)	18,300	22,500
Percent of Labor Force in Agriculture	71	67
Percent of Labor Force in Industry	11	15
Percent unemployed		
Percent of Women in Total Labor Force	39	39
Dependency Ratio	1.4	1.3

Source: Statistical Yearbook, United Nations, 1977.

Conclusions and Remarks

The basic problems which must follow a transition to industrialization are confronting Nigeria now. The country is relentlessly tackling and solving these problems. The construction

industry is geared to facing the challenge ahead for rapid industrialization. Its stride from nowhere to becoming a major industry is a bold step ahead. Much remains to be done, and management must be ready to provide the lead for the industry.

The various incentive programs are designed to stimulate and exploit the various opportunities which the industry could offer. A need remains for the development of a more compact management structure for the smaller industries. More management focus on investment funding, technology development, scheduling, resource control and field implementation are essential. There is a need for extensive data collection and research to establish criteria and control the construction process when unpredictables occur.

The central planning function so broadly applied is essential in a society with so varied people..

Management should be equal to the task since there is no likelihood of the industry subsiding.

CHAPTER 3

NIGERIAN CONSTRUCTION INDUSTRY PROFILE

Just exactly how many construction companies there are in Nigeria remains uncertain. A recent survey by the Post and Telegraphs Department indicated that, "In all 19 States of the Federation there were 936 construction companies operating in the country in 1976." S.P. Schatz[1] in a recent study in 1977 listed a total of 1,243 contractors existing in former Western and Northern Nigeria.

Unfortunately, none of the previous surveys or studies gave any estimates of the number of indigenous contractors operating in the country. These studies only counted the number of contractors without identifying them. Published listings of the Nigeria Construction companies show fewer companies nationwide as compared to earlier reports. "Contractors' as defined by these sources included, "any one who registered himself as a contractor performing construction for money." Here one is faced with the problem of classification, considering how ambiguous some construction contractors are registered in Nigeria (see Table 48 Appendix).

Some construction companies in Nigeria bear names like Nigeria Construction and Furniture Company, Nigeria Trading and Construction Company, Nigeria Engineering Works, Nigeria Group of

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[1] Sayre P. Schatz, Nigerian Capitalism, p. 176.

Companies. Here the picture becomes unclear whether these companies are partly engaged in construction and partly engaged in other activities. "For many registrants it was stretching things to call them contractors at all. Many of these (small) firms exist in name only, as anyone who attempts to locate them find to his amusement."[1]

> A large number of these aspirants sought to share in the petty contracts as a result, a great many of the firms on the petty-contract registries never got any jobs at all or got them only exceedingly rarely. Moreover registrants were frequently persons with no experience at all in construction or related activities. If they were awarded contracts, they might take a commission for themselves and subcontract the job to someone else, or they might carry out the jobs themselves but often rather badly[2].

Those registered as a group of companies pose sticky problems of classification, since the variety of activities they engage in make it impossible to align their operation with the standard industrial classification of construction industry. The best that could be done is to produce a list of companies which to the best of ones belief represents the construction companies in Nigeria based on the information supplied by the Registrar of Companies. Using this approach, this study has uncovered names and sketchy information on several construction firms in Nigeria not classified before.

Approximately 709 construction companies were registered in Nigeria by 1976. Of this 478 were indigenous contractors.

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[1] G. Akin Ogunpola, Pattern of Organization, p. 353

[2] Sayre P. Schatz, Nigeria Capitalism, p. 172

On the average there were 40 construction companies registered in each older state of the federation*. Indigenous contractors tended to site their headquarters in their state of region of origin. The distribution of all Nigerian contractors by state in 1976 is shown in Table 13.

Table 13. Distribution of Companies

Region	State	Total Number of Construction Companies	Total Number of Foreign Construction Companies	Total Number of Indigenous Construction Companies	% Indigenous	% Foreign
EAST	Anambra	68	11	57	12	5
	Cross-River	17	1	16	3	.4
	Imo	17	2	15	3	9
	Rivers	58	24	34	7	10.1
LAGOS	Lagos	274	120	154	32	5.0
(west)	Bendel	44	8	36	8	3.5
	Ogun	25	1	24	5	04
	Ondo	4	1	3	0.6	.4
	Oyo	58	12	46	10	5.2
PLATEAU	Benue	2	1	1	0.2	.4
	Plateau	28	5	23	4.8	2.2
	Kwara	8	3	5	1.0	1.3
	Niger	-	-	-		
NORTH	Bauchi	-	-	-		
	Borno	9	5	4	0.8	2.2
	Gongola	-	-	-		
	Kaduna	39	17	22	4.6	7.4
	Kano	44	19	25	5.0	8.2
	Sokoto	14	1	13	3.0	.4
NATION		709	231	478	100	100

Apart from these state variations regional variations existed in the number of companies registered in the country. Figure 8 shows

*Excluding Lagos

the regional distribution of these companies. Table 14 lists this distribution in terms of all of the indigenous firms in operation then.

The greatest regional concentration of construction companies were in Lagos.

Table 14. Regional Distribution of All Construction Company

	All Construction Companies	Indigenous
East	160	122
Lagos	274	154
West	131	109
Plateau	38	29
North	106	64

Location of Home Office

Nigerian contractors come from the six continents. Table 15 shows the list of countries where the home office of Nigerian construction companies are located. About 67.4% of these contractors had their home office in Nigeria. It was curious to note that none of these African countries had any construction company operating in Nigeria. Britain, Italy, West Germany, and the Netherlands had the highest number of construction companies in Nigeria. United States, France, Korea, Brazil, Bulgaria, and Yugoslavia were the newcomers to the Nigeria construction industry.

FIGURE 8

Map of the Federal Republic of Nigeria showing the states



REGIONAL DISTRIBUTION

Table 15. Location of Home Office

1. Nigeria	10. Israel
2. Britain	11. Korea
3. Italy	12. Ceylon
4. Germany	13. Brazil
5. France	14. Sweden
6. Canada	15. Norway
7. Japan	16. Bulgaria
8. Netherlands	17. Yugoslavia
9. U.S.A.	18. Rumania
	19. Lebanon

Size of Companies

The largest companies in terms of capital and contract size were Cappa & D'Alberto (Italian), Julius Berger (German), G. Cappa (Italian), Impresit (Italian), Guffanti (Italian), Dumez, Costain (British), Taylor Woodrow (British), Brown & Root (U.S.A.), Raymond International (U.S.A.), Petra Monk (U.K.).

Figure 9 shows that, in terms of capital, 37% of contractors were large size; 53% of medium size and 10% small size. All large companies were foreign companies. Indigenous contractors were mainly medium and small in size. Though indigenous contractors out-number foreign contractors by a ratio of 2 to 1, the foreign contractors in terms of investment control 90% of the industry. There is no indigenous contractor capable of handling contracts of the size of Dumez.

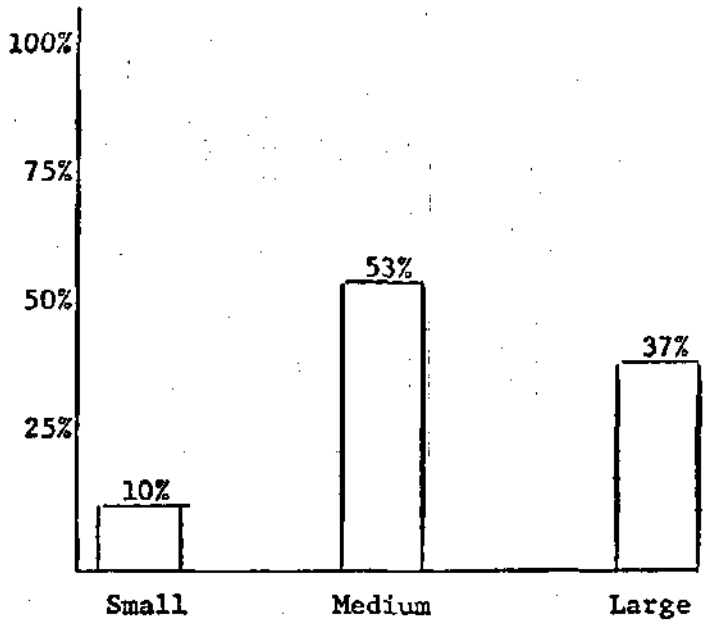


Figure 9. Size of Companies

Registration of Companies

Figure 10 shows the distribution of company registration in Nigeria. Of the 709 construction companies operating in 1976 approximately 112 were classifed as General Contractors, 560 Building and Civil Engineering Contractors and the other 37 consist of firms specializing in dredging, asphalt, and earth moving. These figures must be approached with caution, as this study has found that out of the 125 surveyed, 26 were untraced.

Secondly all these contractors have not been reached for verification. Since the information used is two years old most of those named have probably died, retired, moved, gone out of business, or ceased operation in Nigeria. Also several new firms have sprang up in the country for which no new information is yet available.

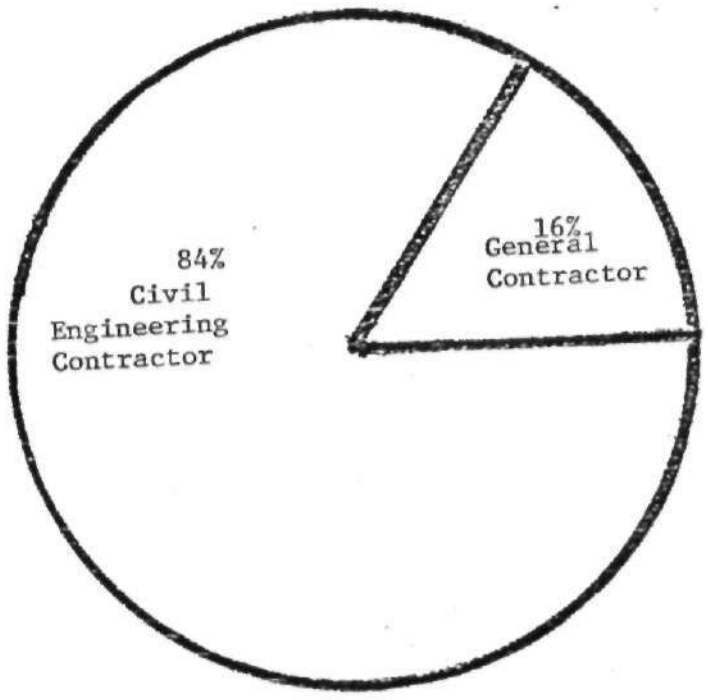


Figure 10. Company Registration

Building contractors accounted for 79% of all the companies. Indigenous contractors were traditionally building contractors with 78% of them operating in this sector. The strongest contingents of indigenous contractors were registered in Lagos, Anambra and Oyo states. Most companies registered as "Engineering and Construction Companies" were design and construct firms."

Contractors from Germany and Italy were mainly engaged in heavy construction; while contractors from the Netherlands were more frequent in the fields of the water front, port and dredging construction. Indigenous contractors were virtually absent from such contracts like dredging, dam , bridges and airport construction.

Location of Branches

On the average, indigenous contractors had 2 branches in other states of the country. Foreign contractors had on the average 7 other branches.

Table 16 shows the relative distribution of branch location of these construction companies. As expected Lagos ranked first on the list. It was no surprise to see Jos ranked second with a large influx of companies. Jos has long been a traditional mining and resort town and is gradually becoming a focal point of higher education. A majority of the new state capitals show even distribution of company branches. The cities with the highest concentration of indigenous company branches were Lagos, 14%; Jos 10%. Foreign companies operated company branches most frequently in Ibadan, Enugu, Abeokuta, Kano, Kaduna, Makurdi,

Table 16. Most Frequent Cities Where Construction Companies are Located

Rank Ordered	
1. Lagos	20. Ontisha
2. Jos	21. Ijebu Ode
3. Kaduna	22. Funtua
4. Markurdi	23. Ilorin
5. Enugu	24. Nsukka
6. Ibadan	25. Shaki
7. Abeokuta	26. Gboko
8. Bauchi	27. Lokoja
9. Kano	28. Yola
10. Warri	29. Auchi
11. Umuahia	30. Ehor
12. Port Harcourt	31. Eko-Iguo Bazwa
13. Sokoto	32. Ubiaja
14. Benin City	33. Gombe
15. Calabar	34. Aba
16. Akure	35. Jebba
17. Owerri	36. Ibusa
18. Minna	37. Sapele
19. Maiduguri	38. Oleh
	39. Ikot Ekpene

Nsukka, Warri, and Port Harcourt. Nsukka had the lowest number of indigenous construction company branches.

Cities left out were those in which the companies surveyed did not locate brances. Lagos had a clear edge over other cities because of Nigerians mistake of concentrating most industries in Lagos only.

Characteristics of the Contractors

Nigerian contractors have quite diverse background in education, experience and capabilities. Having personally interviewed some of these contractors in the summer of 1977, one would find it quite difficult to describe a typical Nigerian However, a national pattern develops after one evaluates all the information.

The average age of the managing directors were in the mid-forties. A foreign contractor can be easily identified with his large fleet of cars, equipment symbolically painted with the "trademark" to identify the company. Indigenous contractors own a couple of pick-up trucks and identification is only possible if one looks close. Foreign contractors are mostly found in large cities. Most indigenous contractors indicated that they were craftsmen for the government before they entered construction. The managing directors came from fields such as Civil Engineering, Accounting, Business Administration, Industrial Management, Mechanical, Industrial and Electrical Engineering. Some indigenous contractors were illiterates. Educated indigenous contractors did the best and handled the greatest number of contracts. The most successful indigenous contractors were college graduates. The capabilities of most indigenous contractors were hampered by lack of management experience, technical know-how, and finance. About 60% of the indigenous contractors had some kind of management training before setting up. About 90% of indigenous contractors started their own companies, rather than inherited it. Most indigenous contractors had their relatives working for them.

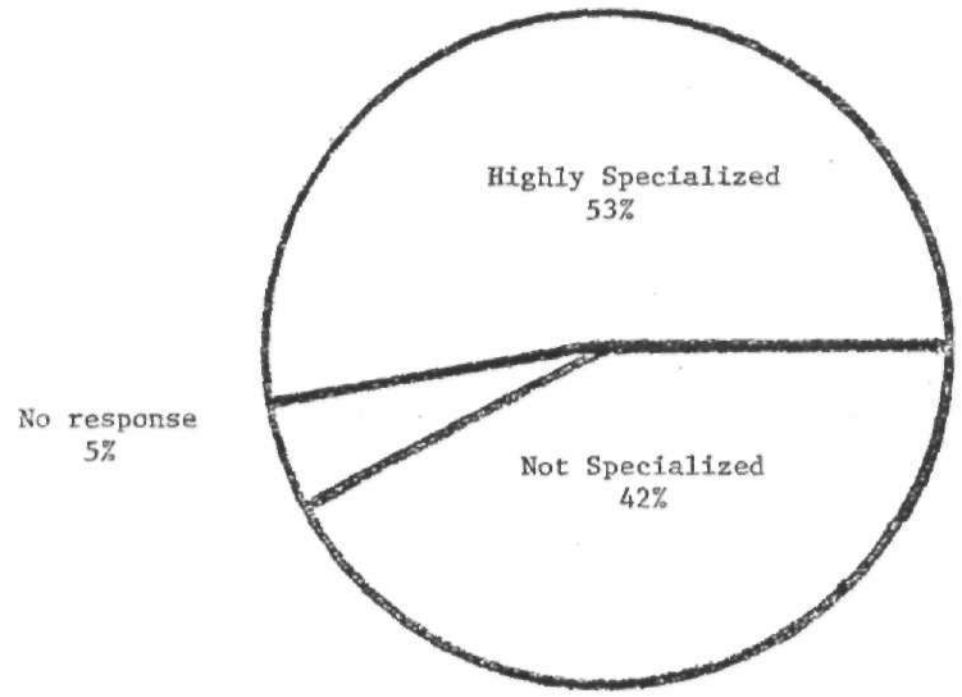


Figure 11. Construction Specialty

There were frequent incidence of "moon lighting" to learn more about construction before plunging in.

Type of Work

In question 7 the contractors were asked to indicate their speciality. Figure 11 shows that 42% were not specialized while 53% were highly specialized. The area of specialty mentioned by these contractors were:

1. Building and Civil Engineering
2. Asphalt Manufacture and Road Paving
3. Building and Roads

4. Building Construction
5. Housing
6. High Quality Construction
7. Terrazzo Flooring

The various types of work done by these companies are listed in Appendix.

Annual Volume of Work

The average annual volume of work for the sample population varied from 1.8 million to 83.86 million with a median of 41.5 million and a mean of about 44.7 million. Table 17 depicts the sample population annual volume in a frequency table.

Table 17. Annual Volumes of Respondents

Annual Volume in Million Niara	Frequency of Respondents	Cumulative Respondents
0 - 5.99	4	4
6 - 11.99	2	6
12 - 17.99	5	11
18 - 23.99	4	15
24 - 29.99	4	19
30 - 35.99	8	27
36 - 41.99	6	33
42 - 47.99	4	37
48 - 53.99	3	40
54 - 59.99	3	43
60 - 65.99	4	47
66 - 71.99	3	50
72 - 77.99	5	55
78 - 83.99	9	64

Note: All sums in Naira

Regional Differences

Significant differences exist between patterns in all regions of the country.

Large companies were located mostly in Lagos. The number of building contractors remain fairly high in all the regions. The British standard forms of contract (RIBA and RICS) were mostly used in Lagos. Standard form for the Federation of Building and Civil Engineering contractors, "I.C.E. British Condition" were used in Western regions. Imo State used a different form called "Building and Roads" contract. Contractors in Kano indicated using J.C.T. British form. High quality specifications were written in Anambra and Lagos states. Performance and payment bond were required most frequently in the Lagos, Plateau and Kano regions. Performance bond only were required in Bendel State. All contractors who joint ventured were located in Lagos. Most Northern and foreign contractors ordered equipment abroad. One contractor in Lagos indicated hiring expatriate engineers. Union contractors were located in Anambra State only. Higher wages were paid in the Eastern region (Anambra and Imo State area). Most large firms do not use the computer. Construction management firms were used in Jos only. Development taxes were reported only in Ibadan and pay as you earn for employees were reported by contractors in Jos.

CHAPTER 4

MANAGEMENT TECHNIQUES

This section treats the management techniques used by these companies.

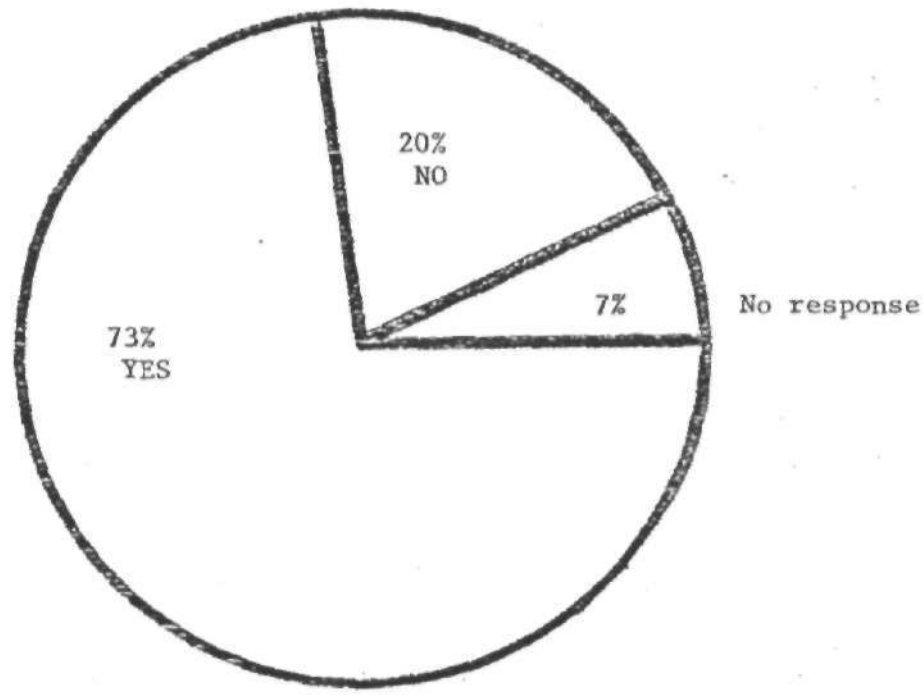


Figure 12. Forms of Construction Contract

Q. 8-9. FORMS OF CONTRUCTION CONTRACT

There are many variations of the construction contract forms. Depending on the size of project, some are made short and simple while others are long and detailed.

Because of repeated use of specific form and particular terms or clauses and to keep ambiguity at a minimum, various agencies have adopted standard froms of contracts and revise them

from time to time. This is done to reduce expensive and unnecessary lawsuits.

Question 8 was framed to find out whether there is any standardization in the Nigeria construction industry at all. Figure 12 shows the result of response from the companies surveyed. Following is a list which presents all types of construction contracts these companies listed as being used in Nigeria.

List of Forms of Contracts

1. Standard forms of contract for the Federation of Building and Civil Engineering - Western Nigeria
2. Building contracts, Road Contracts - Imo State
3. British RIBA standards form of contracts. Adopted by the Nigerian Institute of Architects, Governments, Corporations - Lagos
4. ICE Condition (British) - Ibadan
5. Abridged version of British JCT Contract - Kano
6. Standard Conditions of Contracts and Bills of Quantities based on the RIBA and RICS document with minor local variation for Nigeria. (RICS - Royal Institute of Chartered Architects, RIBA - Royal Institute of British Architects.)
7. FDIC for Civil Engineering, RIBA for Building - Lagos

There was great variation all over the country in the type of contract form used. Construction companies in the Greater Lagos area reported they used British RIBA (Royal Institute of Chartered Architects) and RICS (Royal Institute of British Architects) standard conditions of contracts and Bills of Quantities with a minor

local variation for Nigeria. These companies also indicated that these forms have been adopted by the Nigerian Institute of Architects, Government and corporations, Contractors in Kano indicated they use an abridged version of British JCT contract with no definition of JCT. Some contractors in Ibadan metropolitan area and neighboring states indicated that they use ICE Conditions (British). Other contractors in Ibadan reported they used standard forms of contract for the Federation of Building and Civil Engineering. None of the foreign companies operating in Ibadan responded which follows that these variations were all reported by local contractors only. Imo state mentioned they use some form of contract called "Building" and "Roads" contract. One can easily conclude then that there is no locally developed and standardized national construction contract form similar to that of the AIA (American Institute of Architects) in Nigeria.

Q. 10 CONSTRUCTION CONTRACTS

There are two types of contracts; written and oral. Contracts are required by statute of Fraud to be written to be enforceable. Nonetheless oral contracts exist and are also legal and enforceable. Contracts are also classified as public or private. Public contracts are those awarded by government agencies. There are many differences between public and private contracts. A contractor having contract with the government is precluded by law from suing the government for breach of contract. Therefore a contractor bidding on government work must take the terms as he finds it or leave it. There are also differences on the type of contracts awarded in the public and private sector.

In question 10 when asked which sector they perform over half of their jobs, 80% of the firms indicated the public sector (Figure 3). About 83.3% of the indigenous contracts performed their contracts in the public sector. The only explanation for this high percentage is that the public sector is where the urban development projects, housing estates, satellite township construction are taking place. Since indigenous contractors are more numerous in the building sector this is apt to show a high percentage as reflected in question 10.

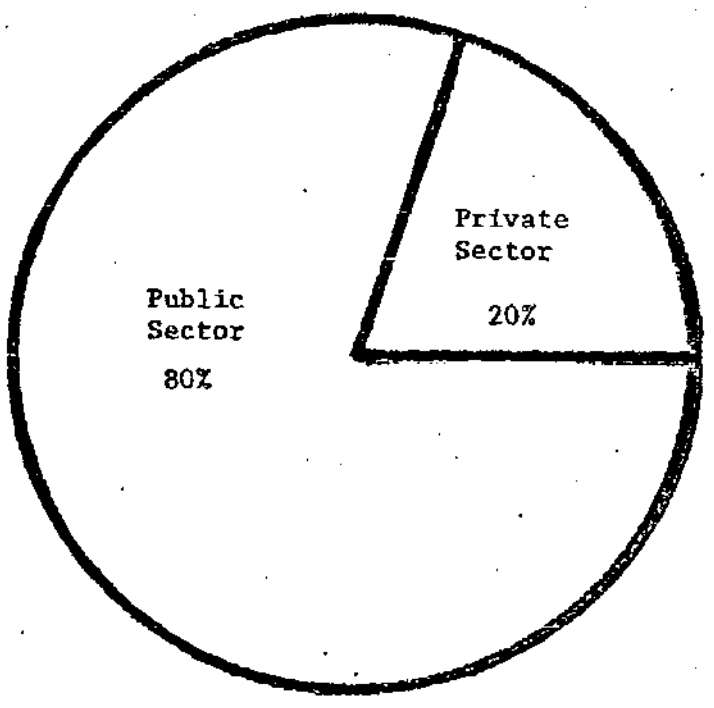


Figure 13. Construction Contracts

Q. 11. SPECIFICATION AND CONTROL OF QUALITY

Specifications are written to establish quality levels in construction. Quality controls are exercised in construction to make sure that what is being specified is met. Specifications are written such that they are practical and realistic. Specifications provide a standard guide for a contractor to allow him to know what he is doing. Specifications outline the required characteristics or materials products or completed work, provides guidelines for construction methods, necessary to the production of desired result, and the basis for acceptance and the method for sampling and testing.

Material and methods or substantial compliance specification specifies definite properties, particular equipment and construction methods to be used on the job. This type of specification is difficult to enforce. End result specification places the entire responsibility for supplying the product on the contractor. The contractor usually selects the material, equipment, etc. to get the end result specified.

Quality assurance specifications describes the method and also the end result. Statistically-based sampling techniques are used to test for quality. The contractor is required to keep track of quality with an inspector. The owner has an inspector who helps him to keep track of quality also. Samples are randomly taken to determine compliance with the specification. The owner rejects or accepts portions of the projects tested as he sees fit. This type of specification adds too much cost to the project as a result of frequent testing and usually the contractor passes

the cost down to the owner. Activities of concern in quality control include the development of information about process and product that should be objective and unbiased, the equipment for testing should be standardized, engineers decisions (policy and specification units), implementation of rejection and acceptance criteria.

Question 11 was designed to find out whether structures designed and built in Nigeria have quality control standards.

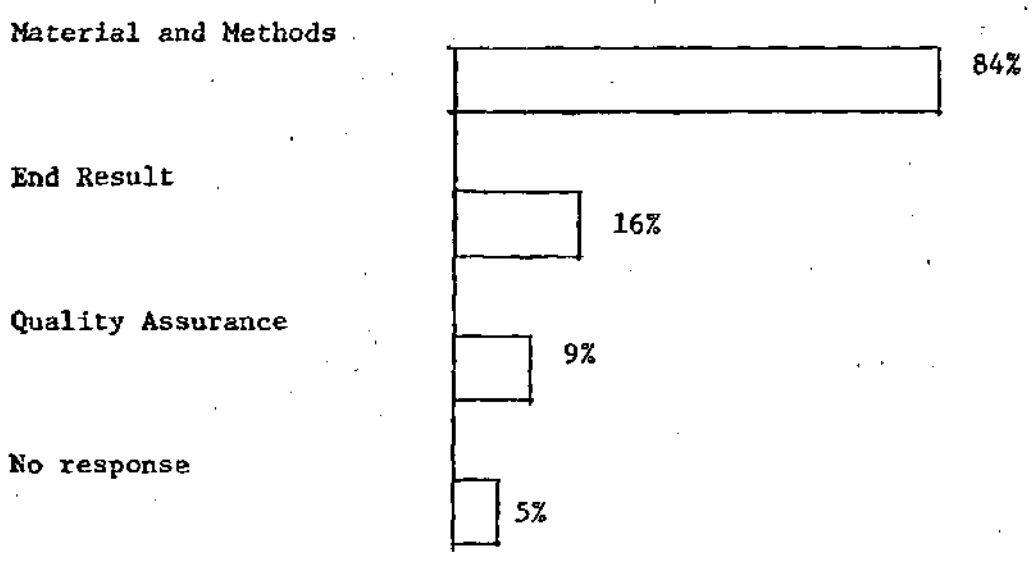
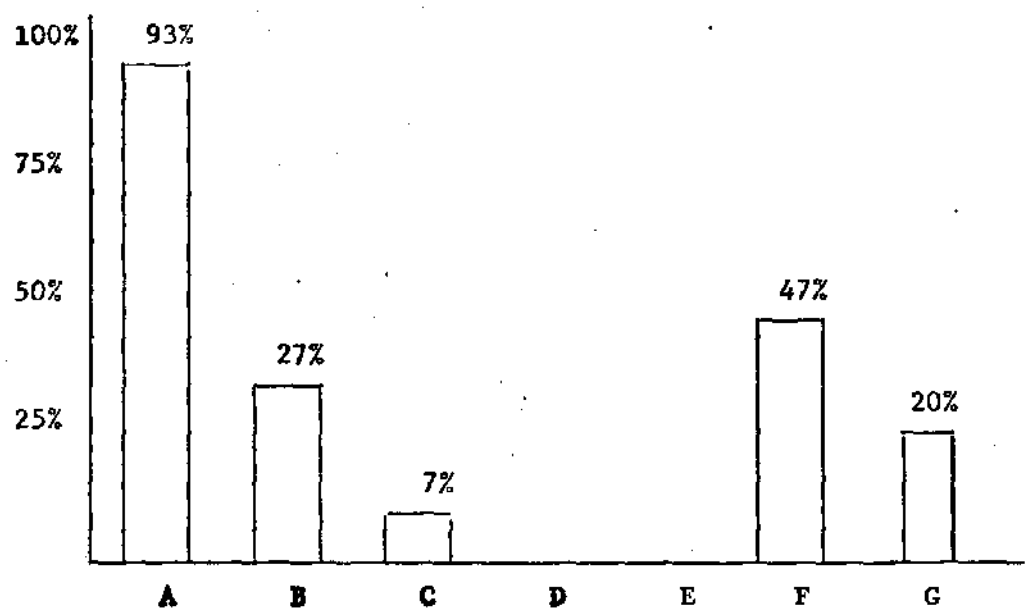


Figure 14. Specification and Quality Control

Figure 14 shows that 84% of the companies indicated that material and methods specifications were the most frequently used specification in Nigeria. Only "Asphalt Paving" contractors indicated that end result specification were used on their contracts. Nine percent of the contractors indicated that quality assurance was also specified on their job. This 9% all came from Imo and Anambra States. One building contractor in Imo State indicated that quality assurance was specified on his contract.

Q. 12. METHOD OF CONTRACT ACQUISITION

If a contractor is to remain in business and make a profit, he must continuously have good jobs going on. The ability to choose where, when and which job to bid on shows the mark sign of a good contractor. Jobs are either obtained by bidding or by negotiation.



A) Competitive
B) Lumpsum
C) C.P. Fixed fee*
D) C.P. % Cost*
E) C.P. Incentive Fee
F) Negotiated
G) Unit Price

Figure 15. Method of Contract Acquisition

In response to question 12 (Figure 15), 93% of the firms indicated that they obtain their job by competitive bidding. This reflects the tight competition in the Nigeria construction industry. Eighty seven percent of ongoing public projects were competitively bid. Competitive bids were used most frequently on large public projects. Forty seven percent of the firms reported using

*C.P. means Cost Plus

negotiated contract; twenty seven percent of the firms bid on fixed price contracts and 20% on unit price; seven percent bid on cost plus contracts.

Not a single indigenous constractor surveyed obtained a cost plus contract. Cost plus contracts were mostly used on industrial, waterfront contracts. Unit price was more frequently used in dredging, building, transportation, oil and gas industry contracts. Building contractors obtained their jobs mostly by competitive bids and lumpsum.

Q. 13. SOURCE OF CONTRACT

In the modern society where information fed by the mass media is enormous and changing, the inattentive contractor is apt to lose his way if he does not keep abreast with the world.

The construction contractor needs jobs and must obtain information on available jobs from some source. These sources include government gazette, newspapers, personal contacts, technical journals, referrals, invitation by owners. Ability to keep abreast of current information enables the contractor to select the best project based on profitability and market situation (recession or boom). In a recession,construction market is very tight while in a boom, the market is flooded with work.

Also, the source of information the contractor relies in getting his contract could bring him good jobs or expose him to high competition.

Figure 16 shows the response to the question "How or where dc you get job information in Nigeria?" Ninety three percent

of the companies indicated that the owners invited them to bid, 87% reported they use newspapers, 53% used personal contacts, 7% reported they use referrals. No company indicated using technical journals which means there are no construction journals comparable to the Engineering News Record in Nigeria. The low percentage using referrals indicates the inability of the contractor association to serve as a job clearing house to the Nigerian contractors.

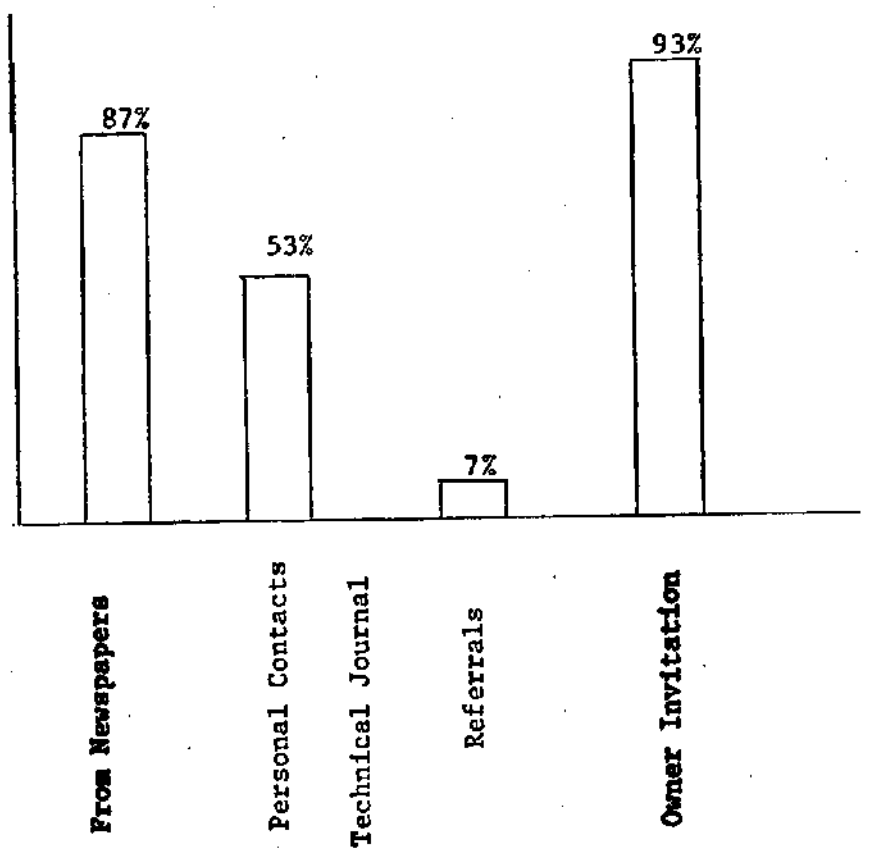


Figure 16. Source of Contract

Q. 14. BONDING

Bonding (Figure 17) is a concept in which a third party secures a first party against a default. In construction these include bid, performance and payment defaults. In Nigeria the

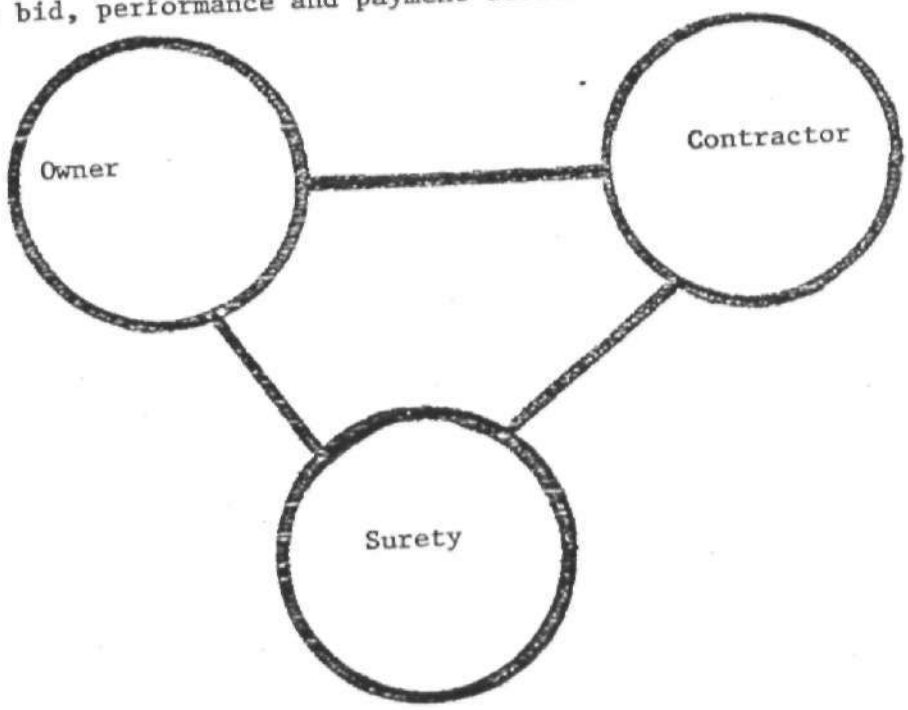


Figure 17

posting of surety bond, bid bond, performance bond, payment bond is required on most jobs.

Bid bond enables the owner to recover from the contractor if he defaults commencing work after being awarded the contract.

The performance bond allows the owner to look to the surety to assume the risk of the contractors incomplete work or poor performance.

Payment bond protects the owner from the risk of unpaid material suppliers putting lien on property constructed.

Figure 18 shows the response to question 14. Sixty seven percent of the companies mentioned posting performance bond, 33% reported payment bond, 20% were required to post bid bond, fifty three percent of the companies who operated mainly in the public sector indicated that performance and payment bond were those required on government jobs. Bid bonds were only indicated by companies operating in Kaduna State. In the private sector performance bonds and payment bonds were the most frequently mentioned. Some companies operating in Anambra, Imo and Plateau State mentioned that no bonding was required on their jobs.

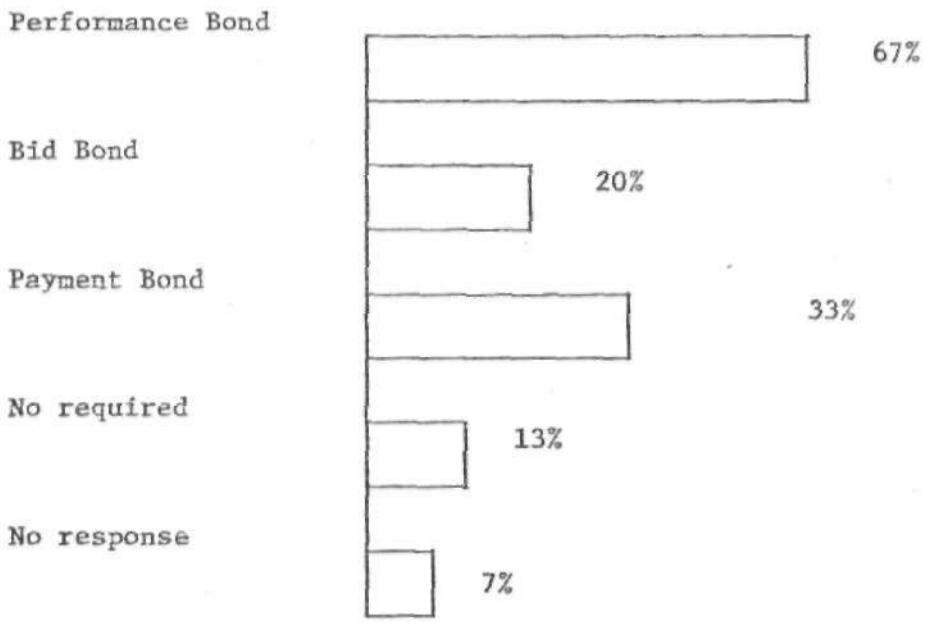


Figure 18. Bonding

Q. 15. SELECTION OF A BONDING COMPANY

Selecting the proper bonding company is of prime importance to the contractor. "It is a matter that should not be left to others to decide as a contractor's entire future may depend on the proper selection of a bonding company."[1]

In Nigeria there are bonding companies as well as insurance, banks that have trained bond underwriters. There are hundreds of these companies including many foreign companies with large capital listed in the directory.

What a contractor looks for in a bonding company is quality of service, the type of contractor-bonding company relationship that is appreciable during difficult situations.

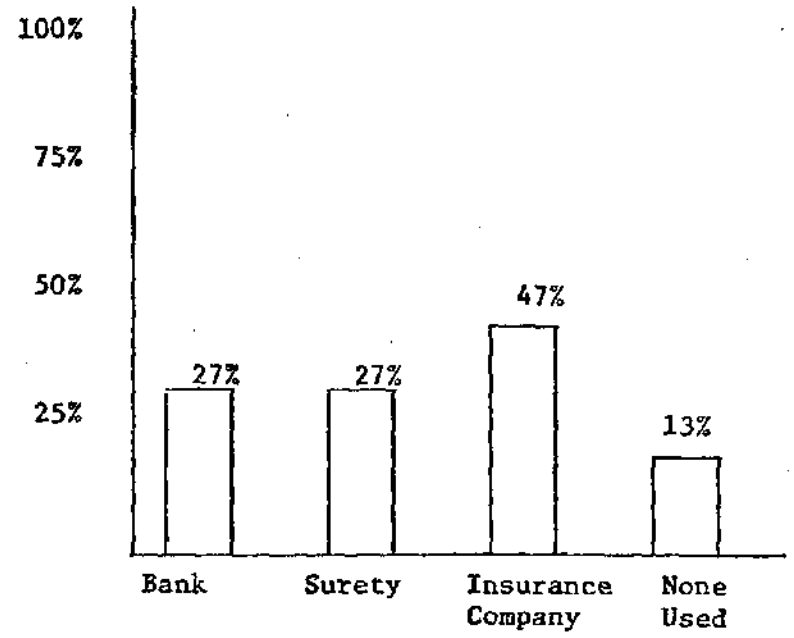


Figure 19. Selection of Bonding Company

[1] Handbook of Construction, Management and Orgnization, J.B. Bonny J.P. Frein Van Nostrand Reinhold, p. 94.

Answers to questions 15 (Figure 19) showed that 47% of the companies select insurance companies as their bonding companies. Twenty seven percent used a surety company. To the surprise of the author, 27% mentioned using banks, while 13% used no bonding company at all. One contractor mentioned he arranges bonding with a insurance company through a broker.

Q. 16-17 FINANCING

No matter the size of a construction company, there is always the problem of assuring adequate funds are available to keep contracts going, pay wages and salaries, buy and maintain equipment, order and pay for supplies and materials, provide for overhead and shoulder losses if they occur.

Therefore, arranging for financing is of paramount importance to the contractor. In contracting financing, the contractor obtains funds to finance the project (material, labor), main office, equipment, company growth. Projects are financed on short term basis. Equipment and company growth are financed by intermediate and long term basis. Long term financing includes long term debt (bonds), equity funding (selling stock). Short term financing includes credit line (banks), loan (project), trade credit, sale of accounts receivable, customers and suppliers loans, loans from small business administration.

Question 16 concerned itself with where these companies obtain capital to finance "Company Expansion". See Figure 20.

Source of Finance	Nigeria Bank	Insurance Companies	Pension Funds	Overseas Investment Banks	Selling Stock Publicly	Selling Stock Privately
Percentage of Respondents	100%				13%	7%

Figure 20. Financing

All the companies indicated their main source were Nigerian banks. Thirteen percent of these companies indicated their alternative source was selling stock to the public, while 7% indicated selling stock privately.

In answer to question 17, 78% of the companies in Figure 21 indicated the prime source of their long term project financing as being the Nigerian banks located near the job site. Seventeen percent indicated Nigerian Banks in other cities. Other sources which these contractors listed include:

1. Local loans from friends,
2. Ploughing back profit,
3. Friendly source, private and creditors,
4. Internal resources,
5. Traders and suppliers.

What could be inferred from these responses is that government regulations have debarred contractors from obtaining

financing from abroad. The high percentage utilizing local banks indicate that 93% of these companies keep good banking relationsips.

A) Nigeria Bank(s) near the location of job

B) Nigeria Banks in other cities

C) Banks in foreign countries

D) Other sources

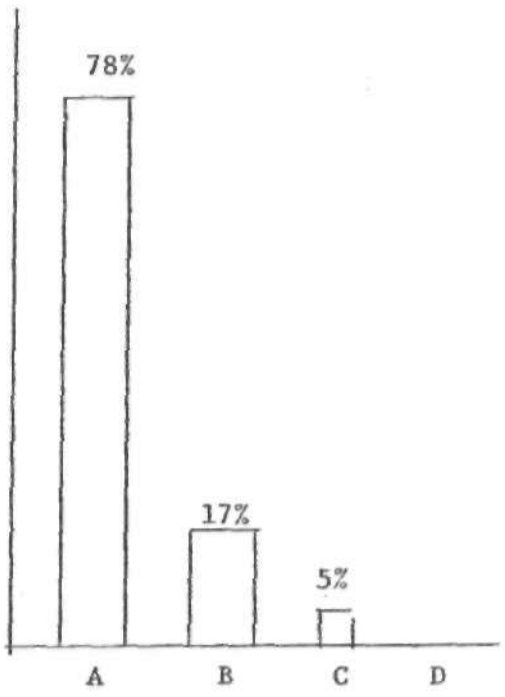


Figure 21. Financing

Q. 18 INTEREST RATE

"Interest designates a rental amount charged by financial institution for the use of money. An interest rate is the rate of gain received from an investment."[1] From the lender's stand point interest is a gain or profit that accrues from investing funds, either by loaning or purchasing of material, labor, or facility. From the borrowers standpoint interest is an amount of money paid out as a result of borrowing funds. It is a cost to the borrower.

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[1]Engineering Economy, H.G. Theusen, W.J. Fabrycky, G.J. Theusen, Prentice Hall, page. 62, 63, 64.

Interest charged contractors vary with each contractor and depends on several factors. Usually the bank considers the contractors net quick worth, current ratios, quick assets, working capital, securities and short term receivables plus equipment in determining the loan. The final interest rate charged the contractor are made up of percentages for: 1) the risk of loss; 2) administrative expenses; 3) pure gain, or profit. Other criteria used by the bank to evaluate the contractors eligible for a loan include integrity, history of paybacks, honesty of contractor.

As Figure 22 illustrates, forty percent of the companies pay 10% interest rates to Nigerian banks. Twenty seven percent of the companies pay 8% and 9% while 6% of the companies pay 6% interest rates.

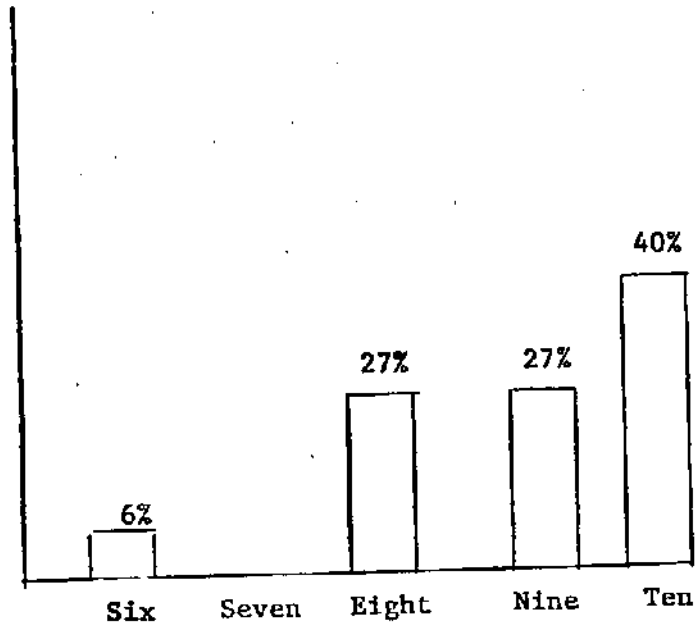


Figure 22. Interest Rates

It could be concluded that on the average Nigerian contractors pay lower interest rates as compared to their American counterparts. These Nigerian rates are as low as the average prime lending rate in America.

Q. 19 JOINT VENTURE

Joint venture is cooperation in construction. It is the pooling of assets and abilities of two or more firms to accomplish a project. First used in Hoover Dam Project (U.S.A.), it is being increasingly used for very large contracts.

Contractors joint venture with others to attract equipment or resources. Other reasons include increasing financial and working capacity, spreading risk, reducing competition and local conditions. Joint venture has immense benefits in Nigeria because it allows the sharing of "special talent" and "know-how" of the foreign contractor with the indigenous contractor. Secondly, from the standpoint of availability of equipment, pooling of ideas, reduction of competition and investment so badly needed in Nigeria, joint venture has tremendous advantages.

However, the disadvantages of joint venture are beauracracy and only one contractor being mentioned as the contract sponsor.

Question 19 was structured to determine how competitive the Nigerian Construction industry is. Figure 23 shows the response. Twenty one percent of the contractors reported ever participating in joint ventures, while an astonishing 79% said no. Overall, joint venture appears to have no appeal to Nigerian contractors.

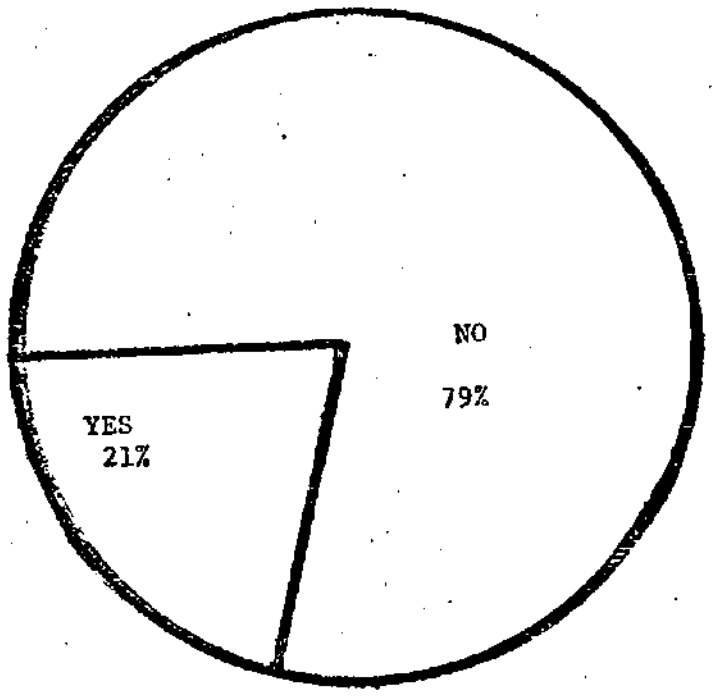


Figure 23. Joint Venture

This indicates that the Nigeria Construction market is very competitive because no attempts to have indigenous-indigenous, indigenous-foreign, foreign-foreign joint ventures have been practiced in full scale. Contractors in Nigeria are "Man Alone" each to his own way.

Q. 20-21 CONSTRUCTION EQUIPMENT

Construction companies invest a large portion of their capital on equipment spread. Equipment is financed by:

1) Bank Loan

2) Equipment Financing Companies

Equipment is financed by intermediate financing which usually lasts for 2 to 4 years. Banks usually finance 75% of the equipment purchase value. A collateral is registered to secure such loans. The length of time for financing depends on the type of equipment, viz.

Heavy excavating equipment - 4 years

Trucks - 3 years

Mixers - 2-2½years

The contractor could either purchase or lease equipment. In purchasing, the contractor owns title to the equipment after all payments, while in a lease the title remains with the lessor. The decision to buy any equipment depends on equipment analysis and continued deployment of the equipment.

The contractor needs to manage an equipment fleet to minimize operating, maintenance, repair cost and to maximize productivity and return on investment.

Equipment related costs include:

1) Ownership cost - depreciation, insurance, taxes, interest on investment, major overhauls, repairs, rents.
2) Operating cost: fuel and lube, normal repairs and maintenance, tires, operators wage, wear and tear items (blade, fan belts).
3) Overhead: supervision, transportation and storage.

In order to avoid wasted investment on highly advance and expensive or second hand equipment, the Nigerian contractor need up-to-date counseling and data from equipment dealers. Innovations in modern equipment technology might take long to reach the country since there are presently no equipment manufacturers locally.

Equipment Purchase

In answer to question 20, 93% of the companies indicated that they buy their equipment from local Nigerian dealers. Sixty percent reported buying it from abroad (see Figure 24).

From Abroad	Locally
93%	60%

Figure 24. Equipment Purchase

Some contractors indicated buying 90% locally and 10% abroad.

In Lagos, Jos, Ibadan, Kano, indigenous contractors frequency of buying equipment abroad were highest. All foreign contractors indicated buying their equipment abroad. Contractors buying directly from foreign manufacturers tend to be smarter because they save themselves the trouble of buying used and rebuilt equipment locally. After all, equipment transactions in Nigeria are third party deal between a foreign manufacturer-Nigerian representative (dealer) and contractor. Ordering the wrong

equipment from a catalog is likely to ensure in such deals.

Equipment Ownership

Eighty nine of the companies indicated they own 75-100% of their equipment, 11% own 50-75%. One company reported owning all their equipment. Equipment ownership is show in Figure 25. In the final analysis, what could be inferred from this high percentage of equipment ownership is that because Nigerian contractors own too much equipment, it might not be uncommon on job sites to find extensive equipment down time and idleness. This conclusively would mean very low productivity in the face of many opportunities for these contractors to utilize these equipment.

% OF OWNERSHIP	0-25	25-50	50-75	75-100
% OF RESPONSE	-	-	11%	89%

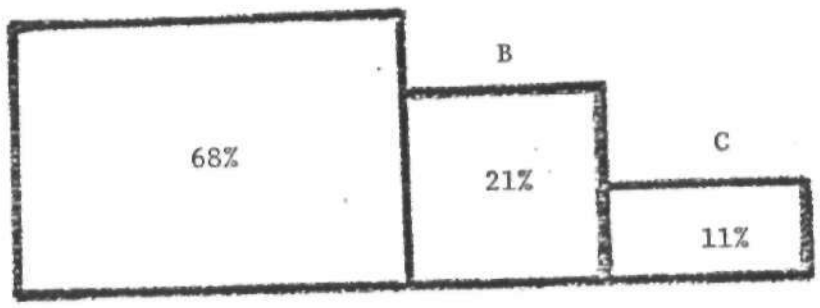
Figure 25. Equipment Ownership

Q. 22 DESIGN WORK

"To design is to project and evaluate ideas for attaining an objective. Design makes it possible to try out a great many ideas on paper more or less conclusively. A decision to accept a design is a decision to assume the advantages and disadvantages associated with it and to discard other design that may have been

considered."[1]

When the structure so designed fails after substantial performance by the contractor according to plans and specifications the owner must have someone to look up to. This person is usually the designer (architect, engineer). So the ability to come up with economical, safe and useful designer depends on having the right people with experience. One thing the new foreign contractor operating in Nigeria usually discovers is that he may be forced to send design construction drawings to be done overseas, because there are not many technical men around to form an engineering unit.



A) Done locally by Nigerian consulting firms.

B) By consulting firms overseas

C) By contractors engineering department

Figure 26. Design Work

When asked in question 22 "Where do you do over 50% of your design." Figure 26 shows response to this question. Sixty eight percent of the respondents indicated that their design were done locally by Nigerian consulting firms. Twenty one percent

[1]H.G. Thuesen, W.J. Fabrycky, G.J. Thuesen, Engineering Economy, Prentice Hall, 1977, p.41.

did their design overseas while 11% indicated that they did some design work. The eleven percent were all foreign companies. All the indigenous firms used local consulting firms for design work. All foreign firms did their major design work overseas. The meagre 11% design done by all the contractors engineering unit speaks for itself. Unquestionably, this means that these firms have insufficient engineers with the expertise to perform major design work. What these contractors have are small design units capable of producing minor shop drawings and all the indigenous contractors surveyed have no design department.

Q. 23 PAYROLL PROCEDURES

In a labor intensive construction industry like Nigeria the maintenance of an good and efficient payroll system enables the contractor to tell quickly whether he has problems with his labor productivity. Payroll system includes the payment of wages, the accumulation of time and the distribution of payroll and related cost on the project.

Methods used in recording labor time include labor time cards, daily logs of construction and work item cards. The recorded times accumulated by the payroll department are used to determine the wage rate of an employee. Several methods are used to process these data, these include, manual system, mechanical, electronic and bank computer systems. The method used by a particular contractor depends on the level of sophistication, the size of the company, the availability of equipment and the need for it. Figure 27 depicts the level of sophistication and mechanization

of the personnel management system. This figure shows that all the respondents indicated using only manual system. This simply means that personnel management systems in Nigeria are in an embryonic stage with no technology what-so-ever being introduced into the office routines.

Manual System	Mechanical payroll system	Electronic data processing	Use of Bank Computer System
100%	-	-	-

Figure 27. Payroll Procedures

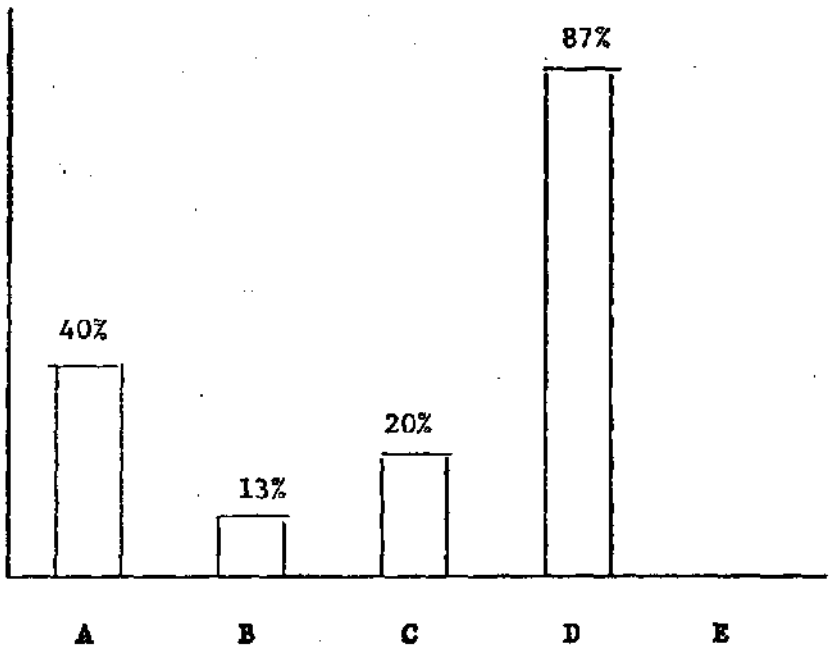
Q. 24 RECRUITMENT

In Nigeria, unskilled workers are available but skilled labor is difficult to find. The Nigerian education system formerly laid emphasis on theory but the construction industry depends on practical and technical education.

Finding skilled personnel in Nigeria could pose a sticky problem to a new Nigerian contractor. So in order to recruit competent employees the contractor has to devise some means or use certain sources to locate craftsment. Informal sources include phone calls, walking on job site and office, referrals from (employees, suppliers and customers), recommendations by friends and relatives, and recruitment trips to other towns. Formal sources include unions, employment services, referral organizations, trade school, advertisement in newspapers, advertisement on radio and television,

training programs, processing individual applications.

The contractors were asked in question 24 how they recruited their skilled and semi-skilled workers. Figure 28 depicts the response. Eighty seven percent hire people by processing individual applications. Forty percent hire and provide on the job training, 20% mentioned going on recruitment drives to technical schools, 13% used the union halls and none of the companies recruited from placement bureaus.



A) Hiring and providing on the job training;

B) From the labor union;

C) By going to various technical school colleges and recruiting

D) By accepting and processing individual applications

E) By job placement bureau.

Figure 28. Recruitment

One company indicated advertising vacant positions in newspapers.

This question was also framed to reveal the union status of these contractors. Unquestionably, only 13% of the respondents indicated recruiting from the labor unions. This low percentage of utilizing of labor union workers means that 87% of these contractors surveyed are open shop contractors.

Anambra State was the only state where the union hiring halls were used to obtain labor. All the contractors in Anambra indicated they used the labor union workers. Forty two percent of the indigenous contractors hire and train their craftsmen , of this 80% were building contractors.

Q. 25 CONTRACTOR ENGINEERS

Question 25 concerned itself with finding out the number of Engineers employed by these contractors.

Figure 29 presents the results. On the average, the large construction companies had 50 engineers. The medium and small companies had 18, and 4 engineers respectively in their firms.

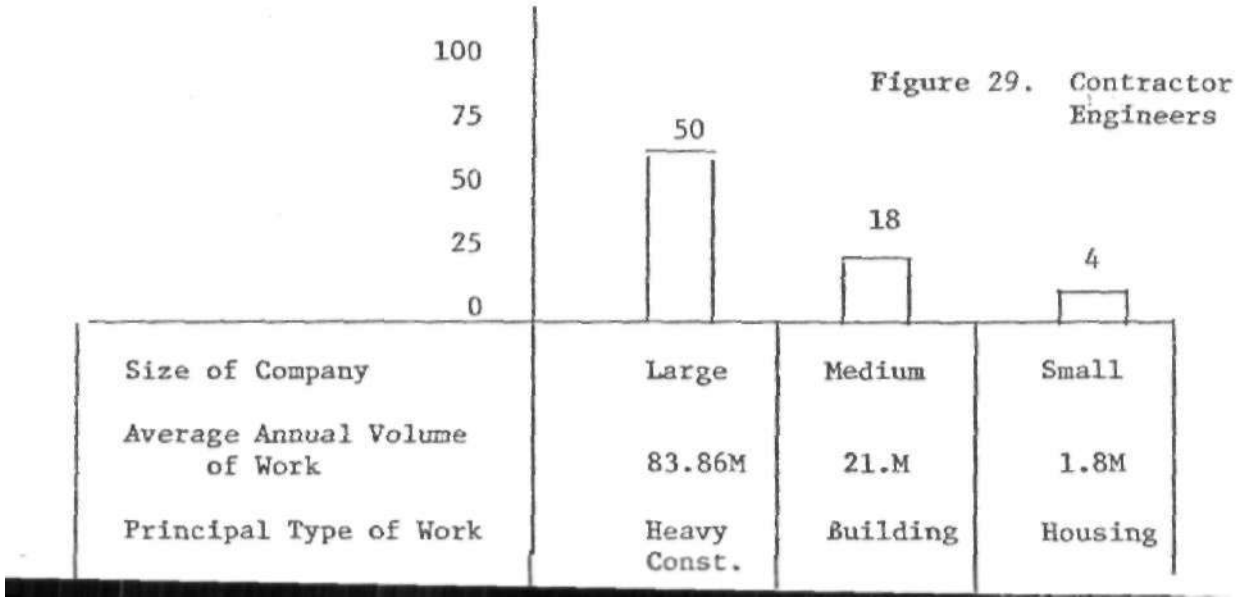


Figure 29. Contractor Engineers

Q. 26 LABOR RELATIONS

A contractor is confronted with labor relations immediately as he enters the construction business. He may decide to be an "open shop" or "union" contractor. This decision is his labor relation policy .

"In practically all industry except construction, no employer may enter into collective bargaining agreements with a union unless his employees have so designated that union as their collective bargaining representative."[1] Once the contractor

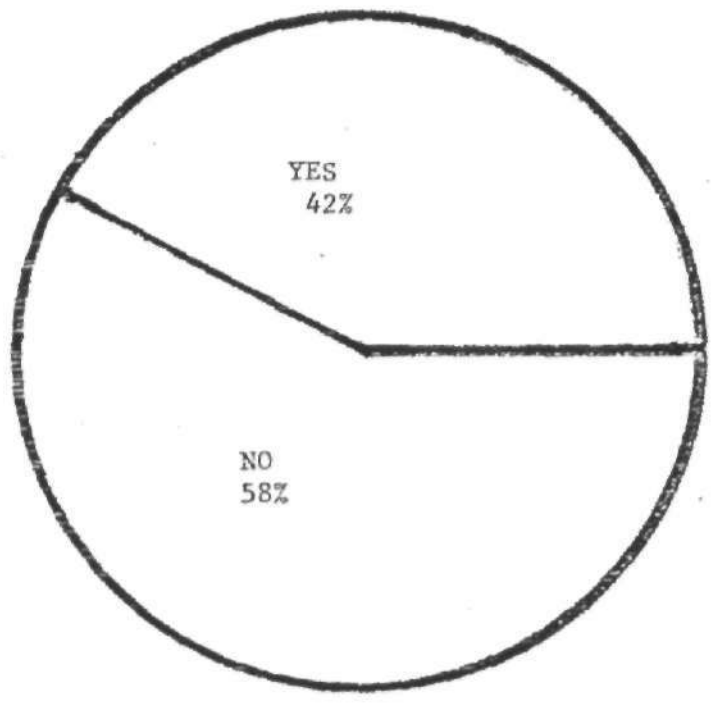


Figure 30. Labor Relations

is at the bargaining table he will find himself bargaining with specific crafts unions, namely, laborers teamsters, carpenters, cement finishers, operating engineers, iron workers, plumbers,

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[1] J.B. Bonny, and Joseph P. Frein, Handbook of Construction Management and Organization, Van Nostrand Reinhold, New York 1973, p. 555

fitters, sheet metal workers, painters, electricians and so on.

Labor relations departments are maintained by contractors to deal with labor problems and unions.

Question 26 sought to find out whether these contractors had a labor relations department. Figure 30 shows that 42% said yes while 58% said no. Sixty percent of all the contractors who indicated having labor relations departments were located in Lagos, 20% in Imo State, 20% in Kaduna. Some contractors indicated it was a part of the administrative department.

Q. 27 PERSONNEL DEVELOPMENT AND TRAINING

In a society where skilled labor shortages are prominent the best recourse for the contractor is to hire the unemployables and teach them how to perform the required job in the shortest time possible and in the most efficient way. Therefore training programs should be selected to fill a specific need and tailored to meet these needs. In other words, training programs should train people for jobs that need them rather than train people who need jobs.

Question 27 as shown in Figure 31 sought to find out whether Nigerian contractors have personnel development programs.

Yes	No
53.3%	46.7%

Figure 31. Personnel Development

Fifty three percent of the respondents said yes, while 46% said no. Eighty five percent of all the firms who said no were indigenous building contractors. Twenty five percent of the foreign contractors had no personnel development program.

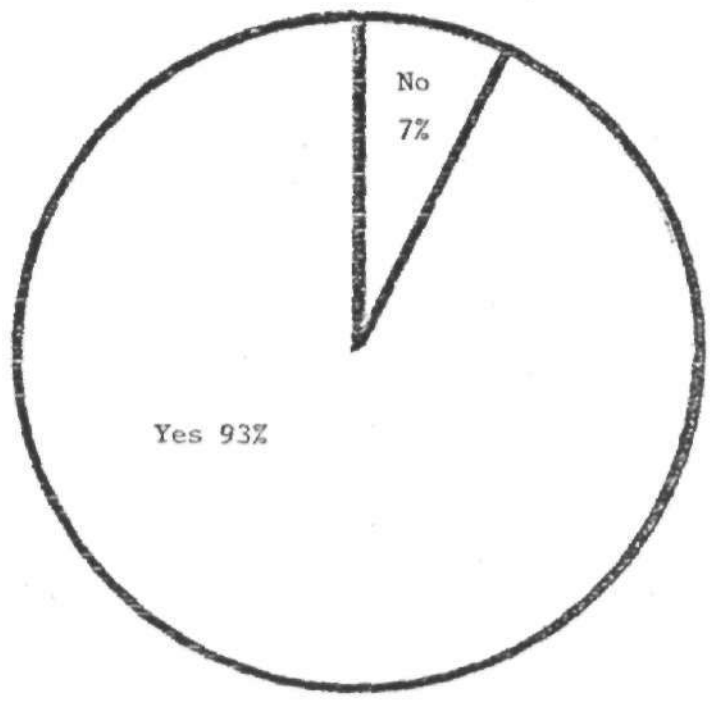


Figure 32. Labor Unions

Q. 28 LABOR UNIONS

Unions traditionally have been very powerful organizations, Unions are capable of using strikes, picketing, boycotts to combat open shop or non-union competiton. These acts in Nigeria are presently ruled illegal under the military rule.

Nigerian labor unions are weak because of government regulations and a lack of organizations. In question 28 when asked whether there are labor unions in Nigeria, Figure 32 shows

that 93% of the respondents said yes. The most surprising thing is that 87% of these contractors are open shop or non-union contractors. Some of these contractors mentioned that they preferred to be open shop because unlike union contractors they could vary work assignments between crafts to alleviate manpower problems in Nigeria. Some mentioned that they went non-union because overtimes on union work are figured in excess of 8 hours per day while on open shop it is after 40 hours per week.

However the disadvantage of this huge open shop system in Nigeria is that a contractor has to live with a lazy craftsmen who refuses to work due to difficulties in replacement. Secondly the advantages of union halls serving the labor clearing house function is non-existent. In the long run, union contractors are better because union training programs provide better skilled personnel with high productivity and ability to produce better quality products.

Q. 29 STRIKES AND LOCK OUTS

Construction unions have historically used strike tactics against its members. Strikes allow contractors and union to come to quick agreements at the bargaining table.

Question 29 concerns itself with the problem of strikes in Nigeria. Figure 33 shows that 53 percent of the respondents said yes while 47 percent said no. One company mentioned that these strikes occured during the "Udoji Review" for wage increase. One can immediately see that strikes in Nigeria are caused by the government. Eighty seven percent of these contractors were non-union and 13% union. But 53% reported facing strikes which

is considerably greater than the 13% union contractors surveyed which means these strikes in Nigeria cannot possible be union strikes since unions as a strong political instrument is presently controlled in the country.

Yes	No
53%	47%

Figure 33. Strikes and Lock Outs

Q. 30 ABSENTEEISM

Absenteeism whether is is a daily experience or the one occurring after a pay day or holiday is a potential problem to the contractor. Studies have shown that absenteeism when it runs up to 25% in construction can alter the project schedule.

Question 30 is very interesting from the standpoint of the author's field experience in Nigeria. Some Nigerian job roamers after being employed would just disappear without notification to the contractor. Some might show up in the early morning to punch their time card and thereafter disappear. When questioned where they went, some would say to the dispensary or hospital. Table 18 shows a typical absenteeism experience in a Nigerian construction firm observed in summer 1977.

Table 18. Reynold Construction Company
Calabar
Calabar Township Road Project
Absenteeism Experience Observed from June, 1977 to Sept. 1977

Category	Number of Employees Absent		
	June 1977	July 1977	August 1977
Voluntary Absence	26	32	21
Sickness	15	18	12
Leave	3	4	4
Dispute	5	7	4

Total Number of Employees in Field Unit = 100

A contractor in Nigeria must be able to cope with this type of situation because its a commonplace experience.

In Table 19, absenteeism has been correlated with the minimum wage paid and the type of contractor. From this table it is seen that 43% of the indigenous contractors who paid the lowest salaries had the major problem with absenteeism.

Absenteeism seems to be highest with contractors paying the lowest wage. All contractors from Anambra who are union contractors did not consider absenteeism a problem. This shows the affectiveness of using union hall workers.

Figure 34 shows that 53% of the contract in response to question 30 indicated that absenteeism is a problem in Nigeria, while 40% said no and 7% gave no response. One contractor mentioned that absenteeism is caused prinicipally by the Nigerian's apalling attitude to work.

Table 19. Minimum Wages Paid by Contractor

*Minimum Wage	1.87	2.20	2.75	3	4	5	6
% of indigenous contractors paying this rate	43	7	15	7	14	7	7
% of foreign contractors paying this rate	67	21	12	-	-	-	-
Absenteeism Frequency - %	60	27	9	4	-	-	-

*Figures in Niara

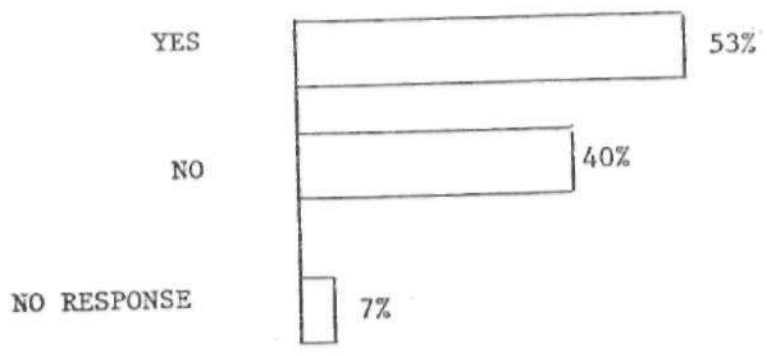


Figure 34. Absenteeism

Q. 31-32 WAGES

Table 20 shows the minimum wage variations in Nigerian public and private sector. This table shows the inflationary consequences of government controls on wages. Wages varied all across the country irrespective of controls.

Anambra and Imo state have the highest paid "minimum wage" workers in the country. This is no surprise since labor unions are operating in this area. Lagos paid minimum wages of ₦ 2.00 - ₦ 3.00.

This is surprising to the author considering the high cost of living in Lagos as compared to other parts of the country.

Table 20. Regional Distribution of Minimum Wages Paid

Private Sector

*Region	1-1.95	2-2.95	3-3.95	4-6
East	-	-	-	-
Lagos	-	32%	-	-
West	7%	7%	-	-
Plateau	16%	-	-	-
North	15%	-	16%	7%

*Values in Niara

Public Sector

*Region	1.75-2.25	2.30-2.80	5-6	6
East	-	-	23%	-
Lagos	23%	8%	-	-
West	15%	-	-	-
Plateau	15%	-	-	-
North	8%	8%	-	-

*Values in Niara

Q. 33-34 ESTIMATING

Estimating is very demanding and time consuming work. An estimator has to give full attention and care to every detail to make sure everything is considered and priced in the estimate. Basically estimating is building the project on paper. During this process, plant and equipment selection, crew size formation, programming, and price assignments are made. Estimating is the process where available information is used to look into the future and try to determine project cost and resource requirements. Cecil G. Johnson calls it the "vaguest thing in the world', in that given ten contractors the same plans and specifications they will arrive at different total prices. This means that there is no correct answer or procedure to estimate. The best estimate then implies

coming very close to the set down price.

Because estimating is of prime importance in determining the success of failure of a contractor it therefore follows that the keeping of a good and well-managed estimating department is very essential to the contractor.

As Figure 35 illustrates, 75% of the respondents to question 33 said that they had an estimating department.

Two methods are used in estimating: one method is to summarize all of the costs involved in a very broad, comprehensive unit such as square foot of floor space or cubic foot of usable space, then to multiply the figures thus derived by the number of units. The other method is to accurately calculate sub-quantities and total quantities of materials, labor and equipment needed to complete each activity and multiply by their individual costs to determine the total estimated cost of the project (Figure 36).

Figure 37, which summarizes the responses to question 34, shows that 40% of the contractors indicated using historical unit cost data and resource enumeration and costing method in estimating their construction project. Thirty-three percent used intuitive methods or recalled old cost data, 7% did not use any of these. Those contractors who did not use any estimating method indicated they used the services of "quantify surveyor or firm."

Yes	No
75	25

Figure 35. Estimating

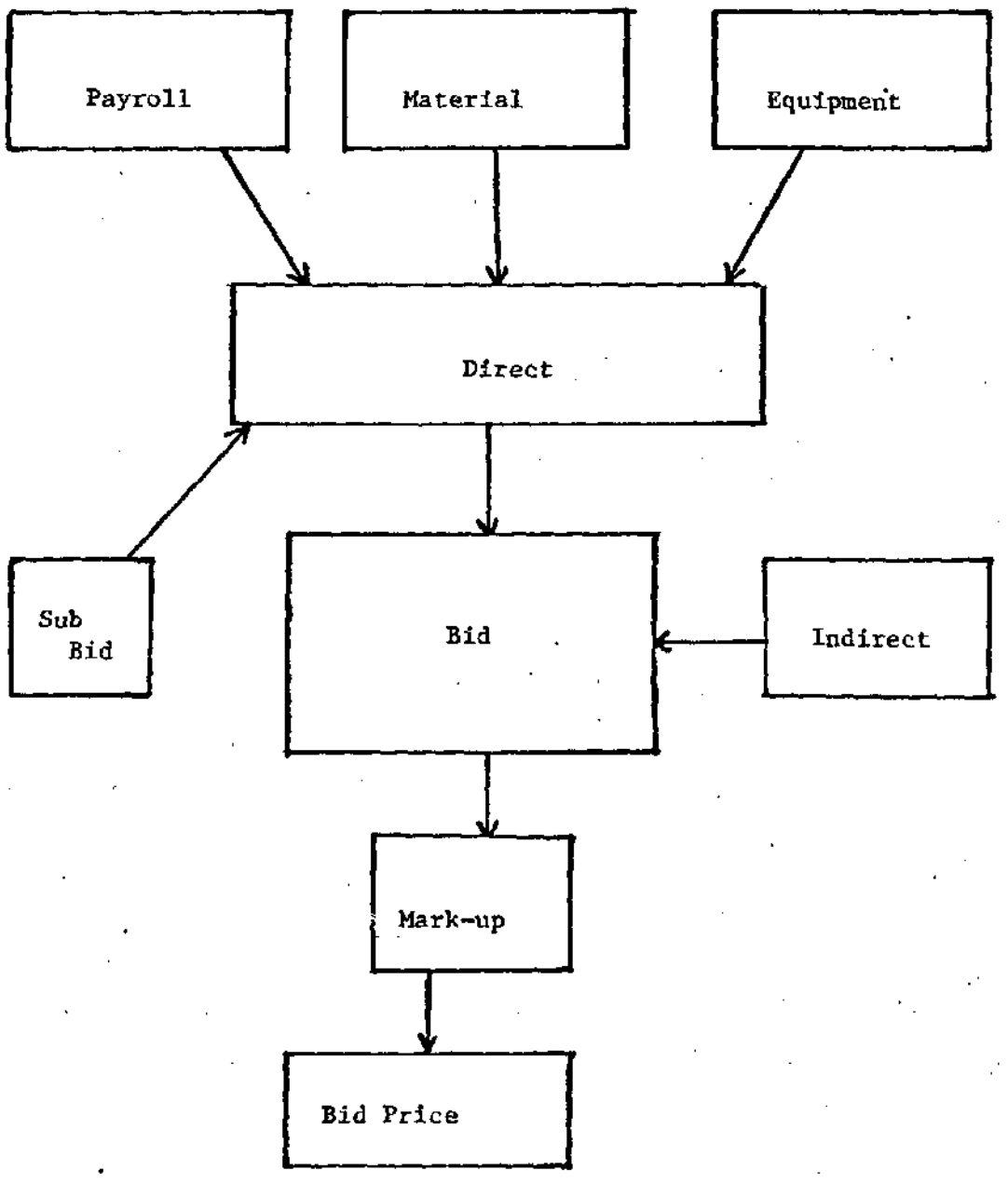
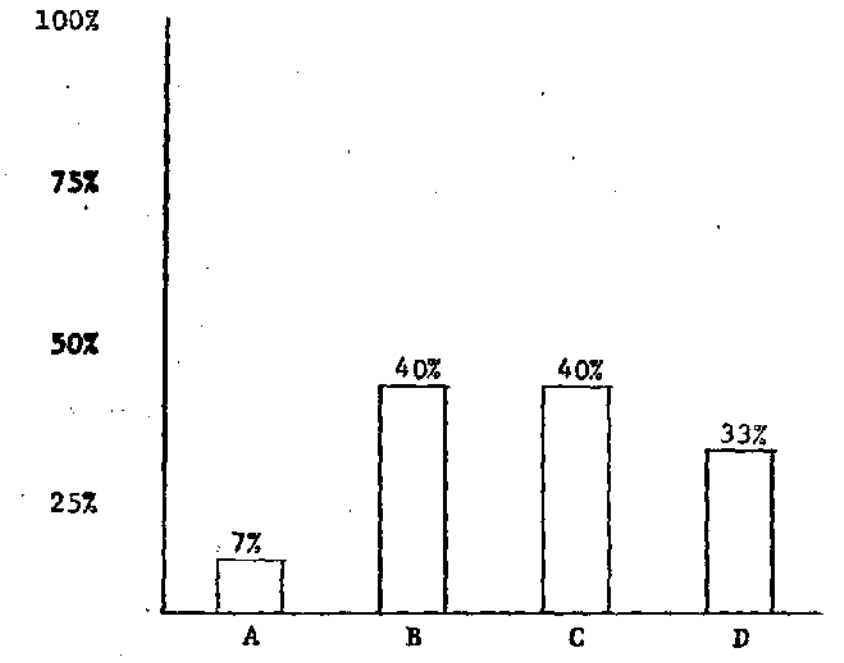


Figure 36. Schematic Diagram of Lumpsum Estimating Equipment

Planning

Planning is concerned with the establishment of organizational objectives and the general ways these objectives can be accomplished. The alternative is random behavior. Therefore, if any organization is to remain alive, it must pursue realistic objectives.

Although it is possible that activities can be coordinated without planning, there is a high probability that unplanned activities will be random, uncoordinated and very wasteful.



A) Use none
B) Historical unit cost
C) Resource enumeration
D) Intuitive method

Figure 37. Estimating Method Used

Construction planning then involved developing a concept to be used in performing the various construction activities efficiently and on schedule. Some authorities define construction planning as evaluation, study and a proposal for the disposition of labor, material, equipment and money on the project. This may take the form of simple bar charts, ideas written on paper or C.P.M. networks. Planning and estimating are inseparable and must be initiated when the cost estimate is prepared. The plan then serves as the basis for control, efficiency and good operation management especially if all the uncertainties on the project are considered when developing the initial plan.

Implementation

A plan which is not implemented is no plan at all. Implementation or expediting is simply the activation of a plan. This includes material orders, shopdrawing reviews, field force direction, sending messages, phone calls and so on. A plan must precede the implementation of that plan. The processes of plan implementation are : 1) analysis; 2) communication; 3) review; 4) completion.

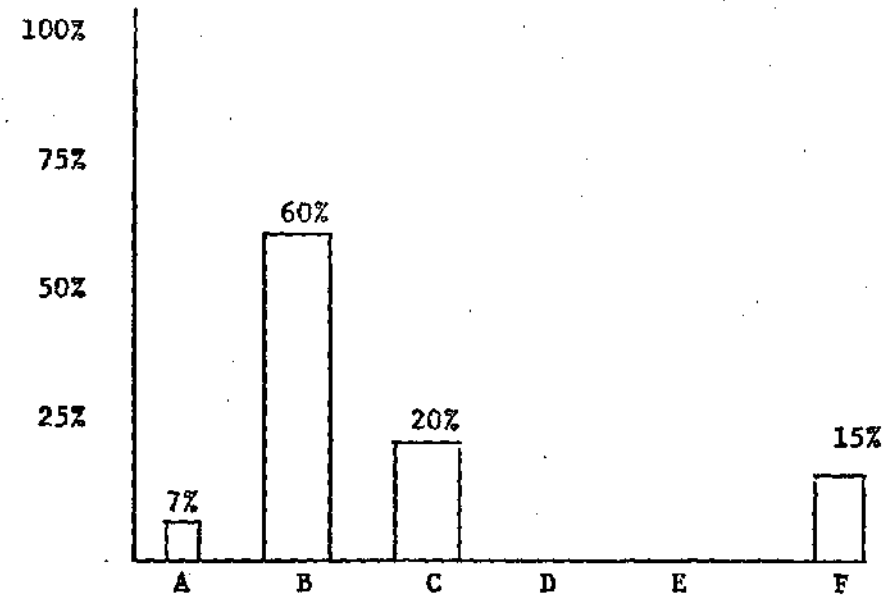
Controlling

Controlling is basically stating at a given time the amount and quality of work to be done and taking necessary steps to see the work is done as required within the limits specified. Put in simple terms, it means staying as close to the proposed plan as possible or departing to another for some reason. In entails

developing a sense of purpose and direction.

Scheduling

Scheduling considers a project as a collection of work packages. The information derived at the scheduling stage of the project is very vital to the construction manager and planner. Scheduling allows the manager to commit the available technology., time and resources effectively. It provides standards which permit the comparative evaluation of the project as "performed" to as "planned" and allows corrective actions if need be.



A) Use none
B) Bar chart
C) Network analysis
D) Pert
E) Computer systems
F) No response

Figure 38. Scheduling

It helps smooth out labor and plant requirements. Scheduling considers a project as a collection of work packages which have a number of attributes. Examples are duration, equipment labor material and direct cost. Scheduling techniques in construction are modeling concepts formulated to establish chain of action, correct level of detail, logic of action and identification of

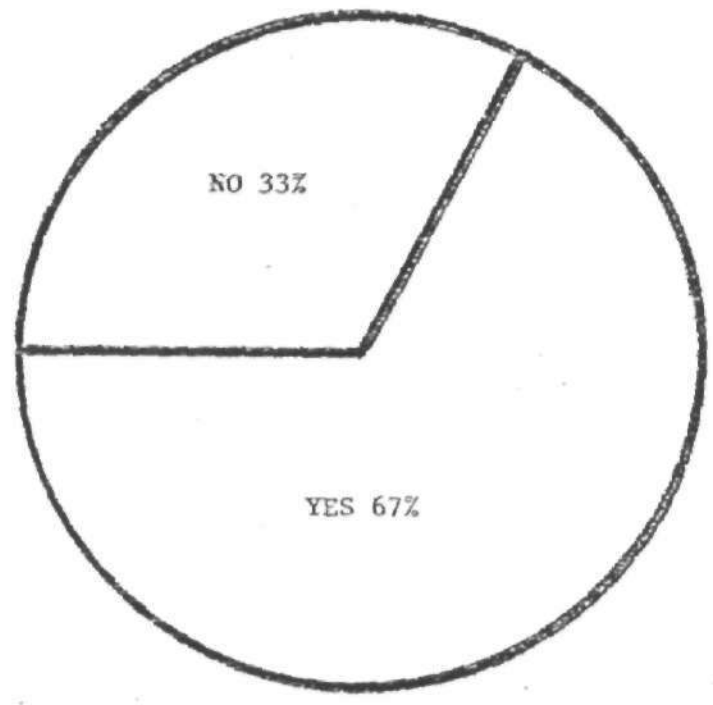


Figure 39. Scheduling In Planning Phase

construction activity.

Bar chart uses horizontal time scale against which operations are blocked to indicate the activity duration. CPM works on "work packages" duration and constructional or technological order or sequence of work package, calculated floats allow the manager to get back on schedule if he is off track. PERT is used for situations where there is insufficient background information or

where a project activity requires research and development. It introduces some uncertainties into the time estimates for activity and project duration. Question 35 sought to find out whether Nigerian contractors utilized any controls at all on their job. Figure 38 shows the response. Sixty percent of the respondents use bar charts, 20% CPM, 7% none of these techniques and 15% did not respond. One company indicated using CPM only on large projects.

Figure 39 shows the response to question 36. Sixty seven percent of the companies use scheduling during the planning phase, 33% said no.

Figure 40 shows the response to question 37. Here 60% of the respondents indicated yes while 40% responded no.

Yes	No
60%	40%

Figure 40. Scheduling During Construction Phase

Q. 38 COMPUTER USAGE

Computers have many applications in construction. Its advantages greatly outweighs its disadvantages. Computers can be used for:

1) Updating historical cost information

2) Design

3) Long calculations

4) Deciding choice of alternatives

5) Storage of data

6) Performance of clerical functions

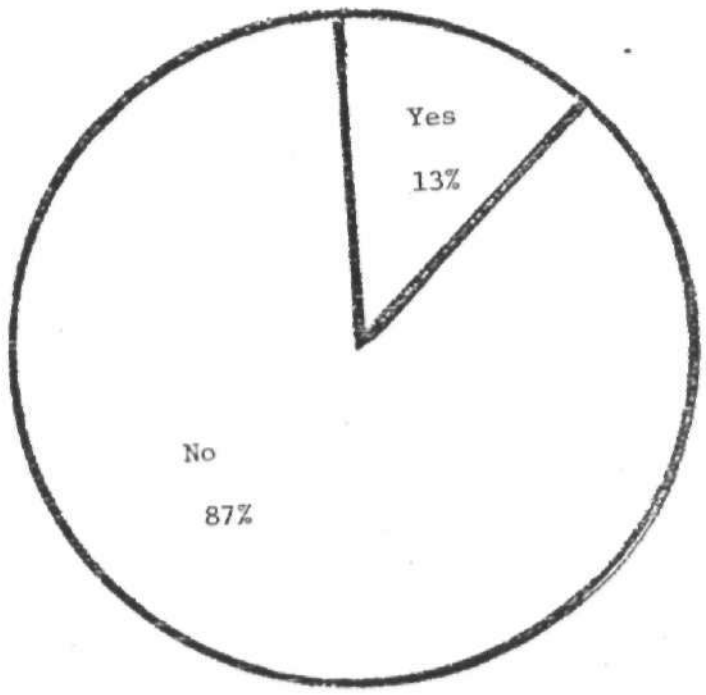


Figure 41. Computer Usage

7) Analyzing the performance of off highway trucking

8) Estimating

9) Planning and scheduling

10) Cost control

11) Other

The contractors were asked in question 38 whether computers are used in their organization. Figure 41 shows that 13% of the respondents said yes and 87% said no. This indicates the level of computer technology application in the Nigerian construction industry.

Q. 39-40 ACCOUNTING

For management to draw any conclusion is has to understand financial accounting methods and financial statements. The basic steps involved in accounting cycle are:

1. Financial transaction
2. Journalizing
3. Posting of entries to ledger
4. Ledgers closed
5. Preparing statements

For long term construction contracts, two methods of accounting are used. There are: completed contract method; 2) percentage of completion method.

A) Cash receipt and disbursement
B) Accrual
C) Percentage Completion
D) Completed Contract

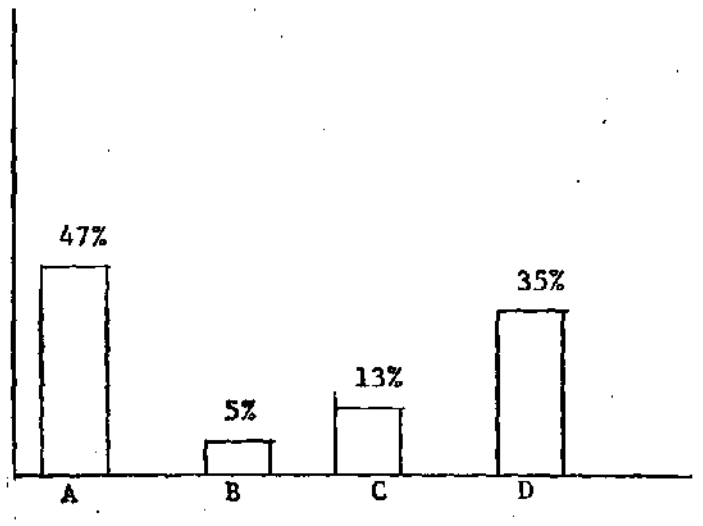
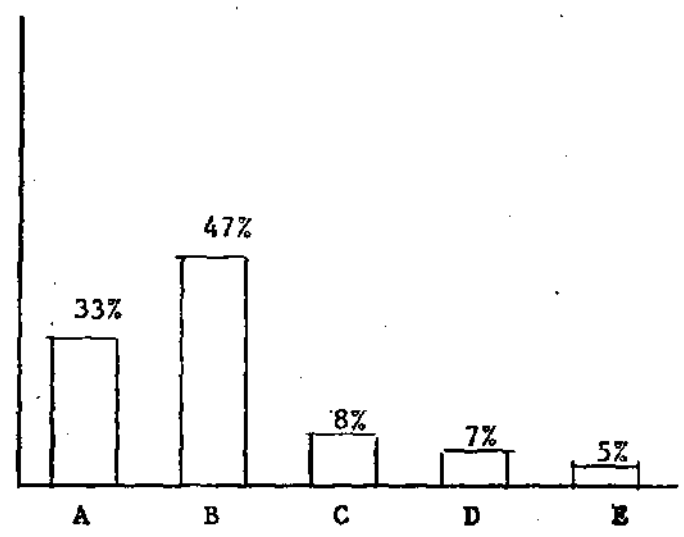


Figure 42. Accounting System

In completed contract method, income accrues at the end of the contract, while in percentage of completion, income is realized as the various phases of the project is finished. Each method has its advantages and disadvantages.

The basic philosophy of cost accounting systems is to enable the contractor to monitor and control construction cost and thereby making more profit. Since no profit can be realized when wrong estimates are used it therefore follows that information from the cost accounting system may be used to up-date the estimating system.



A) Standard system cost code
B) Cost codes developed by own company
C) Other simplified cost codes
D) None
E) No response

Figure 43. Type of Cost Code

Therefore, using the same cost accounting or cost codes for estimating and cost account helps in reducing inaccuracy and provide for better communication.

In question 39 the contractors were asked what accounting system they used. Figure 42 shows the response to this question. Thirty-five percent of these contractors used completed contract, 13% used percentage of completion method, while 47% used cash receipts and disbursements.

In response to question 40, "which cost codes do you use," Figure 43 shows that 33% of the respondents use standard system of cost codes, 47% used cost codes developed by their own companies, 8% indicated using "simplified cost codes."

Q. 41 PUBLIC RELATIONS

Public relations has to do with the ability of a contractor to successfully perform the contract first and then communicate his performance to the public. Construction projects have impact on people. A contractor must recognize that with the public opposing his project he could be subjected to costly delays, annoyance, harassment, embarassment and damage of company's reputation. Being able to maintain good public relations when the project encroaches on the public interest is what a public relations department is all about.

In question 41, the contactors were asked whether they had any public relations departments. Figure 44 shows the response to this question. Fifty three percent of the companies indicated yes, while 47% said no.

Yes	No
53%	47%

Figure 44. Public Relations

Q. 42-43 SAFETY

The Constitution provides for the protection and preservation of the public health, safety, comfort and general welfare of all. The government finds that personal injuries and illness arising out of work situations impose substantial burden upon the industry in terms of loss production, wage loss, medical expenses and disability compensation payments.

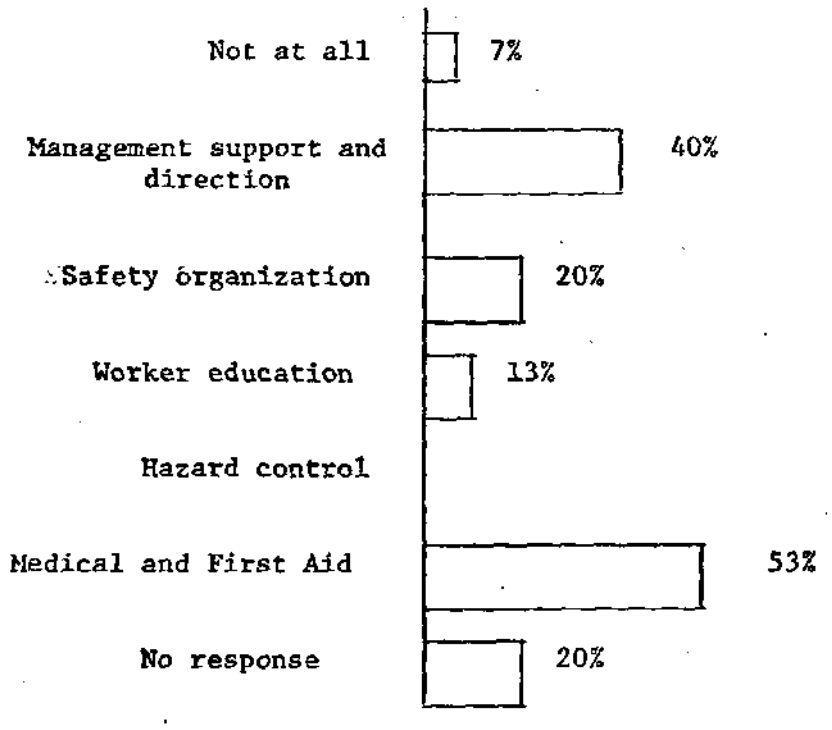


Figure 45. Safety

Question 42 sought to find out the standard of safety in the industry. Figure 45 shows that forty percent of the respondents reported they use management support programs, 20% indicated safety organization, 13% used worker education, 53% indicated having medical and first aid plan. In question 43 Figure 46 shows that 40% of the respondents indicated that there is a national

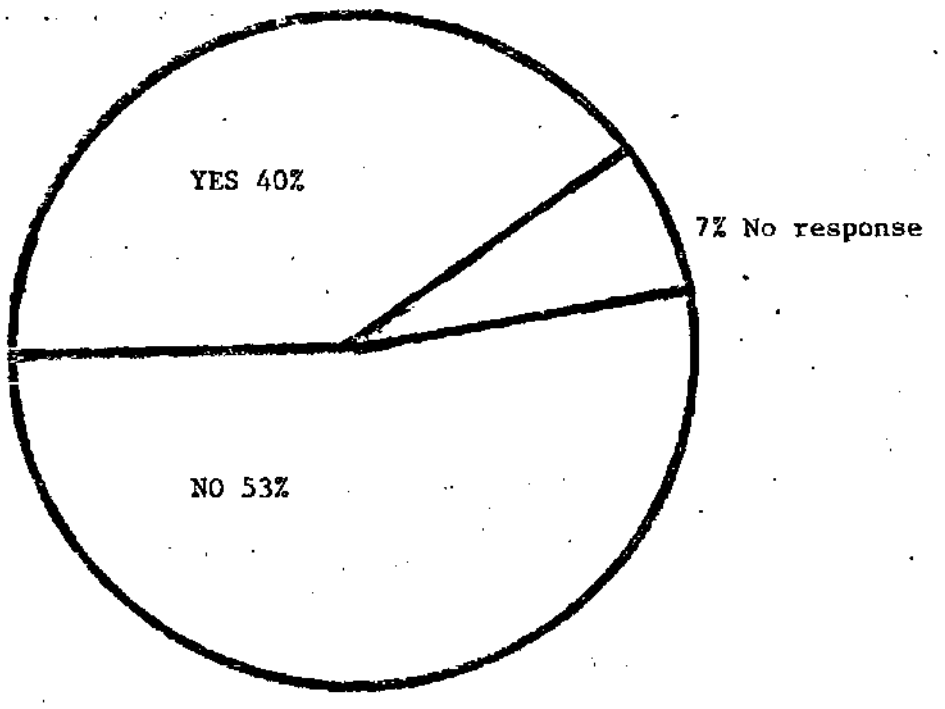


Figure 46. National Safety Program

safety program in the country, 53% said no and 7% gave no response to the question.

Q. 44 PENSION PLAN

Pension plans are arrangements which the contractor provides for the retirement benefits of his employees in recognition of their services to the company. Question 44 sought to determine if the responding companies had a pension plan. As Figure 47

illustrates, 27% of the respondents said yes while 73% said no.

The large number that responded no indicates the relative youth of the construction industry in Nigeria. The only pension plan mentioned was the National Provident Fund.

Yes	No
27%	73%

Figure 47. Pension Plan

Q. 45 USE OF SERVICE COMPANIES

Construction Management (C.M.) firms provide management services to the industry.

Computer service bureaus provide computer services to the contractor for a fee. A quantity surveyor or firm helps the contractor in estimating and quantity take off. In answers to question 45, it was learned that 7% of responding firms use the services of C.M. and 60% use the service of a Quantity Surveyor while 27% did not respond and 13% indicated not using any services of these firms (see Figure 48). The services of quantity surveyors was used frequently by the building contractors. The mention of using C.M. firms were by contractors operating in Jos.

Q. 46-47 TAX STRUCTURE

Though the country's tax structure has contributed to the development of the economy, the different rates all across the country, have inhibited the growth of an effective development oriented national fiscal policy.

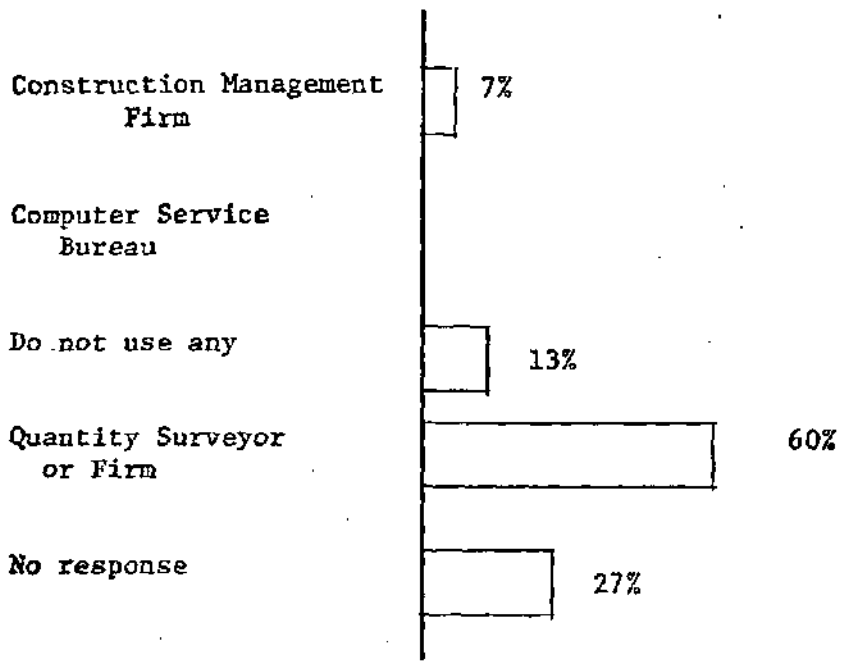


Figure 48. Use of Service Companies

There are 19 tax structures for all the states in the country. The Federal government has constitutional powers to impose taxes and at the same time has obligation to share the revenues accrueing from such taxes with the states. Major revenue sources are import duties, export taxes, excise taxes, personal income tax and companies taxes.

The taxation of companies falls within the jurisdiction of the Nigerian federal government. The government uses its tax and tax relief policies to encourage industrial and commercial investment from foreign or domestic sources. Tax is charged on the profits of companies in accordance with the provision of the companies tax act of 1961.[1]

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[1]Federal Ministry of Information, Industrial Directory Lagos, Federal Ministry of Industry, 3rd Edition, 1965, p. 37.

This act allows for liberal depreciation allowances for capital expenditures, such as for machinery and fixtures, construction of building and mine and plantation development.

Initial allowances are provided at the following rates for qualifying for capital expenditures:

Machinery and equipment - 40%

Mines - 25%

Industrial buildings - 20%

Plantations - 25%

Non industrial buildings - Nil

In response to questions 46 and 47, which asked the names of taxes they pay in Nigeria, the contractors mentioned the following:

1. Company tax - 45%
2. Income tax
3. Profit tax
4. Turnover tax - 2½%
5. Pay as you earn

   For employees (PAYE)
6. Development tax

Development tax was mentioned by companies in Ibadan while PAYE was mentioned by Jos contractors.

CHAPTER 5

CONSTRUCTION OUTPUT GRAPHICAL ANALYSIS

This section analyzes the various data reported by the companies which returned the questionnaire.

Index of National Construction Activities

Figure 49 presents the index of construction activities in the country from 1964 to 1973. The decline from 1966 to 1968 is as a result of the Nigerian Civil War. From 1968 to 1972 the number of construction activities in the country shows a progressive trend.

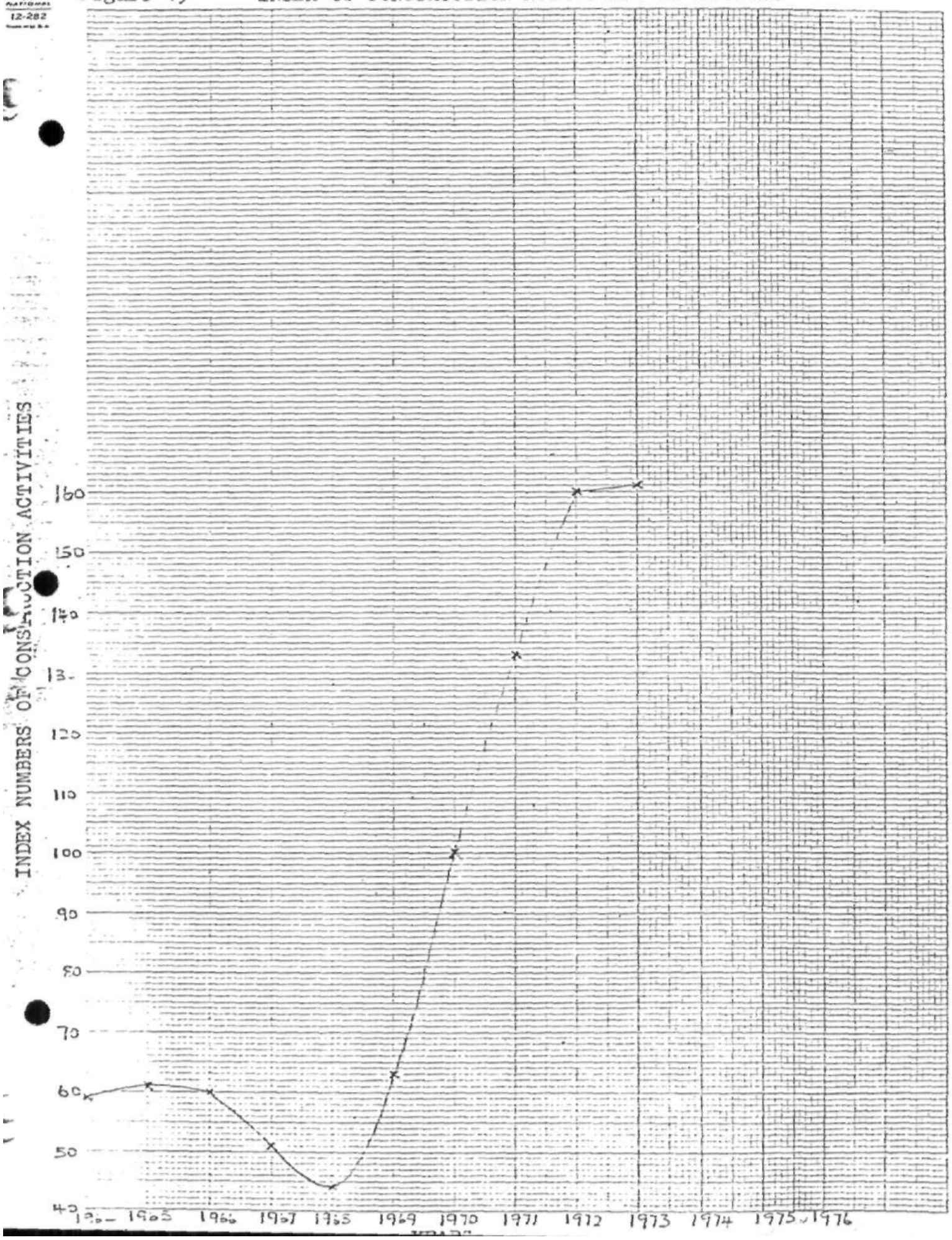
Highway

Highway work is not for beginners. It is the least profitable and requires a large amount of equipment outlay. At times more than a million dollars is required for grading, scraping, excavating, paving and rolling equipment required to perform a million dollar project. This means the contractor has to get more road contracts or go out of business. Only 27% of the indigenous contractors surveyed indicated they were not specialized and could handle road work.

These indigenous contractors were all medium size companies. A hundred percent of the foreign companies surveyed had a highway contract.

Transportation is the lifeline of any nation in time of peace and emergency. Developing an efficient road network in

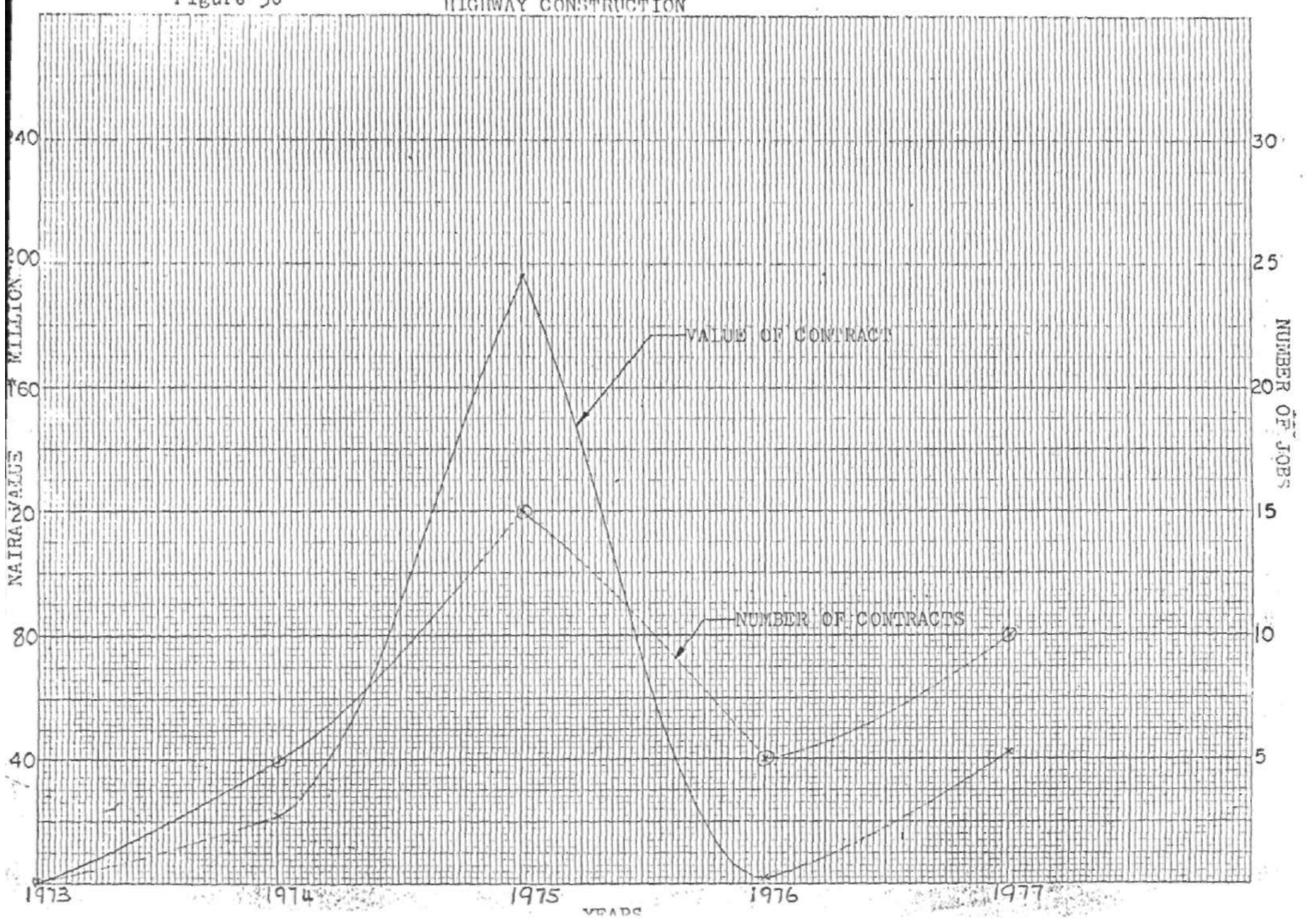
Figure 49 INDEX OF CONSTRUCTION ACTIVITIES IN NIGERIA



K+E 20 X 20 TO THE INCH • 7 X 10 INCHES
KEUFFEL & ESSER CO. MADE IN U.S.A.

46 1242

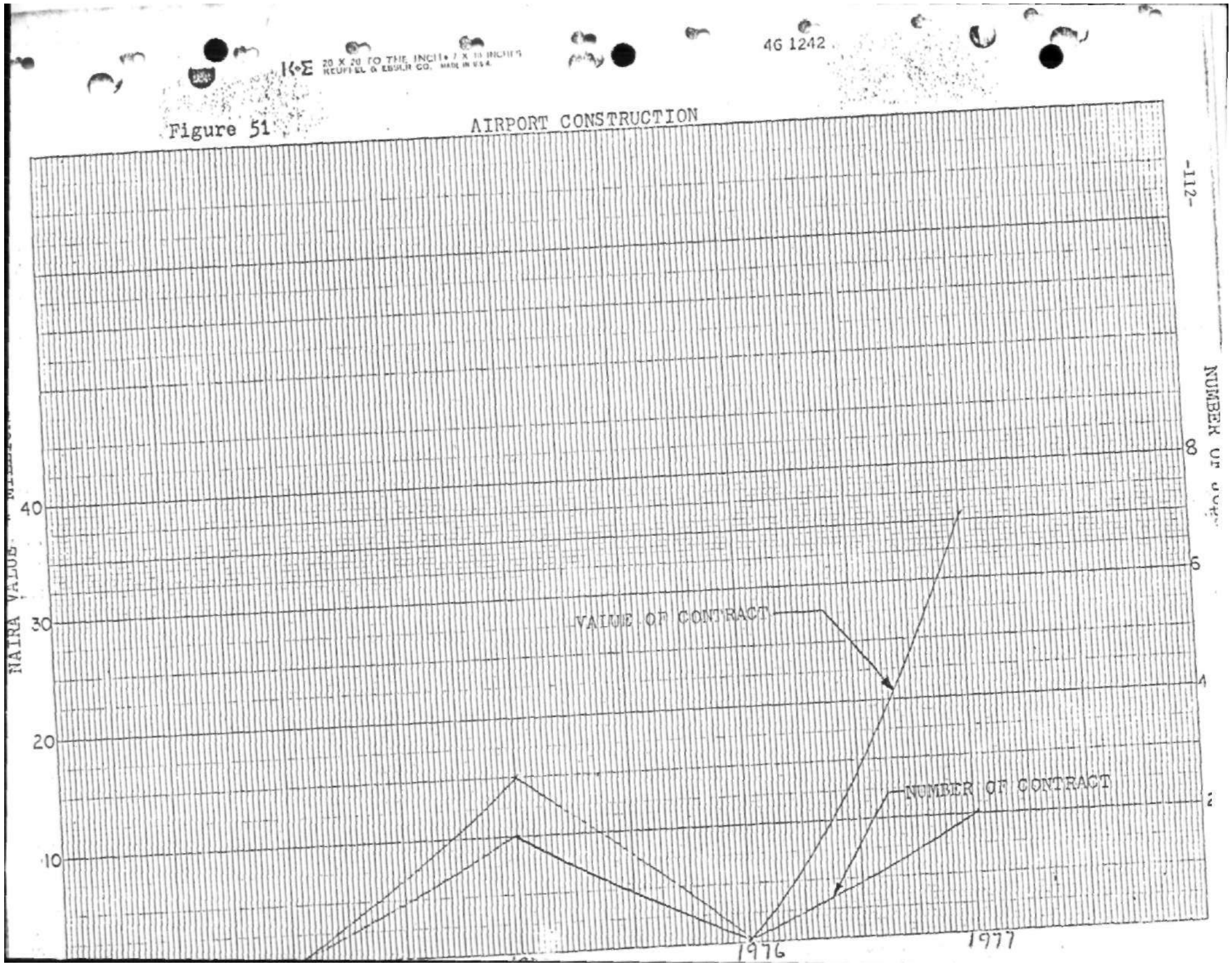
Figure 50



Nigeria has been of top priority in the last two Nigeria development plans. Figure 50 shows progressive trends in the number of contractors and value of job during the Second National Plan 1970-74. Nigeria's booming economy far outpaced transport and communication development thereby resulting in influx of people into cities and resultant congestion. Figure 50 shows that in order to cope with these problems the greatest in number of highway contracts were awarded at the beginning of the Third Development Plan in 1975. The sample survey all contracted for a total of 15 jobs for a Naira value of 196.0M in 1975. A sharp drop in the graph from 1975-76 is as a result of the confusion in the government due to a military coup in the country in 1975.

However a trend develops again from 1976 indicating the governments goal to provide more good roads. Since highway projects are let as Federal and State contracts it stands to reason that any situation (political, economical, etc.) which affects the government would affect highway contracts drastically. Assuming a stable political situation and continuous economic boom , highway construction will continue to be flooded with more contracts until roughly 10 years from now. After 10 years when major road projects will have been completed, there will probably be a sharp decline in highway contracts giving way to reconstruction and alteration of highway facilities not giving a high level of service and performance.

Figure 51


AIRPORT CONSTRUCTION
NAIRA VALUE
NUMBER OF CONTRACT
40
30
20
10
8
6
4
2
VALUE OF CONTRACT
NUMBER OF CONTRACT
1976
1977

Airports

Aviation activities in Nigeria have tripled in the past three years. Businessmen, educators, government officials and so on now prefer flying because of its relative speed and safety compared to driving. Increased demand in airport usage has brought a great strain on the domestic and international airports. To alleviate this problem 18 airports are to be completed by 1980. Figure 51 shows the airport development started during the First National Plan with major contractors awarded in later phases of the plan. Twenty percent of the foreign contractors surveyed had engaged in airport construction. None of the indigenous contractors surveyed had any airport contract.

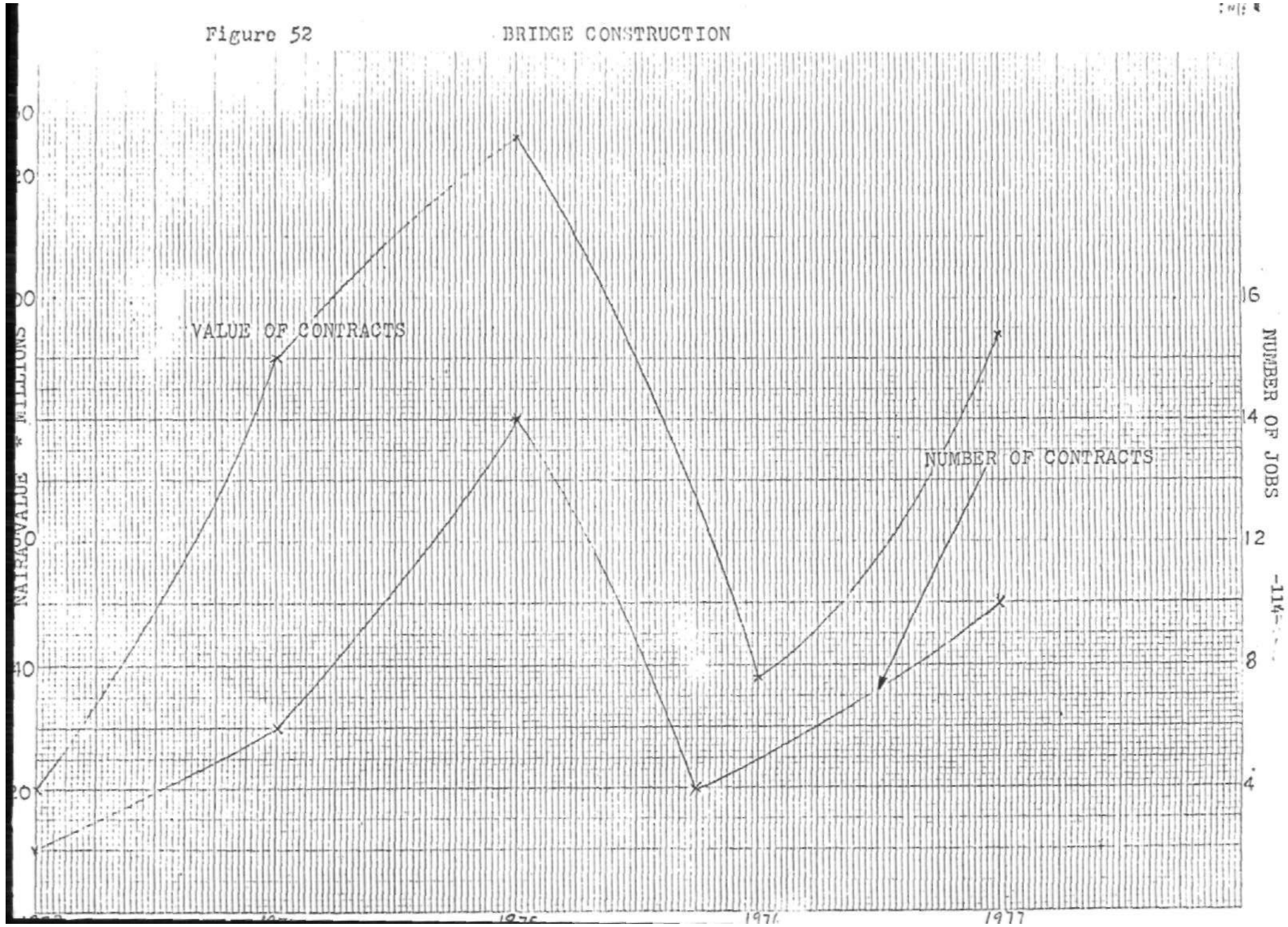
Airport construction showed an increasing trend from ₦ 0.00 in 1974 to a peak of ₦ 15.00M in 1975 and a total contract of 2. Because of the aforementioned crisis in the country there was a sharp decline from 1975-1976. During 1976 to 1977, Nigeria started to airlift most of its import due to port congestion. This sharp trend is reflected from 1976 to 1977 in Figure 51. Ninety five percent of these contracts were crashed.

After all the 18 airports have been completed, airport construction is expected to decline very sharply wiht only minor maintenance work being carried on thereafter. A total of ₦ 320.5 million has been allocated for this sector.

Bridge Construction

Old Nigerian bridges are well below standard. They are generally 10 to 12 feet wide with poorly maintained supports

Figure 52


BRIDGE CONSTRUCTION
VALUE OF CONTRACTS
NUMBER OF CONTRACTS
NAIRA VALUE * MILLIONS
NUMBER OF JOBS
60
40
20
16
12
8
4
1976
1977

making them unsuitable to carry most heavy truck loads[1]. Under the Third Plan period bridge construction has been given considerable attention. New two lane briges have overall width of 34 feet.

Bridge construction is treated as a topic quite apart from highway because in Nigeria bridges are constructed at intersections and called "flyovers' to alleviate traffic congestion.

Figure 52 shows the number of contractors and value of bridge construction from 1973 to 1977. The highest number of contracts and outputs occurred in 1975 with 14 contracts and ₦ 126 M value of contracts respectively. The decline from 1975-76 was due to the military trouble in the country resulting in fewer contracts being awarded. A sharp rise again from 1976-77 shows a regain of momentum in this sector to construct more bridges to alleviate some of the irritating "go slow" in Nigeria.

Waterfront Construction

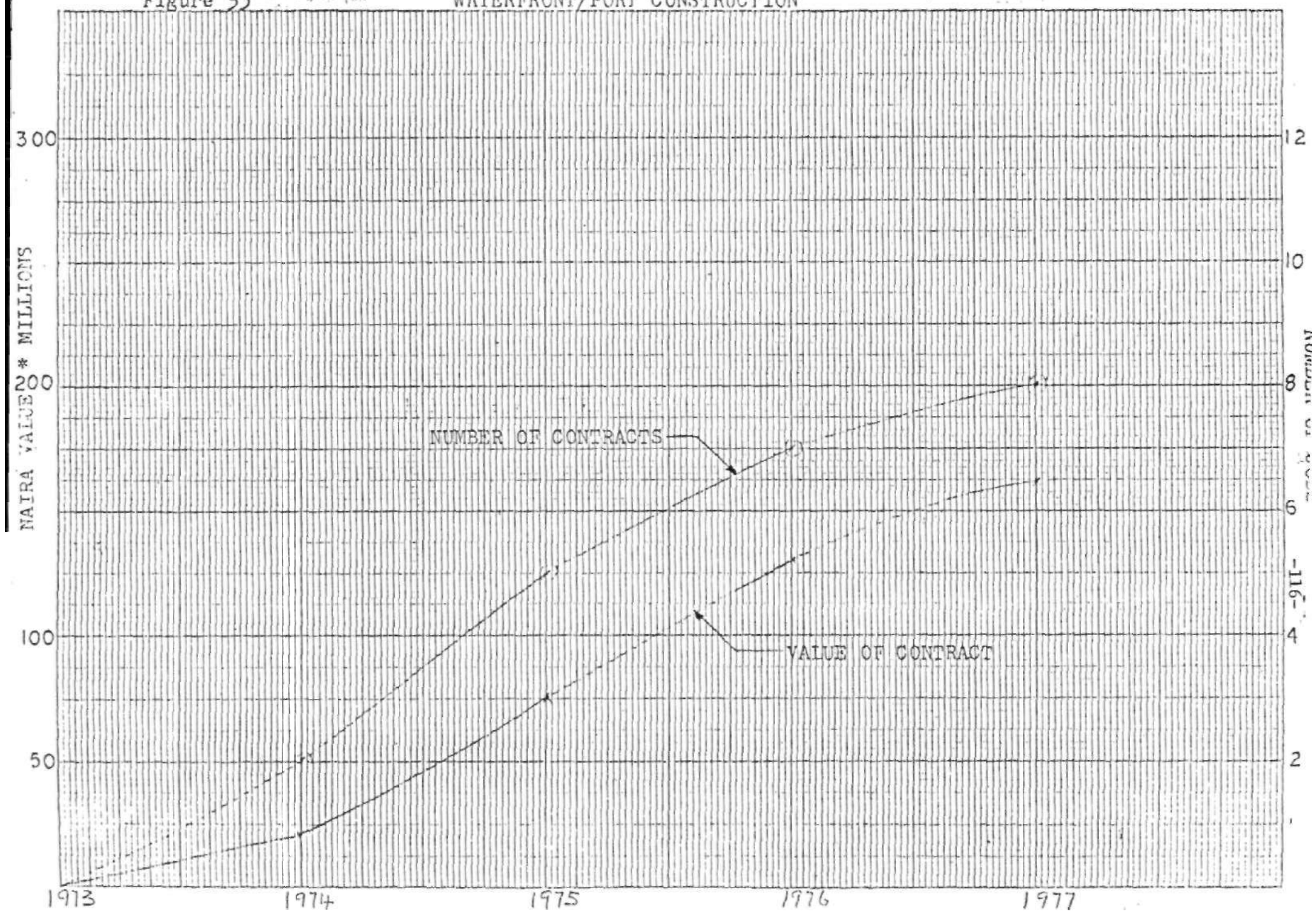
During 1974, the huge oil earnings of at least ₦ 5,700 million rolled into Nigeria which in turn released a flood of government and commercial spending. At the end of the rainy season in October/November 1973 when ships began queueing outside the Nigerian harbours many thought it was only a seasonal upsurge. But this was a queue that was to develop into the worst congestion in maritime history. Shippers once joked that, "boats passing Lagos could book a place in the

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[1]U.S. Department of Commerce Nigeria: A Survey of U.S. Business Opportunities, page 121.

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Figure 53



queue, return to Europe, load up, and get back in time to take up their reserved place."[1]

In order to solve this port congestion problem the government awarded many waterfront contracts in 1974. The companies surveyed only performed 2 waterfront contracts in 1974. A very distinct and clear cut trend over the two development plans period can be seen in Figure 53 where waterfront construction increased from 2 in 1974 to 8 in 1977 with values of ₦ 21.0M and ₦ 200 M, respectively. Waterfront projects include ports, piers, jetties and breakwaters.

All waterfront projects were handled by the foreign contractors. The continuous trend in Figure 53 is as a result of the government awarding more contractors yearly to alleviate other ports that were unable to cope with the congestion.

Visual extrapolation of Figure 53 indicates that major waterfront contracts have already been let by 1977. After all the current contracts have been completed, waterfront construction will drastically decline. Seventy five percent of all firms that engaged in waterfront construction came from Holland.

More waterfront contracts in the future will be on river ports if Nigeria is interested in modernizing its inland waterways.

Water Supply

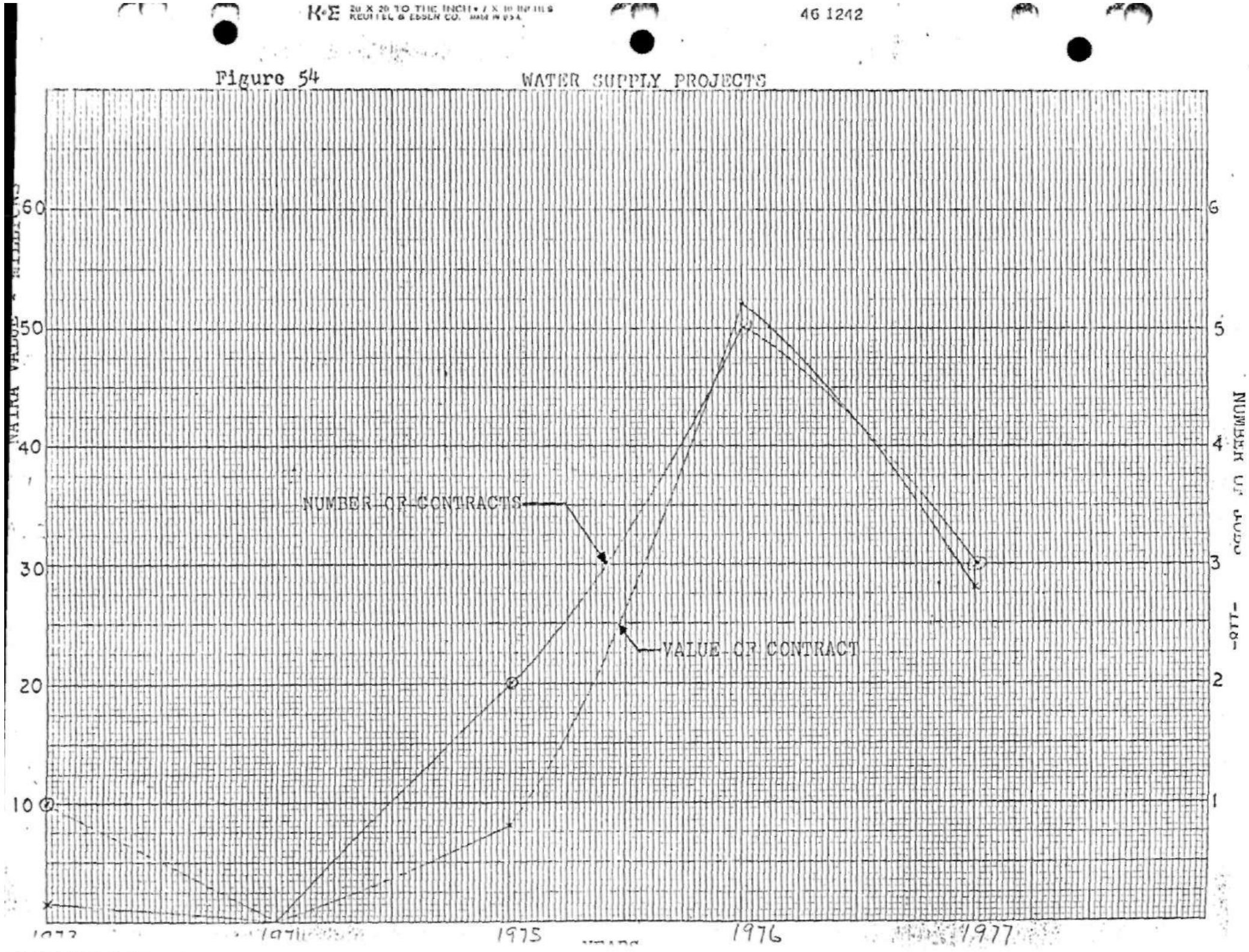
National growth in population and rising standards have put tremendous pressure on practically all basic services in the country including water supplies. Government efforts are being focused

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[1]Alan Rake - Report on Lagos Port Congestion, African Development, 1974.

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Figure 54



on providing efficient water supplies to all towns and rural areas.

Most water supply projects were formerly financed by the World Bank and other foreign governments and agencies.

Figure 54 depicts the trends in water supply construction. Water supply projects undertaken during the Second National Plan spilled into the Third Plan period with the peak occurring in 1976.

This year recorded a value of ₦ 52 M and 5 contracts as reported by the firms surveyed. From 1976 on, only minor rural water projects were let in the country, these being handled by medium-sized contractors. All water projects reported herein were handled by all foreign contractors. Since a majority of water projects are financed with foreign assistance it stands to reason that there is apt to be sharp fluctuation in this type of construction depending on the inflow of foreign money. This is depicted in Figure 54 with a rise and drop in value of ₦0.00 1974, to ₦ 52.0M in 1976 and to ₦ 28 M 1977, reported by all the firms surveyed.

Dredging

Most dredging done in Nigeria is to reclaim land from swamp or lagoon for port construction or the expansion of cities (example Lagos).

When the author personally interviewd Nigerian dredging contractors in 1977 they indicated that dredging can be "feast" or "famine" in Nigeria and right now it is feast. All these

contractors indicated that they usually go searching for contracts wherever it is and get it at a fair price. A dredging giant in Nigeria, Westminster Dredging indicated that during the First Plan only a couple of companies had full monopoly of this type of contract. But now the story is different, dredging is so competitive in Nigeria that world renowned Costain Blankevoort Nigeria Ltd Dredging indicated to the author that they were not operating anymore in Nigeria.

Figure 55 shows the relationship that exists between the number of contracts and value of dredging contracts. A trend developed during the Second Plan in 1970-74. The peak value and number of contracts occurred in 1975 with a value of N 19 and 6 contracts. Though the same dredging contracts were awarded in 1976, these were very small jobs as compared to other years. Probably the political instability in 1975 did not allow the awarding of major dredging contracts as reflected in the drop rather than a rise after 1975. Eighty percent of all dredging jobs in Nigeria are done in Lagos alone.

However, in 1977, fewer contracts of N 3000 were worth about 500% over 1976 were reported by firms surveyed. As Figure 55 illustrates, dredging is the main work of foreign contractors. Not a single indigenous contractor surveyed undertook any dredging work.

Pipeline (Oil and Gas) and Pumping Stations

This type of contract is the most volatile and risky or "go for broke"[1] type of contract in Nigeria. The pipeline contractor

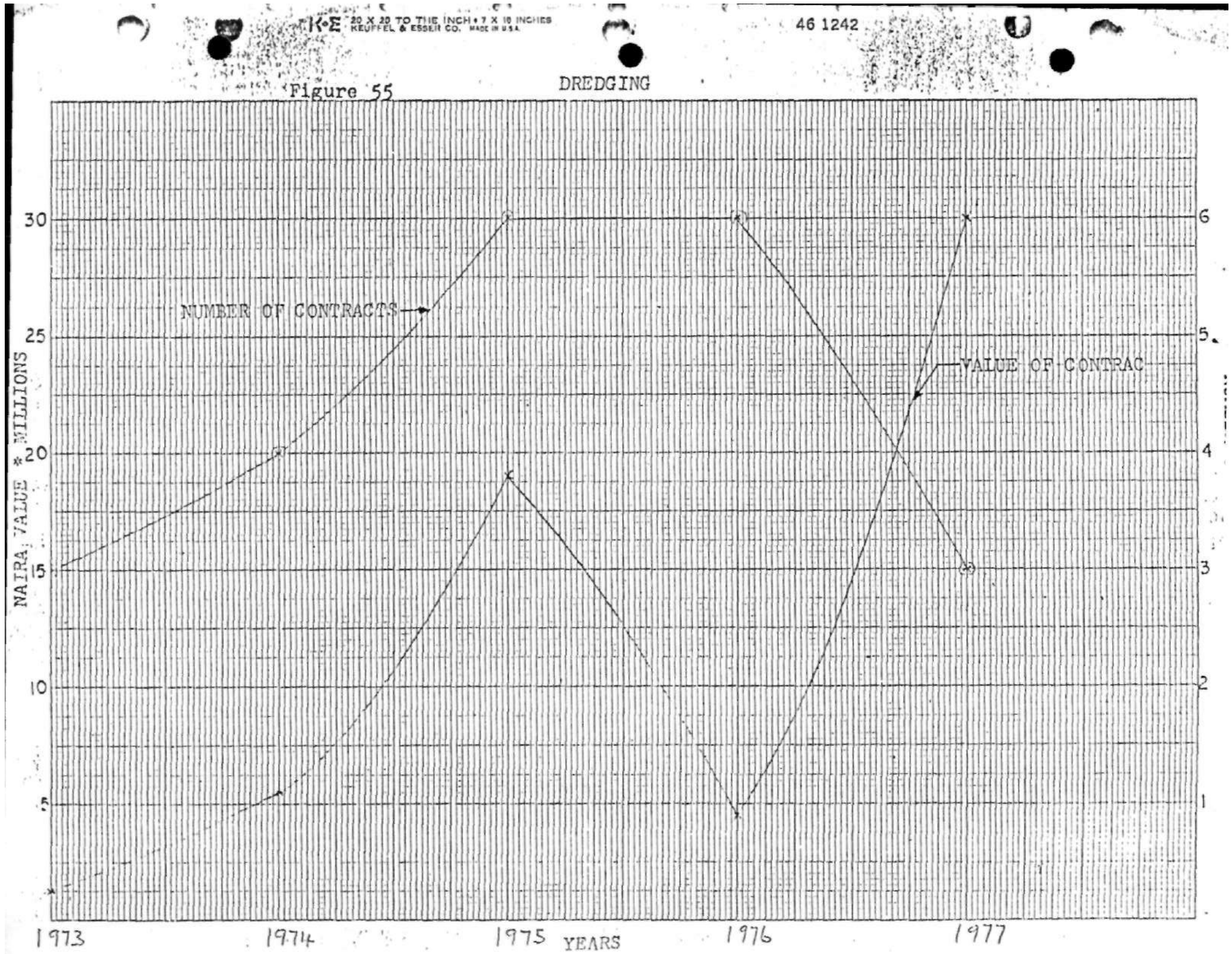
[1]Handbook of Construction and Management, J.D. Bonny and J.P. Fren Van Nostrand Reinhold Co., page 5.

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Figure 55

DREDGING



requires trenching, wrapping, laying and backfilling equipment and as such this type of contract goes to the contractor who is experienced in these types of contracts. Of all the companies surveyed, only foreign contractors operated in this field. Foreign contractors had the sound financial background required for this type of construction. Usually the contractor does not know whether he is making or losing money until the work is all over. All foreign contractors who did pipeline contracts reported also they operated in the public sector, which means these were government contracts. These contracts would include pipeline and pumping for the new refineries and petroleum storage facilities being constructed in the country.

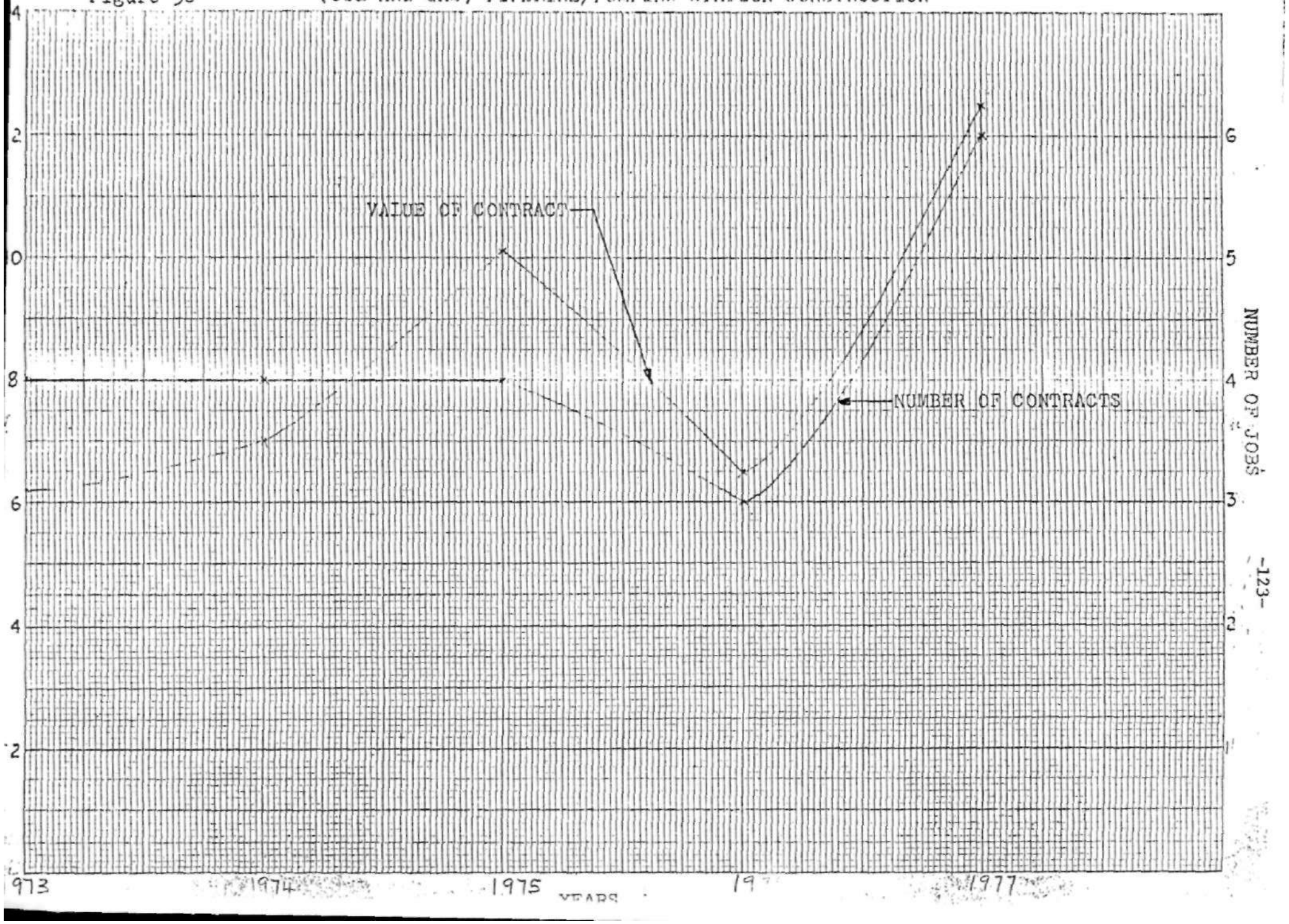
Figure 56 shows that under the years of study pipeline construction showed a steady trend up to 1975. After which it declined due to political reasons.

The rapid rise from 1976 may be explained by the fact that the government awarded many contracts for pipeline construction in an attempt to develop the Petrochemical industry. This was done to alleviate the acute shortage of refined crude petroleum products in the country. Ninety percent of these contracts were crashed. A total Naira value of ₦ 12.5 and 6 contracts were recorded by the firms surveyed. So long as the Nigerian petroleum and petroleum chemical industry is developing rapidly this type of construction will continue to show a progressive trend in the future.

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Figure 56 (OIL AND GAS) PIPELINE/PUMPING STATION CONSTRUCTION



Military Projects

The Nigerian civil war has brought increased strength and military personnel to the Armed Forces. Military contracts are awarded to build Army bases and military facilities to accommodate these personnel and equipment. Figure 57 shows the trends in Military construction. During the "Gowon's Military Regime" several military projects were planned and a few executed because the government contemplated on trimming its military forces. Gowon was deposed for this in late 1975. After this military coup the government awarded several military contracts from 1976 as Figure 57 shows. Military contracts slightly rose from 3 contracts for Naira value of ₦ 5.00M in 1973 to 4 contracts and ₦ 6.0M in 1974 and from 2 contracts and a vluae of ₦ 2.75M in 1976 to contracts for a total of ₦ 29.0M in 1977.

Ten to fifteen percent of the current projects are military projects. Twenty-two percent of the companies surveyed reported they had executed a military contract. Of all the firms who did military work, fifty percent were indigenous companies.

Building Construction

In the field of building construction, 67% of the companies returned the survey. Seventy five percent of these companies were medium size with a meagre 13% small and the rest large.

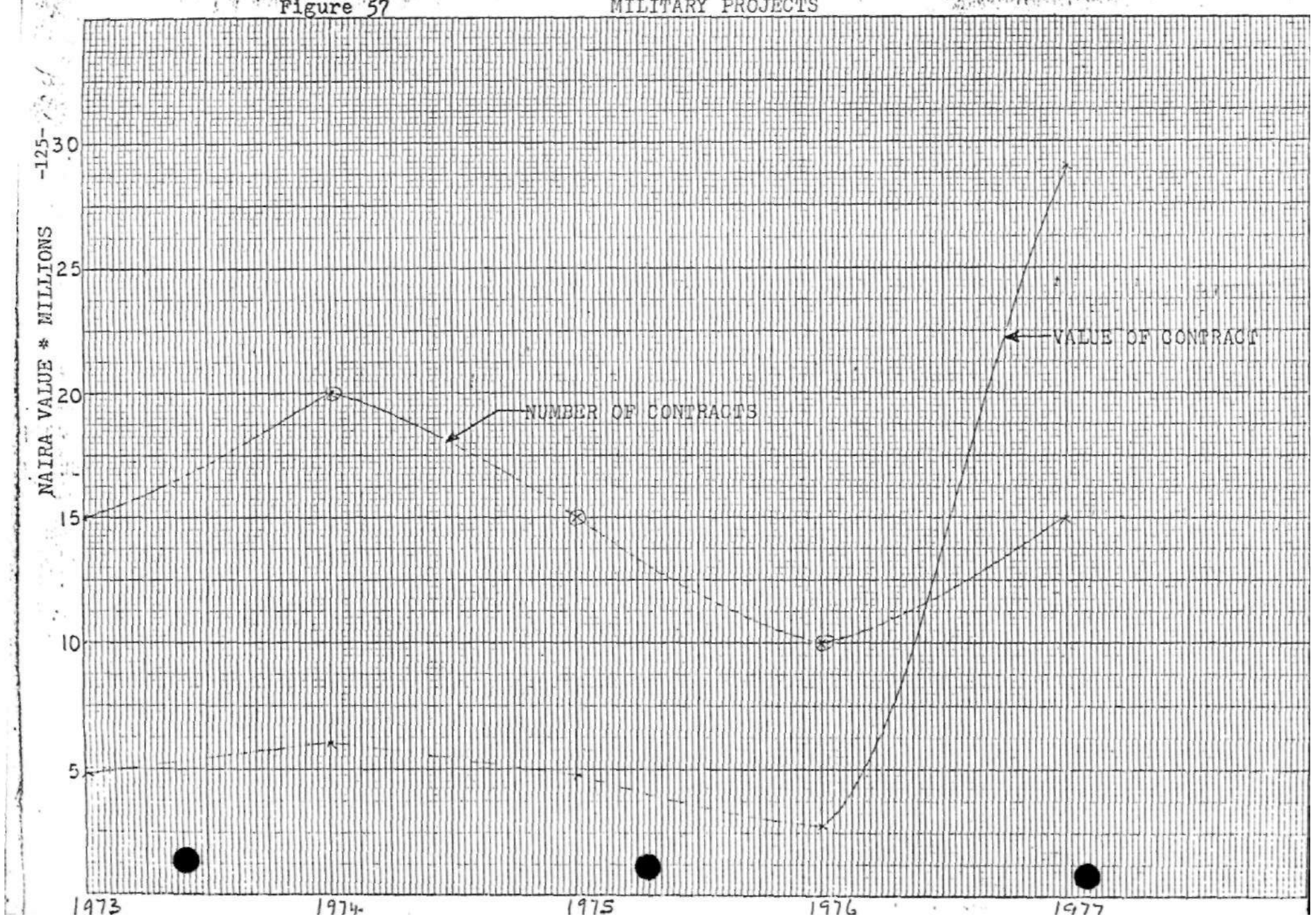
Building construction as defined here under excluded high rise, industrial, residential, public office, commerical, recreational, hotel, school, medical and church construction.

Figure 58 shows the frequent downturns and the unpredictable nature of the building construction. There were 310 contracts

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Figure 57

MILITARY PROJECTS



and ₦ 68.75M value of job performed in 1973 as compared to 250 contracts and ₦ 150.0M value in 1974. This figure shows that though the number of contracts were 24% lower in 1974 than in 1973 it recorded a higher Naira value of 54% higher than 1973. The value of jobs performed reached its peak in 1974 with a value of ₦ 150.00M, declining to ₦ 68.75M in 1977. The largest number of contracts were awarded in 1975 the beginning of the Third Plan. This trend shows that though the total number of contracts awarded were in some years relatively higher than the preceding years, the cost of building were relatively cheaper. Visually extrapolating the curve of number of contracts one would conclude that the building field will still be flooded with many contracts though the Naira value could be higher or lower than the preceding year depending on the type of buildings constructed. It may be concluded that, given the current building activities going in the country, now building construction will still be filled with numerous contracts. The trend will always be fluctuating until most building projects have been completed in the country. This will be so many years from hence.

Highrise/Public Office Construction

Highrise buildings are construted in urban and large cities in Nigeria to provide office space, apartment space and hotel space and so on.

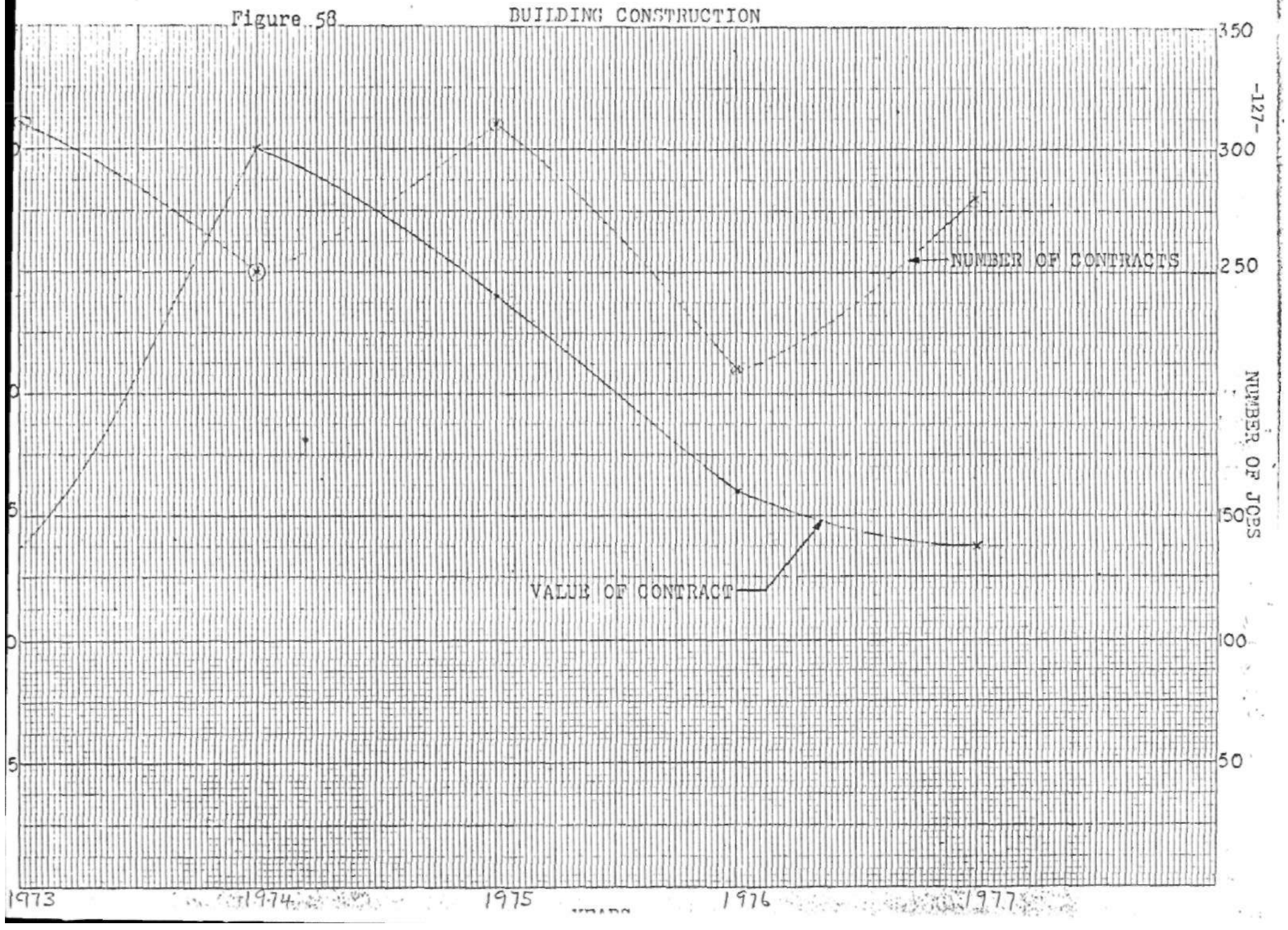
Thirteen percent of the companies surveyed had performed highrise contracts of some sort. It was surprising to find that

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Figure 58

BUILDING CONSTRUCTION



70% of the high rise construction was executed by medium-sized indigenous contractors according to the survey. All the companies which performed highrise work indicated they obtained over 50% of their contracts in the public sector. This means that these were all government contracts for secretariats buildings, etc.

Figure 59 shows the trends in highrise construction. The inactivity in this field from 1975 to 1976 was as a result of the political instability in the country. Highrise construction regained momentum from 1976 to 1977 as shown in this figure and will continue like this untill all secretariats, etc. are constructed in all the new state capitals in the country. Given that there will be more urban renewals this field promises to be a good field for these contractors with the skills. However, highrise "field" is very sensitive to any critical situation that affects the public sector economy of the country.

Industrial

This field of construction embraces so many speciality fields. It is the type of contract normally awarded as "turnkey" projects in the country. As expected all the companies surveyed indicated that they performed industrial contracts in the major urban centres of the country. Only twenty percent of all the contractors surveyed were industrial contractors. Sixty percent of the industrial contractors were located in the North where major industries like automobiles and fertilizer are located. Fifty percent of these industrial contractors were indigenous contractors.

Figure 60 clearly shows that industrial development in the country follows each development plan period. During the First Plan 1970-74 industrial construction attained its peak in 1974 with 2 contracts and a Naira value of N 11.6 M. Since it takes some leeway in time to order and deliver industrial material and equipment, industrial construction slowed down until the Third Plan period 1975-80. A steep trend develops from 1976. It must be noted that the present government which took office late 1975 is bent on transforming Nigeria to an industrial state. This is reflected in this trend from 1976 to 1977.

With the world tradefair just concluded in 1978 in Lagos, and Nigeria formulating new policies to attract U.S. industries into the country, it could be concluded that industrial activities will be tremendous in the next two years. It could be inferred from the trends in Figure 60 that industrial construction will be increasing and will reach a peak around 1980 under the Third National Plan period. This field of construction promises to be a good one for contractors who can handle this type of job.

Residential

Traditionally, the house builder is the backbone of the building construction profession. In Nigeria these type of construction are all handled by indigenous contractor. Thirty three percent of all contractors that return their questionnaires were residential contractors. A hundred percent of the small contractors were house builders and sixty percent of all residential contractors were medium size firms. One contractor had to obtain a total of 40 residential jobs for only two million dollars which

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Figure 59

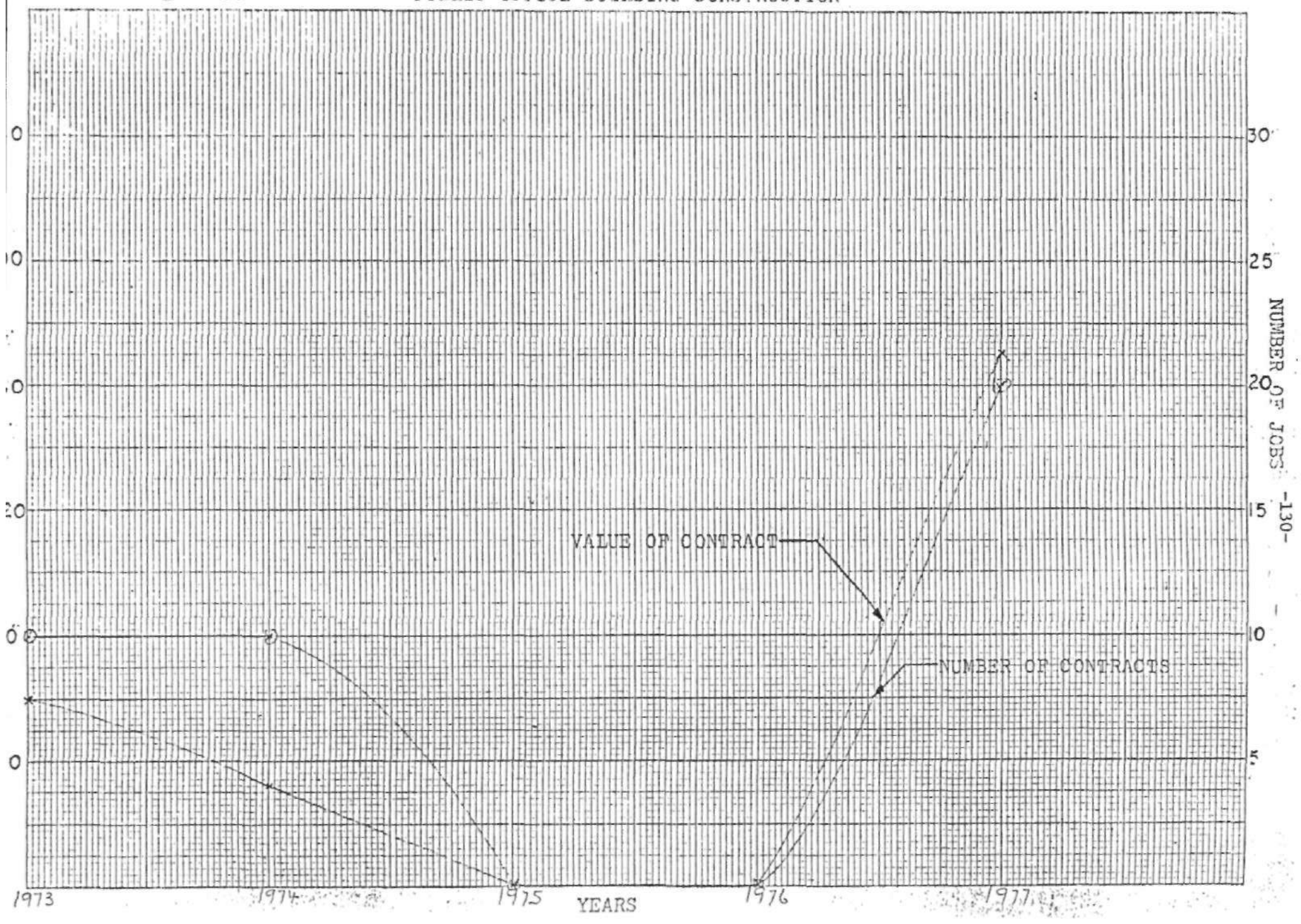
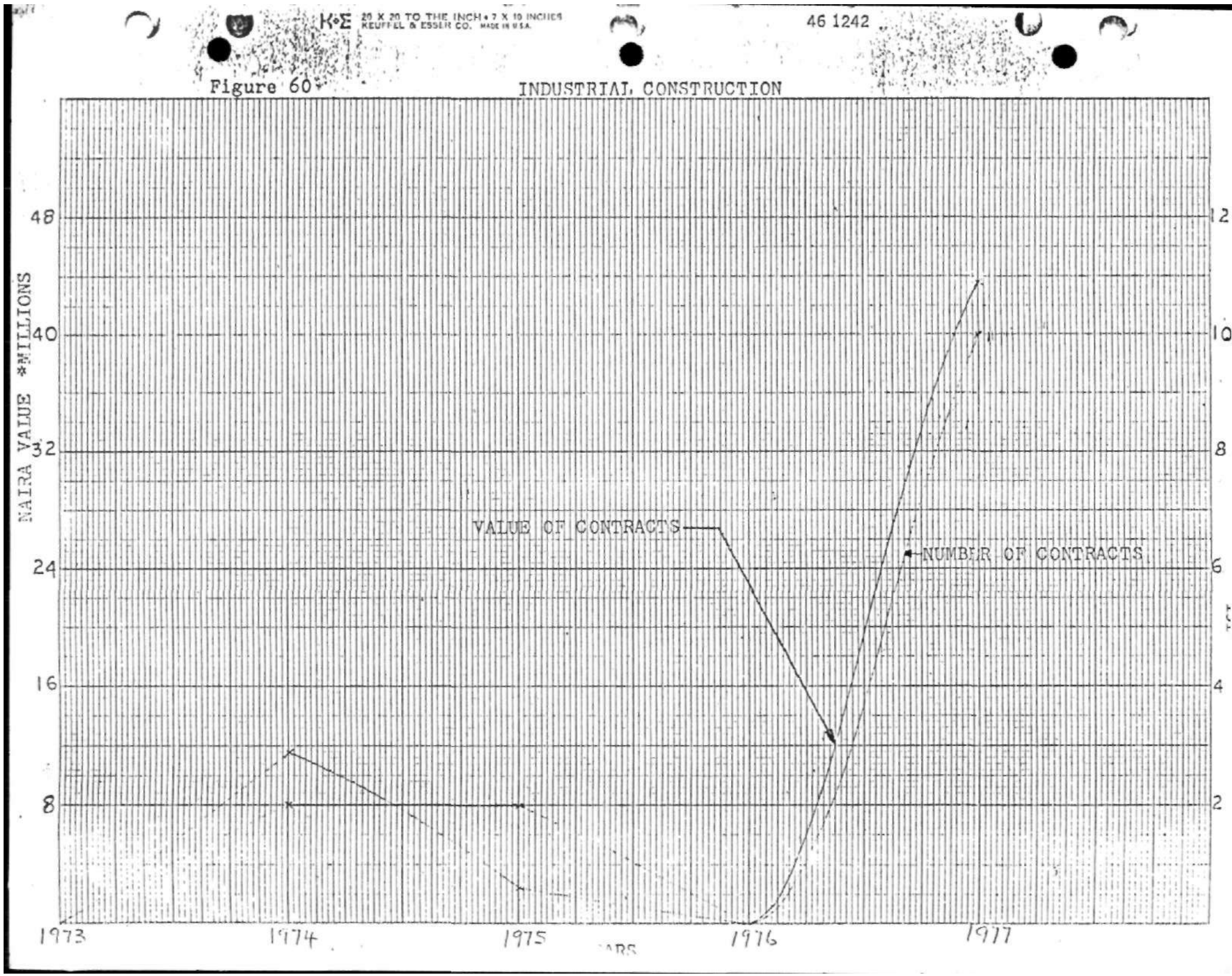


Figure 60


INDUSTRIAL CONSTRUCTION
NAIRA VALUE *MILLIONS
48
40
32
24
16
8
12
10
8
6
4
2
VALUE OF CONTRACTS
NUMBER OF CONTRACTS
1973
1974
1975
1976
1977

shows that this type of construction does not entail fat sums of money.

Figure 61 clearly shows a quantum jump in the standard of living in terms of house ownership in Nigeria from the beginning of 1974. Residential construction showed zero contracts for ₦ 00 value in 1974 and increase to 60 contract and ₦ 45M value in 1976 and climbed to 450 contracts and ₦ 295 value in 1977. Extrapolation of these curves show that there are still so many houses to be built in the country and this field promises to be a very lucrative field for the small contractors. Comparing this chart to that of building construction this chart did not show sharp fluctuations as building construction in Figure 58.

Commercial Development

Shopping Centres, supermarkets, branch banks, stores came under this general heading. Since this type of construction is usually simple it was found that 100% of the commercial developments reported were done by small companies.

Figure 62 shows that commercial construction increased significantly from the end of the Second National Plan 1974, peaking in 1976 during the Third Plan Period. Higher affluence during this period can be attributed to the increase in building supermarkets, banks, etc.

Seventy-five percent of these type of construction were reported by northern contractors surveyed. A total of 20 contracts were recorded in 1976 with a Naira value of ₦ 18.0M. The sharp

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Figure 61

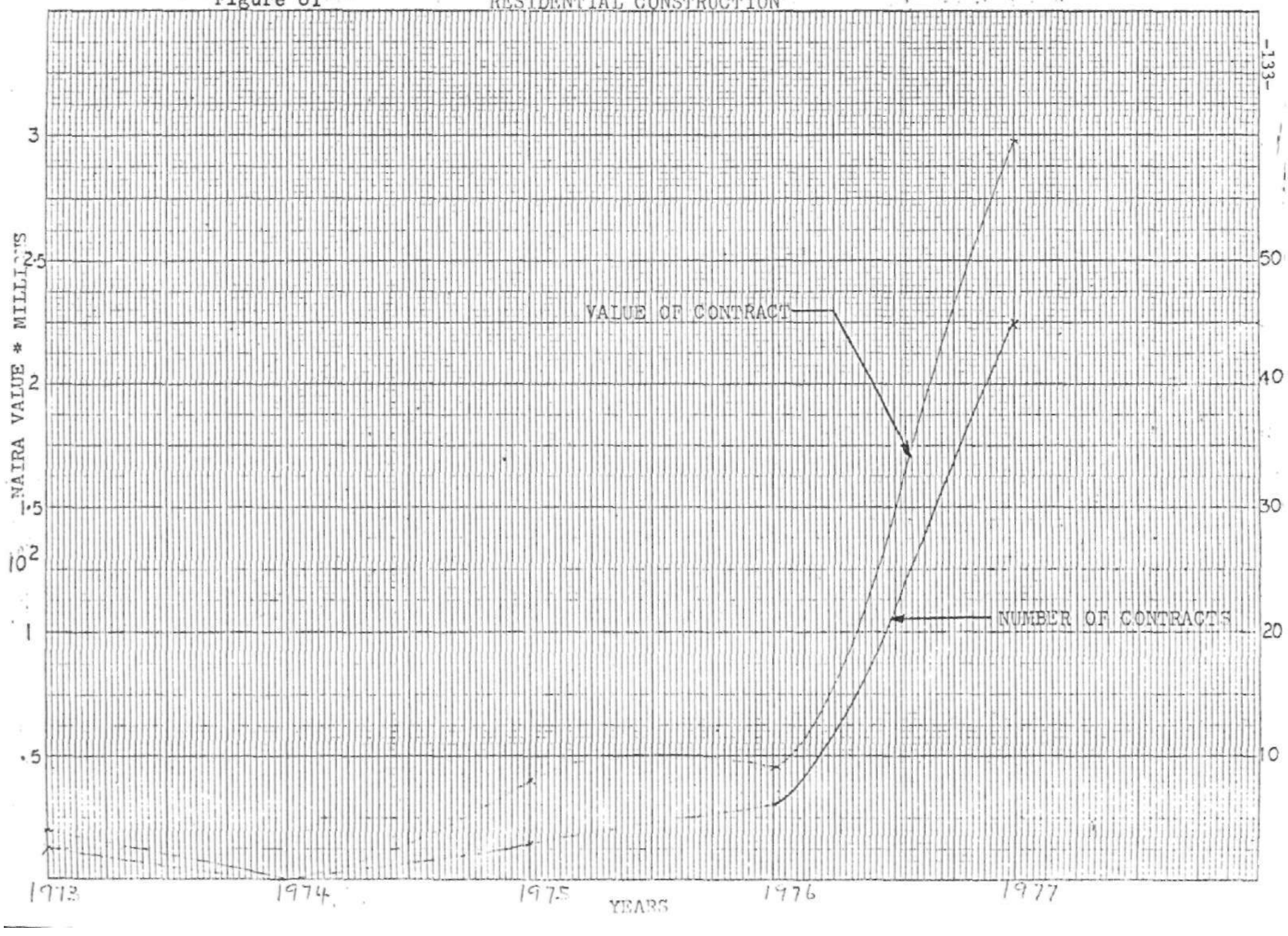
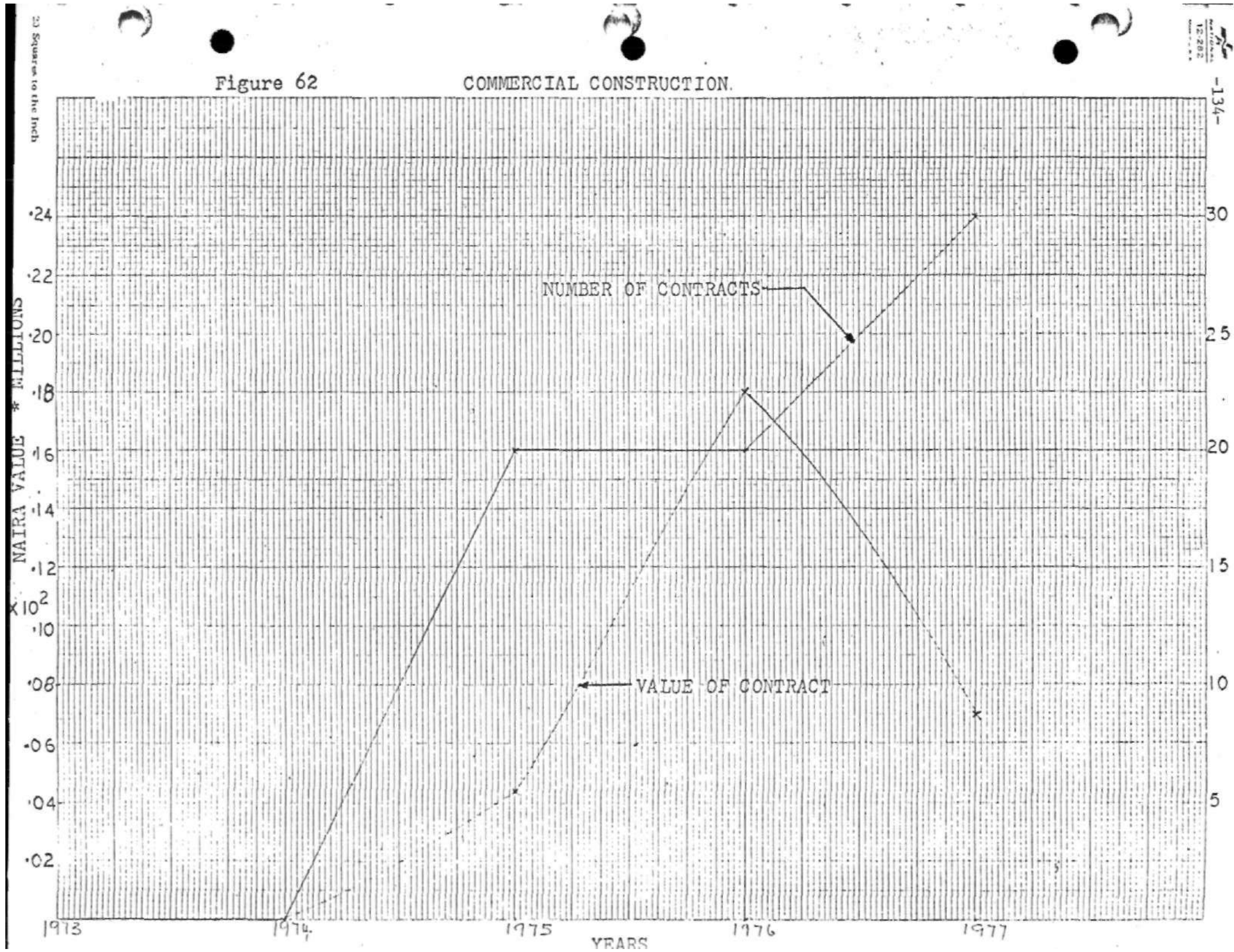


Figure 62 COMMERCIAL CONSTRUCTION.



drop from 1976-1977 only shows that though more contracts were awarded in 1977 and 1976 they were worth less than the previous years. With the urban sprawl hitting Nigerian cities like American cities it is quite likely that planners and developers will go for more commercial (the mall type) development in the country.

Hotel Construction

Tourism is at its infancy in Nigeria. Though the country has many potential tourist attractions, beaches, parklands, etc., the planners have almost neglected this type of development. Tourism is a major foreign exchange earner as exemplified in Kenya in East Africa.

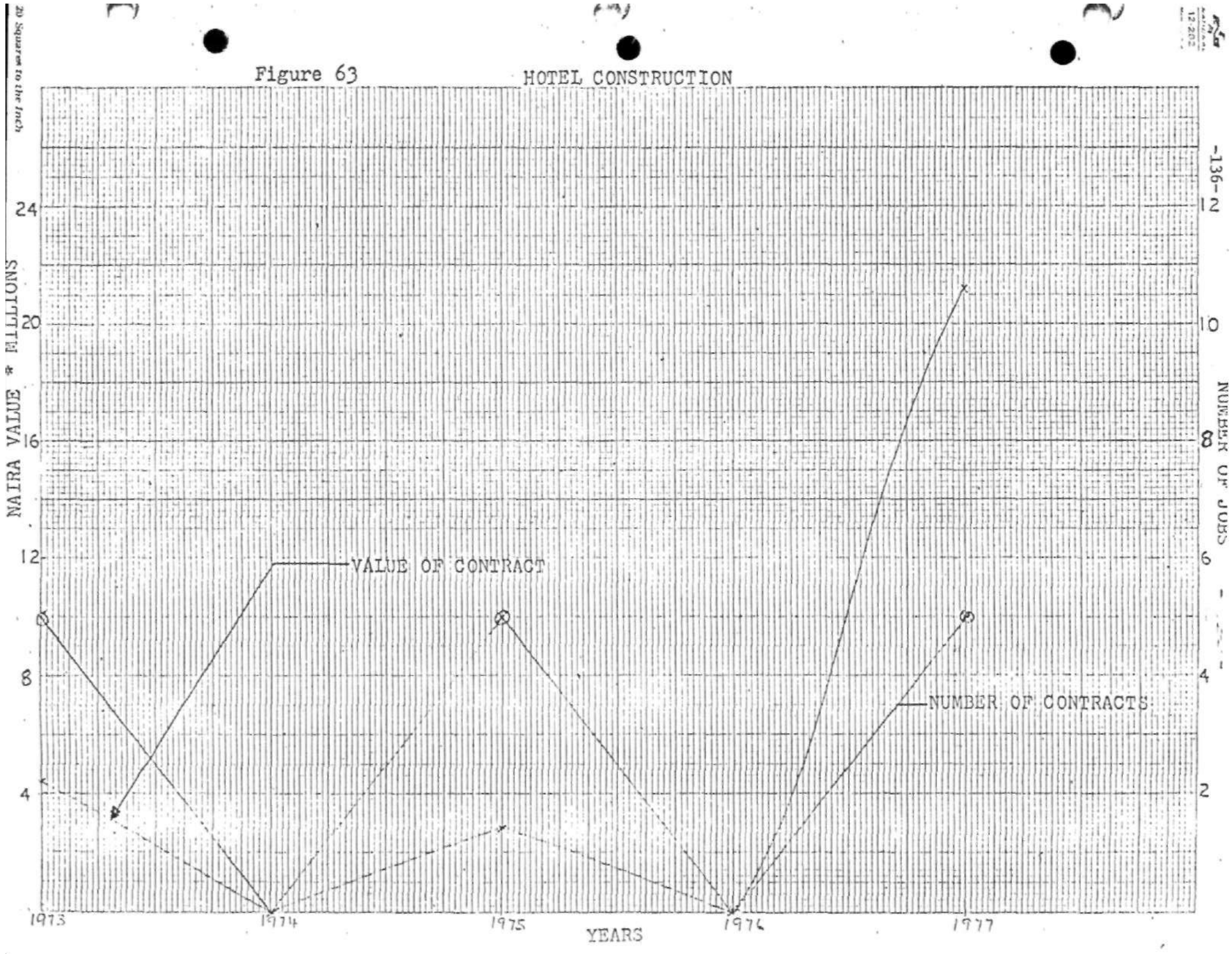
Hotel as defined herein excludes the small restaurants or bars commonly called hotels in Nigeria. Hotel construction therefore falls into the category of multistory type construction commonly dominated by large and medium size companies with the technical capabilities. Small contractors only handle the smaller resturants jobs and alterations.

Figure 63 shows the correlation between the number and value of hotel construction reported by the contractors surveyed. Twenty seven percent of the contractors who returned the questionnaire reported they carried out hotel construction. All of them were indigenous contractors.

This was not surprising as most hotels are state owned and operated and this type of contracts are likely to be awarded to the Nigerian contractor. Figure 63 shows that hotel development only became an issue during the end of the Second Plan with the peak during this plan period occurring in 1975 or the beginning

Figure 63

HOTEL CONSTRUCTION



of the Third Plan. In this particular year, there were 5 hotel contracts for a worth of ₦ 2.81M. The reason for the peak in 1975 being that more businessmen flocked into the ocuntry due to the boom and hotel rooms were hard to find. So more contracts were awarded that year. Because most hotel businesses are state-owned, the political situation in late 1975 caused a slump from 1975-76. A sharp rise from 1976 to 1977 is because more hotel contracts were awarded because hotel rooms were hard to find in Lagos, Kano and State capitals by foreigners and businessmen. Secondly, Nigeria hosted a lot of international events like the all World Black Festival of Arts, the World Trade Fair, etc., within this period.

Hotel construction is sensitive to any situation affecting the government. In time of crisis, tourists simply stayed away from the country. It could be concluded that this type of construction will rapidly decline after major hotels have been built in the country.

Schools/University Facilities

Late Murtala Muhammed, Nigerian Head of State's Lada, dreamed of placing 18.5 million Nigerians behind the school desk by 1980. This can be seen in Figure 64. This figure shows that all major education projects were contracted in 1975 when he came in to power. Between 1974-75 the Universal Primary Education (UPE) and partial free University, free technical education program in the country came in to being.

Figure 64 SCHOOLS/UNIVERSITY CONSTRUCTION

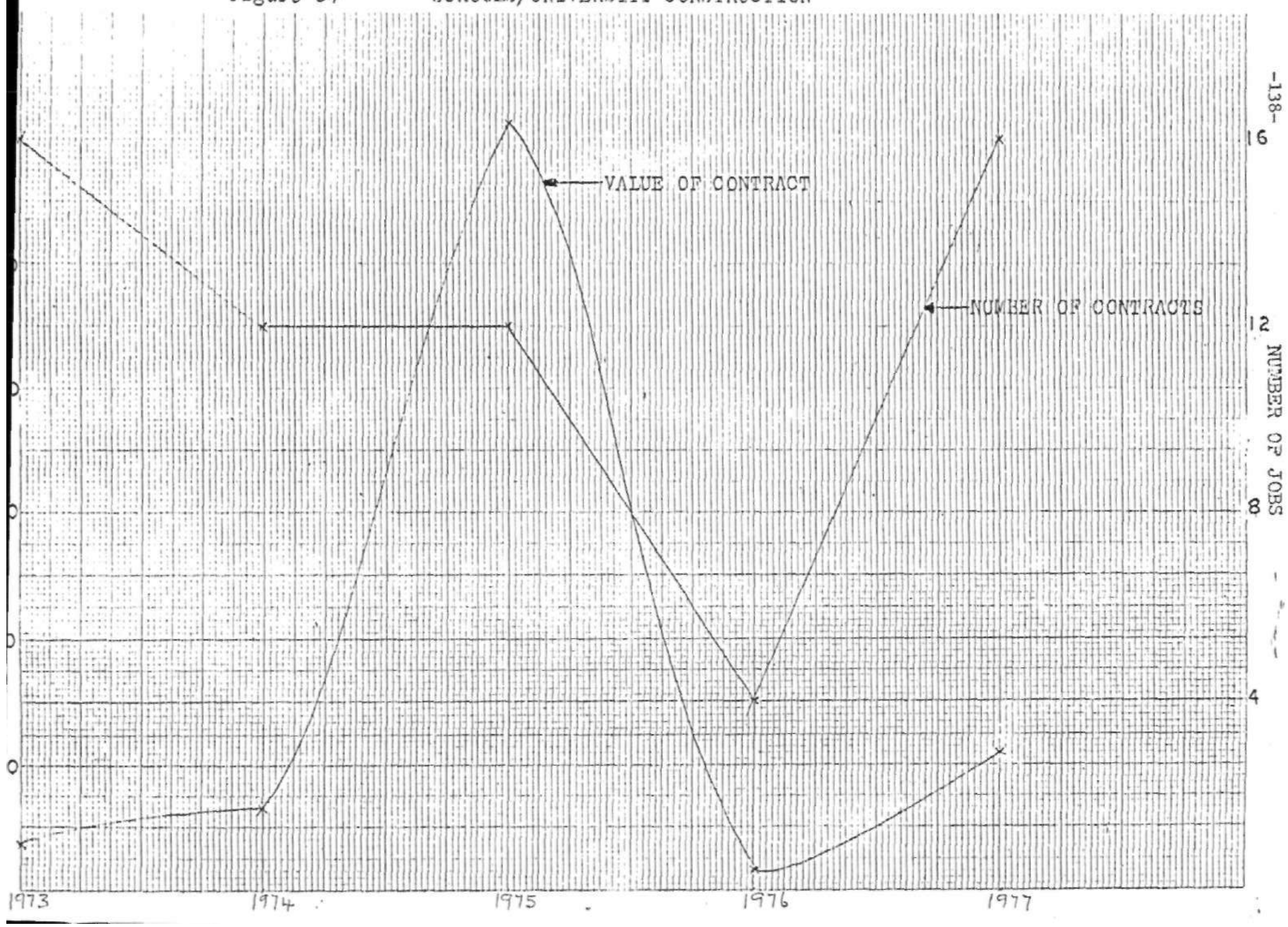


Figure 64 show that the total value of contract in 1975 was 12 with a total of N 122.5M contracts awarded. The death of Murtala caused a shift in the education policy and spending as the slump from 1975-76 shows an increase trend again from 1976 only indicates that some of the projects Murtala's regime did not contract were let out after his death.

Twenty six percent of the contractors who returned their questionnaire indicated they handle this type of educational project. Seventy-five percent of these educational contractors were medium indigenous contractors the rest were large foreign firms. All these companies indicated they had branches in most of the Nigerian university towns.

This means they perform most of the construction for the new universities springing up in the country. It must be pointed out that from the size of these firms it could be inferred that none of the firms surveyed did small primary and secondary school work. These small contracts are always awarded to state registered or very small local contractors.

Educational construction is expected to slump after all major projects have been completed in the country. This type of construction is very sensitive to the political and economic situation in the country.

Railroads

The government plans to invest 1 billion in the development of Nigerian road system during the 1975-80 plan period. The main project planned for is the conversion of the entire rail system from (3 feet, 6 inches) narrow gauge to (4 feet, 8.5 inches)

standard gauge. Since no contract has been let in this sector yet there was no data reported for railroads.

Table 21. Contracts With or Without Enough Data for Graphical Representation

Type of Construction	YEAR									
	1973		1974		1975		1976		1977	
	A	B	A	B	A	B	A	B	A	B
Railroads										
Dams and Canals										
Hydro Projects										
Sewerage										
Land Drainage and River Maintenance										
Underground Construction							1	0.075		
Power Project							1	0.02		
Recreational Development	2	.03								
Medical Facility							2	0.08	1	0.06
Church Construction										
Asphalt only					*	4.8	*	4.9	*	10
Miscellaneous Work			*	1			*	1	*	2

* Various

A Number of Contracts

B Value of Contracts - Million

Dams and Canals

Nigeria plans to spend $486.5 million for the planning an construction of irrigation facilities under the 1975-80 plan period. Most of these projects are located in the semi-arid northern regions of the country. Only a few construction contracts have been awarded yet in this sector, the most important being the $180 million contract granted in June 1975 to the Italian-Nigerian firm Impresit Bakolari Nigeria Ltd, for the building by 1980 of the Bakolari dam in Sokoto State. Most of the dam and irrigation projects are at the planning or bidding stages so there were no representative data available for this report. The following large projects have been planned for the Third National Development period.

	PROJECT	AREA (HECTARES)	ESTIMATED COST (MILLIONS)
1.	South Chad irrigation	40,467	67.1
2.	Mada River	30,350	33
3.	Baga Polder	40,469	11
4.	Karaduwa	32,000	22
5.	Gari River	4,000	8.8
6.	Challowa Gorge Dam	182,880	8.8
7.	Tada-Shonga Rice Prod.	2,145	2
8.	Kwara Food Prod. Co. Irri.	-	3.8
9.	North Central State	-	18.7
10.	N.E. State (small dam irrigation scheme)	-	10.7
11.	Bakogi Irrigation	2,000	3.5

Source: Nigeria, A Survey of U.S. Business Opportunities, U.S. Department of Commerce, 1976., pp. 173.

Power

The National Electric Power Authority (NEPA) plans to spend 1.13 billion over the next 5 years for new generating capacity, transmission, distribution system and rural electrification projects. Table 37 shows the projects planned under the Third National Development Plan. There was no data reported in this sector.

Sewage

Nigeria plans to install modern water and sewer systems at a cost of 1.5 billion during the Third Plan period. No data were reported in this sector since most of the projects are at their design stages.

Land Drainage and River Maintenance

The government plans to spend 600 million on the improvement and development of water transport sector. Expenditures for the inland waterway system will exceed $150 million. Irrespective of the persistent port congestion, Nigeria has not made any attempt to develop some of its good river ports. No data was reported in this sector.

Underground Construction

Only one contractor located at Enugu, Anambra State reported doing any underground work. Since the contractor was medium size and the value of the contract was ₦ 75,000 one can easily rule out the contract being a major underground contract. Tunnels and subways have not yet been constructed in Nigeria. Insufficient data reported did not allow any graphical representation.

Note: All sums in Naira

Recreational Development

The only recreational construction reported was in the plateau area of Nigeria. In the authors opinion, recreation has not caught on with the Nigerian life style yet. Only a few miniature "Six Flags over Georgia" are located in some major cities in the country. None of the beaches or lakes or abundant potential resorts have been developed yet. No representative data was collected in this sector.

Medical Facility

The authors of the Nigeria Development Plan have long recognized the relationship between standard of health and productivity. For instance, the authors of the 1946 plan stated, "Neither would it be rational to attempt to apply a plan which would call for greater effort on the part of the people while many of therm are in a debilitated condition from worm infestation and endemic and epidemic disease. A healthy body, reasonably nourished is essential before futher productivity efforts can be expected."[1]

The Federal Government in an attempt to eradicate most diseases have awarded many contractors in the medical sector. about N 0.8 billion is allocated for the medical sector during the Third Plan period.

Insufficient data were gathered in this field which did not warrant any graphical representation.

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1 Federal Ministry of Economic Development, Lagos: First National Plan

Church Construction

Church construction was put intentionally by the author to reflect the spiritual lives of modern Nigerians. No single construction activity was reported in this sector. Though most of the churches were already built by the missions, it is the author's opinion that the inactivity in this sector even for repair jobs reflect the modern Nigerian attitude away from the church towards acquiring wealth only.

Asphalt

Some companies reported laying only asphalt. This has not been classified under highway because this more probably was the resurfacing of old township's roads, a common type of contract going on in the nation now.

Miscellaneous Work

Some contractors reported miscellaneous work with no further definition of this type of work. These figures are presented in Table 21.

CHAPTER 6

TECHNOLOGY IMPACTS

"Technology" is the set of economically viable and socially acceptable processes and products used by man for the attainment of his needs at any point in time. Latent technology is that set of processes and products that is technically developed but is not presently registered as viable in the existing private market and social system.

Technological change is the technically feasible process and products that are adopted and prove economically viable in the private market, are compatible with the existing social, political and legal systems and constitute a departure from the previous technology to the newly established technology. Technological change is initially registered as technological innovation at the level of the firm, it has social and economic repercussions.[1] "Problems of technological change originate from the impact of technological change. The total impact of technological change is best captured at the 'Community level'."[2]

Technology and Nigeria

Technology whether applied in Nigeria or India is Western. In the developed countries the application of Science and Technology has substantially affected and stimulated the industrialization process. But technology when imported and applied to a developing nation like Nigeria does not necessarily constitute an adequate

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[1,2] An Introduction to the Study of Technological Change and its Consequences for Regional and Community Development. The Transportation Centre: At Northwest University Eraton, Illinois, p.IV, March 1967

solution to Nigerian problems since conditions under which these technologies were developed in advanced countries are not necessarily the same as in Nigeria. Therefore to acquire foreign technology without modifying it to suit the cultural, environmental and economic needs of the country is "technology misused," because apart from the different conditions that exist in the developer -- user nations, it is commonly believed that advance technology when applied so quickly to eliminate under development normally eliminates the usual development stages and therefore breeds problems. And we know that technology wrongly applied generates more problems than solves them. To determine then, whether there are problems generated in the country we have to look at the institutions and the individuals. By examining the problem in these two contexts, we find that:

1. The institutions are inadequate to cope with the present challenges in our society,
2. The roots of personal identity are eroding.[1]

The root cause of "these problems is technological change" and its effects on the social fabric of our society.

National Climate for Technological Transfer

Technological information are not goods which a developing nation could buy from the market. In order to effect a transfer there has to be a "relay system"[1] through which information flow in both directions between "Sender" and "Receiver" of technical

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[1]Besim Hakim, The Impact of Technological Growth and Social Change On Physical Design and Planning, Harvard University, 1971, p. 1

information. Therefore, at the relay station information can be filtered out and some added[2]. "Technology transfer" might embrace the transfer of scientific results or information, machinery or other forms of technology. Technological information given out by the "sender" ranges from recommendations for carrying out a new invention to applying natural principles to advise on improving performance. Therefore, the only correct technological informatin can only come from the source with the right technology. To get to the right source, therefore, involves journeys by individuals. This might take the form of government officials travelling abroad to sign technical agreements or the apprenticement of youths abroad to have on-the-job-experience. Other relay systems include schools, libraries, technical periodicals and trade journals. Technical information acquired from books alone are not enough unless accompanied by experience. But experience in building and operating a modern industries is what Nigeria lacks. To effect an orderly transfer and expose Nigerians to advance technology the government has:

1. Established some guidelines on the payment of royalties, license, management and technical service fees,
2. Increased contribution to industrial research and development through the industrial centers
3. Established a Research Products Development Company,

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[2]W. Strassman - Technological Change and Economic Development, Cornell University. Press, p. 29-30, 1968.

4. Supported the Federal Institute of Industrial Research and the Project Development Agency Enugu,
5. Provided funds for the Nigeria Council for Science and Technology,
6. Improved the efficiency of the Industrial Research Council in organizing and coordinating industrial research efforts.

Technical Assistance

When skilled personnel are in short supply in a developing nation, the only recourse is to import such skills. These skills might include engineers, managers, accountants, statisticians and so on. But a developing nation will not be contented to rely on importing skills from abroad always, so it will resort to imparting such skills to its own nationals. This would involve importing teachers and sending its nationals for training abroad. Therefore, the provision of teaching equipment and training constitutes a major part of technical assistance. Technical assistance given by some quarters can even become a conditional aid where the financial aid given by the donor country is tied to the import of people from the donor country.

It has become obvious to Nigerians that the easy availability of expatriate personnel on technical assistance does not help to facilitate the mobility of trained man power or the optimum utilization of Nigerian manpower in the economy. Secondly with the growing improvement in Nigerians financial resources donor

countries are unwilling to bear the burden any longer but rather the receiver (Nigeria) has to pay fully for its man power needs. To take account for these eventualities, public sector employers are required to explore local labor markets before resorting to technical assistance programmes and all expatriates hired paid in full for their services.

Multinational Corporations and Technology Transfer

A Multinational Corporation (MNC) is any parent company with majority ownership by nationals of one country, that controls a large cluster of corporations, affiliates/subsidiaries of various nationalities[1].

Until quite recently MNC viewed investment in Africa as a risk with the disadvantages far outweighing the rewards. African population they contended is poor, its markets small, its infrastructure roads, electricity inadequate, its labor cheap but unskilled and its bureaucracies often corrupt and inefficient. But shortages of food, raw materials, oil embargos have made the multinationals to focus attention more in Africa, which has 42% of the worlds cobalt, 34% of it bauxite, 17% of its copper and twice the iron reserves of USA and 2/3 of that of USSR and oil reserves.

The MNC have played a key role in the transformation of Nigeria. Multinationals constitute the most efficient and significant channels for the transfer of capital, investment, plant and equipment, technological information into Nigeria.

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[1] D. Babatunde Thomas - Importing Technology into Africa, Praeger Publishers, p. 65, 1976.

Table 22. Multinational Corporations and Nigeria

Multinationals	Converging Interest	Nigeria
Need Minerals	Exploitation of Resources	Want to utilize mineral potential
MNC/s strength	Technology and Management	Country weakness
Seek Cheap Labor	Employment Creation	Fight under employment
Seek new markets and frontiers	Diversification	Balance old with new investors
	Diverging Interest	
Maximize sales, profit and on a global basis	Long term objectives	National, Economic, Social and political development objectives and priorities
Repatriate dividends, maximize tax and tariff exeptions	Profit and Capital Flows	Maximize capital inflow reinvestment, use of local supplies and taxation.
100% ownership; complete management control	Control	Government ownership, maximize control by local people
Obtain optimum protection minimize local competition	Competition	Ensure cost-efficient price competitive production. Maximize opportunity for indigenous entrepreneurs

Though the presence of multinational are highly welcomed, MNC and Nigeria share a converging and diverging interest (Table 22). The MNC come to Nigeria mainly for mining and small scale manufacturing, In other African countries they carry out agribusiness, mining, assembling, and textile industries. According to an OECD study as of 1967, the US ranked third (with 15%) among all foreign investors in Africa. That was behind Great Britain (35%) and France (25%), but before Belgium and Italy.[1]

Existing Technological Levels

Unlike the United States, where the governemtn plays the umpire and the industry plays the game , the Nigerian government is very active in effecting technological development. At times the government speaks and acts as the responsible body for inducing of new technology into the industry. It has opted to remove restrictive industrial policies, shortages of manpower and delay in programme implementation. In order to talk about industrial technology one must look at it under its three aspects of process; equipment and operational efficiency. Industrial processes are either continuous or discontinuous. In Nigeria, industries with the higher grade of mechanization and better organization are those that use continuous product processes. The keeping of industrial equipment showing a higher degree of obsolescence in the most wide spread way of adjusting production methods to scarce capital and abundance labor in Nigeria. Industries would prefer keeping old equipment or maybe buy second hand equipment from developing

[1] African Development, July 1974

countries with the argument that the later compared to a new machinery saves investment cost per worker. But a second hand machinery is not only old but its an old machinery which has been lifted, transported and reinstalled. Even officials sent to buy new equipment often wind up buying old ones, the better to reserve some funds for personal commision. Even some equipment orders are made without the barest knowledge that machine manufacturer abroad might have stopped making the older type of machine ordered.

Technological Change In the Nigeria Construction Industry

The construction industry is viewed by many as not an industry at all in the sense in which the traditional textile and machine tool industries are. The assembly of groups devoted to the building tasks contains no one group of companies traditionally responsible for building as the old-line machine tool companies have been responsible for making machine tools or the old-line textile mills have been responsible for making cloth.[1] Construction is then viewed as an assembly of companies which continue to promote customizing.

Of the miriad of groups involved in construction, no one has actually controlled a dominant share of the construction naira, except for the importation of modern equipment into the industry there is no noticeable technological change at all. All these are evolutionary changes in the industry and no invention.

The change can be termed management, organizational, material, equipment, power tool and off site prefabrication improvements.

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[1] D.A. Schon Technology Change. Dela Corte Press, New York, 1967

Even the introduction of totally manufactured factory-assembled module of space is no change but an "industrialization of construction" or the provision of "Century 21"[1] housing for a society beset with housing problems. Even the industry has not adapted its imported technology to local situations to solve the massive manpower waste prevalent in the country.

Technological Impact of the Construction Industry in Nigeria

It is a commonly held view that if a variable cannot be quantified, then either one does not really understand the phenomenon (or its characteristics) one is attempting to measure, or an improved measuring technique called for. The latter is called "statistical" measurement while the former is "conceptual" measurement problem. Technological change is a phenomenon which does not lend itself to statistical or "conceptual" measurement.[1]

Technological change can be measured by "changes in the existing technology" and in terms of the "effects of the change in technology."[2] The first approach boils down to measuring technical change over the period of study. This approach attempts to measure the number of technical workers in the labor force, number of patent granted or applied for or number of new inventions, expenditures on research and development. This measure is grossly inaccurate because it measures the gross addition to the "stock of technology" without corresponding account for obsolescence.

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[1] R.M. Englebrecht, Building Research, Jan/March, 1969., p. 6

[2] An Introduction to the Study of Technological Change and Its Consequences on Regional and Community Development. The Transportation Center - Northwestern University, Illinois, p. A-59, A-60, A-62, A-63, 1967

The second method of measure is to estimate the contribution to economic growth, labor and productivity. Here tracing the effects of the contribution of a particular technology to the firm, the industry and national economy becomes a sticky problem. Therefore the analysis of national aggregate statistics of output (e.g., G.N.P.) readily allows us to ascertain the effect of technological change.

Many authors have attempted to formulate models for measuring technological change. Abramovitz made the first attempt to measure technological change using a national accounting model in U.S.A. Solow and Massell formulated a model which represented technological change as a shift in the aggregate production function. Other authors have formulated various models measuring technological change in terms of slow down, GNP, improvement in labor skills, material methods, etc.

A common approach used to model technological impact of change which will be used in this paper attempts to classify the many components of technological change by estimating the contribution of each class to productivity increase. Components studied include increase education and skill attainment, improved health, improved market organization, improved mobility, increased utilization of resources, and managerial efficiency. This approach is taken because technological data is hard to come by in Nigeria.

Technological Impact Assessment

No matter the wealth of a nation, if there are no men to design and build the desired buildings and structures, then there is every likelihood that a conceived national plan might not be brought to fruition. This next section attempts to assess the

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technological impact of some construction and construction motivated developments in the country.

Education

A European visitor to Nigeria in 1975 once remarked, "I have travelled in many lands but I do not think that there is anywhere I have witnessed such a consuming thirst for education as I have in this country."[1]

The Construction industry in Nigeria has had a tremendous impact in transforming a "Theoretical Based Education" to a more "Practical Oriented Education." Table 23 shows the number of enrollment in Nigerian schools. Primary education jumped from 2.9 million 1960, to 11.5 million 1975; while technical education jumped from 5,037 1960, to 117,686 in 1975. The university enrollment increased from 1,395 in 1960 to 53,000. (1975).

Table 23. Education Enrollment in Nigeria

Type of School	Year 1960	1964	1971	1973	1975-80
Primary School	2,912,618	2,849,488	3,894,539	4,746,808	11,521,500
Secondary School	135,364	205,002	343,313	448,904	1,555,180
Secondary, Technical and Vocational Schools	5,037	7,702	15,590	22,588	117,686
Teacher Training Colleges	27,908	31,054	38,095	46,951	234,680
Universities	1,395	6,719	14,371	23,173	53,000

Source: Third National Development Plan, p. 238-243

[1] Federal Republic of Nigeria - Publication by Embassy of Nigeria Washington, D.C., 1976

Table 24 shows that the nubmer of primary schools dropped from 15,703 (1960) to 14,525 (1975) while the number of secondary school rose to 2,296 in 1975, technical schools rose from 29 (1960) to 178 (1975), Universities rose from 2 (1960) to 10 (1975).

Table 24. Number of Schools in Nigeria

Type of School	1960	1964	1971	1973	1975-80
Primary Schools	15,703	14,976	15,324	14,525	-
Secondary Schools	883	1,327	1,234	1,499	2,296
Secondary Technical and Vocational Schools	29	39	69	84	178
Teacher Training Colleges	315	257	169	157	-
Universities	2	5	6	6	10

Source: Third National Development Plan. p. 238-243.

Housing

Shelter represents one of the most basic human needs and has a profound impact on the health, welfare and productivity of the individual. The existing housing conditions in selected Nigerian cities is shown in Table 25.

Table 25. Housing

Town	% Of Households Occupying One Room	Average No. of Persons Per Room	% OF Houses With Tap Water	% Of Houses With Flush Toilet	% Of Houses With Electricity
Lagos	72.5	3.8	71.7	43.5	93.2
Port Harcourt	51.5	2.4	75.0	18.6	81.4
Benin	48.0	2.2	24.9	4.0	59.3
Warri	59.9	2.6	62.4	10.9	89.7
Kaduna	63.9	2.1	40.3	14.1	53.3
Kano	69.1	2.4	26.1	1.8	69.1
Ilorin	23.9	1.6	30.7	10.3	28.4
Ibadan	47.3	2.1	33.4	25.2	56.1

Source: Third National Plan

Housing problems in Nigeria is essentially an urban problem. With several construction companies able to build these houses many Nigerians have resorted to building or buying houses. Table 26 shows a conservative estimate of the housing demand in the country.

Table 26. Targets for Dwelling Units 1972-1980

City	Dwelling Units - 1972	New Units Required Up To 1980	Percentage of New To Existing Units Percent
Lagos	224,500	233,190	104
Ibadan	110,833	119,300	108
Kano	55,100	77,852	141
Ilorin	44,100	34,359	78
Port Harcourt	28,667	35,440	124
Kaduna	25,067	42,441	169
Maiduguri	20,333	27,773	137
Enugu	35,227	40,540	114
Benin City	28,950	26,857	93
Jos	21,067	14,961	71
Calabar	16,071	16,691	104
Sokoto	15,167	22,570	149
Aba	21,227	52,154	246
Onitsha	13,467	35,483	166
Abeokuta	34,693	17,870	52
Ondo	15,167	7,653	50
Zaria	18,624	19,278	104
Warri	11,400	25,301	222
Sapele	9,333	11,620	125
Ikot Ekpene	6,667	5,883	88
TOTAL	755,708	867,316	115

Source: Third National Plan

Manpower

The Nigerian government has become aware of the fact that rapid economic growth in terms of Gross Domestic Product (GDP) capital formation is not necessarily concomitant with improvement in the standard of living of the masses.

The inability of the economic growth to generate adequate employment opportunities for the masses and the shortages of skilled and executive manpower has made the government reexamine its priorities. Table 27, and 28 present the labor force estimates and distribution in the country.

Table 27. Labor Force Distribution

		Total	Male	Female
1.	Farmers, fishermen , Hunters, Loggers and Related Workers	14,838,295	13,414,469	1,423,680
2.	Sales Workers	4,081,557	1,620,206	2,461,351
3.	Craftsmen, Production process workers and Laborers	3,185,560	2,438,257	747,303
4.	Service, sports and recreation worker	1,266,740	933,339	333,400
5.	Professional, technical and related worker	640,891	545,550	95,341
6.	Transport and Communication	406,189	397,461	8,471
7.	Clerical worker	331,662	299,858	31,803
8.	Miners, quarrymen and related worker	20,154	19,773	381
9.	Unspecified occupation	1,296,503	80,433	1,216,170
10.	Unemployed persons	501,703	395,889	105,813

Source: Adapted from Nigeria Handbook, 1975-76, Federal Ministry of Information, Lagos p. 170

Table 28. Labor Force Estimates 1966-75

Year	Labor Force Estimates (Millions)	Increase in Labor Force (Million)
1966	23.81	-
1970	26.08	2.27
1975	29.22	3.14

Source: Third National Plan

An important aspect of the labor force is its quality in terms of educational and skill content not its numerical strength. Construction industry ranks third as the major employer in the country. Table 29, and 30 show recent trends and targets in modern sector employment.

Table 29. Recent Trends in Modern Sector Employment 1973-75

	Employment				
	September 1973		April 1975		Additional Employment
Industry Group	% Share	No. (Thousands)	% Share	No. (Thousands)	September 1973 to April 1975
Agriculture	7,3	101.5	7.0	105.0	3,500
Mining and quarrying	6.4	89.0	6.0	90.0	1,000
Manufacturing and processing	21.4	297.4	21.6	324.0	26,600
Const. and Building	13.7	190.4	14.0	210.0	19,600
Electricity, Gas and Water	2.1	29.2	2.0	30.0	
Distribution	7.0	97.3	6.6	99.0	1,700
Transport and Communication	6.4	89.0	6.1	91.5	2,500
Services	35.7	496.2	36.7	550.5	54,300
TOTAL	100.0	1,390.0	100.0	1,500.0	110,000

Source: Third National Plan

Table 30. Employment Targets in Large and Medium-Sized Establishments 1975-1980

Occupational Group	Estimated Employment 1975	1980	Additional Employment 1975-80
1. Senior Category	91,500	126,750	35,250
2. Intermediate Category	252,000	339,300	87,300
3. Skilled and Semi-Skilled Category	436,500	559,650	123,150
4. Unskilled and Others	720,000	954,300	234,300
TOTAL	1,500,000	1,980,000	480,000

Source: Third National Plan

Recent estimates show that about 6.1% of the persons employed in large and medium size firms are in the senior category, 16.8% in the intermediate category, 29.1% in the skilled and 48% in the residual category. Intermediate category particularly the field of Engineering and Technology still experience shortages. Intermediate category is the main source of construction industry labor force. Table 31 and 32 show the probable source of persons to alleviate these shortages.

Table 31. Projected Out-Turn from Nigeria Universities

Courses	1975-76	1979-80	Total Out-Turn 1975-76, 1979-80
Business Administration, Commerce, Finance and accounts	284	442	1,731
Economics and Social Sciences	592	920	3,605
Medicine and Dentistry, Nursing and Other Para-Medicals	710	1,104	4,325
Pharmacy	308	479	1,875
Engineering, Surveying and Environmental Design	569	884	3,462
Natural Science	782	1,215	4,759
Agricultural Science	237	368	1,443
Arts	474	736	2,884
Education	588	913	3,577
Mass Communication, Journalism, Law and Others	194	302	1,187
Total	4,738	7,363	28,843

Source: Third National Plan

Table 32. Projected Out-Turn of All Colleges of Technology and Polytechnics 1975-1980

Courses	Out-Turn 1975-76	Out-Turn 1979-80	Total 1975-76 to 1979-80
Engineering	920	3,120	9,570
Commerce, Management, Secretaryship, Accounts, Insurance, etc.	545	1,095	3,975
Environmental Technology (town planning, Architecture, Surveying, etc.)	660	2,075	6,515
Laboratory Technology	310	985	3,060
Textile Technology	40	90	315
Basis Studies	165	365	1,305
Technical Education (NCE)	220	745	2,275
Catering and Food Technology	65	145	520
Others	130	495	1,495
Total	3,055	9,115	29,030

Source: Third National Plan

Construction Related Industries

The development in the country has spearheaded a lot of manufacturing activities. However, the manufacturing sector lags behind all other sectors of the economy representing only 5% of the (GDP) and growing at an annual rate of 10%. A subsectorial distribution of manufacturing projects is shown in Table 33.

Table 33. Subsectorial Distribution of Manufacturing

Source: Third National Plan

Project	Percentage
Petrochemical	44%
Iron and Steel	22.5%
Building Material	5.9%
Paper and Paper Products	7.2%
Fertilizer	1.6%

Because of the structural imbalance in manufacturing the government has increased its investment in the manufacturing sector (see Table 34).

Table 34. Government Investment in Manufacturing 1975-80 (in million of Naira)

	Federal	State	Total
1. Food Processing	401.6	81.7	483.3
2. Textile	5.8	24.4	30.2
3. Timber Processing	350.0	18.5	368.6
4. Chemical	390.1	22.9	413.14
5. Petroleum and Petrochemical	2,143.2	10.2	230.4
6. Mineral Products (Cement, Brick, Glass, etc.)	179.5	116.8	296.3
7. Iron and Steel	1,098.3	2.05	1,100.3
8. Machinery and Equipment	-	22.8	22.7
9. Electrical Machinery	1.02	5.8	6.8
10. Transport and Equipment	12.5	0.13	12.6
11. Other Manufacturing	1.85	7.1	8.9
12. All Manufacturing	4,583.9	312.6	4,896.5

Source: Third National Plan

Based on the size of Nigeria and its economic development and the consumption of basic construction material, the country has opted to create basic metal and engineering industries. Table 35 shows the list of projects and size of new construction related industries in the country. Without the construction industries like iron and steel would never be dreamed of in the country.

Table 35. Construction Related Industries

Project	Capacity Tons	Allocation (Million)
A. Iron and Steel		
1. Blast and Furnace Complex	1.5 Million	800
2. Direct Reduction	500,000	-
B. Cement Expansion		
1. Ukpilla Factory	150,000 to 500,000	20
2. Calabar	100,000 to 400,000	-
3. Sokoto	150,000 to 400,000	-
4. Nkalagu		
C. New Factories Cement		
1. Ashaka *	600,000	-
2. Yandev *	600,000	40
3. Shagamu *	600,000	197
D. Joint Cement Project With Dahomey		
1. Onigholo Dahomey	-	7.2
E. Timber		
1. Sapele Plant Expansion	-	3
Asbestos:		
Enugu Plant		
Kaduna		
Oron		
Otta		
Lagos		
Sapele		
Aluminum:		
Isolo Plant	10,000	4.8
Port Harcourt	6,000	-

*Initial Capacity

Source: Third National Plan

Power

The Fusion Energy Foundation in Washington, D.C. did a recent study which concluded that the rapid industrialization and elevation of the standard of living of people in third world nations depended on increasing the consumption of energy. In

short, the amount of energy consumed in a country can be used as an index to measure the level of development.

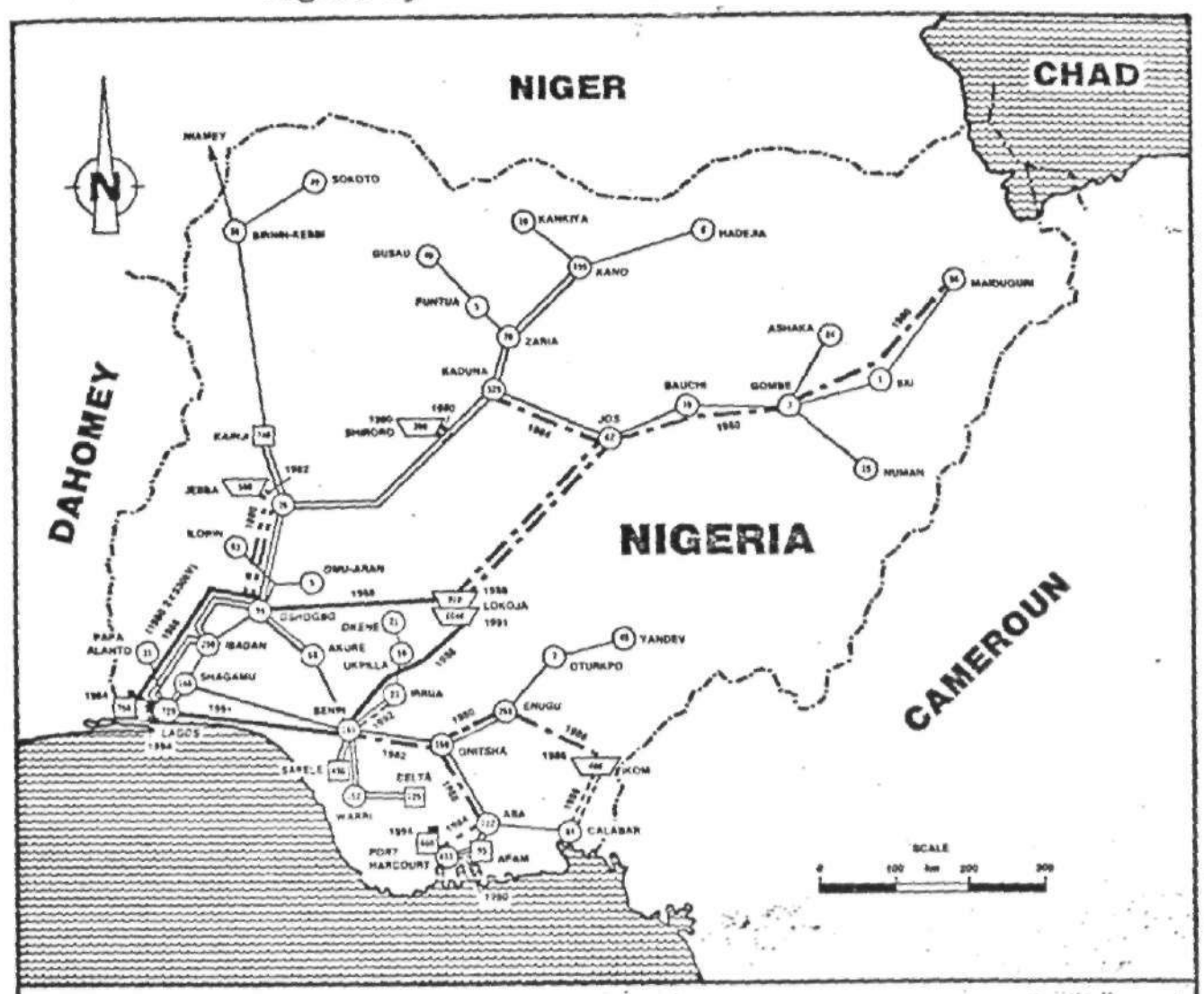
Table 36. Capital Programme by Governments (Power)

GOVERNMENTS	TOTAL	1975-76	1976-77	1977-78	1978-79	1979-80
Federal	927.818	164,220	149.259	143.723	191.861	278.755
1. NEPA						
2. Electrical inspectorate Division (mines and power)	4.220	0.420	1.100	1.500	1.200	–
Benue-Plateau	12.000	1.000	2.000	3.000	3.000	3.000
East-Central	10.000	1.000	2.000	3.000	2.000	2.000
Kano	8.000	2.000	2.000	2.000	1.000	1.000
Kwara	15.000	1.000	2.000	4.000	4.000	4.000
Lagos	0.200	0.200	–	–	–	–
Mid-Western	10.000	1.000	2.000	3.000	2.000	2.000
North-Central	10.000	1.000	2.000	3.000	2.000	2.000
North-Eastern	20.000	2.000	3.000	5.000	5.000	5.000
North-Western	20.000	2.000	3.000	5.000	5.000	5.000
Rivers	8.000	1.000	1.000	2.000	2.000	2.000
South-Eastern	10.000	1.000	2.000	3.000	2.000	2.000
Western State	20.000	4.000	5.000	5.000	4.000	2.000
Total	1,075.238	181.840	176.359	183.223	225.061	308.755

Source: Third National Plan

The rapid expansion of Nigeria economy has brought phenomenal growth of industries, commerce and urbanization and has left the national electric power authority hard-pressed to maintain adequate supplies of power. The result of effective demand exceeding system capacity had tended to manifest itself not only in the ability to supply new customers but also in generally deteriorating quality of service and frequent power failure and load shedding. Table 36 shows the National Capital Programmes in energy, while Figure 65 shows the National Grid Network. In order to ensure that the economic and social development of the country is not

Figure 65



Development of National Grid System

National Electric Power Authority, Nigeria

Plan for electrical power system development

Legend

- 330 kV and 132 kV feeding point, 70 MW maximum demand in 1994/95
- Existing power station 740 MW
- New thermal power station 600 MW, to be ready for service in 1980/81
- New hydroelectric power station 500 MW, to be ready for service in 1981/82
- Existing or committed 132 kV line
- Existing or committed 330 kV line
- Proposed 132 kV line, to be ready for service in 1981/82
- Proposed 330 kV line, to be ready for service in 1980/81
- Proposed 700 kV line, to be ready for service in 1991/92

hampered by endemic shortages of power supply the overriding national policy objectives are increase of generating capacity, the extension of transmission and distribution facilities.

Table 37. New Power Projects In Nigeria

	Project	Thermal Capacity M.W.	Investment (Million)
	Thermal Generation		
1.	Sapele Thermal Plant	360	115.5
2.	Afam Power Station Extension	155	11.8
3.	Delta 2 Thermal Plant	120	2.2
4.	Eket Power Station	-	3.0
	Hydraulic Generation		
5.	Kainji Extension	760	25
6.	Shiroro Hydro-electric project	300	145.6
7.	Jebba Hydro-electric Power Station	500	29.2
8.	Gongola Power Station	30	10
9.	Ikom, Markundi and Lokoja Hydro-electric Power Station	600	50.8

Source: Third National Plan

improvement of quality of service. All suitable dam projects in the country are designed to serve multi-purpose functions including irrigation, navigation development, flood controls and hydroelectric power generation. Table 37, and 38 summarize the new power programmes in the country.

Table 38. Power Transmission

Project	*Type of Line (KV)	Investment Million
1. Kaduna-Jos-Maiduguri-Numan-Ashaka	132/330	12
2. Kainji-Niamey	330/132	9.7
3. Kaduna-Kano	330	9.4
4. Jebba-Kaduna	330	5.7
5. Kano-Hadeija Kano-Kankiya	132	9.7
6. Onitsha-Port Harcourt	330	7.4
7. Kano-Potiskum-Maiduguri	330	33.4
8. Other: 28 other transmission lines		
Total Distribution Cost		130.9
Total Training Cost		10

*Means step up or step down

Source: Third National Plan

Health

The provision of better health care occupies a major position in the Third National Development Plan.

Health manpower, facilities and services in Nigeria all fall short of the standards set by the world health organization[1]. Most people in the country suffer mostly from communicable diseases caused by inappropriate water and sewage systems, lack of immunization and nutrition programs. Table 39 shows the number of health establishments in the country.

[1]U.S. Department of Commerce, Nigeria: A Survey of U.S. Business Opportunities, p. 74, 1976.

people (see Table 41).

Table 41. New Basic Health Service Facilities Planned by State Governments 1975-80

Government	Comprehensive Health Centers	Health Centers	Health Clinic	Mobile Clinic	Beds To Be Added	Capital Expenditure (Million)
Benue Plateau	21	84	420	105	1,638	13.5
East Central	32	128	640	160	2,496	16.5
Kano	32	88	440	110	1,716	12.6
Lagos	10	40	200	50	780	8.01
Mid-western	13	52	260	65	1,014	10.96
North-central	27	108	540	135	2,106	15.64
North-eastern	40	160	800	200	3,120	22.82
North-western	25	100	500	125	1,950	14.87
Rivers	9	36	180	45	702	6.67
South-eastern	14	56	280	70	1,092	8.01
Western	40	150	725	185	2,850	24.16
Kwara	22	128	640	160	2,496	19.6
Total	285	1,130	5,625	1,410	21,960	175.0

Source: Third National Plan, Vol. I., p. 271.

Mobility

Transportation is the life line of any nation. The transport system, then, has to support the growth and development of agriculture, commerce and industry with efficient movement of people and goods throughout the country.

The industrial and economic boom has increased automobile ownership in the country. Table 43 shows the current and the projected number of cars in the country.

The economic boom is so great that transport machineries are imported into the country though the road facilities have not been completely built. Table 44 shows the import of machinery and transport equipmen. into the country. The average annual growth rate in automobile ownership is shown in Table 42.

Table 42. Vehicle Growth Rate

Vehicle Type	Percentage Annual Growth Rate
Saloon Car	13%
Kit Car	13%
Commercial	17%

As industrialized nations know, automobiles cause a lot of problems to the environment. In Nigeria, conditions on the road network are so bad especially in the large cities that one has to allow plenty of time. Things take longer to accomplish in Nigeria - especially in Lagos. Traffic frequently congests to a standstill sometimes lasting for hours .

Table 43 ROAD VEHICLES IN NIGERIA

MONTH	YEAR	COMMERCIAL CARS	PRIVATE CARS	MOTOR CYCLE	TOTAL
January	1953	11,014	9,511	1,216	21,741
	1955	12,642	13,973	1,810	28,425
	1957	16,367	19,823	3,395	39,585
	1959	17,430	23,451	4,935	45,816
	1961	23,908	36,761	11,151	71,820
	1962	24,036	36,852	12,242	75,130
	*1967	135,803	208,213	69,167	413,183
	*1972	767,286	1,176,403	390,794	2,334,483
	*1977	4,335,166	3,529,209	3,900,940	11,765,315
	*1980	14,696,213	11,964,018	13,224,186	39,884,417

** Adapted from Standford Research Institute: The Economic Coordination of Transport Development in Nigeria (Menlo Park California).

* Estimates.

Table 44

Imports of Machinery and Transport Equipment: 1970-1974

COMMODITY	VALUE IN MILLIONS					PERCENT OF TOTAL IMPORTS				
	1974	1973	1972	1971	1970	1974	1973	1972	1971	1970
Gen Machinery	105.9	131.5	124.8	137.0	84.6	11.3	10.7	12.6	12.7	11.2
Radio and Television sets	5.8	5.1	1.4	1.0	0.2	0.3	0.4	0.1	0.1	
Serving Machines and Textile machinery	26.2	23.6	18.2	43.2	24.0	1.5	1.9	1.8	4.0	3.2
Electric Batteries	5.9	4.6	3.7	2.3	3.4	0.4	0.4	0.4	0.3	0.4
Electric Motor and Parts	36.6	26.4	16.6	20.8	10.6	2.1	2.2	1.7	1.9	1.4
Other electric goods	64.9	56.8	38.5	38.6	34.6	3.7	4.6	3.9	3.6	4.6
Passanger Cars	97.0	76.7	60.2	29.6	13.8	5.6	6.3	6.1	2.7	1.8
Commercial and road Vehicles	61.4	59.4	47.0	56.2	50.8	3.5	4.9	4.7	5.2	6.0
Motor Vehicle spare Parts	29.7	24.7	20.4	20.4	16.6	1.7	2.0	2.1	1.9	2.2
Bicycles, Motorcycles and parts	24.8	28.0	23.7	20.6	12.4	1.4	2.3	2.4	1.9	1.6
Railway Rolling stock	1.8	9.6	8.1	4.4	1.4	0.1	0.8	0.8	0.4	0.2
Ships and Boats	9.0	9.1	4.3	9.8	5.0	0.5	0.7	0.4	0.9	0.7
Office Equipment	6.4	5.1	5.2	4.2	3.0	0.4	0.4	0.5	0.4	0.4
Power Generating Machinery	20.5	8.3	8.4	10.0	7.8	1.2	0.7	0.9	0.9	1.0
Agric. Machinery and Implement	10.8	8.8	8.9	7.6	6.0	0.6	0.7	0.9	0.7	0.8
Trailer and other vehicles not motorized	4.8	2.7	2.4	4.0	3.2	0.3	0.2	0.2	0.4	0.4
Aircrafts and parts	10.0	10.7	6.1	14.6	1.8	0.6	0.9	0.6	1.3	0.3
Other commodities	0.3	0.3	0.6	4.0	3.4			0.1	0.4	0.5
Total	611.8	491.4	398.5	428.8	282.6	35.2	40.1	40.2	39.7	37.4

Source: Third National Plan

Table 45 shows the results of a delay study conducted by the author in the summer of 1977.

Table 45. *Impact of Automobile in Nigeria

From	To	Distance Miles	Average Travel Times Peak Period MIN (AM)	Average Travel Times off Peak Period MIN (AM)	Time Lost Due to Delay MIN(AM)
Independence Square	Federal Palace Hotel	2.75	35	11	24
Federal Palace Hotel	Ikoji Hotel	3.75	22.5	15	7.5
Ikoji Hotel	Indepedence Square	4	68	16.2	51.8
Independence Square	The Museum	1.5	40.5	6.0	34.5
Museum	Bristol Hotel	1.75	47.25	7.5	39.75
Bristol Hotel	Ikeja International Airport	12	156	57	99
Ikeja International Airport	Niger Palace Hotel	8	190.5	33.1	157.4
Niger Palace Hotel	Apapa Wharf	7	145.6	28.3	117.3
Apapa Wharf	Teaching Hospital	7.5	225	30	195
Teaching Hospital	Federal Palace Hotel	9	117	36.8	80.2
Victoria	Lagos City Council	3	42.3	12.2	30.1

*Based on Field Study Conducted by Author in Lagos, Traffic Delay Studies, June 10-Aug. 29, 1977.

The government is relentlessly battling with the congestion of port and transportation problems generated by the economic boom in the country. Table 46 shows the capital programme undertaken by the government.

Overall Impact of National Projects

Table 47 summarizes the impact of construction projects on the National Plan objectives.

Table 46

Capital Programme by Governments and Activities (Transport)

		TOTAL	1975-76	1976-77	1977-78	1978-79	1979-80
Roads	Federal	4,355.960	979.924	1,123,474	966.144	739.924	546.494
	All States	984.476	210.798	254.054	223.158	178.188	118.278
Railways		885.020	35.052	52.004	261.556	267.704	268.704
Civil Aviation		476.980	59.630	100.560	126.800	83.850	106.140
Nigeria Airways		50.950	12.600	18.750	10.100	8.000	1.500
Inland Waterways	Federal	47.541	9.901	12.160	11.188	8.695	5.597
	States	44.250	12.370	12.655	13.110	4.220	1.895
Maritime							
Service		13.730	2.260	4.070	3.300	2.300	1.800
Shipping		118.090	17.820	33.370	26.300	20.300	20.300
Ports		322.010	47.460	71.700	83.000	66.400	53.450
Government							
Coastal Agency		4.061	1.020	1.091	0.870	0.540	0.540
	All States	1,028.726	223.168	266.709	236.268	182.408	120.173
Total	Federal	6,274.342	1,165.667	1,417.179	1,489 .258	1,197.713	1,004.525
	All Governments	7,303.068	1,388.835	1,683.888	1,725 .526	1,380.121	1,124.698

Source: Third National Plan

Table 47. Impact of Construction Projects On the Nation

Objectives/ Projects	Transportation	Communication	Housing	Education	Recreation	Power	Petroleum	Industrial	Health	Commercial	Sewage	TOTAL
Minimize Congestion	1	1	0	0	0	0	0	0	0	0	0	2
Increase Safety	1	1	1	0	0	1	0	1	1	0	0	5
Increase Product-ivity	1	1	1	1	0	1	1	1	1	1	0	9
Provide Better and More Housing	0	0	1	0	1	0	0	1	0	0	0	3
Encourage balanced Development	1	1	1	1	1	1	1	1	0	1	0	9
Reduce Pollution	-1	0	-1	0	-1	-1	-1	-1	0	-1	1	-6
Generate more Revenues	1	1	1	1	1	1	1	1	1	1	0	10
Provide more Jobs	1	1	1	1	1	1	1	1	1	1	1	11
Improve Communication	1	1	0	1	0	1	0	1	0	1	0	6
Provide more Schools and Means to attend	1	1	0	1	0	0	1	1	0	1	0	6
Improve Health Standards	-1	1	1	1	1	1	1	1	1	1	10	10
Provide Parks	0	0	0	0	1	0	0	0	0	0	1	1
Column TOTAL	6	9	6	7	5	6	5	8	5	6	3	66

1 = Helps
0 = Neutral
-1 = Deters

*Column total shows the impact of each project on national objectives
*Row total shows the impact of each objective on all projects.

SUMMARY AND CONCLUSIONS

The Nigeria construction industry for the past five years has been experiencing a great boom.

This study recorded 709 construction companies as registered in Nigeria by 1976. These figures were lower than earlier reports because previous studies counted the small contractors with less than 10 employees who are often difficult to trace. Of the 125 companies surveyed, 26 were untraced.

Contractors come from all parts of the world to compete in the Nigerian construction market. The largest Nigerian contractors come from Italy. A majority of the indigenous contractors operated in Lagos, Anambra and Bendel State. On the average, indigenous contractors had 2 branches and foreign contractors 7 branches in other towns in Nigeria.

Building and civil engineering contractors accounted for 79% of these contractors. Medium size companies were the most numerous in Nigeria. Indigenous contractors were mainly specialized in building construction. Foreign contractors handled most of the heavy construction projects.

There is no standardized contract form in Nigeria. Contracts were most numerous in the public sector. Quality control in most Nigerian projects are at the barest minimum. Contracts are let on competitive, lumpsum, negotiated, unit price, cost-plus-a fixed-fee basis. Most contractors are invited by owners to bid. Bonds are required on some contracts. The bonding companies are insurance,

banks and surety companies. A majority of the companies finance their expansion and long term projects from funds obtained locally. The maximum interest rate paid to Nigerian Banks is 10%. Joint venture does not appeal to most contractors. Construction equipmetn is imported and sold locally. A majority of these contractors own excessive pieces of equipment. Most drawings are done locally but most foreign firms do their design overseas. All construction companies surveyed used manual system to prepare their payroll. Processing individual applications and hiring and providing on the job training were the most frequent ways to recruit skilled personnel.

Large, medium and small firms had on the average 50, 18, 4, engineers respectively, in their firms. Most firms surveyed has no labor relations department. Personnel development programs were used by most firms. There are labor unions in Nigeria but 87% of Nigerian contractors are open shop or non-union contractors. Labor unions were active only in Anambra State. Strikes in Nigeria were caused by government wage regulations. Absenteeism is a problem to some contractors. Absenteeism is mostly experienced by contractors who pay the lowest wages. The highest wages in Nigeria construction industry are paid in Anambra State where there are unions. Seventy-five percent of these contractors had estimating departments.

A majority of the firms surveyed used historical unit cost data and intuitive method in estimating. Job scheduling and control were used at a minimum. Seventy-two percent of these companies

used bar charts for scheduling. Computers are not used effectively in the Nigerian construction industry. The most frequent methods of accounting reported were cash receipt and disbursement, completed contract and percentage completion accrual method. A majority of the firms developed and used their own cost codes.

Safety practices and programs were exercised by most firms. There is no national safety programs developed for the industry. Most firms were young and had no pension plans. The services of the quantity surveyor was the most frequently used. Industry pays various taxes in Nigeria.

Transportation, educational military construction are very sensitive to economic and political situations in the country. Indigenous contractors are virtually absent in dam, bridge, airport, port, dredging, pipeline construction. Indigenous contractors engaged in heavy construction do better than other indigenous contractors. All types of building and transportation related construction seemed to be flooded with so many contracts than other fields. All contractors surveyed seemed to do very well irrespective of management, technical and financial problems.

Assuming stable government, continuous inflow of the petroleum -' dollars and more spending, the Nigerian construction industry will continue to see a boom for decades ahead.

It is imperative from this study that due to a crippling inflation, slow pace of plan implementation, power failures and congestion on the transport facilities, most of the construction projects in the 1975-80 plan period will be abandoned or not started at all because the costs will skyrocket beyond the reach

of the national purse.

Recommendation for Future Study

Several areas were identified during this study which qualify for further studies.

The area of business failures, labor productivity, absenteeism warrants special studies. Studies should be made to find out the most pressing problems of the indigenous contractors and ways to upgrade their operation. The areas of equipment, material and labor cost need further studies. Studies on the effect of government. regulations on the industry should not be left out.

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APPENDIX

SAMPLE POPULATION

NAMES AND ADDRESSES

Mothercat (overseas) Nigeria Ltd.
P.O. Box 402
Warri, Nigeria.

P. Beccarelli and Co. Ltd.
13 Rhodes Crescent
Apapa, Lagos Nigeria

Reynolds Construction Co. (Nig)
Ltd.
Plot 870 Victoria Island
Victoria Island
Lagos, Nigeria

Cappa and D'Alberto Ltd.
72 Campbell Street
Lagos, Nigeria

Cubitts Nigeria Ltd.
Kaduna, Nigeria

Costain Blankevoort dredging
Co. Ltd.
174 Western Avenue
Lagos, Nigeria

Drake Scull Nigeria Ltd.
241 Igbosere Road
Lagos, Nigeria

Dumez Nigeria Ltd.
21 Marina
Lagos, Nigeria

Fougerolle Nigeria Ltd.
7th Floor
25 Boyle Street
Victoria Island
Lagos, Nigeria

Foundation Engineering Nig.
Ltd.
Iganmu office
Western Avenue
Lagos, Nigeria

Italo Builders Co. Ltd.
11/13 Shonola Street
Ebute Metta
Lagos, Nigeria

Julius Berger Nigeria Ltd.
Ijora Causeway GRA
Lagos, Nigeria

Monier Construction Co. Nig. Ltd.
42/44 Warehouse Road
Apapa, Lagos, Nigeria

Nigeria Dredging Roads and
General Works Ltd.
6/8 Bauchi Road
Apapa, Lagos, Nigeria

Overseas Construction Co. Nig.
Ltd.
1 Chief Okupe Estate
Maryland Ikeja
Lagos, Nigeria

Petramonk Engineering & Contracting Coy Ltd.
34 Oduduwa Way G.R.A.
Ikeja, Lagos, Nigeria

Tarmac Engineering Co. Ltd.
13b Forcados Road
Apapa, Lagos, Nigeria

Taylor Woodrow of Nig. Ltd.
10 Abebe Village Road
Iganmu, Lagos, Nigeria

Westminster Dredging (Nig) Ltd.
25 Creek Road
Apapa, Lagos, Nigeria

Guffanti A. & Milano & Co.
Box 123
Apapa, Lagos, Nigeria

Nigeria Road Construction Ltd.
167 Ahmadu Bello Way
Kano, Nigeria

Gato Engineering Construction
129 Aba Road
P.O. Box 218
Port Harcourt
Rivers State, Nigeria

International Dredging Consortium
Plot 15-21b Trans Amadi
Port Harcourt
Rivers State, Nigeria

Lecco Engineering Construction Co. Ltd.
11 Chief Nduka St.
Port Harcourt, Nigeria

Manila Construction Co.
10 Aba Road
Port Harcourt
Rivers State, Nigeria

BEPCO Ltd.
113 Tudum Wada Road
P.M.B. 2103
Jos
Plateau State, Nigeria

Benfobil & Co.
83 Aitken Road
P.O. Box 2030 Sabon-Gabi
Kano, Nigeria

Dantata Land and Sea Coy Ltd.
24 Club Road
P.O. Box 2291
Kano, Nigeria

A.C.C. Ltd.
P.O. Box 713
Jos, Nigeria

Plateau Construction Ltd.
5 Constitution Hill
P.O. Box 806
Jos, Nigeria

Franco Builders Ltd.
12a Station Road
Enugu, Anambra State, Nigeria

Wimpey & Co. Nig. Ltd.
5 Jumbo Jibowu St.
P.O. Box 2049
Ikoji, Nigeria

Hokoson Engineering Co. Nig. Ltd.
155 Zik Avenue
Enugu, Anambra State, Nigeria

D.A. Jideofo Enterprises
13 Ogui Road
P.O. Box 443
Enugu, Anambra State, Nigeria

Anyi Group Builders
6 Edinburgh Road
Enugu, Anambra State, Nigeria

Fodeh Building Construction Co. Ltd.
96 West Circular Road
Benin City
Bendel State, Nigeria

Alhaji Mai Deribe & Sons Ltd.
Headquarters Sir Kassim Ibrahim Road
P.O. Box 28
Maiduguri, Borno State, Nigeria

Alhaji Garba Wand
P.M.B. 1197
Maiduguri, Borno State, Nigeria

E.M. Micheletti & Son (nig) Ltd.
P.O. Box 569
Kaduna, Nigeria

Galco Ltd.
17-18 Bello Road
P.O. Box 5
Kano, Nigeria

Acme Builders Ltd.
Plot No. 56
Oregun Village
Ikeja, Lagos, Nigeria

Arbico Ltd.
46 Payne Crescent
Apapa, Nigeria

Bakare the Builders
13 Broad Street
Lagos, Nigeria

Bicc Construction Nig. Ltd.
17 Badagry Road
Apapa, Lagos, Nigeria

Caaso Construction Works Ltd.
1b Market Street
Ebute Metta, Lagos, Nigeria

Engineering Construction & Co. Ltd.
1 Takoradi Road
Apapa, Lagos, Nigeria

Fessy Builders
17f Ladoke Akintola Road
G.R.A. Ikeja, Lagos, Nigeria

Group Construction Co. Ltd.
1 Raymond St
Yaba, Lagos, Nigeria

Howard Construction Co. Nig.
1 Sumbo Jibowu St
Ikoyi S.W. Lagos, Nigeria

Hager Builders Ltd.
Plot 55 Igammu
Onitiri Close
Igamnu, Lagos, Nigeria

Jlgt Construction Co. Ltd.
Plot 228
Musa Yar' Adua St
Victoria Island
Lagos, Nigeria

Manhattan Construction Co. Ltd.
198 Murtala Muhammed Way
Yaba, Lagos, Nigeria

Neptune Construction Ltd.
12 Makoko Road
Yaba, Lagos, Nigeria

Impresit (Bakalori) Nig. Ltd.
P.O. Box 52
Sokoto, Nigeria

Mercury Builders Ltd.
Bank Chambers
2nd Floor
27/29 Martin Street
Lagos, Nigeria

Technical Construction Nig. Ltd.
6 Ijora Causeway
Apapa, Lagos, Nigeria

Naphju Plan & Construction Co.
1 Nafill Street
Maryland, Ikeja, Lagos, Nigeria

Niger Scot Construction Co.
126/130 Nnamdi Asikuve Street
Lagos, Nigeria

O.C.C. Contractors
Plot A
Chief Okupe Estate
Ikeja, Lagos, Nigeria

Power Construction & Engineering
Co.
19 Adebola Street
Surulere, Lagos, Nigeria

West Africa Construction &
Development Ltd.
6 Murtala Muhammed Way
Ebute Metta, Lagos, Nigeria

Hallco Builders Co.
51/121 Kudeti Road
Ibadan, Nigeria

Ja-Pol Construction Co. Ltd.
Molete Ibadan, Nigeria

Solid Builders Co.
N3/379 Inalende
Ibadan, Nigeria

Chris Builders
15a New Lagos Road
Benin
Bendel State, Nigeria

G.E.M. Construction
Plot 13 Block 8 Fagbemi Road
Iyaganku
Ibadan, Nigeria

Nigersol Construction Co. Ltd.
51 Awolowo Avenue
Bodija Estate
Ibadan, Nigeria

Anisiobi Builders Co.
43 Chukwuani Street
Enugu, Anambra State, Nigeria

Fisko Construction Engineering
Co. Ltd.
22 Olatunde Labinjo Ave.
Ikorodu Road
Lagos, Nigeria

Intergrace Construction Co. Ltd.
3 Murtala Road
Enugu, Anambra State, Nigeria

Barade Construction Co. Ltd.
P.O. Box 43
Funtua, Nigeria

Bendel Construction Co.
Sapele Road
Benin
Bendel State, Nigeria

Fin Niger Construction Co. Ltd.
15 Rhode Crescent
Apapa, Lagos, Nigeria

Viewpoint Nig. Ltd.
70 Gboko Road
P.O. Box 8
Makurdi, Nigeria

Pauling Nig. Ltd.
195a Club Road
P.O. Box 91
Kano, Nigeria

E. Piazza & Co. Ltd.
Trans Amadi Layout
P.O. Box 576
Port Harcourt
Rivers State, Nigeria

Afro-International Construction Co. Ltd.
3a Zaria Road
Jos, Nigeria

Plateau Quarry & Construction Co. Ltd.
Dogon-Dutse
Jos, Plateau State, Nigeria

City Group Construction Nig. Ltd.
New Secretariat Site Works Road
Port Harcourt, Nigeria

Dosco Engineering Construction Co. Ltd.
Plot 279 T/A Industrial Layout
Port Harcourt
Rivers, State, Nigeria

Angus Builders Co. Nig. Ltd.
1 Koko Road
Sokoto, Nigeria

Niger North Construction Co.
Sokoto, Sokoto State, Nigeria

North Co. Construction Co. Ltd.
Birnin Kebbi Road
Sokoto, Nigeria

Shehu Montay Construction Co. Ltd.
Sokoto, Sokot State, Nigeria

Jas Builders
162 Zik Avenue
Enugu, Anambra State, Nigeria

B.A. Asi Construction Co.
45 Douglas Road
Owerri, Imo State, Nigeria

Lakati Construction & Co.
21 Ahmadu Bello Road
Jos, Nigeria

Progress Contracts Ltd.
SW 8/491b Lagos Bye Pass
Oke Ado
Ibadan, Nigeria

Nigeria Construction Consortium
13 Ilar Street
Bodija Estate
P.M.B. 5373
Ibadan, Nigeria

Comrade Construction Nig. Ltd.
SW 8/176b Lagos, Bye Pass
Oke Ado
P.O. Box 138
Ibadan, Nigeria

Structor
1 Aerodrome Road
Apapa, Lagos, Nigeria

City Construction Co.
18 Jebba Street
East Ebute Metta
Lagos, Nigeria

Edoh Building Services
11 Ohafia Road
Umuahia
Imo State, Nigeria

Anosike Building Co. (Nig.) Ltd.
44 Umunna Street
Onitsha
Anambra State, Nigeria

Crescent Building & Engineering Co.
14 Owerri Road
Enugu, Nigeria

Nigeria Construction Co.
3 Ozigbo Street off
Ekenwan Road
Benin Bendel State, Nigeria

International Construction Engineers
121 Agbani Road
P.O. Box 420
Enugu, Nigeria

Kakatua Construction Co. Nig. Ltd.
48 Mission Road
Benin
Bendel, Nigeria

Afolabi Multi Builders & Trading Co.
38 Onifade St
Mushim, Lagos, Nigeria

British & African Engineering Co.
16 Burma Road
P.M.B. 1084
Apapa, Lagos, Nigeria

Champion Builders
P.O. Box 57
Ibadan, Nigeria

Coast Construction Nig. Ltd.
12 Creek Rd.
Box 40
Apapa, Nigeria

Dolcino G.G.R.
P.O. Box 40
Port Harcourt, Nigeria

Impresit Bakalori
P.O. Box 57
Sokoto, Nigeria

Abidukum W.
8 Isolo st.
Akure, Nigeria

Adams Bros.
17 Queen Elizabeth Way
P.O. Box 79
Jos, Nigeria

Adams J.I.
6 Ouida St.
P.O. Box 43
Abeokuta, Nigeria

Taylor Wooddrow
10 Abebe Village Rd.
Igannu, Lagos, Nigeria

Borini Prono & Co. Nig. Ltd.
1 Emotan Rd.
Apapa, Nigeria

Petraco Nig. Ltd.
7 Apapa Rd.
Ebute Metta, Nigeria

Snamprogetti SPA
16 Louis Solomon Close
Apapa, Nigeria

Akanji Group
21 Ahmadu Bello rd.
Jos, Nigeria

Gumea Construction Co.
Victoria Beach
Box 2319
Lagos, Nigeria

Robert T. & L. Co.
34 Marcathy St.
Lagos, Nigeria

Lakati Construction Co.
21 Ahmadu Bello Rd.
Jos, Nigeria

Dys-Trocea Valsesia & Co. Ltd.
P.O. Box 317
Ebute Metta, Nigeria

Poletti & Bros
15 Burma Rd.
Apapa, Nigeria

Voteniski International Group
5 Naraguta Ave.
Jos, Nigeria

Ainbrosini L. Ltd.
Box 133
Nguru, Nigeria

Pedrochi & Co.
Apapa Causeway
Lagos, Nigeria

Item	YEAR									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Agriculture	1855·0	1527·9	1415·2	1712·4	2354·0	2423·0	3021·0	3413·8		
Mining	163·0	103·6	71·6	244·8	570·0	1064·0	1236·0	2647·8		
Manufacturing	233·0	194·2	198·6	281·8	362·0	391·0	454·0	574·8		
* Construction	180·4	154·8	131·4	161·4	244·0	411·0	503·0	656·9		
Electricity, Gas and Water	19·6	14·0	14·8	24·8	30·0	37·0	43·0	54·1		
Transportation and Communications	151·6	123·0	135·8	139·8	210·0	255·0	302·0	401·9		
Trade	435·4	356·6	342·2	453·2	610·0	675·0	719·0	891·6		
Public Administration and Defense	104·0	88·6	145·6	251·4	284·0	332·0	426·0	589·3		
Other Branches	232·8	189·2	201·0	228·2	250·0	294·0	362·0	429·8		
GDP (at market prices)	3614·4	2950·4	2877·8	3791·6	5320·0	6788·0	7520·0	10210·0		
GNP (at market prices)	3435·6	2886·1	2764·4	3583·6	4983·0	6202·0	7033·0	9740·0		
Populations (millions)	59·95	61·45	62·98	64·56	66·17	67·83	69·52	71·24		

NIGERIA: SECTORIAL CONTRIBUTION TO THE GROSS NATIONAL PRODUCT PER CAPITA

ITEM	ACTIVITIES	REMARKS
1	TOPIC DECISION	
2	SUBMIT RESEARCH PROPOSAL	
3	DRAFT PRESURVEY LETTERS	
4	MAIL PRESURVEY LETTERS	
5	LITERATURE SEARCH FOR QUESTIONNAIRE DEVELOPMENT	
6	DEVELOPMENT OF QUESTIONNAIRE	
7	PRINT QUESTIONNAIRE DRAFT	
8	PRETEST QUESTIONNAIRE	
9	PRINT QUESTIONNAIRE	
10	MAIL QUESTIONNAIRE	CRITICAL
11	LITERATURE SEARCH	
12	DESPATCH LETTERS TO STATISTICAL OFFICES	
13	LITERATURE SEARCH	
14	CONSULT ADVISER	
15	MAIL FOLLOW UP LETTERS	
16	PREPARE STATE OF THE ART REPORT	
17	SUBMIT REPORT	CRITICAL
18	WRITE PROJECT OBJECTIVES	
19	SUBMIT WRITE UP	CRITICAL
20	END SURVEY	
21	CONSULT ADVISER	
22	TABULATE DATA	
23	ANALYSE DATA	
24	CONSULT ADVISER	CRITICAL
25	WRITE UP ROUGH DRAFT	
26	SUBMIT ROUGH DRAFT	CRITICAL
27	CONFERENCE WITH ADVISER	CRITICAL
28	WRITE UP REPORT AND TYPE	
29	SUBMIT FINAL 3 COPIES	CRITICAL
30	END OF PROJECT	

NOV DEC JAN FEB MAR APR MAY

1 Part 234-838 A 96-42 449 Hoods

CONSTRUCTION INDUSTRY IN NIGERIA NETWORK SCHEDULE

2/25/78

GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332

SCHOOL OF
CIVIL ENGINEERING

Department of Construction
Student P. O. Box 35991

TELEPHONE
(404) 894. 2

November 21, 1977

Dear Sir:

We need your help. We are conducting a research study of the construction industry in Nigeria. The research follows a three-month cross-country survey visit to Nigeria which determined that the Nigerian construction industry is growing.

In the next few weeks you will be receiving a questionnaire designed to gather useful data related to the construction activities in Nigeria. The purpose of this research is to come up with useful findings which would enable the government to encourage the growth of the construction and auxiliary industries in Nigeria and which would be published in a language every contractor will understand.

So that this study will most accurately reflect the opinion of all, we urgently request your participation in this study by promptly returning the forthcoming questionnaire. We will be willing to send you a copy of this research report after it has been published in Nigeria.

We thank you in advance for your time and cooperation.

Sincerely,

Daniel W. Halpin, Ph.D.
Associate Professor

Enekan Thompson Akpan
Research Fellow
P. O. Box 35991
Georgia Institute of Technology
Atlanta, Georgia 30332
USA

Roland Gareis
Visiting Assistant Professor

NIGERIA CONSTRUCTION INDUSTRY

RESEARCH SURVEY 1977

This questionnaire is part of a study being conducted by the Georgia Institute of Technology, Department of Construction, in conjunction with your company. In the broadest sense the goals of this study are to learn more about the Nigerian construction industry and to make some recommendations to the Nigerian government and the construction industry as to ways to help the industry grow and improve.

If this study is to be helpful, it is important that you answer each question as thoughtfully and frankly as possible. This is not a test; there are no right or wrong answers. We are not attempting to dig into your privacy, but only to use the data and information you give to present a report and recommendations that would help the young construction industry in Nigeria to grow. So, the important thing is that you answer the questions the way you see things or the way you feel about them.

The completed questionnaires are processed by automated equipment which summarizes the answers so that individuals cannot be identified. So we guarantee you complete confidentiality in all the information you provide.

A copy of the report and recommendations will be sent to you in gratitude for your cooperation.

Please return the completed questionnaire by air mail to:

The Department of Construction
Georgia Institute of Technology
c/o P.O. Box 35991
Atlanta, Georgia 30332
USA

SCHOOL OF CIVIL ENGINEERING
GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA

INSTRUCTIONS

1. Most questions have more than one answer.

2. Most questions can be answered by filling in one or more answer spaces. If you don't find the exact answer that fits your case, use the one that is closest to it.

3. Use a check mark in the box provided, i.e. ✓

4. Please answer all questions in order.

5. Use a pencil or a pen.

6. Complete the attached acknowledgement form and return it to us.

7. The first part of the questionnaire takes about 20 minutes to complete.

DETACH ALONG PERFORATED LINE AND MAIL TO US

TO:

The Department of Construction
c/o P.O. Box 35991
Georgia Institute of Technology
Atlanta, Georgia 30332
USA

This is to notify you that we received your Nigeria Construction Industry Survey 1977.

FROM:

_____
Signature

_____
Name of Company

_____
Address

_____

NOTE: Please answer the following questions by completing the blank spaces or placing a check mark (✓).

1. What is the name of your company? _____

_____

2. Address: _____

_____

3. In which country is your home office located? _____

_____

4. In which other cities in Nigeria are your field offices located?

_____ _____

_____ _____

_____ _____

5. How is your company registered in Nigeria?

General Contractor

Building and Civil Engineering Contractor

6. In terms of capital, how would you rank your company in size?

Small company

Medium company

Large company

7. What type of construction do you specialize in?

We are not specialized - could handle any job.

Highly specialized. Our field is _____.

8. Are there any adopted standard forms of contracts in Nigeria?

Yes

No

9. If yes, what are the names of these standard forms of contracts?

_____

_____

_____

10. In what sector do you perform more than 50% of your contract works?

Public sector

Private sector

11. On more than 50% of the jobs you have completed so far, which of these types of specifications did the engineers write?

Material and Methods Specifications

End-Result Specifications

Quality Assurance (using Statistical Quality Control)

12. What type of contracts do you generally bid on?

Competitive Bid

Fixed Price or Lump Sum

Cost Plus a Fixed Fee

Cost Plus a Percentage of Cost

Cost-Plus an Incentive Fee

Negotiated

Unit Price

13. How or where do you get information when jobs are available for bids in Nigeria?

From newspapers

By personal contacts

From technical journals

By referrals

By owners inviting you to bid

14. In Nigerian contracts are you required to pose a bond? If so, which ones?

    Performance Bond

    Bid Bond

    Payment Bond

15. Which of these types of companies do you select as your bonding company?

    A surety company

    An insurance company

    A broker

16. Where do you obtain capital for your company's expansion?

    Nigerian banks

    Insurance companies

    Pension funds

    Overseas investment banking

    Selling stock to the public

17. From what source do you obtain money to finance your long term construction projects?

    Nigerian bank(s) near the location of job

    Nigerian bank(s) in other cities

    Bank(s) in foreign countries

    Other sources. Specify: _____

    _____

18. On the average, what interest rate do you pay to these Nigerian banks? _____%

19. Has your company ever joint ventured on any project with other firms in Nigeria?

    Yes

    No

20. Where do you purchase your construction equipment?

From Nigerian equipment dealer(s)

From abroad

21. What % of your equipment do you own?

0-25%

25-50%

50-75%

75-100%

22. Where is over 50% of your design normally done?

Done locally by Nigerian consulting firms

By consulting firms overseas

By our company Engineering Department

23. What methods do you use to prepare your payroll?

Manual system

Mechanical payroll system

Electronic data processing

Use of bank computer system

24. How does your Personnel Department recruit its skilled and semi-skilled staff?

Hiring and providing on the job training

From the labor union

By going to various technical schools/colleges and recruiting

By accepting and processing individual applications

From job placement bureaus

25. How many engineers do you have in your company? _____

26. Does your company have a labor relations department?

Yes

No

27. Are there any personnel development or training programs in your company?

Yes

No

28. Are there any labor unions in Nigeria?

Yes

No

29. Has your company ever experienced any problem of strikes or lock outs in Nigeria?

Yes

No

30. Is absenteeism a problem in Nigeria?

Yes

No

31. What is the minimum wage per day paid by your company to your lowest paid employees?

_____

32. What is the minimum wage rate per day in Nigeria?

In the private sector: _____

In the public sector: _____

33. Do you have an Estimating Department?

Yes

No

34. What methods are used by your company in estimating construction projects?

Historical unit cost data in the calculations

Resource enumeration and costing

Intuitive method or recalling old cost data and reusing

//

35. What type of scheduling or control techniques does your company use?

Bar charts

Network analysis (Critical Path)

PERT

Computer systems (using any scheduling technique)

36. Is scheduling used in the planning phase of your jobs?

Yes

No

37. Is scheduling used during construction to control your jobs?

Yes

No

38. Is a computer used in your engineering organization?

Yes

No

39. Which of these tax accounting methods do you use to account for your income?

Cash receipts and disbursements

Accrual

Percentage of completion

Completed contract

40. What type of cost codes do you use?

Standard system cost codes

Cost codes developed by our company

Other. Specify: _____

41. Does your company have a Public Relations Department?

Yes

No

42. Does your company have any of these safety programs?

Management support and direction

Safety organization

Worker education

Hazard control

Medical and first aid plans

43. Is there any national safety program for the construction industry in Nigeria?

Yes

No

44. Does your company have any type of pension plan for its employees?

Yes

No

45. Indicate which of these companies your company uses for its services.

Construction Management firms

Computer Service Bureau

Quantity surveyor or firm

46. What are the names of the taxes paid in Nigeria by your construction?

_____

_____

_____

47. What is the effective tax rate in Nigeria? _____%

TABLE 1

Please complete the following information by filling in the total number of projects or contracts won for each category performed each year and the total value in Naira of these projects.

1973

TYPE OF CONSTRUCTION	TOTAL NUMBER OF THESE CONTRACTS WON	TOTAL NAIRA VALUE OF THESE CONTRACTS
Highways		
Railroads		
Airports		
Bridges		
Dam and canal construction		
Hydro projects		
Waterfront construction		
Water supply		
Sewerage		
Dredging		
Land drainage and river maintenance		
Pipeline (oil & gas) and pumping stations		
Underground construction		
Power projects		
Power transmissions		
Military projects		
Building construction		
High-rise construction		
Industrial plants/buildings		
Residential buildings		
Public/office buildings		
Commercial developments		
Recreational developments		
Hotel construction		
Medical facilities		
Schools/university facilities		
Church construction		

TABLE 1

Please complete the following information by filling in the total number of projects or contracts won for each category performed each year and the total value in Naira of these projects.

1974

TYPE OF CONSTRUCTION	TOTAL NUMBER OF THESE CONTRACTS WON	TOTAL NAIRA VALUE OF THESE CONTRACTS
Highways		
Railroads		
Airports		
Bridges		
Dam and canal construction		
Hydro projects		
Waterfront construction		
Water supply		
Sewerage		
Dredging		
Land drainage and river maintenance		
Pipeline (oil & gas) and pumping stations		
Underground construction		
Power projects		
Power transmissions		
Military projects		
Building construction		
High-rise construction		
Industrial plants/buildings		
Residential buildings		
Public/office buildings		
Commercial developments		
Recreational developments		
Hotel construction		
Medical facilities		
Schools/university facilities		
Church construction		

TABLE 1

Please complete the following information by filling in the total number of projects or contracts won for each category performed each year and the total value in Naira of these projects.

1975

TYPE OF CONSTRUCTION	TOTAL NUMBER OF THESE CONTRACTS WON	TOTAL NAIRA VALUE OF THESE CONTRACTS
Highways		
Railroads		
Airports		
Bridges		
Dam and canal construction		
Hydro projects		
Waterfront construction		
Water supply		
Sewerage		
Dredging		
Land drainage and river maintenance		
Pipeline (oil & gas) and pumping stations		
Underground construction		
Power projects		
Power transmissions		
Military projects		
Building construction		
High-rise construction		
Industrial plants/buildings		
Residential buildings		
Public/office buildings		
Commercial developments		
Recreational developments		
Hotel construction		
Medical facilities		
Schools/university facilities		
Church construction		

TABLE 1

Please complete the following information by filling in the total number of projects or contracts won for each category performed each year and the total value in Naira of these projects.

1976

TYPE OF CONSTRUCTION	TOTAL NUMBER OF THESE CONTRACTS WON	TOTAL NAIRA VALUE OF THESE CONTRACTS
Highways		
Railroads		
Airports		
Bridges		
Dam and canal construction		
Hydro projects		
Waterfront construction		
Water supply		
Sewerage		
Dredging		
Land drainage and river maintenance		
Pipeline (oil & gas) and pumping stations		
Underground construction		
Power projects		
Power transmissions		
Military projects		
Building construction		
High-rise construction		
Industrial plants/buildings		
Residential buildings		
Public/office buildings		
Commercial developments		
Recreational developments		
Hotel construction		
Medical facilities		
Schools/university facilities		
Church construction		

TABLE 1

Please complete the following information by filling in the total number of projects or contracts won for each category performed each year and the total value in Naira of these projects.

1977

TYPE OF CONSTRUCTION	TOTAL NUMBER OF THESE CONTRACTS WON	TOTAL NAIRA VALUE OF THESE CONTRACTS
Highways		
Railroads		
Airports		
Bridges		
Dam and canal construction		
Hydro projects		
Waterfront construction		
Water supply		
Sewerage		
Dredging		
Land drainage and river maintenance		
Pipeline (oil & gas) and pumping stations		
Underground construction		
Power projects		
Power transmissions		
Military projects		
Building construction		
High-rise construction		
Industrial plants/buildings		
Residential buildings		
Public/office buildings		
Commercial developments		
Recreational developments		
Hotel construction		
Medical facilities		
Schools/university facilities		
Church construction		

Department of Construction
Student P.O. Box 35991

18 January 1978

Dear Sir,

As you may recall a questionnaire was sent to you from our department entitled "Nigeria Construction Industry Survey 1977." We wish to seize this opportunity to thank you for cooperating, filling out, and returning the questionnaire to us.

Since situations may differ greatly and since we wish the results of this study to be as accurate as possible, we cannot overemphasize the importance of receiving your completed questionnaire. Perhaps you are too busy and might tend to forget about us; if this is the case, please take some time from your busy schedule to help us out. It is by your response that we would be able to assist the industry and the government.

Please feel free to attach a sheet of your own suggestions, if any, on ways you see fit for the government to help the Nigerian construction industry to improve. You could write a few words on any items in the questionnaire so as to clarify your response if need be. We would incorporate all useful suggestions in our final report to you and to the government.

You should take some time to fill out and return the survey to us urgently, by air mail, because our data collecting phase will end in February.

Thank you very much for your cooperation. You will hear from us again after we have analyzed your information.

Sincerely,

Enekan T. Akpan
Research Fellow
Department of Construction
P.O. Box 35991
Georgia Institute of Technology
Atlanta, Georgia 30332
U.S.A.

PLEASE RETURN TO
D.W. HALPIN
CIVIL
ENGR

CONSTRUCTION INDUSTRY IN NIGERIA

A Special Research Problem

Presented to

The Faculty of the School of
Civil Engineering

By

Enekan Thompson Akpan

Georgia Institute of Technology
May 1978

SCHOOL OF CIVIL ENGINEERING
GEORGIA INSTITUTE OF TECHNOLOGY
ATLANTA, GEORGIA 30332