Thesis

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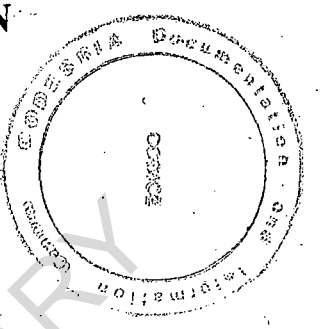
Spatial Patterns of Production Subcontracting in Nigeria; a case studof the Lagos Region

February 1998

SPATIAL PATTERNS OF PRODUCTION SUBCONTRACTING IN NIGERIA: A CASE STUDY OF THE LAGOS REGION



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ABSTRACT

Studies on production subcontracting have usually been conducted within the transaction costs perspective. This has tended to hinder an understanding of the networks of interfirm relationships which could be better understood through a spatial perspective. This study which analyzes the spatial relationships amongst places through subcontracting introduces the spatial perspective.

In a broad sense, this study analyzes the spatial relationships amongst places through production subcontracting, using the Lagos region as a case study. The Lagos region is defined as the Lagos metropolitan area, and the outlying districts of Agbara, Sango/Ota and Ojodu/Isheri, in Ogun State. Data were collected from both secondary and primary sources. The collection of data from the primary source involved reconnaissance survey and questionnaire interview. The questionnaire administered on the 68 contracting firms covered the background information, and subcontracting history of the firms. Secondary data were collected from several sources including the Manufacturers' Association of Nigeria (MAN) Industrial Directory, Vanguard Yellow Pages, the Nigerian Telephone Directory, the Nigerian Annual Abstract of Statistics, the Directory of Incorporated Companies, and the Federal Ministry of Industries, Abuja. Other sources are the National Population Commission, National Medical Directory, and the Nigeria Road Network Map.

The relevant concepts/theories in this study are integration and industrial linkage, production subcontracting and the related spatio-economic development concepts and diffusion of innovation. The Lagos region, apart from being the industrial nerve centre of Nigeria, is also the leading centre of commerce. About 70 per cent of the country's industrial investment, and 65 per cent of industrial employment are accounted for by the Lagos region. The ports in Lagos (Apapa and Tin Can) handle about 60 per cent of total exports (excluding crude oil), and about 70 per cent of imports in Nigeria. At both the aggregate level and the level of the Lagos region, industrial activities are concentrated in a few locations. The growth in production subcontracting over time is statistically significant at 0.0001 per cent level. This study also indicates that there is variation in production subcontracting amongst the industry groups. Textiles, wearing apparels and leather industry group dominates the production subcontracting scene. The dominant form of production subcontracting is speciality subcontracting, carried out by independent subcontractors. The number of subcontractors engaged by any contracting firm ranges from one to four.

Production subcontracting carried out over short distances, became very important after the introduction of the Structural Adjustment Programme (SAP), especially in reducing the costs of production. The volume of production subcontracting increased amongst the contracting firms over the years. A test of

variation in the volume of production subcontracting by the contracting firms, using the one-way analysis of variance, indicates that the result is significant at 0.0001 per cent level.

The analysis of the determinants of the volume of production subcontracting, using the stepwise multiple regression model shows that the size and structural characteristics of the firms explain only 17 per cent of the volume of production subcontracting. The result is not statistically significant. The networks of interfirm relationships show that production subcontracting is concentrated in a few locations. The spatial distribution of production subcontracting is analysed using the step-wise multiple regression analysis. The dependent variables are the number of subcontractors and the volume of production subcontracting while the independent variables are the size and structural characteristics of the various locations. In each case, the result of the analysis is highly significant at 0.0001 per cent level. The number of industrial establishments is the most significant explanatory variable. The implication of this study is that, if encouraged, production subcontracting could be used to enhance the development of indigenous entrepreneurship in particular, and the industrial development of Nigeria in general.

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Ajayi, Dickson 'Dare

February 1998

DEDICATION

To the Memories of

My late Father,

Samuel Ajayi Isinkaye;

Uncle

Alfred Abejide Aluko

"The soul of the virtuous are in the hands of God, no torment shall ever touch them; ... for those who have been faithful, O Lord; Life is not ended but merely transformed, and when this earthly abode dissolves, an eternal dwelling place awaits them in HEAVEN."

- The Book of Wisdom

and to

The Generations Unborn

CERTIFICATION

I certify that this work was carried out by Mr. D.D. Ajayi in the Department of Geography, University of Ibadan.

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CHAPTER ONE

INTRODUCTION: BACKGROUND, OBJECTIVES AND DATA COLLECTION

1.1 BACKGROUND AND RESEARCH PROBLEM

Production subcontracting, the breaking down of the production process into smaller units by firms, is a major strategy of corporate organizations [Clutterbuck, 1985; Lash and Urry, 1987]. It is a production technique whereby part of a firm's production is handled by other independent firms. It is also a system in which firms perform different tasks in a chain of production. It is, thus, the de-concentration of production processes into smaller units over space.

In developed market economies, such as the United States of America, the rise of production subcontracting is attributable to the performance problems caused by capital redundancy and labour militancy [Piore and Sabel, 1984; Cooke, 1988]. Some writers [e.g. Corbridge, 1986; Walker, 1988; Storper and Walker, 1989; Best, 1990], also attribute the rise of production subcontracting to the strategic responses of firms towards rapid market changes, increased international competition, and the corresponding development of new modes of corporate competition, which are based on

interfirm consultative coordination and continuous improvement in the production process.

Production subcontracting provides firms the benefits of reduced investments risks, strengthens control over the labour process, and fosters response to technological and market changes [Holmes, 1986; Imrie, 1986; Donaghu and Barff, 1990]. In addition, it provides production systems increased viability for long-term growth and development [Sato, 1984; Saxenian, 1990], and promotes exchanges between firms in many forms [Contractor and Lorange, 1988]. Furthermore, it plays an important role in the restructuring of some industrial sectors both at the intranational and international levels. Perhaps, this explains why international subcontracting linked to the development of free trade areas and Export Processing Zones (EPZ) has become of particular interest to international agencies, such as United Nations Industrial Development Organization and the World Bank [UNIDO, 1974; UNTCD, 1975, 1979; Berthomeiu and Hanaut, 1980].

The development of production subcontracting is not confined to the developed market economies. A number of major developing market economies, such as Hong Kong, Taiwan and the People's Republic of China, have also experienced similar changes. These changes are attributable to the strategic needs of firms to expand production and/or to reduce cost pressures

associated with labour shortages or labour cost [Chen, 1983; Federation of Hong Kong Industries, 1990].

Four major themes persist in the literature on production subcontracting. These are, the nature of production subcontracting; the basis for its existence; the temporal dynamics; and the locational structure. These themes have been approached in the literature from a transaction costs perspective as developed by Coase (1937), and later espoused by Williamson (1975; 1979; 1984; 1985); Scott (1983a; 1986; 1988a); and Storper and Scott (1990).

The transaction costs perspective posits that production subcontracting promotes locational agglomeration because external transaction costs between firms in the markets, including transportation and communication costs, increase with distance. The propensity to agglomerate (locationally) increases further either when transactions include small-scale, irregular, unstandardized, or contact-intensive activities that have high unit linkage costs, or when firms seek to reduce demand fluctuations by improving their customer base through locational clustering [Leung, 1993]. This locational tendency, according to Storper and Scott (1989:21) "is associated with a flexible regime of capital accumulation or mode of corporate organization characterized by intense external transactions between firms (external economies of scale) as a result of unstable market conditions." Flexible regime of accumulation encompasses new forms of production (including

subcontracting) characterized by a well developed ability to shift promptly from one process and/or product arrangement to another. It is a mechanism for rapidly adjusting to changes in the market without harmful effects on the level of efficiency.

On the other hand, the locational dispersal of production occurs when the transactions involve bulky, stable, standardized, or easily manageable activities that have low unit linkage costs. These activities "contain primarily routine deskilled production processes and are dispersed to peripheral areas where labour or land costs are low" [Scott 1988a; 210]. This locational tendency, as stated by Storper and Scott (1989:22) is associated with a Fordist regime of capital accumulation typified by deepened internal transactions within firms (internal economies of scale) as a result of stable market circumstances." Consequent on this is the emergence of spatial and international division of labour, with the centres dominating in unstandardized skilled labour and the hinterlands depending on routine unskilled activities [Scott and Storper, 1986].

Two major flaws are associated with the transaction costs perspective (see literature review for details). First, the heavy reliance on cost considerations has 'masked' our knowledge of the major agent of capitalism, the firm, as it determines production subcontracting. Indeed, Yeung (1994:462), notes that "not only does the main capitalist agency, the firm, disappear in the sea of structural current ... but the central importance of

culture and social relations in the capitalist formation is also masked." A few recent works [see Leung, 1993; Jussaume Jr., 1995], are explicit on the importance of culture and social relations. Second, whereas the literature suggests that the locational structure is either agglomeration or dispersal into the hinterlands and across national boundaries, our knowledge of production subcontracting, especially in relation to pre-existing spatial structures, characteristics of specific places, deserves attention.

1.2 AIM AND OBJECTIVES

The broad aim of this study is to analyze the spatial relationships amongst places through production subcontracting within Nigeria, using the Lagos region as a case study.

Specifically, the objectives are to analyze:

1. the temporal trend in production subcontracting;
2. the nature, scope, volume and the perceived significance of subcontracting linkages;
3. the determinants of the volume of production subcontracting by contracting firms;
4. the spatial distribution of production subcontractors and offer an explanation for the spatial distribution.

1.3 JUSTIFICATION OF STUDY

Contemporary thinking in industrial geography places a lot of emphasis on the understanding of the networks of interfirm relationships. According to Dicken and Thrift (1992:286), "it is only through an analysis of the networks of interfirm relationships that the firm, as the basic element in the capitalist organization of production, can be resurrected. Through the networks of interfirm relationships one can probably overcome the problem created by the imposition of western-centric theories on to the economic reality in other parts of the world."

An activity perspective has been suggested to explain the spatial organization of the networks of interfirm relationships [Christensen *et al.*, 1990]. The choice of a network of relationships with its spatial pattern is argued to be more germane to the strategic positioning of the firm [Yeung, 1994]. The present study posits that the spatial pattern of the network of interfirm relationships, through production subcontracting, can be better understood through the pre-existing characteristics of specific places, as opposed to the transaction costs perspective. It is obvious from the literature that the spatial relationships amongst places (locations) through subcontracting activities based on the pre-existing characteristics of locations has not attracted much attention (see literature review).

It may be added that, while several studies on production subcontracting have been conducted in the western world, especially the United States of

America and Great Britain, studies on industrialization in sub-Saharan Africa and especially in Nigeria, have largely focussed on the examination and analysis of single components of industrial activity or the spatial distribution and development of manufacturing industries. Examples of earlier works include Schatzl (1973), Aboyade (1973, 1977), Onyemelukwe (1974); Vegale *et al.*, (1974), Ayeni (1976, 1981a), Teriba and Kayode (1977), Omuta (1980), Arikawe-Akintola (1986), and Ighalo (1989). Other studies [Lewis, 1972; 1973; 1974; Oyebanji, 1978, 1980], have focussed on small scale industries at the regional level. More recent studies, among which are Lee and Anas (1989), Lee (1991), and Babarinde (1995), have focused on some behavioural aspects of manufacturing in Nigeria. In some cases, explanations have been offered in terms of factor endowments. In other words, there is no known study conducted on production subcontracting in sub-saharan Africa and especially in Nigeria.

1.4 DATA COLLECTION PROCEDURE

1.4.1 Types of data required

Both primary and secondary data were required in this study. While primary data were collected from contracting firms, secondary data were collected from published sources.

1.4.2 Primary data source

Since no publication on the location and operation of production subcontracting activities in the country is available, information on these had to be collected from relevant firms. The collection of data from the primary source was done in two different stages. These are the reconnaissance survey and questionnaire administration.

1.4.2.1 Reconnaissance survey

The reconnaissance survey was carried out during the months of November and December, 1995. It covered all the fifteen industrial estates/areas and outlying firms in the Lagos region.

In each of the industrial estates/areas, all the industrial establishments were visited to determine whether or not they are involved in production subcontracting. The purpose of visiting all firms in each estate and other industrial centres was to ensure that none of the industrial establishments was left uncovered during the survey. The visit entailed personal interview with the industrialists or designated officers.

The result of the reconnaissance survey, shown in Table 1.1, indicates that 68 (10.7%) of all the operating firms in the Lagos region are involved in production subcontracting. The locations of these firms are shown in Figure 1.1. The number of contracting firms varies from one industrial

Table 1.1: Distribution of Contracting firms in Lagos region

S/No.	Industrial Estate/Area	Number of Contracting Firms	Percentage
1.	Ikeja/Ogba/Isheri	9	13.2
2.	Oregun	7	10.3
3.	Gbadaga	0	0.0
4.	Ikorudu Road/Ojota	3	4.4
5.	Oshodi/Agege	5	7.4
6.	Matori	1	1.5
7.	Isolo	5	7.4
8.	Ilupeju	12	17.6
9.	Mushin/Surulere	4	5.9
10.	Yaba	0	0.0
11.	Ijora	1	1.5
12.	Iganmu	7	10.3
13	Sango/Ota	5	7.4
14.	Agbara	7	10.4
15.	Apapa/Tin Can Island	2	2.9
	Total	68	100.0

Source: Field Survey, 1995

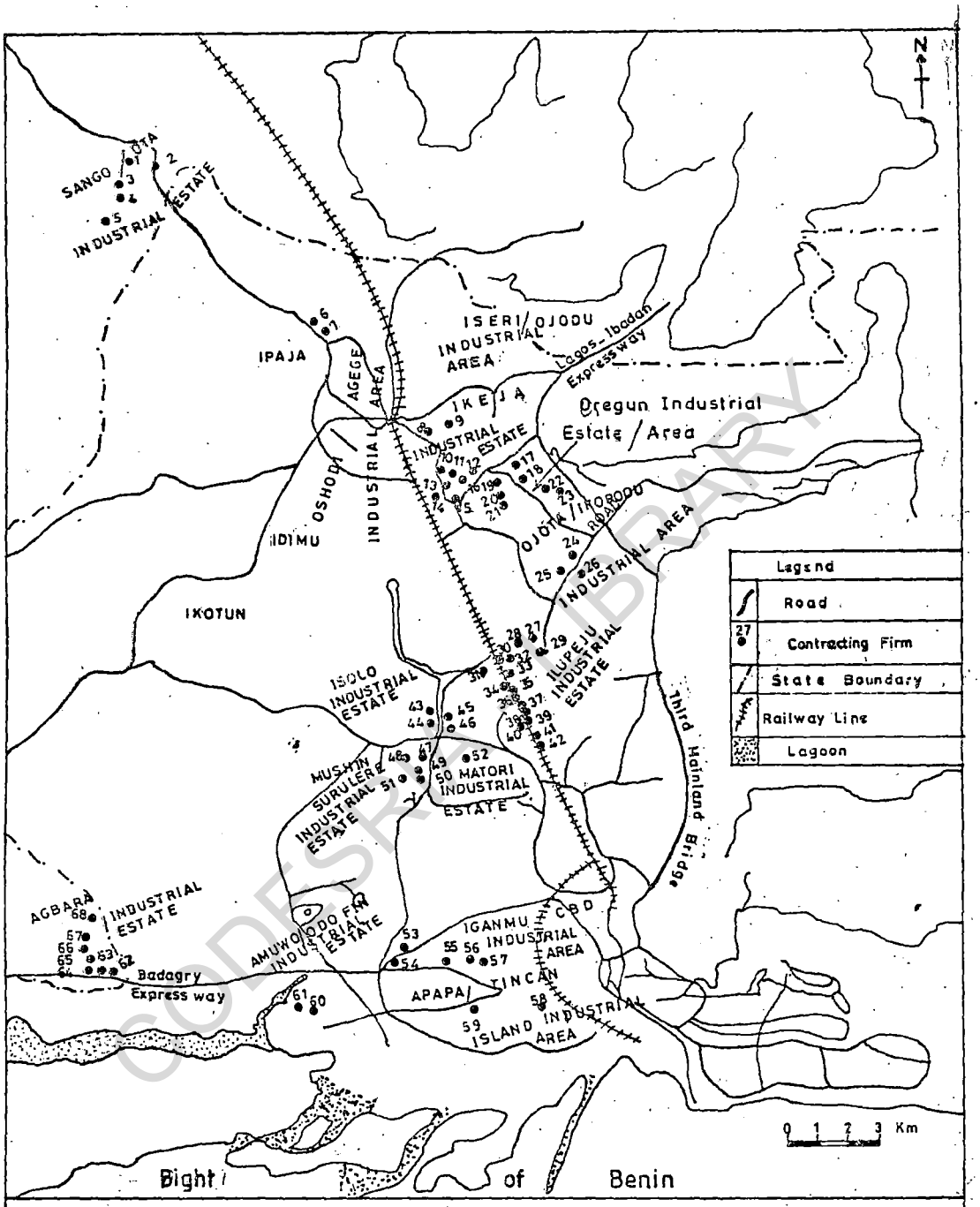


Fig. 1.1.: Location of Contracting Firms (the corresponding list of firms is provided in table 1.2)

Source.: Field Survey, (1995), Base map from Surveyor General's Office, Ikeja - Lagos.

estate/area to the other. While two of the estates (Gbagada and Yaba) have no contracting firms, Ilupeju estate alone has 12 (representing 17.6 per cent) of the total. Ikeja/Ogba/Iseri industrial estate/area accounts for 9 (13.2 per cent), while Oregun, Iganmu and Agbara estates/areas have 7 (10.3 per cent) firms each. Other industrial estates account for numbers ranging from 1 (1.5 per cent) to 5 (7.4 per cent).

Table 1.2 **List of Contracting Firms shown in Fig.1.1.**

S/No.	Industrial Estate/Area	Name of Firm
1.	Sango/Ota	Nigeria Distilleries Limited, Sango
2.	Sango/Ota	Maribon Industries Limited, Sango
3.	Sango/Ota	Leady-Pharma Industries, Sango
4.	Sango/Ota	Hong-Kong Synthetic Fibre Co. (Nig.) Limited, Ota
5.	Sango/Ota	Auto Components Limited, Ota
6.	Oshodi/Agege	Roche (Nig.) Limited, Dopemu
7.	Oshodi/Agege	Smurfit Cases Limited, Dopemu
8.	Ikeja/Ogba/Iseri	Cocoa Industries Limited, Ogba-Ikeja
9.	Ikeja/Ogba/Iseri	Reliance Textiles, Ogba-Ikeja
10.	Ikeja/Ogba/Iseri	Berger Paints (Nig.) Plc, Oba Akran Road, Ikeja
11.	Ikeja/Ogba/Iseri	Woolen and Synthetic Textiles, Oba Akran Road, Ikeja
12.	Ikeja/Ogba/Iseri	Associated Batteries Manufacturers, Ikeja
13.	Ikeja/Ogba/Iseri	Central Packages, Ayodele Diyan Close, Ikeja

Table 1.2: (Contd.)

S/No.	Industrial Estate/Area	Name of Firm
14.	Ikeja/Ogba/Iseri	International Paints for West Africa (IPWA) Plc Oba Akran
15.	Ikeja/Ogba/Iseri	CAPL, Ikeja
16.	Ikeja/Ogba/Iseri	Longman (Nig.) Plc, Oba Akran Road, Ikeja
17.	Oregun	Pfizer Products Plc, Oregun Road
18.	Oregun	WAPCICO Distilleries Limited, Oregun Road
19.	Oregun	Literamed Publications Limited, Oregun
20.	Oregun	African Paints (Nig.) Plc, Oregun
21.	Oregun	Morison Industries Plc, Oregun
22.	Oregun	D.N. Meyer Paints, Oregun
23.	Oregun	A.J. Seward Cosmetics, Oregun
24.	Ikorodu Road/Ojota	Lennards Shoes, Ojota
25.	Ikorodu Road/Ojota	Bata (Nig.) Plc, Ojota
26.	Ikorodu Road/Ojota	Niger Cafe, Maryland
27.	Ilupeju	Westex Textiles, Ilupeju
28.	Ilupeju	AGM Textiles, Ilupeju
29.	Ilupeju	Bhojson Industries, Ilupeju
30.	Ilupeju	Enpee Industries, Ilupeju
31.	Matori	Industrial Gas Limited, Oshodi
32.	Ilupeju	Bidat Sportswear Limited
33.	Ilupeju	Pharmchem. Industries, Ilupeju

Table 1.2: (Contd.)

S/No.	Industrial Estate/Area	Name of Firm
34.	Ilupeju	Healthcare Products Limited, Ilupeju
35.	Ilupeju	Swantex Limited, Ilupeju
36.	Ilupeju	West African Book Publishers Limited, Ilupeju
37.	Ilupeju	Academy Press, Ilupeju
38.	Ilupeju	Avon Cosmetics, Ilupeju
39.	Ilupeju	Nelson Publishing Limited, Ilupeju
40.	Mushin/Surulere	Wrought Iron (Nig.) Limited, Mushin
41.	Mushin/Surulere	Critall-Hope (Nig.) Limited, Mushin
42.	Mushin/Surulere	Critall-Hope (Nig.) Limited, Challenge, Mushin
43.	Oshodi/Agege	Camplas Textiles, Apakun
44.	Isolo	Alumaco Industries
45.	Oshodi/Agege	Daltex Industries
46.	Oshodi/Agege	Five Stars Industries Limited
47.	Isolo	Elite Textiles, Isolo
48.	Isolo	Berec Batteries, Isolo
49.	Isolo	Johnwax (Nig.) Limited, Isolo
50.	Isolo	International Textiles Limited, Isolo
51.	Mushin/Surulere	Indian Dawn Limited, Papa-Ajao
52.	Iganmu	Gemini Pharmaceuticals, Apapa Express Way
53.	Iganmu	Coastal Bottlers Limited, Amuwo-Odofin
54.	Iganmu	Passat Industries Limited, Iganmu

Table 1.2: (Contd.)

S/No.	Industrial Estate/Area	Name of Firm
55.	Iganmu	Sunflag Textiles, Iganmu
56.	Iganmu	Afprint Textiles, Iganmu
57.	Apapa/TinCan Island	Tapaulin Industries, Apapa
58.	Apapa/TinCan Island	Alumaco Industries, Apapa
59.	Ijora	Ijora Textiles Mills, Ijora
60.	Iganmu	Khahao Industries, Maza-Maza
61.	Iganmu	Chartered Aluminium, Maza-Maza
62.	Agbara	Vitamalt Plc, Agbara
63.	Agbara	WTN - Wiggins Teape (Nig.) Plc, Agbara
64.	Agbara	ReKitt and Coleman Limited, Agbara
65.	Agbara	Dumex Industries Limited, Agbara
66.	Agbara	Lever Brothers (Nig.) Plc, Agbara
67.	Agbara	Pharma-Deko Plc, Agbara
68.	Agbara	Drury Chemicals, Agbara

Source: Field survey, 1995

1.4.2.2 Questionnaire administration

All the sixty-eight contracting firms identified during the reconnaissance survey were covered in the questionnaire administration carried out from January to August, 1996. The questionnaire sought information on such issues as the industry group (line of activity), the location (address/industrial estate/or area); the size and structural characteristics of the firm and activities relating to production subcontracting (see Appendix I, for details). The distances separating subcontracting partners were determined with the aid of the road network maps.

The questionnaire was administered such that contracting firms in each of the industrial estates/areas and the outlying firms were visited one after the other. In each case, the questionnaire was left with the industrialist/ designated officer to complete. In some cases, several visits were made to the establishment before the completed questionnaire could be retrieved. All the contracting firms satisfactorily completed the questionnaire by the end of the fieldwork. However, there was considerable non-response to the question on the cost aspect of the firms' operations.

1.4.3 Secondary data types and sources

The Industrial Directory of Nigeria (1993 edition), published by the Manufacturers' Association of Nigeria (MAN), served as the basic source of secondary data. The 1993 edition was the most recent and up-to-date at the beginning of the fieldwork for this study. The Directory contains a list of manufacturing establishments employing at least 10 workers. Other publications include the Nigerian Vanguard Yellow Pages (1991 edition), a publication of the Vanguard Newspaper, which is the directory of business enterprises in Nigeria; the Nigeria Yearbook (1992 edition); the Directory of Incorporated Companies (1993 edition). These other sources were used to supplement information provided by the MAN industrial directory. Information pertaining to the name, location, and addresses of firms were obtained from these sources. However, these publications did not contain all the required information. Other sources were therefore consulted to fill the gaps. For instance, information on the number of educational institutions, number of advertising agencies; number of banks and allied institutions, number of insurance companies, and number of registered hotels/restaurants was collected from the Nigerian Vanguard Yellow Pages (1991 edition). Other sources are, the Annual Abstract of Statistics (1994 edition), and the

Nigerian Statistical Bulletin (1994 edition).

Information on population figures was collected from the National Population Commission (NPC) provisional census result (1991). The National Medical Directory (1993 edition), provided the required information on the number of hospitals/medical facilities. Furthermore, information on the distance (km) between Lagos and other locations where subcontractors are found, availability of rail link, and type of road link - whether dual carriage, trunk road or others – was determined from the Nigeria road network map (1994 edition), published by Macmillan Press PLC and from other existing road network maps of Nigeria. These sources of secondary data (publications) were the most recent and comprehensive editions at the time of the fieldwork. The analytical techniques used in this study are discussed in relevant sections of this thesis.

1.5 BASIS FOR CHOICE OF THE STUDY AREA

The study area is the Lagos region. However, given the fact that the main focus of the study is subcontracting relationships between the Lagos

region and the rest of the country, there is a sense in which the whole country could be regarded as a subsidiary study area. Therefore, this section discusses various aspects of the industrial geography not only the Lagos region but also of Nigeria as a whole.

The Lagos region covers metropolitan Lagos and the outlying districts of Agbara, Sango/Ota and Ojodu/Isheri industrial estates/areas, in Ogun State. This region, located along the south west of Nigeria, is situated approximately between latitudes 6° 27' and 6° 37' North of the equator and longitudes 4° 15' and 4° 47' East of the Greenwich Meridian [see fig. 1.2]. The Lagos region, with an area of about 1,088km^2, covers about 32 per cent of the land area of Lagos State. About 20 per cent of this area is made up of lagoons and mangrove swamps.

The Lagos region, apart from being the industrial nerve centre of Nigeria, is also the leading centre of commerce. Some 60 to 70 per cent of all commercial transactions in Nigeria are carried out or finalised in the Lagos region. About 70 per cent of the total value of industrial investments in Nigeria is in the Lagos region. Over 65 per cent of the country's industrial employment is concentrated in this region, leaving the remaining 35 per cent to other parts of the country. It is, in part, the recognition of the marked

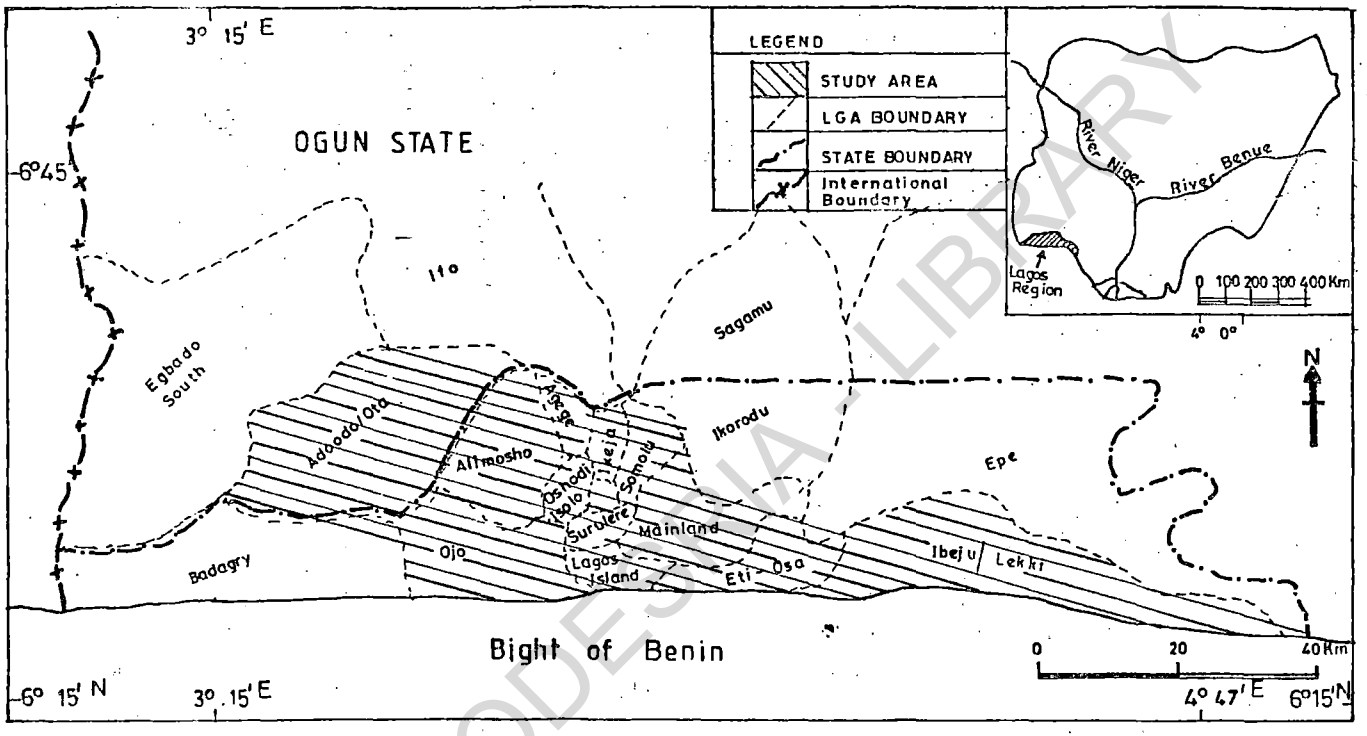


Fig.1.2 : Lagos Region

Source: Surveyor General's Office, Ikeja-Lagos

concentration of industries in the Lagos region that motivated its choice as the study area for this work.

Apart from the foregoing, the Lagos region has two seaports, Tin Can Island and Apapa. The two ports handle about 60 per cent of Nigeria's total exports excluding crude oil and about 70 per cent of imports. Major terminals for both road and rail routes are located in the Lagos region. The strategic location of the Lagos region is further strengthened by the presence of the most important airport. Perhaps it is this strategic position of the Lagos region within the country that explains why most major industrial concerns and trading companies, such as the United African Company (UAC), Union Trading Company (UTC), Patterson and Zochonis (PZ), have their head offices located in this region. In addition, major financial centres, such as the Nigerian Stock Exchange, and the head office of major banks, insurance companies and other financial institutions are located in this region. The implication is that the Lagos region, more than any other part of the country, is likely to have strong links with the other parts of the country.

The subsidiary study area (Nigeria) lies between latitudes 4° 00' and 14° 00' north of the equator, and longitudes 4° 00' and 14° 00' East of the Greenwich Meridian. Nigeria, with a total land area of 923,772 km^2 has the most extensive habitable land area in Africa south of the Sahara. The population of Nigeria was 88.5 million people in 1991 [NPC, Census figures].

1.6 ORGANISATION OF THESIS

Apart from this introductory chapter, the thesis is divided into five chapters. Chapter two presents the conceptual/theoretical framework, the literature review, and the hypotheses, while the Nigeria industrial scene is presented in chapter three. The development and determinants of the volume of production subcontracting are examined in chapter four.

Chapter five analyses the spatial patterns of production subcontracting, and offers explanation for the observed spatial pattern. Chapter six presents a summary of the major findings, the implications of these findings for the development of indigenous entrepreneurship and the industrial development of Nigeria in general, policy implications of the study and areas for further research.

CHAPTER TWO

CONCEPTUAL/THEORETICAL FRAMEWORK, LITERATURE REVIEW, AND HYPOTHESES

2.1 CONCEPTUAL/THEORETICAL FRAMEWORK

The relevant concepts/theories reviewed here are integration and industrial linkage, production subcontracting, and innovation diffusion.

2.1.1 Integration and industrial linkage

Integration involves all forms of collaborative and co-operative ventures among industrial organizations over space. There are two forms of integration, namely vertical integration and horizontal integration. Vertical integration is "a process which refers to the extent to which successive stages in production and distribution are placed under a single firm shaped by internal economies of scope." [Lee 1994:292]. This involves the amalgamation of productive units at different stages of production. By contrast, horizontal integration is a production system whereby "firms producing related products (competitive, complementary or by-products) operate under central control" [Lee 1994:292]. This involves the firm moving into activities that are very closely related to its current activities.

Vertical or horizontal integration may offer greater stability or growth of corporate profits and the spreading of risks [Dicken and Lloyd, 1990]. This is possible because not all activities in the firm will follow an identical cycle of demand. Integration, thus, involves the linkage of firms in a chain of production. In general terms, this is what is referred to as industrial linkage. Industrial linkage is a process whereby one manufacturing firm purchases inputs of good or services from, or sells output to, another manufacturing firm [Keeble, 1976]. "Industrial linkage includes all forms of contacts and flows of information and/or materials between two or more individual firms" [Johnson, 1994:334]. This term is most widely used in industrial geography to indicate the interdependence among firms and its effects on locational choice.

There are three forms of linkages. These are backward, forward and sideways linkages. Backward linkage is a situation where a firm makes use of the products of some other firms as input in its own production process. Forward linkage occurs when a given firm produces its products for use in the production process of other firms. Sideways linkage involves the information flows between firms at the same level of the production process.

Linkage is possible over a wide range of distances. However, strong or complex linkage ties usually operate only over short distances. On a

national scale, "the systematic ties of a plant to others have locational significance. Plants located primarily in relation to raw materials or markets form a small proportion of total industrial activity. On the local scale, connections to adjacent or nearby plants do exist, but such connections do not account for the concentration of heavy industrial areas" [Wood 1969:34]. The foregoing suggests that linkage reflects a distance decay function.

Linkage assumes that the process of manufacturing involves dynamic features, such as a variety of contacts changing over time, the need for rapid exchange in response to supply requirements, and the maintenance of speed and frequency of contacts. The measurable attributes of firms' size, such as manufactured inputs consumed, sales volume, and intensity of intra-regional inter-industry linkages, are fundamental determinants of the way a manufacturer perceives the production environment [Barr and Fairbain, 1978]. Linkage is facilitated by certain basic factors. The importance of flows of commercial, technical, and administrative information into the links of communication-both internal and external between functional units of the firm's organisation enhances linkage [Hägerstrand 1964; Imrie, 1980; O'Farrel and Loughlin, 1980]. Exchange on levels of supply and demand, the optimum price levels, and the technical characteristics of products to be exchanged also facilitate industrial linkage [Klein et al. 1982].

The movement of goods between different firms at stages in the manufacturing process (the supply of machinery and equipment and ancillary parts and maintenance requirements) when supplied by separate firms; ties with other firms that aid in the selling and distribution of goods (e.g. Packers, printers, wholesalers, agents and transport concerns); and ties with financial and advisory services (banks, insurance companies and stockbrokers) have also been emphasized as enhancing industrial linkage [Sargant 1961; Townroe 1969].

Inter-industry linkage may be facilitated by the existence of relatively well-developed infrastructure, such as highways, railroad lines and termini, airports, utilities, commercial facilities, research organizations; and many other services that might not exist or would be less well developed [Smith 1981; Scott and Bergman, 1995]. A city or region specializing in one industry will often have machine workers and repairers, suppliers of component, ancillary to main one and those producing goods and services for it. These services often express themselves directly, through the reduced cost of specific inputs. Certain materials and suppliers may be cheaper in larger cities than in small ones, by virtue of local production, or good transportation facilities, and economies of scale can make power cheaper as the size of the local market increases. Furthermore, linkage may be facilitated by the

existence of an industrial concentration which may contain a pool of labour with particular skills, or special educational institutions to support industrial activities, both of which will reduce the cost of training workers.

2.1.2 Production subcontracting

Production subcontracting is the arrangement of production process wherein firms externalize their manufacturing activities to other independent firms. The contractor provides the orders and the subcontractor furnishes the work or services for the processing of materials or the production of parts, components, subassembly or assembly of products according to the production specifications and the marketing arrangements of the contractor [UNIDO, 1974; Leung, 1993]. Production subcontracting is thus a form of industrial linkage.

Production subcontracting is classified based on the technical character of the subcontracted work, the durability and stability of the relationship between the contractor and the subcontractor; and the nature and form of business relationship between the contractors and the sub-contractor [Sharpston, 1975]. It is further classified based on source of raw materials required for the subcontracted work [Taylor and Thrift, 1975], and who takes the decision on the conception, design, and the production process [Chaillou,

1977]. Although Chaillou (1977) identifies and describes seven distinct subcategories of subcontracting, for simplicity, he collapses them into three major categories. These are capacity subcontracting, specialization subcontracting, and supplier subcontracting.

Based on Chaillou's classification, subcontracting is further classified into industrial and commercial subcontracting. Industrial subcontracting involves a manufacturing process or the production of intermediate products. Commercial subcontracting pertains to finished commodities. Industrial subcontracting, the focus of this study, is further classified into a number of types based on the need of the contracting firm. These are specialized, complementary, and cost-saving subcontracting [Watanable 1971, 1972, 1980; Leung, 1993].

Specialized subcontracting is due to inadequate technological know-how or equipment on the part of the contractor for some aspects of production. For instance, contractor 'A' in domestic and industrial plastic and rubber industry group, producing domestic coolers may not have the technological know-how or equipment for the production of some plastic components, such as the aluminium jar. If firm 'B', the subcontractor, in basic metal, iron and fabricated metal products industry group produces the aluminium jar, such an arrangement is regarded as specialized subcontracting.

Complementary subcontracting occurs as a result of inadequate capacity on the part of the contractor to meet delivery schedule. For instance, a textile factory faced with increased demand for its products, may subcontract some aspects of its production to another factory in the same line of activity. This aspect so subcontracted is meant to complement the production capacity of the contractor. The situation may well be that some aspects of the production process of firm 'C' (contractor) can be produced at a much lower cost by firm 'D' (subcontractor), if firm 'D' now produces such aspects for firm 'C', such an arrangement is generally classified as cost-saving subcontracting.

Another classification is that based on the types of subcontracting relationships. Four types of subcontracting relationships are usually identified. These are branch subcontractors, subsidiary subcontractors, independent subcontractors, and former - employee subcontractors [Lawson 1992; Leung, 1993]. Branch subcontractors are establishments fully owned and controlled by the contractor. Subsidiary subcontractors are wholly-owned by multi-national corporations, while independent subcontractors, apart from the subcontracting arrangement, have no other form of relationship with the contractor hence the contractor and the subcontractor operate as equals. Former-employee subcontractors are those firms owned by entrepreneurs who

have previously worked as employees of the contractors. They have acquired adequate knowledge of the operations of the contracting firms. They may or may not enjoy financial support of the contractor in order to establish or carry out their production activities.

Production subcontracting has been encouraged by at least two fundamental spatio-economic developments. These are post-Fordist flexible specialization of production, and the emergent 'marked' spatial division of labour. The post-Fordist flexible specialization of production came to replace the Fordist regime of capital accumulation by the end of the 1970's and more importantly by the early 1980's. The Fordist regime of accumulation refers to the era during which industrial production was characterized by widespread mass production of standardized goods using inflexible, dedicated machinery, and exploitation of internal scale economies. The post-Fordist flexible specialization is characterized by the application of production methods considered to be more flexible than those of the Fordist era. It involves greater inter-firm relations such as subcontracting, strategic alliances and just-in-time production and a closer integration of product development marketing and production [Storper and Scott, 1989; Gertler, 1994].

Several post-Fordist writers [Storper and Christopherson, 1987; Storper and Scott, 1989, 1992; Walker, 1989; Storper, 1990, 1991, 1992; Benko and

Dunfold 1991; Martinelli and Schoenberger 1991; Ernste and Meier 1992, Rowley, 1996], have given accounts of the emergence of flexible specialization of production. At the intra-firm level, "production is characterised by flexible production: search for external economies of scale and scope, interconnected units of economic activities, reskilling of labour for their redeployabilty, and decentralised management involving greater degree of integration. Intra-firm relations are characterised by vertical integration of smaller and specialized firms, growth of subcontracting and substantial networks of firms" [Yeung 1994:463]. The spatial expression of flexible specialization changed from initial massive industrial agglomeration in the core to decentralization and increasing dispersal of production toward the periphery [Vernon 1966; Schoenberger, 1988; Swyngedouw. 1992; Echeverri-Carrol, 1996].

Spatial division of labour implies the specialization of certain districts in the production of some products, and certain parts of a product, that is, the way different tasks in production are allocated to particular groups of people in particular locations [Lenin, 1956; Schmidt-Renner, 1966; Burch-Hansen and Nielson, 1977; Massey, 1979, 1984; Storper and Walker, 1983; Smith, 1989]. Spatial division of labour occurs first in locationally concentrated organizational form, with each of the plants in a corporation relatively self-

reliant. The total labour process is performed *in situ* and corporate control decentralised to the individual plants. Second, where there is a cloning branch-plant spatial structure in which ownership and overall corporate control are concentrated at a single headquarters while separate divisions, responsible for product production, have administrative control only over the branch plant. Third, where some branch plants produce exclusively for assembly elsewhere, this represents a part-processing structure, as can be found in production subcontracting [Massey, 1979, 1984].

Three alternative sets of factors, that is, (i) industrial organizations and corporate strategy (ii) pre-existing characteristics of specific places, and (iii) the uniqueness of the labour factor, are emphasized as responsible for the continual structuring and restructuring of spatial division of labour [Storper and Walker, 1983]. Spatial division of labour is a local variant of New International Division of Labour associated with internationalization of production and the spread of industrialization, especially in a number of rapidly growing newly industrializing countries.

2.1.3 Diffusion of innovation

Diffusion of innovation refers to the spread of a phenomenon, in this case, innovation over space and through time[Gregory 1994:132]. This

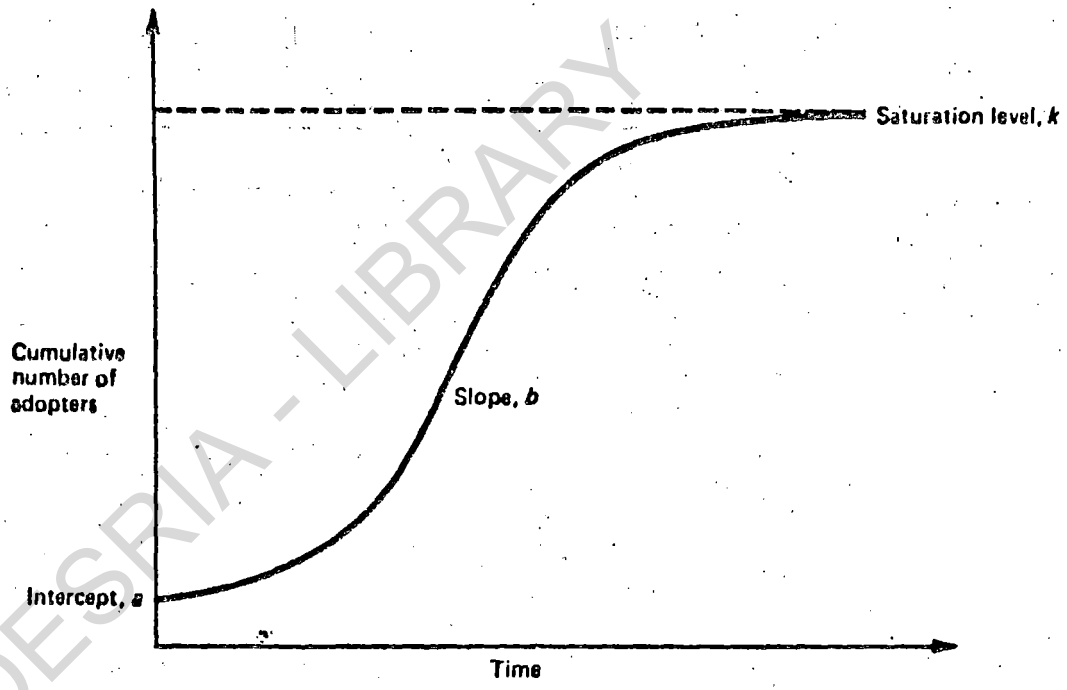


Fig 2.1: The logistic curve.

Source: Adapted from Haggett, P.A. et al; (1977) Locational Mode
Second Edition. Edward Arnold P. 238.

suggests that the diffusion of an innovation takes two dimensions. These are spatial diffusion and temporal diffusion. Spatial diffusion is the process by which innovation spreads over space, while temporal diffusion means the spread of innovation over time. It is the diffusion over time that is of interest here. The adoption of subcontracting could be conceptualised as a temporal diffusion process.

Diffusion process has received considerable attention in geographical studies [see for example, Bowman, 1931; Joerg, 1932; Walter, 1980]; in Sociology [Edmonson, 1961; Rogers, 1962] and in epidemiology [Tinline, 1992; Gilg, 1973]. Hägerstrand [1952, 1953] works form the basis for most geographical studies on the diffusion process. "The acceptance of an innovation is rather slow at the initial stage. This is followed by a rapid build-up as the innovation 'takes off'. Ultimately, there is a levelling out as saturation of the susceptible population is approached" [Hagget *et al.* 1977:238]. Thus, the temporal trend of the diffusion of an innovation usually approximates a logistic curve, that is, an S-shaped curve.

A typical S-shaped logistic curve (fig. 2.1) shows clearly the stages of diffusion process. The logistic curve is widely applied [see for instance, Griliches, 1957; Mansfield 1961; Cassetti and Semple, 1969; Brown and Cox 1971; Cliff and Ord, 1975; Haming, 1983].

2.2 LITERATURE REVIEW

The literature on production subcontracting focuses on four major themes. These are (1) the nature of production subcontracting, (2) basis for production subcontracting, (3) the temporal dynamics of production subcontracting, and (4) the locational structure of subcontracting.

2.2.1 The nature of production subcontracting

The nature of production subcontracting pertains to the nature of work subcontracted, degree to which decisions about the conception, design, and specification of the subcontracted part, the design of labour process to produce part, and the actual production of the part resides with the subcontractor or with the contractor, and power relations. Houssiaux (1957); Sallex and Schlegal (1963); Watanable (1971, 1972, 1980); Sharpston (1975); Chaillou (1977); Friedman (1977); Holmes (1986); and United Nations Industrial Development Organization – UNIDO (1974) examine the nature of subcontracting relationships. The consensus of opinion is that there is always a problem of drawing a distinction between a subcontract and a straight forward market transaction.

Sallex and Schlegel (1963), argue that work done by a direct supplier of parts and components for a manufacturer should be classified technically

as either a straight forward market transaction or as contracted out work, but not as subcontracted work. Friedman (1977:119), points out that "amongst suppliers to the automative industry, the term subcontracting is often used to refer to relations such as those which might be more narrowly defined as simply contracted out relations." Friedman uses the term subcontracting loosely to refer to situation when suppliers produce parts and components to specifications set out in advance by the manufacturers, whether materials are issued or not and whether the contract is directly with the large manufacturer, or through some intermediary contract with another supplier.

Chaillou (1977), opines that when all decisions are made by the contractor, one is faced with a situation of vertically integrated production. On the other hand, where the subcontractor makes all the decisions, the situation is that of an independent supplier. Although, Challiou (1977), identifies and describes seven distinct subcategories of subcontracting, for simplicity, he collapses them into three major categories. These are speciality subcontracting, complementary subcontracting, and supplier subcontracting. This forms the basis for subsequent classification among authors [see Watanable 1971, 1980; Sharpston, 1975; Taylor and Thrift 1975; Leung, 1993].

Watanable (1971, 1980); Leung (1993), draw a distinction between different types of subcontracting based on whether the contractor is a wholesaler or retailer on the one hand or a manufacturer on the other. These authors label these two types of subcontracting as commercial, and industrial subcontracting. Whereas, complementary subcontracting is common in Western European countries such as Italy and France, speciality subcontracting is the predominant form in the North America [Watanable 1971; Berger and Piore, 1980].

In terms of power relations, Watanable (1971), Friedman (1977), and Challiou (1977),note that subcontracting is characterised by unequal or assymetrical power relations between large and small firms. Rubery and Wilkinson (1981), Kaplinsky (1983), Holmes (1986), Imrie (1986), and Echeverri-Carroll (1996), are of the view that subcontracting is characterized by a range of complex contracts and organized relations between firms which are not necessarily based on subservience of the subcontractor to the contractor. Holmes (1986), notes that a subcontracting firm has the capability to innovate and produce, it also exercises a degree of relative autonomy and control through a number of formal and informal networks. These include, the ability to own specific technologies and skills, and the ability to innovate in building a large volume of production. In addition, the subcontractor has

volunteering involvement in a process which ultimately shapes the content of production.

2.2.2 The basis for production subcontracting

Various authors, among which are Friedman (1977), Berger and Piore (1980), Alonso (1983), Benaria and Roldan (1987), and Donaghu and Barff (1990), examine the structure and temporal stability of product markets as basis for production subcontracting. These authors suggest that the situation may arise where the contractor is engaged in manufacturing a product for which demand is uncertain or irregular due to cyclical or seasonal variations in demand for the product. Then production subcontracting becomes a means of production smoothing for the contracting firm. This enables the contracting firm to reduce per unit cost of production.

Berger and Piore's (1980) study of the automobile industry in Italy shows that firms decompose the total demand for their products into a stable and an unstable component when faced with cyclical demand for their products. Such cyclical demand is determined by the demand at the bottom of the trough in the cyclical demand curve. Friedman (1997), notes that the automative industry is traditionally faced with a highly cyclical pattern of demand. Thus, the large automobile assembly firms develop in-house

capacity to produce parts to meet stable component of demand and subcontract the unstable component to a variety of smaller parts producers.

Friedman (1977), notes that during downturn in demand, the auto assemblers' avoid the costs and responsibility for idle specialized fixed capital and the lay-off of workers which are borne by the small subcontracting parts firm. Similar arrangements are noted in IBM, the North American electronics industry by Susman and Schutz (1983), and the Swedish car industry by Fredrickson and Lindmark (1979). Berger and Piore (1980), also note that firms use subcontracting where demand does not exist to permit the continuous mass production of a particular product, using capital intensive Fordist technique.

In addition, these authors report that in the garment industry, the stable portion of demand is composed of such items as work clothes and jeans which are largely factory produced. The unstable component of demand such as quality ladies' and children's fashion ware, for which demand is both limited in scale and highly volatile because of fashion changes, is unsuited to factory production and is largely contracted out. Scott (1982a), Sayer and Morgan (1983), show that the assembly and testing of unstandardized printed circuit boards is often subcontracted in the electronics industry. This is to facilitate the speed with which a new product moves from the design stage to

production so as to ensure success in the market.

Production subcontracting according to Rubery and Wilkinson (1981), Scott(1983d), is also used in situations where a firm's production technology requires an efficient scale considerably greater than the firm's own requirements for the part, subassembly or process. Such parts tend to be separated from the main production process and put out to a subcontractor. The subcontractor, by working for a number of contractors, can achieve a larger and more efficient scale of operation than any individual contractor could have achieved for that particular process or part. In many instances, the subcontractor will utilize highly sophisticated production technology. Rubery and Wilkinson (1981), identify this form of subcontracting in the shoe industry.

The use of subcontractors when technology and labour organization are required, according to Holmes (1986), occurs when economies of scale can be attained at the level of individual machine rather than the factory, as in sewing in the garment industry. Such arrangement is found in the Japanese automative industry by Sheard (1983), where the need to save capital on the part of the contractor encourages the development of specialization subcontracting.

Watanable (1971), Friedman (1977), Berger and Piore (1980), Rubery and Wilkinson (1981), Sabel (1981), and Scott (1983a), Lawson (1992), are explicit on three interrelated but distinct aspects of the structure and nature of labour supply conditions as they influence the extent to which subcontracting takes place in a particular situation. For instance, Rubery and Wilkinson (1981), Peattie (1982), Lawson (1992), show that subcontracting provides an important means of minimizing the costs of labour. This is because, it acts as both a mechanism for ensuring wage discipline and as a method for segmenting the labour force.

Goveneur (1983), Alonso (1983), Beneria and Roldan (1987), Friedman (1977), Portes and Sassen-Koob (1987), and Lawson (1992), note that subcontracting is used to reduce labour union formation, and especially to counter union encroachment on the prerogative of managing the labour process. This is against the background that it is easier for unions to organise worker's resistance in large firms than in small firms. This is the so - called "segmentation of the labour market". Segmentation of the labour market according to Friedman (1977:122), "can be both the medium for and the result of the struggle for control over the labour process". Johnson and Johnson (1983), report that subcontracting is also used to ensure an adequate supply of labour, especially if general or specific types of labour not normally

available for direct wage labour are required.

Alonso (1985), Beneria and Roldan (1987), and Lawson (1992), however, criticize production subcontracting for creating unstable, often illegal work opportunities, low pay, and substandard working conditions. In Mexico for instance, where subcontracting to cheap, nonunionized women workers in illegal sweat shirt shop or their home, is common, Lawson (1992), finds out that subcontracting results in low wage rates since many garment workers are women who combine domestic responsibilities with industrial home work. The women have tangible constraints on the amount of product they can turn out in any period of time. In Brazil, Watanable (1983), and Jenkins (1987), note that subcontracting results in a weak fragmented labour movement, interdependent linkages with specialized components producers. These generate more highly skilled and more stable jobs in formal firms and hence subcontracting is very weak, and translates into less autonomy for the subcontracted firm in the organization of production.

2.2.3 The temporal dynamics of production subcontracting

Holmes (1986), remarks that although some subcontracting relationships do remain stable over relatively long periods of time, it is probably more correct to view such relationships as being more fluid and

dynamic. This is because the level of subcontracting will ebb and flow with the rhythm of business cycles. In discussing subcontracting resulting from the need to segment labour in order to reimpose market discipline on wages, Scott (1983a:244), notes that "a strong overall hypothesis that emerges is that subcontracting tends to decrease in times of economic improvement, when manufacturers can absorb some degree of internal wage drift, but that it increases again as economic conditions deteriorate and strong cost cutting measures become imperative".

In another vein, Friedman's (1977), analysis of capacity subcontracting indicates the reverse pattern, with subcontracting increasing during boom periods and declining during downturns in the economy. Beyond these relatively short-run cyclical variations in the level of subcontracting, Nelson (1975), Clawson (1980), and Litter (1982), show that there are no qualitative shifts in the scale and nature of subcontracting associated with shifts from one phase of capitalist accumulation to another. Holmes (1986:96), however, argues that this assumption "is highly speculative and that it needs much more detailed empirical investigation".

2.2.4 The locational structure of production subcontracting

Scott (1983, 1986, 1988), Scott and Kwok (1988), show that because external transaction costs between firms in the market, including transportation and communication costs increase with distance, production subcontracting thus promotes agglomeration. The propensity to agglomerate (locationally) increases further when the transactions involve small-scale irregular, unstandardized, or contact-intensive activities that have high unit linkage cost, or when firms seek to reduce demand fluctuations by increasing their customer base through locational clustering. Sheard (1983), also reports this form of spatial agglomeration in the Japanese *Kanban* system.

Conversely, Storper and Scott (1989), show that in situations of intense external transactions between firms (external economies of scale) as a result of unstable market conditions, locational dispersal of production occurs. This is especially so when the transactions involve bulky, stable, standardised, or easily manageable activities that have low unit linkage costs. These activities according to Storper and Scott (1989:210), "contain primarily routine deskilled production processes and are dispersed to peripheral areas where labour and land costs are low."

Beyond cost considerations, [Pfeffer and Salancik 1978; Egan and Mody 1982; Hakansson 1982; Rosson and Ford 1982; Johannisson 1987; Johnson

and Mattsson 1987, Burt 1989; Leung, 1993; Christerson and Appelbaum, 1995], show that locational dispersal in production subcontracting is motivated by pre-existing social relations. While Harper and Goodner (1990), Linge (1991), stress the importance of locational dispersal when industrial agglomerations experience labour shortages, Hansen (1991), notes that locational dispersal occurs when preripheral locales possess an entrepreneurial culture.

Jones and North (1991), stress that locational dispersal occurs when regions or nations adopt certain domestic sourcing industrial policies. Locational dispersal is also likely to occur when firms implement inbound transportation planning, using specialist freight services and electronic shipment tracking systems [Ramsdale and Harvey, 1990] or when firms adopt specific purchasing management strategies [Ahmed et al. 1991; Porter, 1991; Bradley, 1991; 1992; Ettlinger, 1992].

2.3 HYPOTHESES

The following hypotheses, which largely derive from the conceptual/ theoretical framework and literature review are tested. The basis for each hypothesis is briefly stated.

(i) The growth over time in the adoption of production subcontracting as

an industrial production technique in Nigeria has been insignificant.

Given the present low level of industrial development in Nigeria, there is a sense in which the growth in the adoption of production subcontracting as an industrial production technique can be expected to be insignificant. This is because, the diffusion of innovation theory, that is, Hägerstrand's (1952, 1953), model of diffusion process (see conceptual framework), show that the acceptance of an innovation is rather slow at the initial stage.

(ii) There is a significant variation in the monetary values of production subcontracting over time.

Although, the literature on production subcontracting suggests cyclical or seasonal variations in production subcontracting, some authors note that subcontracting tends to decrease in times of economic improvement, when manufacturers can absorb some degree of wage drift, but that it increases again as economic conditions deteriorate and strong cost cutting measures become imperative (see literature). Given the down turn in Nigeria's economy which led to the adoption of the Structural Adjustment Programme (SAP), there is a sense in which the monetary values of production subcontracting can be expected to vary significantly over time.

(iii) There is a significant relationship between the volume of production subcontracting and the size and structural characteristics of contracting

firms.

Contemporary thinking in industrial geography places a lot of emphasis on the networks of inter-firm relationships which can be understood through the firm [see literature review]. The measurable attributes of firms' size such as, manufactured inputs consumed, sales volume, and intensity of intra-regional inter-industry linkages are stressed as fundamental determinants of the way a manufacturer perceives the production environment. No known study has quantitatively assessed the determinants of the volume of production subcontracting. In order to do this, there is a sense in which the measurable firm's size and structural characteristics can be used to explain the volume of production subcontracting.

(iv) The locational pattern of production subcontractors is significantly explained by the size and structural characteristics of the location where subcontractors are found.

The basis for this hypothesis is that the literature on industrial linkage stresses the importance of the existence of relatively well-developed infrastructure as determinants of spatially linked industrial activities (see literature). Spatially linked industrial activities tend to converge locationally around points that are maximally accessible, and that linkage ties are said to operate only over short distances.

Good transportation facilities are of importance especially in places of existing industrial concentration which may contain the pool of labour with particular skills. Furthermore, spatial division of labour stresses the importance of pre-existing characteristics of specific places, and the uniqueness of the labour factors as determinants of spatially linked economic activities. These usually descriptive propositions have hardly been tested.

CHAPTER THREE

NIGERIA'S INDUSTRIAL SCENE

This chapter examines the growth pattern of the Lagos region. The trend and spatial pattern of industrialization are also discussed. Where necessary, the situation in Nigeria as a whole is discussed before the situation in the Lagos regions.

3.1 GROWTH PATTERN OF THE LAGOS REGION

The city of Lagos was in the 15th century, a small fishing and farming settlement on an island chosen for that purpose by people from the port hinterland. This island was inhabited because it was comparatively safe from attacks during inter-tribal wars. Lagos became a port of call for Portuguese merchants who later christened it *Lagos de' Curamo* because of its prominence during the slave trade of the 17th and 18th centuries. The indigenes, however, still refer to it as *Eko*, its original name.

Apart from the fact that Lagos, until recently, was the administrative capital of Nigeria, three other factors accounted for the subsequent growth of the Lagos region over time. These factors are (i) the construction, in 1958, of the railway as the most important means of linking the city (the port) with

a rich hinterland, (ii) the development of the Lagos habour between 1908 and 1917 into the largest along the West African coast; and (iii) the construction, in 1900, of Carter bridge (reconstructed in 1933 and 1979), to link the island with the mainland and the hinterland and Eko bridge in 1973. In addition to this was the official commissioning of the Third Mainland Bridge in 1992, to link Lagos island with Oworonshoki which has since become another growth point in the Lagos region.

Lagos provides a good outlet for goods from the hinterland transported by rail, road and the waterways through the Lagos harbour. Lagos region is not only an important commercial/industrial centre in Nigeria, and the West African sub-region, but it is also the seat of a state government, centre of learning, as well as an important cultural centre. All these put together explain the process of migration into Lagos and the beginning of a distinctive type of urban growth [Lagos State Property Development Corporation, 1978].

As the population of Lagos increased, spatial expansion became inevitable. With an initial area of 4km^2 on the Lagos Island, and an estimated population of 28,518 in 1871, the population of the city increased to 126,108 in 1981. The inland areas expanded to 62.8km^2 to encompass areas immediately outside the island and beyond. It is not only the city which has expanded over the years, the largely rural settlements, such as Mushin, Oshodi, Ikeja,

Agege, Shomolu, Bariga, Surulere and villages west of Apapa, Agbara, Sango/Ota and Ojodu/Isheri which were outside the then urban area, have also expanded.

By 1963, the post-independence census recorded a population of 665,246 for the city of Lagos and 457,487, for the settlements outside Lagos. Thus, the population of metropolitan Lagos was 1,122,733 in 1963. This figure excluded 110,735 for Ikorodu, Baiyeku, and two other settlements located about 40 kilometers away from the centre of the city of Lagos [LSPDC, 1978]. The population of the Lagos region was 5,525,261 in 1991.

3.2 TREND IN INDUSTRIALIZATION

3.2.1 Nigeria

The pre-colonial era, that is, the pre-1900 economy of Nigeria featured considerable craft industries in the various clans and kingdoms, modern factory activity was then hardly known [Onyemelukwe, 1983]. Prominent among these craft industries that featured in local and inter-regional trade, were artifacts of wood, brass and bronze, leather, hand woven textiles and bags, iron workings and fire burnt pottery from local clay. The forest zone especially in and around the old Benin Kingdom excelled in wood and bronze workings.

The Awka-Nri-Igbo-Ukwu area of the Igbo heartland was famous for pottery, wood carving and blacksmithing. The Oyo area excelled in calabash carving and textile weaving and dyeing. Bida area was noted for glass and brass works. Hausa-Fulani made leather artifacts while the Ibibio-Efik communities were famous in wood carving and raphia embroidery.

One major characteristic of these craft industries was that they featured in the different locations in close link with the available raw materials. However, the crafts industry has declined considerably following the superior competition from modern industrial activities, particularly manufacturing. Onyemelukwe (1983), notes that Nigeria has embraced the factory type industrialization as the main panacea to her underdevelopment.

The coming of Europeans, especially in the wake of formal trade contact, brought about the first widely recognised forms of modern industrialization. Slave trade yielded priority of place to "legitimate trade" [Flint, 1960], in industrial raw materials obtainable in this part of West Africa. The need then arose for valorization [Aboyade, 1968,; Mabogunje, 1973; Ayeni, 1981; Onyemelukwe, 1983]. Valorization involved the carrying out of initial processing of raw materials with the object of removing waste matter, improving the quality or converting the produce into a form in which it could be more easily stored and transported before being exported. For instance,

the extraction of palm oil from the pulpy pericarp of palm fruits which was crudely processed was by the 1920s better and more economically handled in the 'pioneer oil mills'. Cotton lint was no longer extracted through the laborious and slow manual extraction process but mainly handled in modern ginneries. The forest logs were processed as sawn lumber mainly in power driven sawmills before being exported to Europe.

Considerable finishing operations, including printing and publishing, baking and furniture works, also featured from the beginning. Whereas processing was geared towards the rapidly expanding export trade on a relatively large scale, the finishing operations served only to meet domestic demand which was then relatively small and geographically localised. Onyemelukwe (1983), notes that of the 47 industrial establishments in the country in the pre-1947 period, 21(44.71 per cent) were engaged in processing activities. The remaining 26(55.3 per cent) establishments were engaged in the finishing aspects of manufacturing. Out of the 26, as many as 15(31.9 per cent) establishments were small printing works and bakeries. All these had the bulk of their patronage among the few foreign (mainly European) administrators, missionaries and merchants.

However, the Nigerian industrial scene changed after the end of the second World War, in at least two respects [Adegbola, 1983; Onyemelukwe, 1983].

First, the traditional demand from Europe for industrial raw materials increased tremendously following the post war reconstruction needs and global resumption of full scale activity in trade and industry. Second, the post war economic boom in raw material export and a sharp rise in the general purchasing power and investment potential of indigenous businessmen brought about growth in the number of manufacturing establishments.

The transformation in the Nigerian economy during the post war years was faced with two major constraints. These were the low level of technology and the small size of the available indigenous manpower. Because of the low technological base, industrial development involved the assembly-type pattern of import substitution. Full-scale industrialization involving the production of basic capital goods could not be embarked upon. The gradual assumption of political decision-making power by Nigerians during the 1950s enhanced the substitution of capital goods import or raw material imports for consumers goods.

Table 3.1: Some aspects of Nigeria's Manufacturing 1981 to 1994 (At current price)

Year	Percentage of Total Value Added	Percentage of Gross Domestic Product (GDP)
1981	17.0	9.2
1982	17.3	9.6
1983	17.1	10.0
1984	14.8	7.8
1985	16.4	8.7
1986	16.2	8.7
1987	13.0	6.8
1988	14.3	7.5
1989	10.5	5.3
1990	10.9	5.5
1991	11.9	5.9
1992	10.0	4.8
1993	10.7	5.5
1994	12.1	6.6

Source: Federal Office of Statistics: National Accounts of Nigeria, 1981 to 1994

The industrial sector of the Nigerian economy improved over the years. The relative share of manufacturing industry in the GDP increased from 19.8 per cent in 1966/67 to 32.4 per cent in 1971/72 [Teriba and Kayode, 1977]. However, the manufacturing sector has witnessed considerable decline since the mid-1980s. For instance, Table 3.1 shows that the percentage share of manufacturing in Nigeria's gross value added decreased from about 17 per cent in the early 1980s to 13 per cent in 1987, and 10.7 per cent in 1993. The share of manufacturing in the GDP decreased from 9.2 per cent in 1981 to 6.8 per cent in 1987, and 5.5 per cent in 1993.

The number of industrial establishments which increased from 421 in 1964 to 1,293 in 1975, and 2,360 in 1989, decreased to 1,891 in 1993. The number of industrial employees which increased from 64,965 in 1964 to 93,270 in 1969 (excluding eastern region) decreased to 27,102 in 1989 but increased again to 244,243 in 1985 [Schatzl, 1973; FOS, 1979; Federal Ministry of Industries, 1989; MAN, 1993].

Nigeria's manufacturing consists largely of assembly plants with little or no backward linkage in the economy. This is because the bulk of inputs is imported [Schatzl, 1973; Corfrey *et al.* 1979; Ayeni, 1981]. The few industries that have any form of backward linkage are 'rooted' industries such as tin smelting in Jos, timber and plywood factories at Sapele, and cement factories at Ewekoro and Sagamu. Most industrial activities are linked to industries in foreign countries both for the final consumption goods and intermediate products [Nwafor, 1982; Adegbola, 1983].

The Structural Adjustment Programme (SAP), was in part adopted in July 1986 to redress the prevailing industrial scenario [Ukwu, 1994]. Perhaps as a result of the adoption of SAP, capacity utilization which was 30 per cent at the end of 1986 increased to 36.7 per cent by mid-1987 [MAN, 1987]. However, the situation deteriorated for some highly import dependent industries like electrical/electronics, basic metal, iron and steel, and vehicle assembly where capacity utilization has fallen below 10 per cent.

Some industries now obtain raw materials locally within Nigeria. For instance, the level of local sourcing of materials in selected industrial sectors between 1987 and 1989 is shown in table 3.2. On the average, the percentage of local sourcing of industrial raw materials was about 47 per cent. The percentage of local sourcing of materials increased for 42.8 in the first half of 1987 to 49.7 per cent and 52.0 per cent by mid–1988 and second half of 1988 respectively. However, the percentage of local sourcing materials decreased to 46.0 per cent by mid–1989. The percentage of local sourcing of raw materials was high in non-metallic mineral products; food, beverages and tobacco; and textiles, wearing apparels and leather industry groups in descending order and comparatively low in basic metal, iron and steel and fabricated metal products; motor vehicles and miscellaneous assembly; and electrical/electronic industry groups.

Table 3.2: Level of local sourcing of raw materials in Nigeria, 1987 - 1989

Industry Group	Period			
	Jan-Jun 1987	Jun-Jul 1988	Jun-Dec 1988	Jan-Jun 1989
Food, Beverages and Tobacco	65.2	62.7	63.0	62.0
Wood and Wood Products (Including Furniture)	77.6	N.A	N.A	N.A
Non-metallic Mineral products	76.5	88.4	85.0	81.0
Textiles, Wearing Apparel and Leather	52.4	52.5	57.0	62.0
Chemicals and Pharmaceuticals	31.5	36.3	63.0	37.0
Domestic and Industrial Plastic and Rubber	20.6	53.0	48.0	45.0
Basic metal, Iron and Steel and fabricated metal products	49.7	39.7	30.0	30.0
Motor vehicles and miscellaneous assembly	21.8	N.A	N.A	N.A
Electrical/Electronics	19.3	N.A	N.A	10.0
Pulp, Paper and paper products, printing and publishing	13.7	15.7	42.0	46.0
Average	42.8	49.7	52.0	46.0

Note: Figures in the table are percentages

Sources: (1) National Rolling Plan, 1990. P. 123
(2) Alokan, O.O (1992), "The Challenges of African Economic Integration: Implications for Rural and Small-scale Industria-lization in Nigeria" Nigerian Economic Society, p.149.

3.2.2 Lagos region

Industrialization in the Lagos region started with two brickworks in Ebute Metta in 1859 and 1863, and a palm oil mill established in 1865. The printing works of a mission was established in 1905, the government printing press in 1906, and Daily Times in 1925. All these were located on the island of Lagos, and the railway printing works at Ebute Metta [Schatzl, 1973]. Other large firms were Lever Brothers soap factory established in 1925, and a metal container factory established in 1940, both in Apapa.

Lagos developed into the country's leading industrial centre following the expansion in its service and administrative sectors, and the increase in the population. During the 1950s and 1960s, the built-up area continued to expand northwards beyond the actual city limits. Lagos has since grown into neighbouring villages and expanded both in size and industrial activities. The total land area devoted to industrial landuse in the Lagos region increased from 7.75 per cent in 1966 to 8.41 per cent in 1979 and 8.81 per cent in 1992 [Babarinde, 1994]. Out of the 230 manufacturing establishments operating in the Lagos area in 1969, 5 per cent were established before 1946. Another 3.5 per cent between 1946 and 1950; and 67.5 per cent after 1963. More than 90 per cent of the industrial establishments in the Lagos metropolitan area began production only after 1950. The number of manufacturing establishments in the Lagos region between 1962 and 1993, shown in table 3.2, indicates that the number of industrial establishments increased from only 122 in 1962 to 284 by 1970, 534 by 1989; and 637 by 1993.

Table 3.3: Manufacturing establishments in the Lagos region, 1962 to 1993

Year	Number of Establishments	% Increase
1962	122	-
1965	165	35.2
1968	216	30.9
1970	284	31.5
1985	507	78.5
1989	534	5.3
1993	637	19.3

Sources: (1) Schatzl (1973); pp. 114-124
(2) Federal Ministry of Industries-Abuja, 1989
(3) MAN-Industrial Directory, 1993

3.3 SPATIAL PATTERN OF INDUSTRIALIZATION

3.3.1 Nigeria

Manufacturing activities in Nigeria are concentrated in a few states and primarily in a few cities which are mainly state capitals, ports and major administrative centres [Schatzl, 1973. Mabogunje, 1973; Adegbola, 1983; Onyemelukwe, 1978; Ayeni, 1981a]. Thus, there are spatial disparities in the distribution of industrial establishments. These spatial disparities in the

distribution of manufacturing activities have often been explained in terms of the need for the valorization of raw agricultural products or the treatment of raw materials for export, or through the principle of import substitution adopted by the Nigerian governments as their industrial planning strategy [Ayeni, 1981a]. The result of valorization means the establishment of manufacturing industries in areas where natural resources such as agricultural products and minerals are found [Abiodun and Aguda, 1988]. While valorization meant the establishment in a few cities of mostly consumers goods for which the market existed, import substitution entailed the importation of machinery, raw materials, and in many instances, the skilled manpower.

In spite of the successive development plans aimed at even distribution of industrial activities in all parts of Nigeria, industrial activities are still concentrated in a few locations. Table 3.4 shows that out of the total of 2,355 manufacturing establishments in Nigeria in 1994, 768(32.6 per cent) were concentrated in Lagos State alone. Kano State had 216(9.2 per cent), Rivers and Imo States each had 212 (9.0 per cent) and 171(7.3 per cent) respectively. Bauchi and Katsina States had 8(0.3 per cent) each, while Abia and Jigawa States had no manufacturing establishments at all.

The distribution of manufacturing industries at the city level in 1989, shown in figure 3.1 indicates marked concentration of manufacturing

Table 3.4: Manufacturing Industries in Nigeria, 1989

State	Number of Establishments	Percentage
Abia	0	0.0
Adamawa	5	0.2
Akwa Ibom	40	1.7
Anambra	101	4.3
Bauchi	8	0.3
Benue	37	1.6
Borno	33	1.4
Cross River	59	2.5
Delta	88	3.7
Edo	121	5.1
Enugu	84	3.6
Imo	171	7.3
Jigawa	0	0.0
Kaduna	42	1.8
Kano	216	9.2
Katsina	8	0.3
Kebbi	0	0.0
Kogi	12	0.5
Kwara	33	1.4
Lagos	768	32.6
Niger	17	0.7
Ogun	71	3.0
Ondo	34	1.4
Osun	20	0.8
Oyo	90	3.8
Plateau	46	2.0
Rivers	212	9.0
Sokoto	17	0.7
Taraba	19	0.8
Yobe	2	0.08
FCT	1	0.04
Total	2,355	100.0

Source: Federal Ministry of Industries-Abuja, 1989.

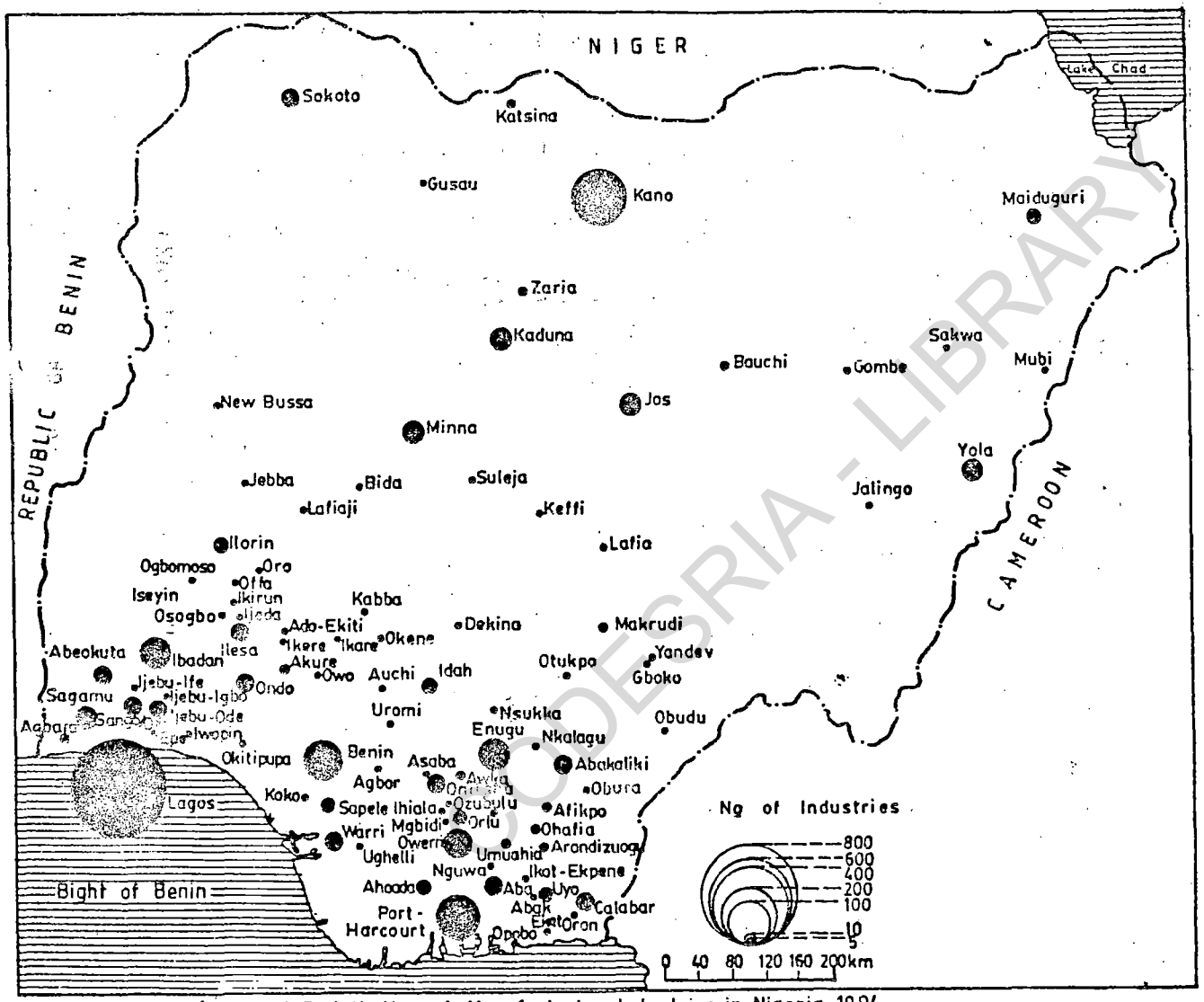


Fig. 3.1: Spatial Distribution of Manufacturing Industries in Nigeria, 1994.

establishments in the southern part of the country. The leading position of Lagos in the south west is clearly shown by the size of the proportional circle. Other locations of relative high concentration of industrial establishments are Kano in the North; Ibadan and Benin in the south west; Enugu and Port-Harcourt in the southeast. While manufacturing establishments are concentrated in several locations in the south, they are found in a few locations in the north.

3.3.2 Lagos Region

Industrial activities are concentrated in Agege, Eti-Osa, Ikeja, Lagos Island, Lagos Mainland, Mushin, Ojo and Shomolu local governent areas of Lagos State, and the adjoining hinterlands of Agbara, Sango/Ota, and Ojodu/Isheri areas to which manufacturing industries in Lagos metropolis relocated. Table 3.5 shows the year of establishment and the relative importance of the industrial estates/areas in the Lagos region, while figure 3.2 shows the location of industrial estates/areas. Six of the industrial estates/areas were established before independence. These are Ikeja/Ogba/Isheri, Gbagada, Matori, Mushin/Surelere, Yaba, and Apapa/Tin Can Island. Four others, Isolo, Ilupeju, Ijora and Iganmu were established between 1960 and 1970, while Oregun, Oshodi/Agege and Agbara industrial

Table 3.5: Industrial Estates/Areas in the Lagos region 1993

S/No	Location (Estate/Area)	Year of Establishments	Area in Hectares	No of Industrial Establishments	(%)
1.	Ikeja/Ogba/Isheri	1957	330	111	17.4
2.	Oregun	1971	100	42	6.6
3.	Gbagada	1958	121	3	0.5
4.	Ikorodu Road/Ojota	N.A	N.A	38	6.0
5.	Oshodi/Agege	1972	120	70	11.0
6.	Matori	1958	120	18	2.8
7.	Isolo	1968	120	46	7.2
8.	Ilupeju	1962	110	58	9.1
9.	Mushin/Surulere	1957	30	22	3.4
10.	Yaba	1958	20	19	3.0
11.	Ijora	1965	138	5	0.8
12.	Iganmu	1965	110	27	4.2
13.	Sango/Ota	N.A	N.A	67	10.5
14.	Agbara	1981	454	52	8.2
15.	Apapa/Tin Can Island	1957	110	59	9.3
	Total			637	100.0

Sources: (1) Lagos State: Directory of Manufacturing Companies, 1989 edition

(2) Babarinde, J.A. (1995). Industrial Migration and Residential Location Decisions in Metropolitan Lagos, Nigeria. Unpublished Ph.D Thesis, Department of Geography, University of Ibadan.

(3) Manufacturers' Association of Nigeria Industrial Directory, 1989 edition.

(4) Manufacturers' Association of Nigeria Industrial Directory, 1993 edition.

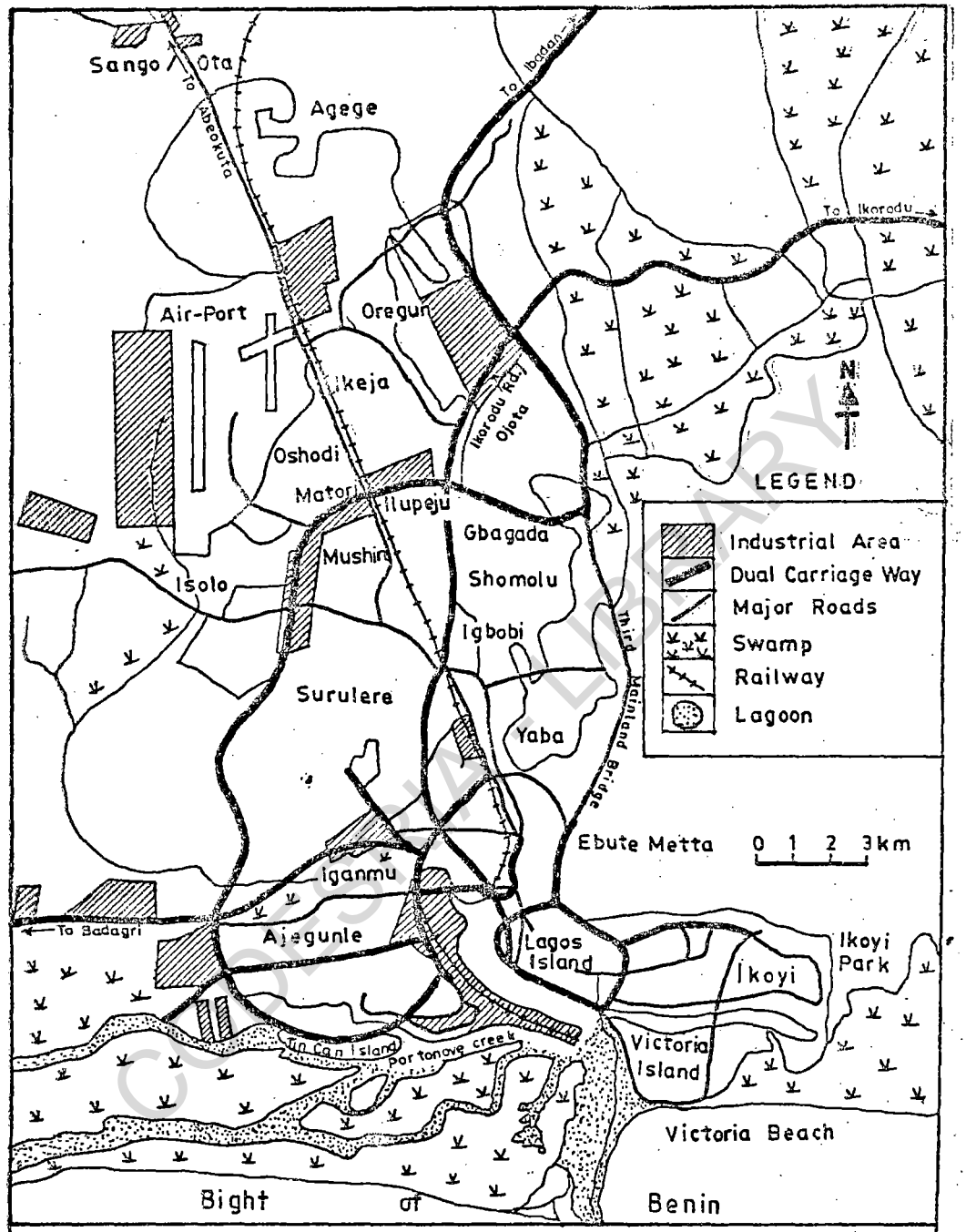


Fig.3.2: Industrial Estates/Areas in the Lagos Region

Source: Surveyor General's Office, Ikeja-Lagos

estates/areas were established after 1970.

The land area of Agbara and Ikeja industrial estates/areas are 454 and 330 hectares respectively. Other industrial estates/areas have below 150 hectares each; Mushin/Surulere industrial estate/area has 30 hectares while Yaba has only 20 hectares. The number of operating industrial establishments varies among the industrial estates/areas. While Ikeja/Ogba/Isheri has a total of 111 (17.4 percent) industrial establihshments, Oshodi/Agege has 70(11.0 per cent), Sango/Ota industrial estate/area has 67(10.5 per cent), Yaba and Matori industrial estates/areas have 19(3.0 per cent) and 18(2.8 per cent) industrial establishments respectively. Ijora industrial estate/area has 5(0.8 per cent) while Gbagada industrial estate/area has 3(0.5 per cent) industrial establishments.

CHAPTER FOUR

THE DEVELOPMENT AND DETERMINANTS OF PRODUCTION SUBCONTRACTING

This chapter examines the development, nature, scope, volume and the perceived significance of subcontracting linkages. The determinants of the volume of production subcontracting are analyzed. Where necessary, the analysis is organized on the basis of the Lagos region on the one hand and the subsidiary study area on the other.

Three hypotheses are tested. These are:

(i) The growth over time in the adoption of production subcontracting as an industrial production technique in Nigeria has been insignificant.

(ii) There has been a significant variation in the monetary values of production subcontracting over time.

(iii) There is a significant relationship between the volume of production subcontracting and the size and structural characteristics of contracting firms.

4.1 THE DEVELOPMENT OF SUBCONTRACTING LINKAGES

This section examines the temporal trend, that is, the growth in the number of contracting firms over the years.

4.1.1 Trend in production subcontracting

The issue of interest here is the growth in the number of adopters over the years. As figure 4.1 shows, production subcontracting as a production technique was first adopted in 1960. On the average, between 1960 and 1994, the number of adopters yearly was two, with a mode of one. The number of adopters varied between zero in some years and 5 in 1986 and 1991. The number of contracting firms (adopters) which was only 1 in 1960, increased to 4 by 1964, 7 by 1969, and 16 by 1974. The number further increased to 33 by 1979, 43 by 1984, 57 by 1989, and 68 by 1994. It is obvious from the graph that the growth in the number of adopters was gradual between 1960 and 1969 and became much more rapid thereafter. A close look at the figure shows that the growth in the trend of production subcontracting reflects the early and middle stages of the S-Shaped logistic curve of Hägerstrand's (1952, 1953) works on the temporal diffusion of innovation.

The result of a linear regression/correlation analysis of the trend, shown in Table 4.1, using the year as dependent variable and number of contractors as independent variable, indicates that R is 0.98476, and R^2 is 0.96975. The regression line is indicated in figure 4.1. The result is significant at the 0.0001 percent level. The conclusion that may be drawn is that the growth in the adoption of production subcontracting as an industrial production technique

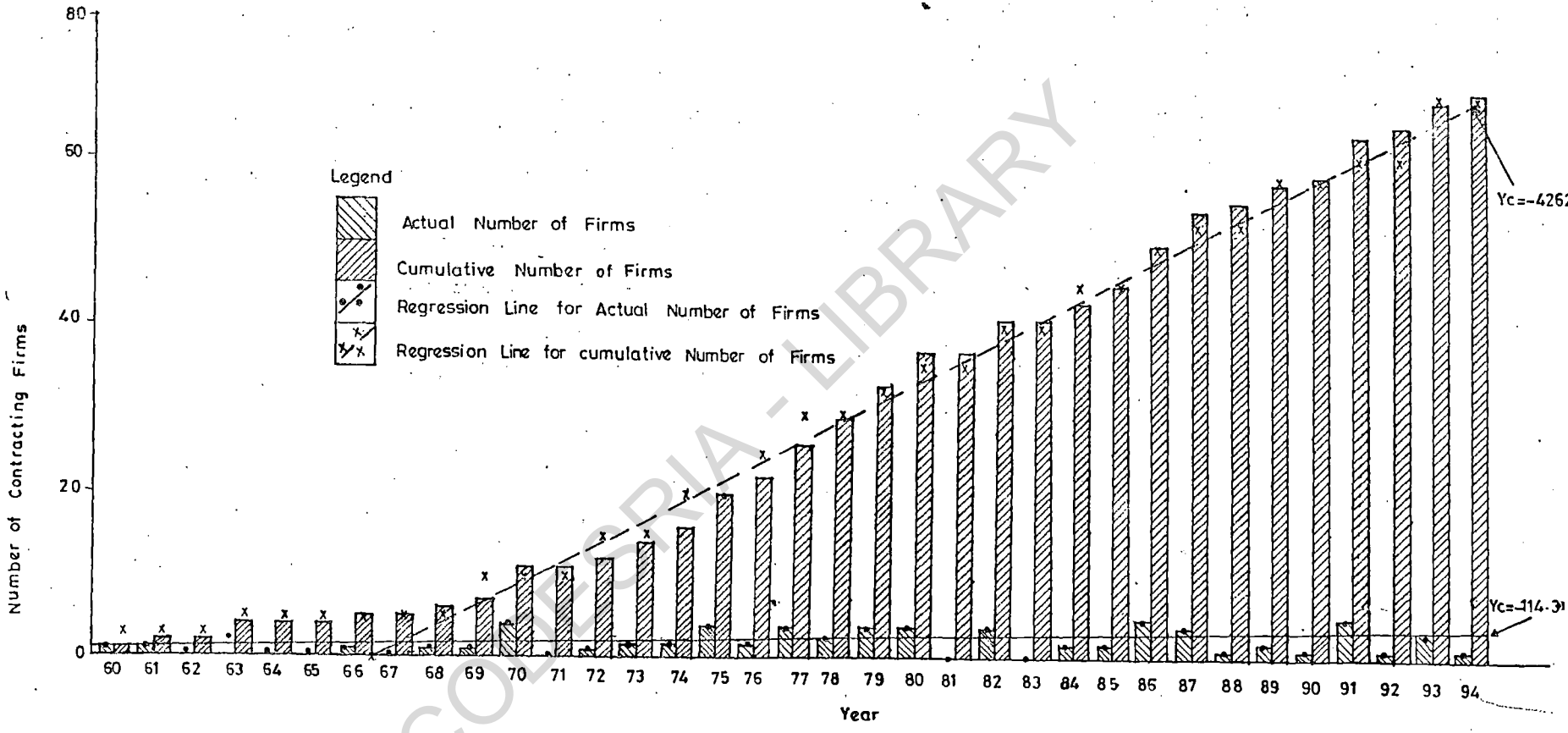


Fig. 4.1: Temporal trend in the number of contractors adopting production subcontracting

Source: Author's Analysis, 1996

in Nigeria is significant. Table 4.2 which is the result of a regression/ correlation analysis using the actual number of adopters in each year, shows that R is 0.37925 while R^2 is 0.14383. The level of significance is as low as 0.02 percent.

Table 4.1: Summary of the Linear Correlation/Regression Analysis for the Cumulative Number of Contractors

Variable	B	Standard Error of B	T	Level of Significance	R	R^2
Cumulative Number of Contractors	2.170868	0.066739	32.528	0.0001	0.98476	0.96975
Constant	-4262.835294	131.945342	-32.308	0.0001		

Source: Author's Analysis, 1996.

Table 4.2: Summary of the Linear Regression/Correlation Analysis for the Actual Number of Contractors

Variable	b	Standard Error of b	t	Level of Significance	R	R^2
Actual Number of Contractors	0.058824	0.024983	2.355	0.0246	0.37925	0.14383
Constant	-114.351261	49.392582	-2.315	0.0246		

Source: Author's Analysis, 1996.

Table 4.3 shows the growth in the number of subcontractors between 1960 and 1994. Both the actual and cumulative number of subcontractors at the aggregate level and the Lagos region are shown in the table. In addition, the table shows the situation in teh Lagos region as a percentage of the aggregate situation. There are no records showing the number of subcontractors between 1960 and 1962. This is because the contractors could not provide adequate information on the number of subcontractors engaged during this period. The table shows that the number of subcontractors engaged varied between zero and 15. On the average, between 1960 and 1994, the number of subcontractors increased by five each year.

The number of subcontractors which was not more than 2 in any of the years up to 1973 increased to 6 by 1974 and 1979. All of these were found

Table 4.3: Growth in the Number of Production Subcontractors, 1960 - 94

Year	Aggregate		Lagos Region			
	Actual No. of Subcontra-ctors	Cum. No. of Subcontra-ctors	Actual No. of Sub-contractors	% of Actual Aggregate No of Sub-contractors	Cum. No. of Subcontr-actors	% of Actual Aggregate No of Sub-contractors
A	B	C	D	E	F	G
1960	0	0	0	0.0	0	0
1961	0	0	0	0.0	0	0
1962	0	0	0	0.0	0	0
1963	2	2	2	100.0	2	100.0
1964	0	2	0	0.0	2	100.0
1965	0	2	0	0.0	2	100.0
1966	1	3	0	0.0	2	66.7
1967	0	3	0	0.0	2	66.7
1968	1	4	1	100.0	3	75.0
1969	0	4	0	0.0	3	75.0
1970	2	6	1	50.0	4	66.7
1971	0	6	0	0.0	4	66.7
1972	2	8	1	50.0	5	62.5
1973	1	9	1	100.0	6	66.7
1974	6	15	6	100.0	12	80.0
1975	3	18	2	66.7	14	77.8
1976	1	19	0	0.0	14	73.7
1977	6	25	5	83.3	19	76.0
1978	4	29	3	75.0	22	75.9
1979	6	35	6	100.0	28	80.0
1980	6	41	4	66.7	32	78.0
1981	4	45	4	100.0	36	80.0
1982	6	51	4	66.7	40	78.4
1983	4	55	4	100.0	44	80.0
1984	11	66	9	81.8	53	80.3
1985	9	75	9	100.0	62	82.7
1986	8	83	8	100.0	70	84.3
1987	9	92	9	100.0	79	85.9
1988	10	102	8	80.0	87	85.3
1989	9	111	9	100.0	96	86.5
1990	15	126	13	86.7	109	86.5
1991	11	137	11	100.0	120	87.6
1992	13	150	10	76.9	130	86.7
1993	11	161	11	100.0	141	87.6
1994	11	172	7	63.6	148	85.5

Note: Col.D/Col. B x 100 = Col. E; Col.F/Col.C x 100 = Col.G.
Source: Author's Analysis, 1996.

in the Lagos region. By 1984 when the number increased to 11, Lagos region alone had 9 (81.8 percent) subcontractors. All the 9 subcontractors in 1989 were found in the Lagos region, while by 1994 when the number of subcontractors was 11, 7(63.6 percent) were in the Lagos region.

The table further shows that while the number of subcontractors was 2 in 1964, all were within the Lagos region. The number in the Lagos region increased to 3 (75.0 percent) out of the total number of 4 subcontractors by 1969. By 1974, when the number of subcontractors was 15, the share of the Lagos region was 12 (80.0 percent). By 1979, out of the 35 subcontractors, 28(80.0 percent) were in the Lagos region. The share of the Lagos region increased to 53 (80.3 percent) out of the 66 subcontractors by 1984, 96 (86.5 percent) out of 111 by 1989 and 142 (85.5 percent) of the total 172 subcontractors in 1994. It is obvious from the table that the growth in the number of subcontractors was gradual between 1960 and 1983. There has been a much more rapid increase thereafter.

The result of a linear correlation/regression analysis of the trend, shown in Table 4.4, indicates that R is 0.92152, and R^2 is 0.84920. Table 4.5, which is the result of a correlation/regression analysis using the aggregate actual number of subcontractors indicates that R is 0.92143, and R^2 is 0.84904. In the Lagos region,the result of a linear correlation/regression analysis of the trend, shown in Table 4.6, indicates that R is 0.91096, and R^2 is 0.82986.

Table 4.4: Summary of the Linear Correlation/Regression for the Aggregate Cumulative Number of Subcontractors

Variable	b	Standard Error of b	t	Level of Significance	R	R^2
Cum. No. of Subcontractors	4.765546	0.349587	13.632	0.0001	0.92152	0.84920
Constant	-9374.142017	691.141597	-13.563	0.0001		

Source: Author's Analysis, 1996

Table 4.5: Summary of the Linear Correlation/Regression for the Aggregate Actual Number of Subcontractors

Variable	b	Standard Error of b	t	Level of Significance	R	R^2
Actual No. of Subcontractors	0.415966	0.030533	13.632	0.0001	0.92143	0.84904
Constant	-817.251261	60.365282	-13.538	0.0001		

Source: Author's Analysis, 1996

Table 4.6: Summary of the Linear Correlation/Regression for the Cumulative Number of Subcontractors in the Lagos Region

Variable	b	Standard Error of b	t	Level of Significance	R	R^2
Cumulative No. of Subcontractors	4.102801	0.323393	12.687	0.0001	0.91096	0.82986
Constant	-8017.494958	639.357099	-12.624	0.0001		

Source: Author's Analysis, 1996

Table 4.7: Summary of the Linear Correlation/Regression for the Actual Number of Subcontractors in the Lagos Region

Variable	b	Standard Error of B	t	Level of Significance	R	R^2
Actual No. of Subcontractors	0.356583	0.031140	11.451	0.0001	0.89383	0.79893
Constant	-7000.735294	61.564968	-11.382	0.0001		

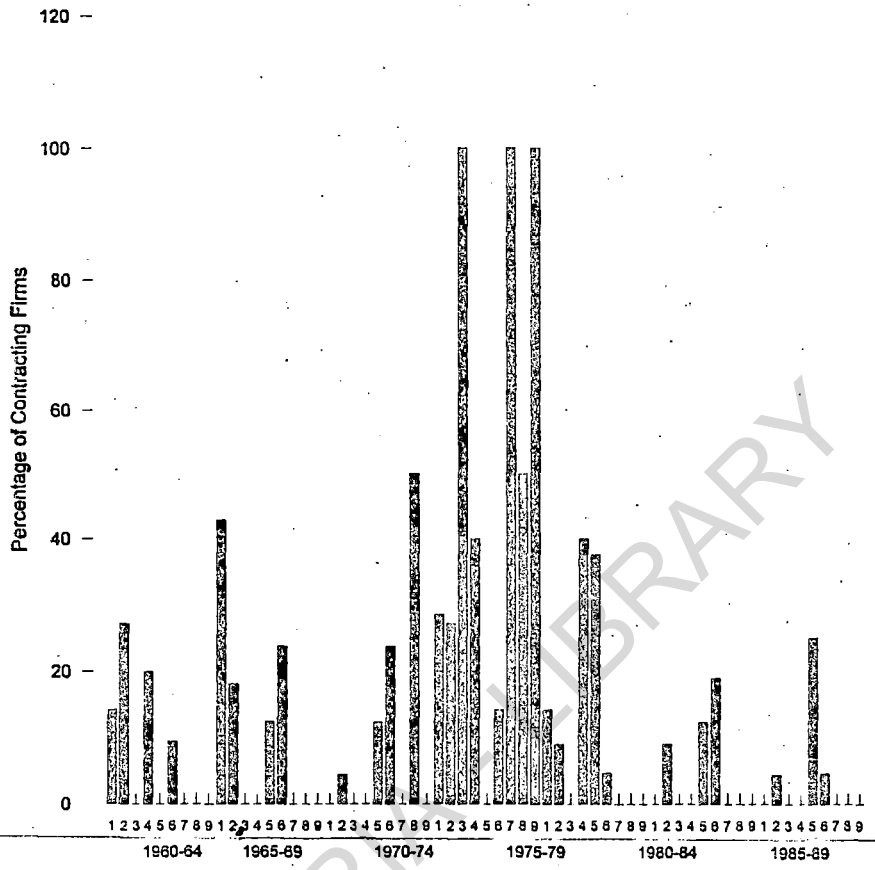
Source: Author's Analysis, 1996

Table 4.7, which is the result of the correlation/regression analysis using the actual number of subcontractors for each of the years shows that R is 0.89383, and R^2 is 0.79893. These results are significant at 0.0001 per cent level. The implication is that the trend in the growth of production subcontractors over time at both the aggregate level and the level of Lagos region is highly significant.

4.1.2 Temporal variation in the adoption of production subcontracting by industry groups

The temporal variation in the adoption of production subcontracting by the industry groups of contractors, figure 4.2, shows that between 1960 and 1964, only four industry groups were involved in production subcontracting. These industry groups were (1) food, beverages and tobacco; (2) chemicals and pharmaceuticals; (3) basic metal, iron and steel and fabricated metal products, and (4) textiles, wearing apparel and leather. The pulp, paper and paper products, printing and publishing industry group featured between 1965 and 1969. Other industry groups did not start production subcontracting until the period between 1975 and 1979.

Table 4.8 shows the percentage of subcontractors that adopted subcontracting in each time period. Before 1970, only 1 (1.5 percent) of the subcontractors in chemicals and pharmaceuticals; 2 (7.7 percent) in pulp, paper



Industry Group.

1 Food, Beverages and Tobacco
2 Chemicals and Pharmaceuticals
3 Domestic and Industrial Plastics and Rubber
4 Basic metal, Iron and Steel and Fabricated Metal
5 Pulp,Paper and Paper Products, Printing and Publishing
6 Textiles,Wearing Apparel and Leather Products
7 Wood and Wood Products (including Furniture)
8 Non-metallic Mineral Products
9 Motor Vehicle and Miscellaneous Assembly

Fig. 4.2: Temporal Trend in the number of Contractors in each Industry Group.

Source: Author's Analysis, 1996.

Table 4.8: Trend in the adoption of subcontracting in each Industry Group, 1960-94

Industry Group	Number adopting in each time period							
	1960-64 (%)	1965-69 (%)	1970-74 (%)	1975-79 (%)	1980-84 (%)	1985-89 (%)	1990-94 (%)	Total
	No	No	No	No	No	No	No	
Food, Beverage and Tobacco	0(0.0)	0(0.0)	2(12.5)	4(25.0)	0(0.0)	8(50.0)	2(12.5)	16
Chemicals and Pharmaceuticals	0(0.0)	1(1.5)	4(6.0)	10(15.0)	13(20.0)	16(24.2)	22(33.3)	66
Domestic and Industrial Plastics and Rubber	0(0.0)	0(0.0)	0(0.0)	0(0.0)	0(0.0)	2(100.0)	0(0.0)	2
Basic metal, Iron and Steel and fabricated metal products	0(0.0)	0(0.0)	1(9.0)	3(27.3)	4(36.4)	0(0.0)	3(27.3)	11
Pulp, Paper and Paper products, Printing and Publishing	2(7.7)	0(0.0)	4(15.4)	0(0.0)	4(15.4)	7(26.9)	9(34.6)	26
Textiles, Wearing Apparel and Leather	0(0.0)	3(7.1)	1(2.4)	3(7.1)	7(16.7)	18(42.9)	10(23.8)	42
Wood and Wood products (including furniture)	0(0.0)	0(0.0)	0(0.0)	1(50.0)	1(50.0)	0(0.0)	0(0.0)	2
Non-Metallic Products	0(0.0)	0(0.0)	0(0.0)	1(25.0)	2(50.0)	1(25.0)	0(0.0)	4
Motor vehicle and Miscellaneous Assembly	0(0.0)	0(0.0)	0(0.0)	0(0.0)	3(100.0)	0(0.0)	0(0.0)	3
Total	2(1.16)	4(2.33)	12(6.98)	22(12.79)	34(19.97)	52(30.23)	46(26.74)	172

Source: Author's Analysis 1996

and paper products, printing and publishing; and 3 (7.1 percent) in textiles, wearing apparel and leather industry groups were involved in production subcontracting. Two other industry groups, 2(12.5 percent) in food, beverages and tobacco; and 1 (9.0 percent) in basic metal, iron and steel and fabricated metal products became involved only in the 1970 to 1974 period. Subcontractors in domestic and industrial plastics and rubber industry group were not involved until the period between 1980 and 1984.

4.2 THE NATURE OF PRODUCTION SUBCONTRACTING

The nature of production subcontracting pertains to the type of subcontracting, items produced, and the types of relationships between contractors and subcontractors.

4.2.1 The nature of production subcontracting

The literature on production subcontracting suggests that whereas complementary subcontracting is common in West European countries such as Italy and France, speciality subcontracting is the predominant form in North America. Table 4.9 shows that the dominant form of subcontracting in Nigeria is speciality subcontracting. Whereas 66 (97.66 percent) of all the contracting firms are involved in speciality subcontracting, only 5 (7.35 percent) of the

TABLE 4.9: Types of Production Subcontracting engaged in by firms in each industry group

Industry Group	Type	
	Speciality Subcontracting No. (%)	Complementary Subcontracting No. (%)
Food, Beverages and Tobacco	7 (100.0)	0 (0.0)
Chemical and Pharmaceuticals	21 (95.45)	1 (4.55)
Domestic and Industrial Plastics and Rubber	1 (100.0)	0 (0.0)
Basic metal, Iron and Steel and Fabricated Metal products	5 (100.0)	0 (0.0)
Pulp, Paper and Paper Products, Printing and Publishing	8 (80.0)	2 (20.0)
Textiles, Wearing Apparel and Leather	20 (90.9)	2 (9.1)
Wood and Wood Products (including furniture)	1 (100.0)	0 (0.0)
Non-metallic Mineral Products	2 (100.0)	0 (0.0)
Motor Vehicle and Miscellaneous Assembly	1 (100.0)	0 (0.0)
Total	66 (97.00	5 (7.35)

Source: Author's Analysis, 1996

firms are involved in complementary subcontracting. None of the firms is involved in cost-saving subcontracting.

While all the industry groups are involved in speciality subcontracting, only three are involved in complementary subcontracting. These are (1) chemicals and pharmaceuticals; (2) pulp, paper and paper products, printing and publishing; and textiles, wearing apparel and leather industry groups. Whereas, only 1 (4.55 percent) of the contractors in chemicals and pharmaceuticals industry group is involved in complementary subcontracting, 2 (20.0 percent) in pulp, paper and paper products, printing and publishing; and 2 (9.1 percent) are involved in textile, wearing apparel and leather industry groups.

4.2.2 Products of subcontracting

The products received by contractors from subcontractors are shown in table 4.10. While all the products in the food, beverages and tobacco industry groups are received from subcontractors in the Lagos region, only plastic crates are received from subcontractors in Ibadan, Ilorin, Kaduna, Kano and Sagamu. In chemicals and pharmaceuticals industry group, in addition to products received from subcontractors within the Lagos region, soaps are received from subcontractors in Ilorin, PVA/Aerosol from Owerri, and industrial carton and starch from Ibadan.

In domestic and industrial plastic and rubber industry group, aluminium plates and plastic components are received from subcontractors within the Lagos region. Whereas translucent sheets, paints and solvents in basic metals iron and steel and fabricated metal products are received from subcontractors within the Lagos region, aluminium coils are produced by subcontractors in Port-Harcourt. Lithocards, print and band, diecutting and dissected cartons, publishing and printing, embossing, prepressing, metal rilming, filming and gold blocking in pulp, paper and paper products, printing and publishing industry group are made by subcontractors within the Lagos region. Publishing and printing are also carried out by subcontractors in Benin and Ibadan.

Table 4.10: Products/Items Received by Contractors from Subcontractors in Lagos and the Rest of Nigeria

Industrial Estate/Area	Food, Beverages and Tobacco						Chemicals and Pharmaceuticals									Domestic/ Industrial Plastic/Rubber		Basic Metal, Iron steel and fabricated metal products		
	1 Bottles	2 Crown Caps	3 Plastic Crates	4 Metal Cans	5 Malt Syrup	6 Labels	7 Plastic Jars/ Bottles	8 Talc/ Sans Cream	9 Drugs	10 Resin	11 Metal Cans/ Drum	12 Soaps	13 PVA/ Aerosol	14 Crown Corks	15 Indus- trial Starch/ Cartons	16 Poly Foils	17 Alumi- nium Plates	18 Plastic Compo- nents	19 Trans- lucent Sheet	20 Paints and Solvent	21 Alumi- nium Coils
A - Benin																					
B - Ibadan			x												x						
C - Ikorudu																					
D - Ilorin			x									x									
E - Jos																					
F - Kaduna			x																		
G - Kano			x																		
H - Lagos	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
I - Owerri													x								x
J - Port-Harcourt																					
K - Sagamu			x																		
L - Sokoto																					
M - Zaria																					

Table 4.10 Contd.

Location of Subcontractors	Pulp, Paper and Paper Products								Textiles, Hearing Apparel and Leather									Wood/ Wood Products (Furniture)	Non-Metallic Mineral Products		Motor Vehicle and Miscellaneous Assembly		
	22 Litho-cards	23 Print and Board	24 Die Cutting/ Disacted Carton	25 Publi-shing and Prin-ting	26 Embo-ssing	27 Pre-pressing	28 Metal Rimming	29 Filming and hold Blocking	30 Spin-nars/ Yarn	31 Tapaulin Meaerials	32 Leather Tanning	33 Dyeing	34 Shoe Fini-shing	35 Buc-kles	36 Chemical/ Nylon Rappers	37 Clothes	38 Scot-hing	39 Foam and Plastic Shells	40 Plastic Contai-ners	41 Cylinder Turner	42 Cover Board	43 Printed Circuit	44 Tin Sheet
A - Benin				x																			
B - Ibadan				x											x			x					
C - Ikorudu									x														
D - Ilorin																							
E - Jos											x												
F - Kaduna																							
G - Kano									x		x												
H - Lagos	x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x	x	x	x
I - Owerri																							
J - Port-Harcourt																							
K - Sagamu																							
L - Sokoto											x												
M - Zaria									x	x													

Note: x indicates the source of products of subcontracting

Source: Author's Analysis, 1996.

In textiles, wearing apparel and leather industry group, while spinnards and yarn are received from subcontractors in Ikorodu, Kano, Lagos and Zaria, tarpaulin materials are received from subcontractors in Zaria only. Leather tanning is carried out by subcontractors in Jos, Kano, Lagos and Sokoto, while chemicals and nylon wrappers are received from subcontractors in Ibadan and Lagos. All other items, such as dyeing, shoe finishing, buckles, clothes and soothing are received from subcontractors within the Lagos region.

Whereas, foam and plastic shells required in the wood and wood products (furniture) industry group are received from subcontractors in Ibadan and Lagos, plastic container and cylinder turner required in non-metallic mineral products industry group are received from subcontractors in Ibadan and Lagos. Also, cover boards, printed circuit, and tin sheet required in motor vehicles and miscellaneous assembly industry group are received from subcontractors within the Lagos region.

Table 4.11 shows the relationship between contractors and subcontrators within Lagos region in terms of the products/items subcontracted. In food, beverages, and tobacco industry group, bottles required by contractors in Ikeja/Ogba/Isheri, Iganmu, Sango/Ota, and Agbara industrial estates/areas are received from subcontractors in Ikeja/

Table 4.11: Products/Items Received by Contractors from Subcontractors within the Lagos Region

Industrial Estate/Area (Destination)	Food, Beverages and Tobacco						Items and their sources: Chemicals and Pharmaceuticals										Domestic/ Industrial Plastic/Rubber		Basic Metal, Iron steel and fabricated metal products		
	1 Bottles	2 Crown Caps	3 Plastic Crates	4 Metal Cans	5 Malt Syrup	6 Labels	7 Plastic Jars/ Bottles	8 Talc/ Sans Cream	9 Drugs	10 Resin	11 Metal Cans/ Drum	12 Soaps	13 PVA/ Aerosol	14 Crown Corks	15 Industrial Starch/ Cartons	16 Poly Foils	17 Aluminium Plates	18 Plastic Components	19 Translucent Sheets	20 Paints and Solvent	21 Aluminium Coils
A - Ikeja/ Ogba/ Isheri	N			A,M	A		G			M	M,A,O,		A		H						
B - Oregun							A,G,N				A,M	O.L			A						
C - Gbagada																					
D - Ikorudu Rd/Ojota				A																	
E - Oshodi/ Agege									N												
F - Matori																					
G - Isolo											M,A			M	A,B	M			E,A		
H - Ilupeju							G,A,N	H			N			A		E					
I - Mushin/ Surulere																			E,M		
J - Yaba																					
K - Ijora																					
L - Iganmu	N	H							N,B										B	L	
M - Sango/ Ota	N	H													E,O,A		M	M			
N - Agbara	A,M,N	H	L			G	A,G,M	A,B,L M,N, F,G			N										
O - Apapa/ Tin Can Island																			E,A		

Table 4.11 Contd.

Location of Subcontractors	Pulp, Paper and Paper Products								Textiles, Wearing Apparel and Leather								Wood/ Wood Products (Furniture)	Non-Metallic Mineral Products		Motor Vehicle and Miscellaneous Assembly		
	22 Litho-cards	23 Print and Board	24 Die Cutting/ Disacted Carton	25 Publi-shing and Prin-ting	26 Embo-ssing	27 Pre-pressing	28 Metal Riamming	29 Filming and nold Blocking	30 Spin-nards/ Yarn	31 Tapaulin Materials	32 Leather Tanning	33 Dyeing	34 Shoe Fini-shing	35 Buk-kles	36 Chemical/ Nylon Rappers	37 Clothes	38 Soot-hing	39 Foam and Plastic Shells	40 Plastic Contai-ners	41 Cylinder Turner	42 Cover Board	43 Printed Circuit	44 Tin Sheet
A - Ikeja/ Ogba/ Isheri			E	H,A, I,B				J	L			G				E,L	A						
B - Oregun				H,A				J															
C - Gbagada																							
D - Ikorudo Rd/ Ojota													H,L										
E - Oshodi/ Agege			E						E,I H,A											A,H			
F - Matori																			F,N				
G - Isolo									E,L G,A														
H - Ilupeju	J	J		H,F,E	K,G	H	H	H	H,I,A			A				G,A,H	H						
I - Mushin/ Surulere									A,E														
J - Yaba																							
K - Ijora									L														
L - Iganmu/ CBD									G,A	O		O		O		L							
M - Sango/ Ota									H			O									H	J	D
N - Agbara																							
O - Apapa/ Tin can Isalnd																							

Note: A to O indicates the sources of products of subcontracting

Source: Author's Analysis, 1996.

Ogba/Isheri, Sango/Ota, and Agbara industrial estates/areas. Crown caps required by contractors in Iganmu, Sango/Ota, and Agbara industrial estates/areas are received from subcontractors in Sango/Ota industrial estate.

Plastic crates required by contractors in Agbara industrial estate/area are received from subcontractors in Iganmu industrial estate/area. Whereas metal cans required by contractors in Ikeja/Ogba/ Isheri and Ikorodu road/Ojota industrial estates/areas are received from subcontractors in Ikeja/Ogba/Isheri and Sango/Ota industrial estates/areas, malt syrup required by contractors in Ikeja/Ogba/Isheri industrial estate/ area are received from subcontractors within the estate. Labels required by contractors in Agbara industrial estate/area are received from sub-contractors located in Isolo industrial estate/area.

In chemicals and pharmaceuticals industry group, plastic jar/bottles required by contractors in Ikeja/Ogba/Isheri, Oregun, Ilupeju and Agbara industrial estates/areas are received from subcontractors located in Ikeja/Ogba/Isheri, Isolo, Sango/Ota and Agbara industrial estates/areas. Whereas, the talc/sans cream required by contractors in Ilupeju and Agbara industrial estates/areas are received from subcontractors located in Ikeja/Ogba/Isheri, Oregun, Isolo, Iganmu, Matori, Sango/Ota and Agbara

industrial estates/areas, drugs required by contractors in Oshodi/Agege and Iganmu industrial estates/areas are received from subcontractors located in Oregun and Agbara industrial estates/areas. Metal cans required by contractors in Ikeja/Ogba/Isheri, Oregun, Isolo, Ilupeju, and Agbara industrial estates/areas are received from subcontractors located in Ikeja/Ogba/Isheri, Sango/Ota, Agbara and Apapa/Tin Can Island industrial estates/areas.

In pulp, paper and paper products industry group, publishing and printing services required by contractors in Ikeja/Ogba Isheri, Oregun and Ilupeju industrial estates/areas are provided by subcontractors in Ikeja/Ogba/Isheri, Oregun, Ilupeju, Oshodi/Agege, Matori, and Mushin/ Surulere industrial estates/areas. Spinnards/yarns required by contractors in the textiles, wearing apparel and leather industry group in Ikeja/Ogba/ Isheri, Oshodi/Agege, Isolo, Ilupeju, Mushin/Surulere Ijora, Iganmu and Sango/Ota industrial estates/areas are received from subcontractors in Ikeja/Ogba/Isheri, Oshodi/Agege, Isolo, Ilupeju, Mushin/Surulere, and Iganmu industrial estates/areas.

While foam and plastic shells required by contractors in the wood and wood products industry group in Ilupeju industrial estate/area are received from subcontractors within the estate, plastic containers, and

cylinder turner required by contractors in non-metallic mineral products industry group in Oshodi/Agege, and Matori indutrial estates/areas are received from subcontractors located in Ikeja/Ogba/Isheri, Matori, Ilupeju, and Agbara industrial estates/areas. Cover boards, printed circuit, and tin sheets required by contractors in the motor vehicle and miscellaneous assembly industry group in Sango/Ota industrial estate/area are received from subcontractors located in Ikorodu road/Ojota, Yaba and Sango/Ota industrial estates/areas.

4.2.3 Types of relationships between contractors and subcontractors

The types of the relationships between contractors and sub-contractors defined in terms of branch subcontractors, subsidiary subcontractors, independent subcontractors, and former-employee subcontractors (see literature) is shown in Table 4.12. The dominant form of relationship is independent subcontracting. A total of 155 (90. 12 percent) of all the subcontractors are independent subcontractors, 11 (6.39 percent) are branch subcontractors while 5 (2.91 percent) and 1 (0.58 percent) are subsidiary subcontractors and former – employee sub-contractors respectively.

Table 4.12: Types of Subcontracting Relationships

Industry Group	Type of Relationship: Branch Subcontractor No	(%)	Subsidiary Subcontractor No	(%)	Independent Subcontractor No	(%)	Former Employee Subcontractor No	(%)
Food, Beverages and Tobacco	0	(0.0	0	(0.0)	16	(100.0)	0	(0.0)
Chemicals and Pharmaceuticals	1	(1.52)	2	(3.03)	63	(95.45)	0	(0.0)
Domestic and Industrial Plastics and Rubber	0	(0.0)	0	(0.0)	2	(100.0)	0	(0.0)
Basic Metal, Iron and Steel and Fabricated Metal	2	(18.18)	0	(0.0)	9	(81.82)	0	(0.0)
Pulp, Paper and Paper Products, Printing and Publishing	2	(7.69)	1	(3.85)	22	(84.62)	1	(3.85)
Textiles, Wearing Apparel and Leather	6	(14.29)	2	(4.76)	34	(80.99)	0	(0.0)
Wood and Wood Products (including furniture)	0	(0.0)	0	(0.0)	2	(100.0)	0	(0.0)
Non metallic mineral Products	0	(0.0)	0	(0.0)	4	(100.0)	0	(0.0)
Motor Vehicle and Miscellaneous Assembly	0	(0.0)	0	(0.0)	3	(100.0)	0	(0.0)
Total	11	(6.39)	5	(2.91)	155	(90.12)	1	(0.58)

Source: Author's Analysis, 1996

All the subcontractors in food, beverages and tobacco; domestic and industrial plastics and rubber; wood and wood products (including furniture); non-metallic mineral products; and motor vehicles and miscellaneous assembly industry groups are independent subcontractors. There is only 1(1.52 percent) branch subcontractor in chemicals and pharmaceuticals industry group. The number of branch subcontractors is 2(18.18 percent) in basic metal, iron and steel and fabricated metal products; 2(7.69 percent) in pulp, paper and paper products, printing and publishing; and 6(14.29 percent) in textiles, wearing apparel and leather industry groups.

While there are 2(3.03 percent) subsidiary subcontractors in chemicals and pharmaceuticals industry group, there is only 1(3.85 percent) subsidiary subcontractor in pulp, paper and paper products, printing and publishing; and 2(4.76 percent) in textiles, wearing apparel and leather industry groups. There is only 1(3.85 percent) former-employee subcontractor in pulp, paper and paper products, printing and publishing industry group.

Table 4.13 shows the categorisation of subcontractors in the Lagos region. While 137 (92.52 percent) of the subcontractors are independent subcontractors, 9(6.08 percent) are branch subcontractors, 1(0.68 percent)

Table 4.13: Types of Subcontracting Relationships between Contractors and Subcontractors in the Lagos Reg

Industry Group	Types of Relationship							
	Branch Subcontractor		Subsidiary Subcontractor		Independent Subcontractor		Former-Employee Subcontractor	
	No	(%)	No	(%)	No	(%)	No	(%)
Food and Beverages And Tobacco	0	(0.0)	0	(0.0)	15	(100.0)	0	(0.0)
Chemicals and Pharmaceuticals	0	(0.0)	1	(1.82)	54	(98.18)	0	(0.0)
Domestic and Industrial Plastics and Rubber	0	(0.0)	0	(0.0)	3	(100.0)	0	(0.0)
Basic Metal, Iron and Steel and Fabricated Metal	1	(10.0)	0	(0.0)	9	(90.0)	0	(0.0)
Pulp, Paper and Paper Products, Printing and Publishing	2	(8.33)	0	(0.0)	21	(87.5)	1	(4.17)
Textiles, Wearing Apparel and Leather	6	(18.18)	0	(0.0)	27	(81.82)	0	(0.0)
Wood and Wood Products (including furniture)	0	(0.0)	0	(0.0)	1	(100.0)	0	(0.0)
Non metallic mineral Products	0	(0.0)	0	(0.0)	4	(100.0)	0	(0.0)
Motor Vehicle and Miscellaneous Assembly	0	(0.0)	0	(0.0)	3	(100.0)	0	(0.0)
Total	9	(6.08)	1	(0.68)	137	(92.57)	1	(0.68)

Source: Author's Analysis, 1996

each is a subsidiary subcontractor, and former-employee subcontractor. There are 2(8.33 percent) and 6(18.18 percent) branch subcontractors in pulp, paper and paper products, printing and publishing; and textiles, wearing apparel and leather industry groups respectively. There is only 1(1.82 percent) subsidiary subcontractor in chemicals and pharmaceuticals; and 1(4.17 percent) former-employee sub-contractor in pulp, paper and paper products, printing and publishing industry groups.

4.3 SCOPE OF PRODUCTION SUBCONTRACTING

The scope of production subcontracting pertains to the number of subcontractors engaged, the percentage of total industrial production accounted for by production subcontracting, and the distances over which subcontracting linkage is carried out.

4.3.1 Number of subcontractors engaged

Table 4.14 shows that the number of subcontractors engaged by any given contractor ranges from one to four. Over fifty percent of the contractors engage the services of a maximum of two subcontractors. Only 12 (17.65 percent) and 19(27.94 percent) of the contractors engage the services of three and four subcontractors respectively.

Table 4.14: Number of Subcontractors Engaged by Contracting Firms

Industry Group	Number of Subcontractors			
	1	2	3	4
	No (%)	No (%)	No (%)	No (%)
Food, Beverages and Tobacco	2 (28.57)	2 (28.57)	2 (28.57)	4 (14.29)
Chemicals and Pharmaceuticals	2 (9.09)	5 (22.73)	6 (27.27)	9 (40.91)
Domestic and Industrial Plastics and Rubber	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)
Basic metal, Iron and Steel and Fabricated Metal Products	0 (0.0)	4 (80.0)	1 (20.0)	0 (0.0)
Pulp, Paper and Paper Products, Printing and Publishing	2 (25.0)	0 (0.0)	0 (0.0)	6 (75.0)
Textiles, Wearing Apparel and Leather Products	8 (38.1)	8 (38.1)	2 (9.52)	3 (14.29)
Wood and Wood Products (including furniture)	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)
Non-metallic Mineral Products	0 (0.0)	2 (100.0)	0 (0.0)	0 (0.0)
Motor Vehicle and Miscellaneous	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)
Total	14 (20.59)	23 (33.84)	12 (17.65)	19 (27.94)

Source: Author's Analysis, 1996

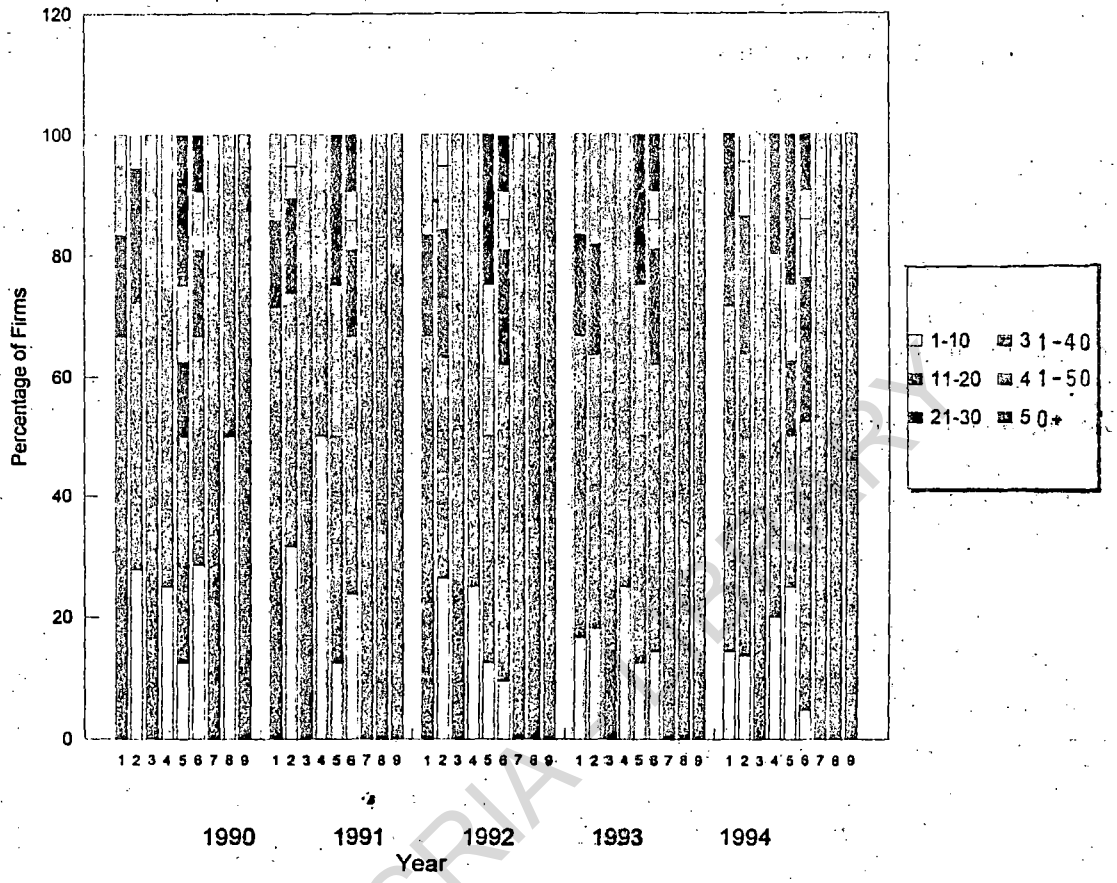
In food, beverages and tobacco industry group, while 2(28.57 percent) contractors each engage the services of one, two and three sub-contractors, 4(14.29 percent) contractors engage the services of four subcontractors. In chemicals and pharmaceuticals industry group, while 2(9.09 percent) contractors engage the services of only one subcontractor each, 5(22.73 percent) contractors engage the services of two subcontractors each, 6(27.27 percent) and 9(40.91 percent) contractors engage the services of three and four subcontractors respectively.

In textiles, wearing apparel and leather industry group, 8(38.1 percent) contractors engage the services of one subcontractor each. Another 8(38.1 percent) contractors engage the services of two subcontractors each while 2(9.52 percent) engage the services of three subcontractors each, and 3(14.29 percent) contractors engage the services of four subcontractors each. On the average, each of the contractors in this industry group engages the services of three subcontractors.

4.3.2 Percentage of total production accounted for by production subcontracting

Figure 4.3 shows that it is only in motor vehicles and miscellaneous assembly industry group that production subcontracting accounted for more than thirty percent of the total costs of production by the contracting firms in any of the years. Production subcontracting accounted for about twenty percent of the total costs of production in the other industry groups in any one year.

In spite of the generally low level of the total costs of production accounted for by production subcontracting, a few of the industry groups show evidence of improved subcontracting activities over the years. For instance, in chemicals and pharmaceutical industry group, the number of firms where the percentage of total costs of production accounted for by production subcontracting is more than 20 percent increased from 4(27.77 percent) in 1990 to 7(36.37 percent) by 1994. Similarly, in textile, wearing apparel and leather industry group, the number of contracting firms where the percentage of total costs of production accounted for by production subcontracting is more than 20 percent increased from 7(33.33 percent) in 1990 to 10(47.62 percent) by 1994.



Industry Group.

1 Food, Beverages and Tobacco
2 Chemicals and Pharmaceuticals
3 Domestic and Industrial Plastics and Rubber
4 Basic metal, Iron and Steel and Fabricated Metal
5 Pulp,Paper and Paper Products, Printing and Publishing
6 Textiles,Wearing Apparel and Leather Products
7 Wood and Wood Products (including Furniture)
8 Non-metallic Mineral Products
9 Motor Vehicle and Miscellaneous Assembly

Fig 4.3: Percentage of Total Costs of Production Accounted for by Production Subcontracting.

Source: Author's Analysis, 1996.

4.3.3 Distances over which subcontracting is carried out

The distances over which subcontracting is carried out shown in Table 4.15, indicate that 144(83.72 percent) of the subcontractors are located between 1 and 40 kilometres from the contractors. While all the industry groups subcontract within this range, six of the industry groups subcontract to locations beyond forty kilometres. These industry groups are food, beverages and tobacco; chemicals and pharmaceuticals; basic metal, iron and steel and fabricated metal products industry groups. Others are pulp, paper and paper products, printing and publishing; wood and wood products (including furniture) and textiles, wearing apparel and leather industry groups. In fact, subcontracting linkage, in some instances, is carried out at distances beyond two hundred kilometres. However, only 28(16.28 percent) of the subcontractors are located at distances more than 200 kilometres from the contractors.

Table 4.16, shows that 49(33.11 percent) of the subcontractors, in the Lagos region, are located at distances not more than 5 kilometres from the contractors, and 30(20.27 percent) at distances between 6 and 10 kilometres. This implies that over 50 percent of the subcontractors are located at distances not more than 10 kilometres away from the contractors. While some 21(14.19 percent) of the subcontractors are

Table 4.15: Distances over which Subcontracting is Carried Out

Industry Group	Distance (Km)					
	1-40 (%)	41-80 (%)	81-120 (%)	121-160 (%)	161-200 (%)	200 + (%)
Food, Beverages and Tobacco	15 (93.75)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (6.25)
Chemicals and Pharmaceuticals	53 (80.30)	5 (7.58)	0 (0.0)	3 (4.55)	0 (0.0)	5 (7.58)
Domestic and Industrial Plastics and Rubber	2 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Basic metal, Iron and Steel and Fabricated Metal Products	10 (90.91)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (9.09)
Pulp, Paper and Paper Products, Printing and Publishing	24 (92.31)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.85)
Textiles, Wearing Apparel and Leather Products	32 (76.19)	1 (2.38)	0 (0.0)	0 (0.0)	0 (0.0)	9 (21.43)
Wood and Wood Products (including furniture)	1 (50.0)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)	0 (0.0)
Non-metallic Mineral Products	4 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Motor Vehicle and Miscellaneous	3 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	144(83.72)	6(3.49)	0 (0.0)	5 (2.91)	0 (0.0)	17 (9.88)

Source: Author's Analysis, 1996.

Table 4.16: Distances over which Subcontracting is Carried Out Within the Lagos Region.

	Distance (km)						
Industry Group	0 – 5 (%)	6 – 10 (%)	11 – 15 (%)	16 – 20 (%)	21–25 (%)	26–30 (%)	30+ (%)
Food, Beverages and Tobacco	5 (33.3)	1 (6.67)	0 (0.0)	1 (6.67)	4 (26.7)	2 (13.3)	2 (13.3)
Chemicals and Pharmaceuticals	13 (23.64)	6 (11.00)	7 (12.73)	9 (16.36)	2 (3.64)	11 (20.0)	7 (12.73)
Domestic and Industrial Plastics and Rubber	1 (33.3)	2 (66.7)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Basic metal, Iron and Steel and Fabricated Metal Products	3 (30.0)	4 (40.0)	0 (0.0)	0 (0.0)	1 (10.0)	2 (20.0)	0 (0.0)
Pulp, Paper and Paper Products, Printing and Publishing	9 (37.5)	5 (20.83)	3 (12.5)	2 (8.33)	1 (4.17)	4 (16.67)	0 (0.0)
Textiles, Wearing Apparel and Leather Products	14 (42.42)	12 (36.36)	6 (18.18)	0 (0.0)	0 (0.0)	1 (3.03)	0 (0.0)
Wood and Wood Products (including furniture)	0 (0.0)	0 (0.0)	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Non-metallic Mineral Products	3 (75.0)	0 (0.0)	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
Motor Vehicle and Miscellaneous	1 (33.33)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (33.33)	1 (33.33)
Total	49 (33.11)	30 (20.27)	17 (11.49)	13 (8.78)	8 (5.41)	21 (14.19)	10 (6.76)

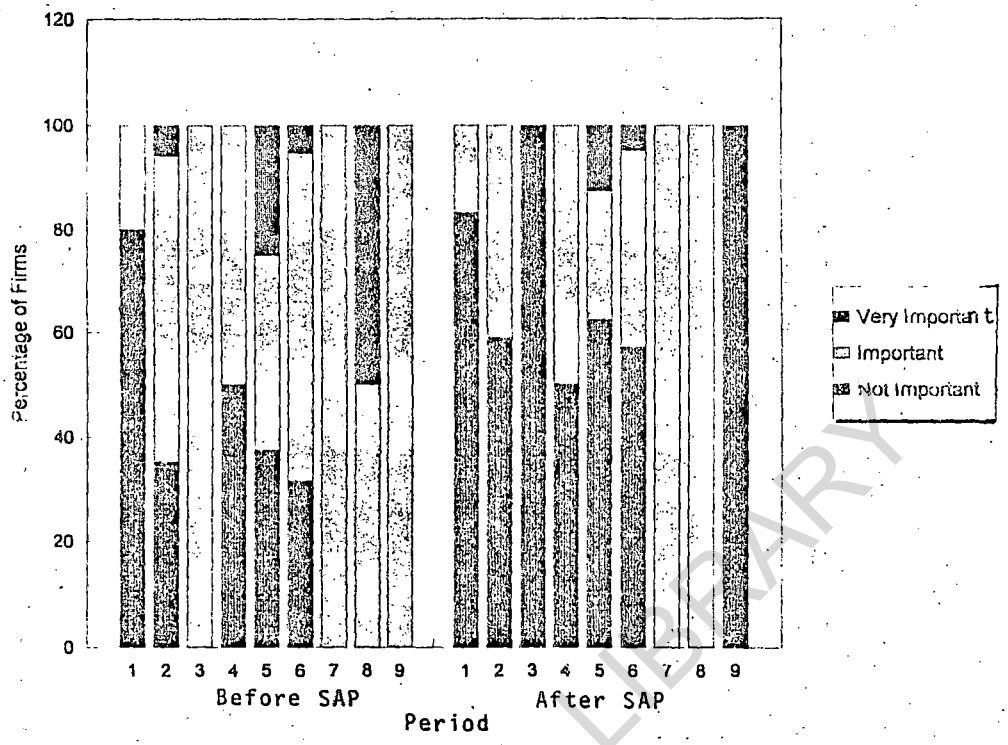
Source: Author's Analysis, 1996

located at distances between 26 and 30 kilometres, 10 (14.19 percent) are located at distances above 30 kilometres. It is only in food, beverages and tobacco, chemicals and pharmaceuticals; and motor vehicles and miscellaneous assembly industry groups that subcontractors are located at distances above 30 kilometres. It is obvious from the foregoing that subcontracting is mainly carried out over short distances.

4.4 PERCEIVED SIGNIFICANCE OF PRODUCTION SUBCONTRACTING

The perceived significance of production subcontracting analysed in this section, is based on the responses of officials of the 68 contracting firms in the study area, Lagos region. Figure 4.4 shows that production subcontracting became very important after the introduction of the Structural Adjustment Programme (SAP) in Nigeria. Only 5(55.5 percent) of the industry groups perceived production subcontracting as very important before SAP. The level of importance in these industry groups range from 32 percent in textile, wearing apparel and leather industry group to as much as 80 percent in the food, beverages and tobacco industry group.

The situation after the introduction of SAP is such that 7(77.78 percent) of the industry groups indicate that production subcontracting is very important.

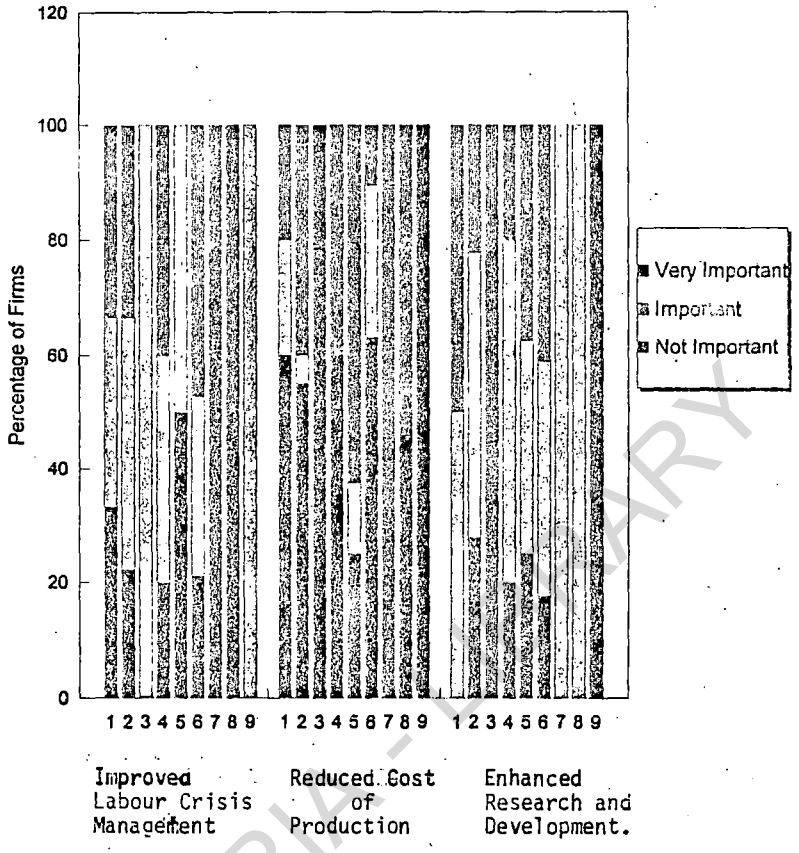


Industry Group.

1 Food, Beverages and Tobacco
2 Chemicals and Pharmaceuticals
3 Domestic and Industrial Plastics and Rubber
4 Basic metal, Iron and Steel and Fabricated Metal
5 Pulp,Paper and Paper Products, Printing and Publishing
6 Textiles,Wearing Apparel and Leather Products
7 Wood and Wood Products (including Furniture)
8 Non-metallic Mineral Products
9 Motor Vehicle and Miscellaneous Assembly

Fig. 4.4: Significance of production Subcontracting Before and After the Introduction of the Structural Adjustment Programme (SAP) in Nigeria.

Source: Author's Analysis, 1996.



Some Basic Aspects of Firm's Operation/Management

Industry Group.

1 Food, Beverages and Tobacco
2 Chemicals and Pharmaceuticals
3 Domestic and Industrial Plastics and Rubber
4 Basic metal, Iron and Steel and Fabricated Metal
5 Pulp,Paper and Paper Products, Printing and Publishing
6 Textiles,Wearing Apparel and Leather Products
7 Wood and Wood Products (including Furniture)
8 Non-metallic Mineral Products
9 Motor Vehicle and Miscellaneous Assembly

Fig. 4.5: Perceived Usefulness of Production Subcontracting

Source: Author's Analysis, 1996

The level of importance in these industry groups ranges from 50 percent in basic metals, iron and steel and fabricated metals industry group to as much as 100.0 percent in motor vehicles and miscellaneous assembly industry group. The level of importance is 50.0 percent in chemicals and pharmaceuticals, and 63.57 percent in pulp, paper and paper products, printing and publishing industry groups.

Figure 4.5 shows that production subcontracting is perceived as most useful in reducing the costs of production, while it is perceived as less useful at improving labour crisis management and the enhancement of research and development (R and D). The foregoing analysis tends to support the assertion in the literature that production subcontracting increases during downturns in an economy.

4.5 THE VOLUME OF PRODUCTION SUBCONTRACTING

The volume of production subcontracting examined in this section is measured in terms of the monetary value of transactions between subcontracting partners.

4.5.1 Temporal variation in the volume of production subcontracting

Table 4.17 shows that the volume of production subcontracting for the five year period is about ₦2.0 billion. Lagos region accounts for 73.33 percent. Whereas the aggregate volume of production subcontracting was ₦191,372,930 in 1990, it increased to ₦697,429,186 by 1994. This represents 264.43 percent increase within the five year period.

In the Lagos region, the volume of production subcontracting which was ₦127,251,530 in 1990 increased to ₦527,251,000 by 1994. This shows that the volume of production subcontracting in the Lagos region increased by 314.35 percent during this period. The implication of this is that the increase in the volume of production subcontracting is more in the Lagos region than in the whole country.

Table 4.17: Temporal Variation in the Volume (₦) of Production Subcontracting

Year	Volume (₦) of Production Subcontracting		
	Aggregate Volume	Volume in the Lagos Region	% of the Aggregate in Lagos Region
1990	191,372,930	127,251,530	66.49
1991	232,319,575	149,438,675	64.32
1992	354,189,806	262,867,606	74.22
1993	466,565,734	357,273,934	76.58
1994	697,429,186	527,251,000	75.60
Total	1,941,877,231	1,424,082,745	73.33

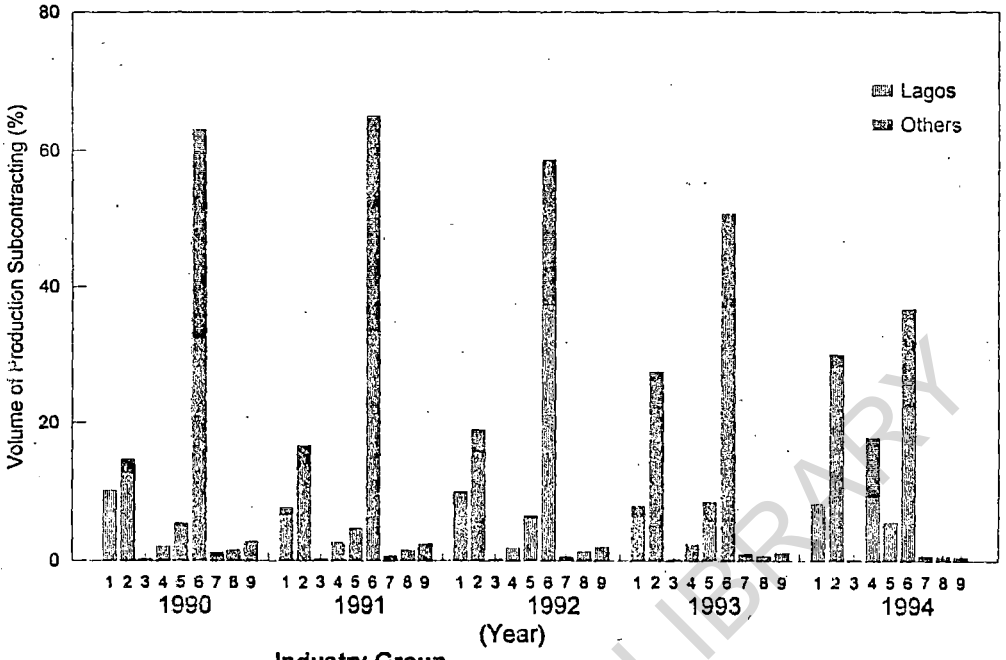
Source: Author's Analysis, 1996

Lagos region accounts for more than 60 percent of the aggregate volume of production subcontracting in any of the years. In addition the volume of production subcontracting in the Lagos region expressed as a percentage of the aggregate total increased from 66.49 percent in 1990 to 75.60 percent by 1994.

4.5.2 Variation among the industry groups

Figure 4.6 shows the temporal variation in the volume of production subcontracting among industry groups. Textiles, wearing apparel and leather industry group accounted for remarkably high percentage of the volume of production subcontracting in each of the years. For instance, in 1990, this industry group accounted for 63.14 percent out of which Lagos region accounted for 32.37 percent. By 1992, when the volume of production subcontracting in this industry group was ₦151,074,294 (63.05 per cent of the total) the Lagos region accounted for 33.47 per cent, and by 1994 when this industry group accounted for ₦255,981,337 the share of the Lagos region was 22.47 percent.

The volume of production subcontracting in chemicals and pharmaceuticals industry group, next in importance, was not more than 30.0 percent of the aggregate volume in any of the years. Whereas chemicals and pharmaceuticals industry group accounted for 14.68 percent of the aggregate volume of



Industry Group.

1 Food, Beverages and Tobacco
2 Chemicals and Pharmaceuticals
3 Domestic and Industrial Plastics and Rubber
4 Basic metal, Iron and Steel and Fabricated Metal
5 Pulp,Paper and Paper Products, Printing and Publishing
6 Textiles,Wearing Apparel and Leather Products
7 Wood and Wood Products (including Furniture)
8 Non-metallic Mineral Products
9 Motor Vehicle and Miscellaneous Assembly

Fig. 4.6: Variation in the Volume of Production Subcontracting Amongst Industry Group.

Source: Author's Analysis, 1996

production subcontracting in 1990, Lagos region accounted for 12.78 percent. By 1994, when this industry group accounted for 29.94 percent, the share of the Lagos region was 28.17 percent.

Domestic and industrial plastic and rubber industry group accounted for the smallest volume of production subcontracting in any of the years. This industry group accounted for less than 1 percent of the volume of production subcontracting in any of the years. The Lagos region accounted for all the volume of production subcontracting in this industry group in all the years.

4.6 TEMPORAL VARIATION IN THE VOLUME OF PRODUCTION SUBCONTRACTING AMONG CONTRACTING FIRMS

The temporal variation in the volume of production subcontracting among the contracting firms, shown in Table 4.18, indicates that the volume of production subcontracting was less than ₦10 million in 64(94.1 percent) of the firms in 1990 and 1991. The number of firms where the volume of production subcontracting was less than ₦10 million decreased to 57(75.0 percent) in 1993, and 42(61.8 percent) by 1994.

The number of firms where the volume of production subcontracting was between ₦10 and ₦20 million increased from only 3 (4.4 percent) in 1990 to 16(23.5 percent) by 1994. Similarly, the number of firms where the volume

Table 4.18 Temporal Variation in the Volume of Production Subcontracting Among Firms

Volume (₦) of production subcontracting	Year 1990 No (%)	1991 No (%)	1992 No (%)	1993 No (%)	1994 No (%)
< 10,000,000	64 (94.1)	64 (94.1)	57 (83.8)	51 (75.0)	42 (61.8)
10,000,001 – 20,000,000	3 (4.4)	2 (2.9)	8 (11.8)	11 (16.2)	16 (23.5)
20,000,001 – 30,000,000	1 (1.5)	2 (2.9)	2 (2.9)	5 (7.4)	5 (7.4)
30,000,001 – 40,000,000	0 (0.0)	0 (0.0)	0 (0.0)	1 (1.5)	2 (2.9)
40,000,001 – 50,000,000	0 (0.0)	0 (0.0)	1 (1.5)	0 (0.0)	1 (1.5)
50,000,001+	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (2.9)
Total	68 (100.0)	68 (100.0)	68 (100.0)	68 (100.0)	68 (100.0)

Source: Author's Analysis, 1996.

of production subcontracting was between ₦20 and ₦30 million increased from 1(1.5 percent) in 1990 to 5(7.4 percent) by 1994. While only 1(1.5 percent) of the firms had volume of production subcontracting more than ₦30 million in 1992 and 1993, 5(7.4 percent) had more than this amount by 1994. Two of the firms each had the volume of production subcontracting more than ₦50 million in 1994.

In order to test whether or not the volume of production subcontracting varied over the years, a one-way analysis of variance was carried out. This analysis is carried out based on the volume of production subcontracting by each of the 68 contracting firms from 1990 to 1994. The analysis of variance tests if there is "real difference between the means of independent observations and indicates magnitude of such difference" [Witherill, 1967: 263]. The analysis of variance assumes (i) homogeneity of variance throughout the groups, (ii) independence of the observations, and (iii) normality of the errors, that is, errors are uncorrelated.

The one-way analysis of variance "provides an optimal test for trends across categories of an interval-level independent variable" [Kim and Kohout, 1975: 398]. The result of the analysis is displayed in Table 4.19.

Table 4.19: Analysis of Variance (ANOVA) for the Volume of Production Subcontracting

Source of Variation	Df	Sum of Squares	Mean Square	F	Level of Significance
Explained	4	3.1719898E+15	7.929975E+14		
Residual	335	2.5872172E+16	7.723036E+13	10.268	0.0001
Total	339	2.9044162E+16	8.567599E+13		

Source: Author's Analysis, 1996

The result is significant at 0.0001 percent level. This confirms the hypothesis which states that the volume of production subcontracting varies significantly over time. This result tends to confirm Scott's (1983) assertion that production subcontracting increases as economic conditions deteriorate and strong cost cutting measures become imperative.

4.7 DETERMINANTS OF THE VOLUME OF PRODUCTION SUB-CONTRACTING

The determinants of the volume of production subcontracting by the 68 contracting firms are analysed using the stepwise multiple regression model.

4.7.1 Stepwise multiple regression model

The stepwise multiple regression analytical technique is a search procedure for identifying which independent variables, previously thought to be of some importance, actually have the strongest relationship with the dependent variable [Hauser, 1974].

The multiple regression equation is given by

$Y_c = a + b_1X_1 + b_2X_2 + \ldots + b_nX_n + e$

where,

Y_c = the dependent variable,

a = base constant,

$b_1 \ldots b_n$ = regression coefficient of $X_1 \ldots X_n$,

$x_1 \ldots X_n$ = the independent variables, and

e = stochastic disturbance or error term.

The stepwise multiple regression model may be used for prediction or explanation [Blalock 1964, Olsson 1970] and the type of procedure used usually reflects this difference [Hauser, 1974]. When it is used for prediction, the objective is to derive an estimating equation with the emphasis accordingly on maximizing the amount of variation in the dependent variable accounted for by the independent set, that is, maximizing R^2. This is often achieved at the expense of relatively insignificant regression coefficients. Indeed, "explanatory" equations typically give low values of R^2. This is because significance tests on individual coefficients using the t-test are conditional upon the other variables being used in the equation and are, therefore, relatively conservative. Thus, it is commonly argued that one can predict or estimate without necessarily explaining.

Conversely, when the stepwise multiple regression is used for explanation, the emphasis is on individual regression coefficients and on establishing significant relationships, so that the objective is to maximize R^2 subject to significant bi's. Since it is not usually possible or worthwhile to compute all equations, the most common stepwise procedure is forward selection (occasionally backward elimination), which adds variables on the basis of their partial correlations (or t-tests) with the dependent variable, such that at each stage the variable with the highest partial is added to the equation [Hauser 1974]. The procedure continues until no further variables which are significantly non-zero can be added to the equation. The forward selection procedure is used in this study.

4.7.2Choice of variables

There have been no studies that explicitly statistically analyzed the determinants of the volume of production subcontracting. However, a few studies [e.g. Barr and Fairbain, 1978] have identified a number of measurable variables that explain the perception of manufacturers. These are manufactured inputs consumed, sales volume, and intensity of intra-regional inter-industry linkages. Some of these variables may guide the choice of variables here.

The volume of production subcontracting measured in naira, that is the amount of money paid by each contracting firm to its subcontractors in 1994, is the dependent variable. The independent variables are the measurable size and structural characteristics of the contracting firms as provided by the officials. These variables are, (1) age of establishment (years), (2) capital investment (₦), (3) plant-size (floor space m^2), and (4) capacity utilization measured as a percentage of installed capacity of plant. Others are (5) staff strength (employment size), (6) number of years since firm has been involved in production subcontracting, and (7) number of production subcontractors engaged. The choice of these variables is based on the fact that the literature on industrial linkage suggests that the measurable attributes of firms' size are fundamental determinants of the way a manufacturer perceives the production environment. Therefore, there is a sense in which the size and structural characteristics of the firm may be expected to determine the volume of production subcontracting by firms. Information on these attributes of the firms were provided by officials of the firms.

It is expected that firms that have higher scores in any of these variables are likely to be more involved in production subcontracting than firms with lower scores. The basis of this expectation is that larger firms

are likely to produce more than smaller firms. In other words, they are likely to be more interested in cost cutting measures often associated with production subcontracting [Holmes, 1986]. In addition, firms with larger number of employees (workforce) are likely to have organised workers' unions. In order to avoid or reduce unions' encroachment on the prerogative of the management, they are likely to be more engaged in production subcontracting activities, and as such reduce the costs of maintaining large workforce [Sheard, 1983]. Also, increased production subcontracting is used as "a means of collectivising work tasks so as to avoid the heavy cost penalties incurred in the partial or inefficient use of capital" [Scott, 1983:121].

4.7.3 Test for multicollinearity

The multiple regression model, like any other statistical technique, makes some basic assumptions. These assumptions are that there should be no autocorrealtion, multicollinearity, homoscedasticity, and that the samples are randomly selected from the total population. Other assumptions are that the data set are normally randomly distributed, and that the independent variables are measured error free.

In general terms, some of these assumptions are assumed to be met when the model is being used [Gould, 1970, Koutsoyiannis 1973]. However, the problem of multicollinearity, if present in the data, must be corrected. This is necessary because multicollinearity impairs the efficiency of the regression model when it is used for explanatory purposes [Farrar and Glauber, 1967; Haitovsky, 1969; Poole and Farrel, 1971; and Hauser, 1974]. Multi-collinearity exists among the independent variables where the pairwise correlation is more than 0.8 [Hauser, 1974].

Two ways of resolving the problem of multicollinearity are:

(1) Ideally, new data on the relevant variables should be obtained, or *a priori* estimates of some of the parameters should be incorporated into the analysis [Gouldberger, 1964], but commonly neither of these solutions is possible [Hauser, 1974].

(2) One of a pair of variables which are collinear is excluded from consideration, this is the so-called "zero-restriction".

Clearly, such a procedure can be based only on pairwise correlations. The main problem concerns which variable to exclude and the consequent possibility of specification bias [Hamburg, 1977]. Table 4.20 shows the correlation matrix between the dependent variable (Y) and the independent variables (X_1 to X_7) on the one hand, and amongst the independent

Table 4.20: Correlation Matrix Amongst the Variables

	Variable	Y	X_1	X_2	X_3	X_4	X_5	X_6	X_7
Y	Volume (₦) of Subcontracting	1.000							
X1	Age of the Establishment	0.178	1.000						
X2	Capital Investment (₦)	0.262	0.177	1.000					
X3	Plantsize (floor space)	0.113	-0.097	-0.94	1.000				
X4	Capacity Utilization (%)	-0.091	-0.264	-0.200	0.079	1.000			
X5	Staff Strength (workforce)	0.359	0.158	0.268	0.040	0.281	1.000		
X6	Number of years since firms started production subcontracting	0.261	-0.638	-0.026	-0.022	0.006	-0.171	1.000	
X7	Number of Subcontractors engaged	0.061	0.264	0.117	0.212	-0.196	-0.011	-0.328	1.000

Source: Author's Analysis, 1996

variables on the other. The correlations between the dependent variable and the independent variables are low. The highest is 0.36 between the volume of production subcontracting and staff strength (workforce). However, the table shows that there is no problem of multicollinearity amongst the independent variables. The implication of this is that all the independent variables can be included in the regression model. This is because, the efficiency of the regression model in providing the required explanation will not be impaired.

4.7.4 Results and discussion

The result of the stepwise multiple regression analysis in Table 4.21 shows that only one step is possible in the stepwise multiple regression analysis. The criterion for selecting the variables in the analysis is set at 0.05 percent tolerance range.

As expected, plant size (floor space), capacity utilization, and staff strength are not significant in explaining the volume of production subcontracting. Even the other variables which are expected to significantly explain the volume of production subcontracting are not significant. The R is 0.41630, while R^2 is 0.17330. This shows that the size and structural characteristics of firms explain only 17 percent of the

Table 4.21 Summary of the Stepwise Multiple Regression Model

Step	Variable Description	b	Stabdard Error of b	t	Level of Significa-nce	R	R^2
1	Number of Subcontractors	3791906.8714	1775169.082	2.136	0.0368	0.41630	0.17330
	Staff Strength	12397.373997	8016.119093	1.547	0.1272		
	Plantsize (Floorspace)	-43.120948	79.934388	-0.539	0.5916		
	Capital Investment	0.004918	0.0044324	1.137	0.2599		
	Age of Establishment	-314849.0932	253919.7149	-1.240	0.2198		
	Capacity Utilization	57198.037396	104918.9881	0.545	0.5877		
	Number of Years since Firms have been involved in production subcontracting	197449.97176	286248.4035	0.690	0.4930		
	(Constant)	-13138536.56	29463734.30	-0.446	0.6573		

Source: Author's Analysis, 1996

volume of production subcontracting. The overall test of significance of the stepwise multiple regression analysis is as low as 0.1045 or 10 percent. This implies that the result is not statistically significant.

In conclusion, the hypothesis which states that there is a significant relationship between the volume of production subcontracting and the size and structural characteristics of firms is thus rejected. In other words, there is no siginificant relationship between the volume of production subcontracting and the size and structural characteristics of contracting firms. This suggests that the networks of interfirm relationships through production subcontracting is not significantly related to the size and structural characteristics of the firm.

The interest has been to determine whether or not there is a significant relationship between the volume of production subcontracting and the size and structural characteristics of firms. This result shows that there is no significan relationship between the volume of production subcontracting and the size and structural characteristics of firms. It is possible that some other variables such as the nationality of firm's owner may be significantly related to the volume of production subcontracting.

Giving the fact that industrialization in Nigeria is still at the early stage, one may expect that the nationality of a firm's owner i.e. whether local or foreign may have a significant relationship with the volume of production subcontracting. Other things being equal, a foreign-owned firm may be more involved in production subcontracting. This may be so because the 'main' company may have successfully been involved in such a corporate strategy in the home country or any other part of the world.

CHAPTER FIVE

SPATIAL PATTERNS OF PRODUCTION SUBCONTRACTING

This chapter examines the spatial distribution of production subcontractors and analyzes the determinants of the spatial distribution of subcontracting activities. Where necessary, the aggregate situation is discussed before the situation within the Lagos region. The only hypothesis tested here is that the locational pattern of production subcontractors is significantly explained by the size and structural characteristics of locations where subcontractors are found.

5.1.1 Spatial Distribution (by Number) of Production Subcontractors

The spatial distribution of production subcontractors from 1990 to 1994 is shown in Figures 5.1 to 5.5. The figures show that subcontractors engaged by the contractors in the Lagos region are concentrated in Lagos, Ikorodu, Sagamu, and Ibadan in the southwest; Jos, Kaduna, Zaria, Kano, and Sokoto in the north and a few other locations such as Benin, Owerri, Port-Harcourt, and Ilorin.

Lagos has the largest concentration of subcontractors in each of the years. For instance, the figures show that out of the total of 149

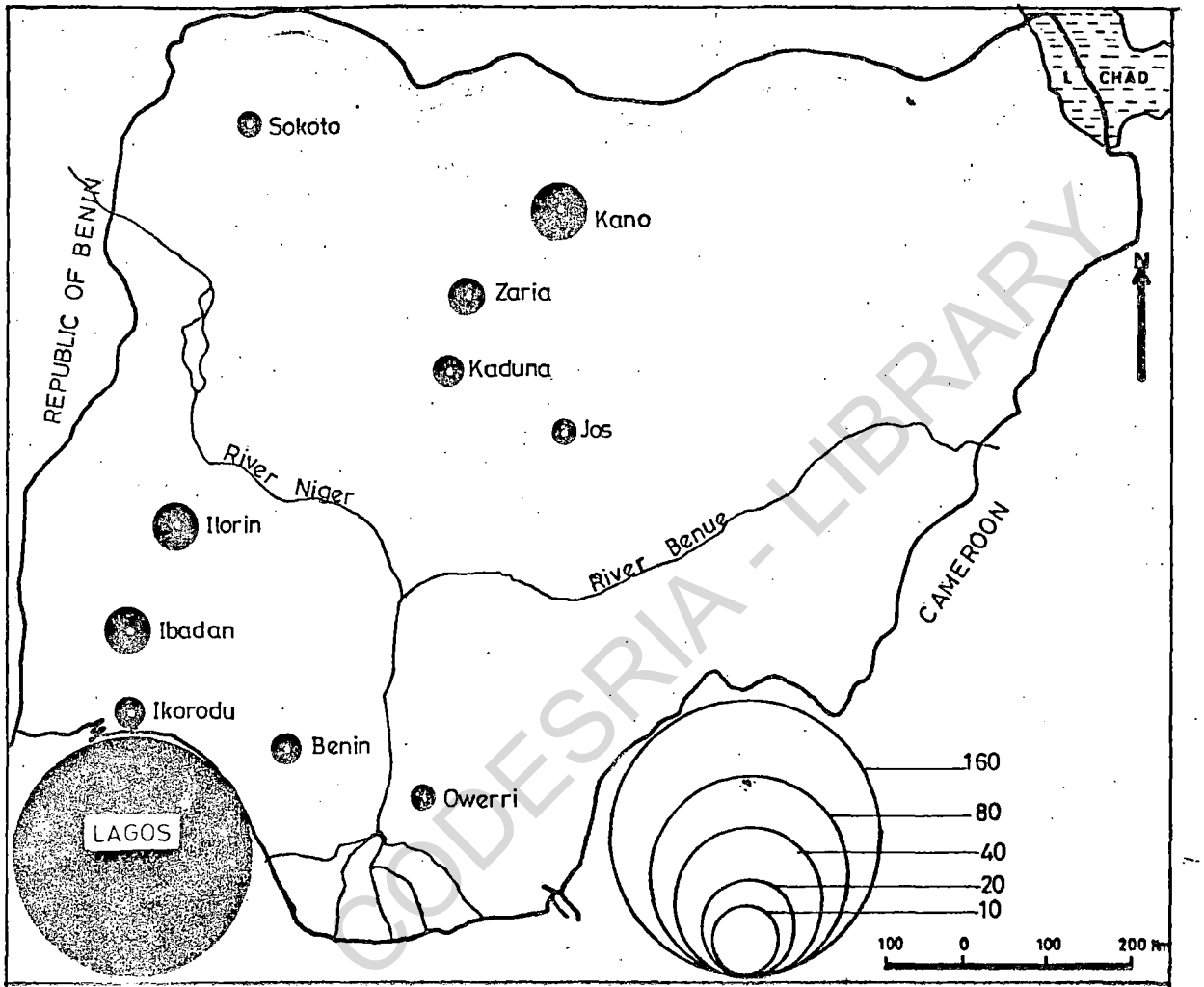


Fig.5.1: Spatial Distribution of Production Subcontractors, 1990

Source: Author's Analysis, 1996.

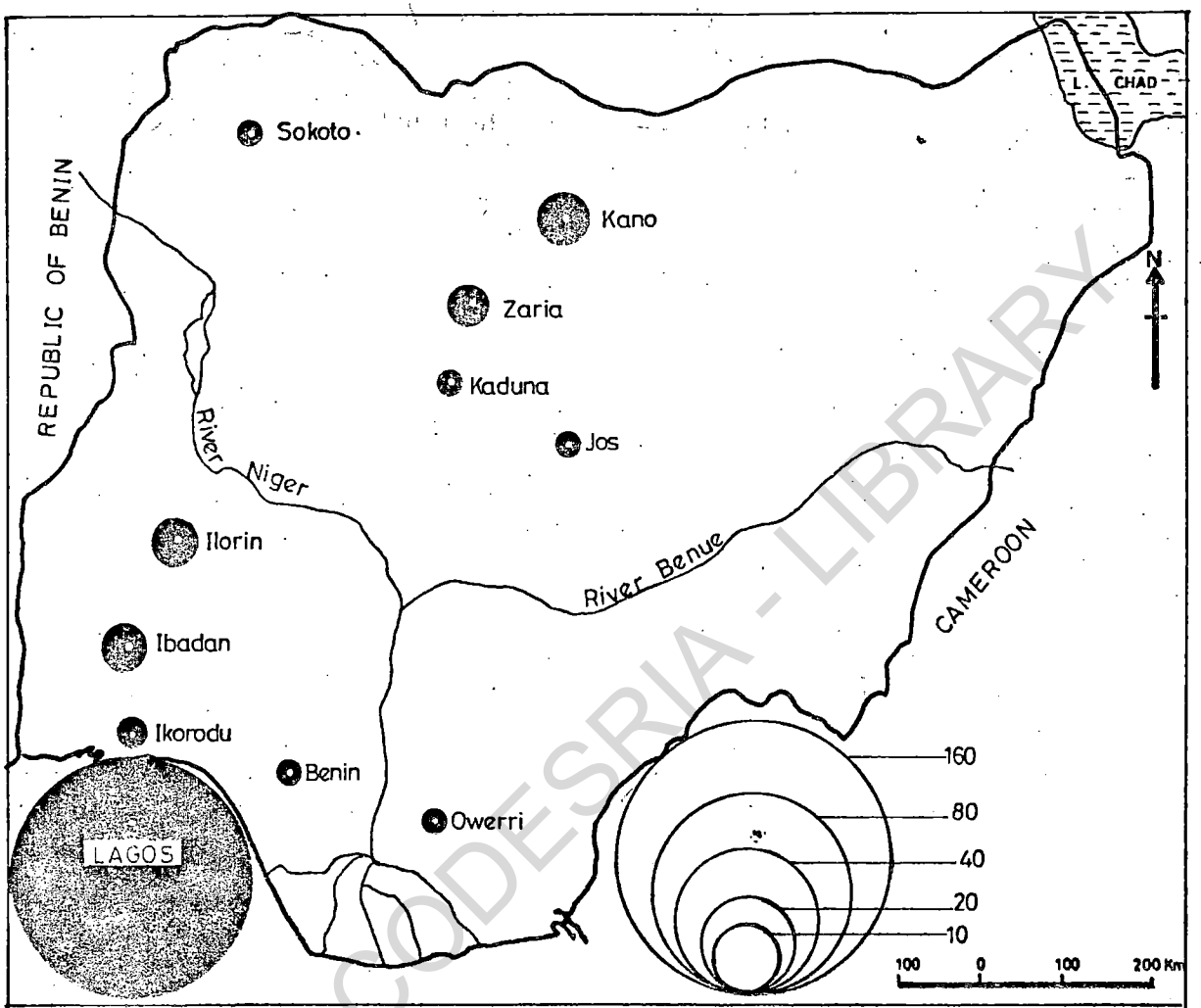


Fig. 5.2 : Spatial Distribution of Production Subcontractors, 1991

Source : Author's Analysis, 1996.

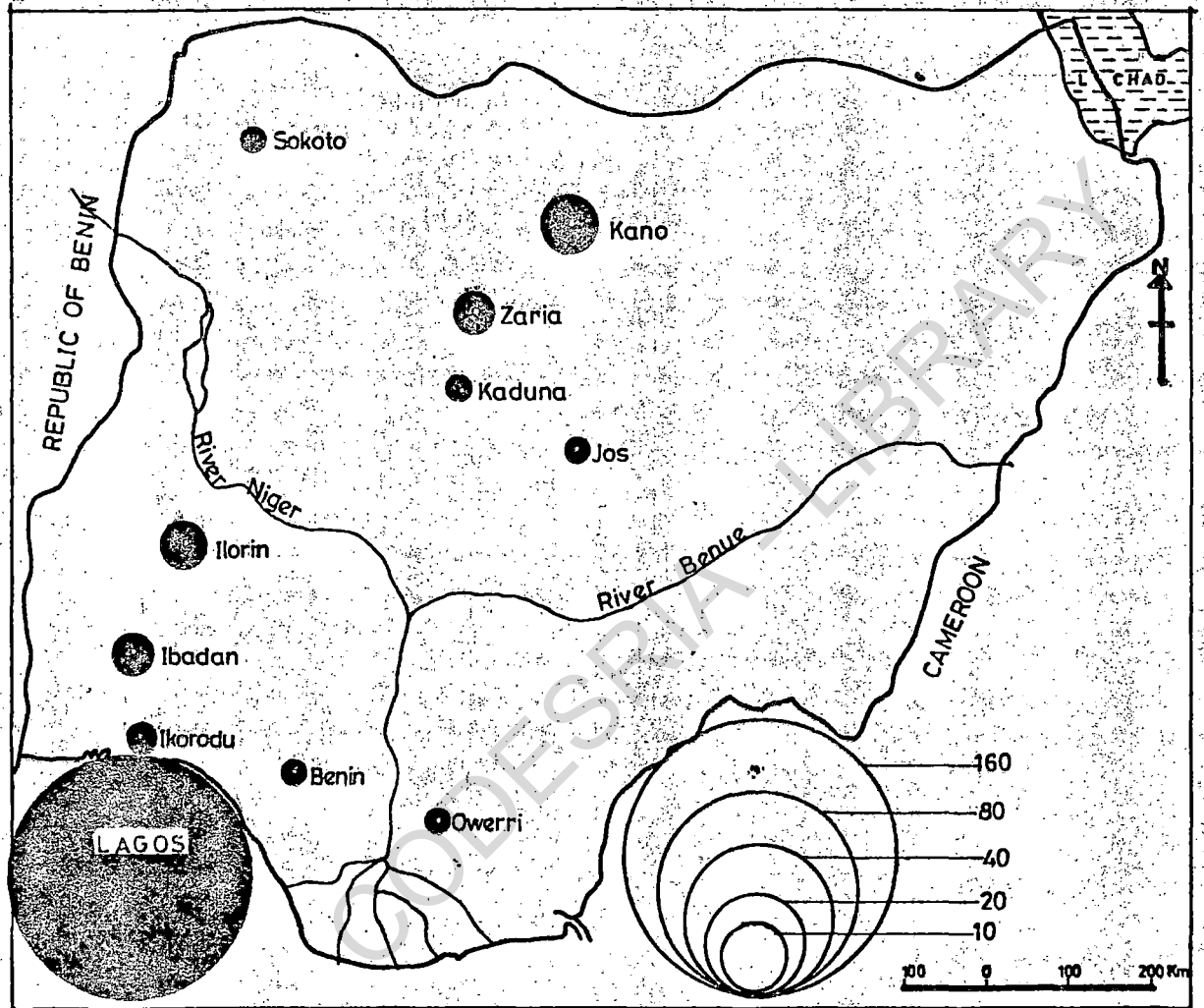


Fig. 5.3. : Spatial Distribution of Prodution Subcontractors, 1992

Source : Author's Analysis, 1996.

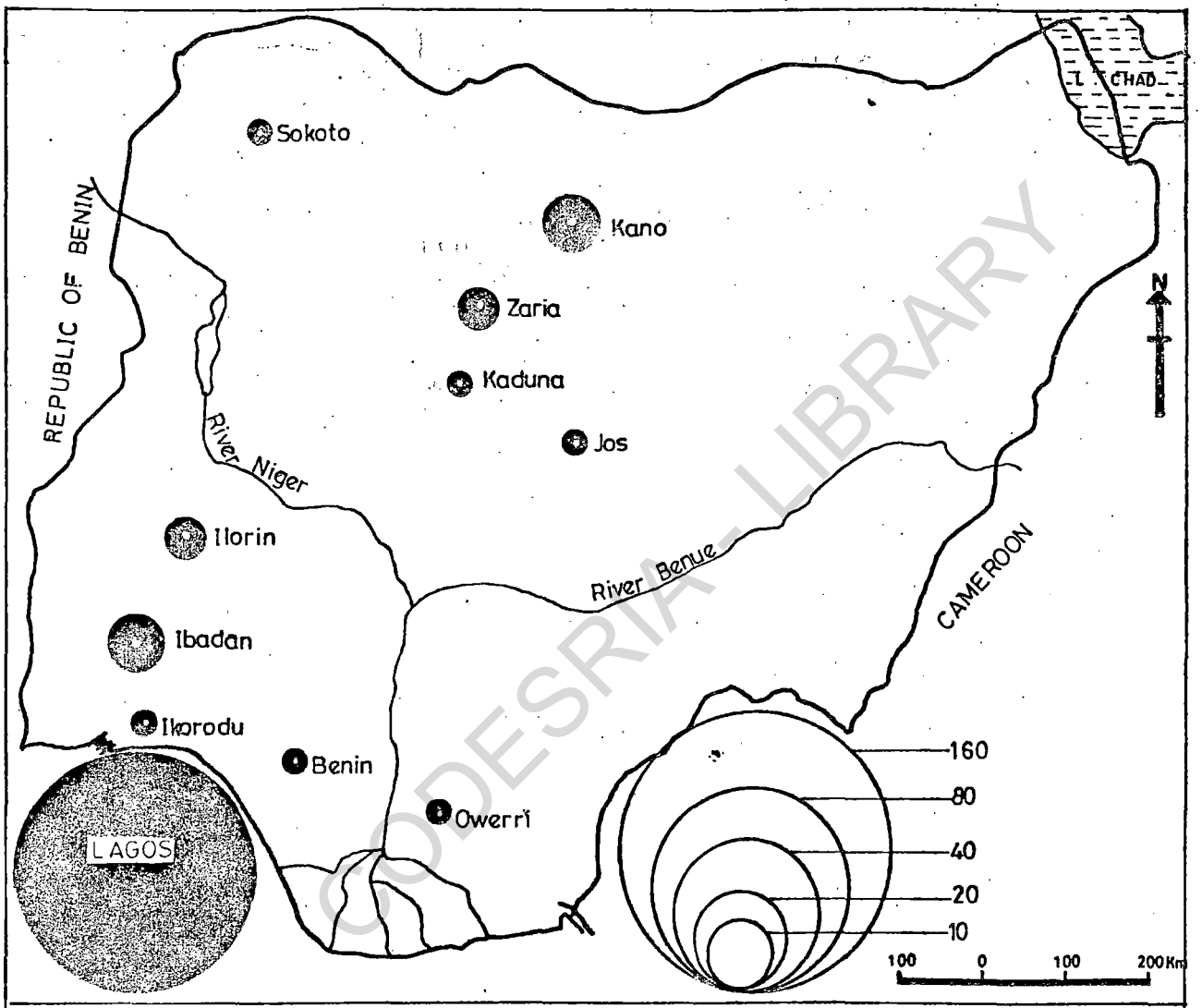


Fig. 5.4. : Spatial Distribution of Production Subcontractors, 1993

Source: Author's Analysis, 1996.

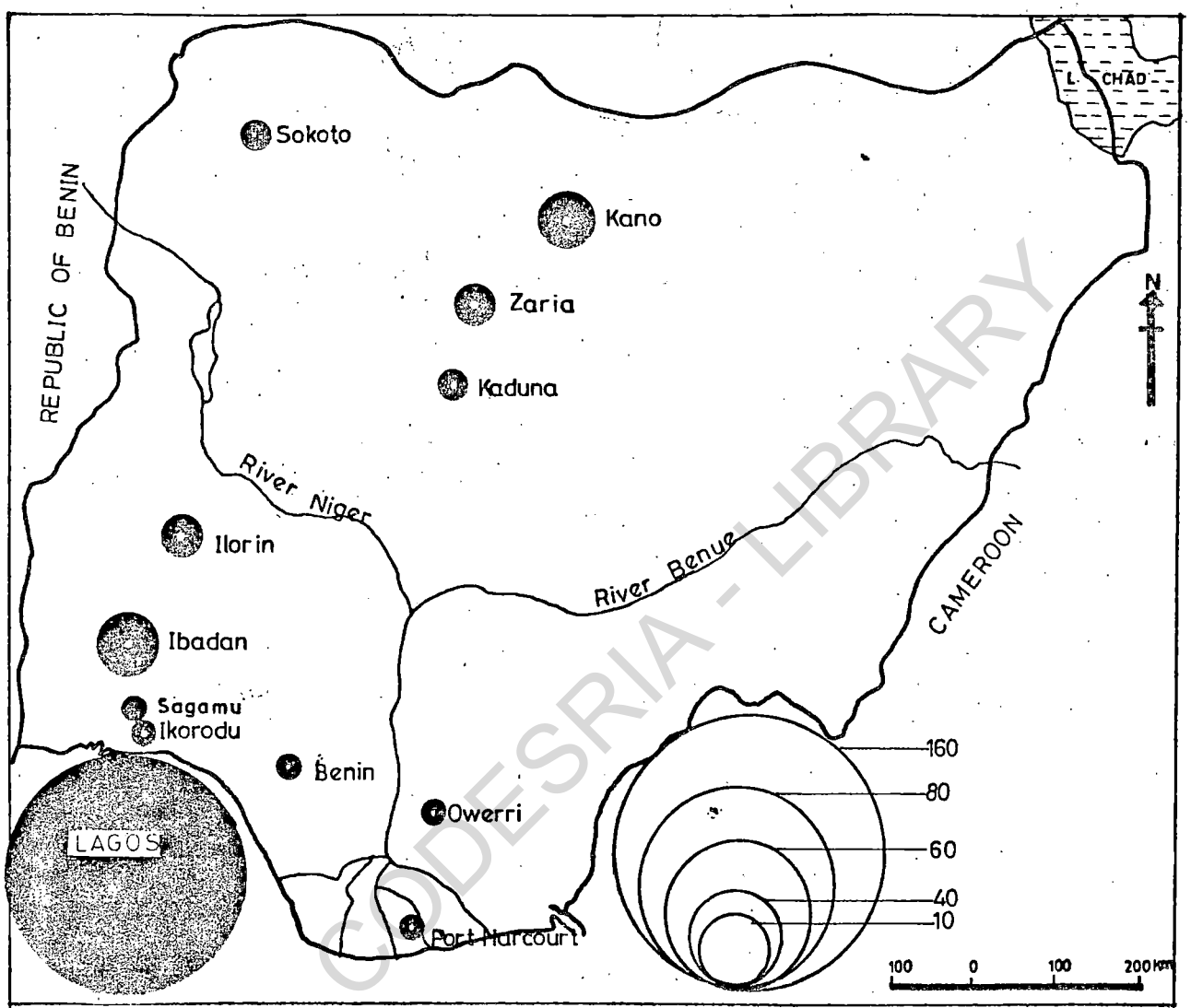


Fig. 5.5. : Spatial Distribution of Production Subcontractors, 1994.

Source : Author's Analysis, 1996.

subcontractors in 1990, 127(85.2 percent) were in Lagos alone. The figure for Lagos rose to 133 subcontractors by 1991, 145 by 1993, and 148 by 1994. In relative terms, the percentage for Lagos rose to 85.8 by 1991 and 86.3 by 1993, but fell slightly from the 1993 figure to 86.1 by 1994.

Apart from Lagos, Kano that is next in importance, has only 6 subcontractors, representing about 4 percent in each of the years. Ibadan, Ilorin and Zaria in that order are next in importance. The number of subcontractors in each of these three locations ranges between 2 and 5 in most of the years. Each of the other locations had one subcontractor, representing 0.67 per cent of the total in each year. Jos did not have any subcontractor in 1974. However, Sagamu in the southwest and Port Harcourt in the southeast have subcontracting links with contractors in the Lagos region only in 1994. The spatial variation in the distribution becomes more evident when the number in Lagos is compared to those of other locations.

5.1.2 Spatial Distribution (by Number) Production Subcontractors in the Lagos Region

The spatial distribution of production subcontractors from 1990 to 1994 shown in figures 5.6 to 5.10, indicate that the number of subcontractors varies markedly amongst the industrial estates/areas in the Lagos region.

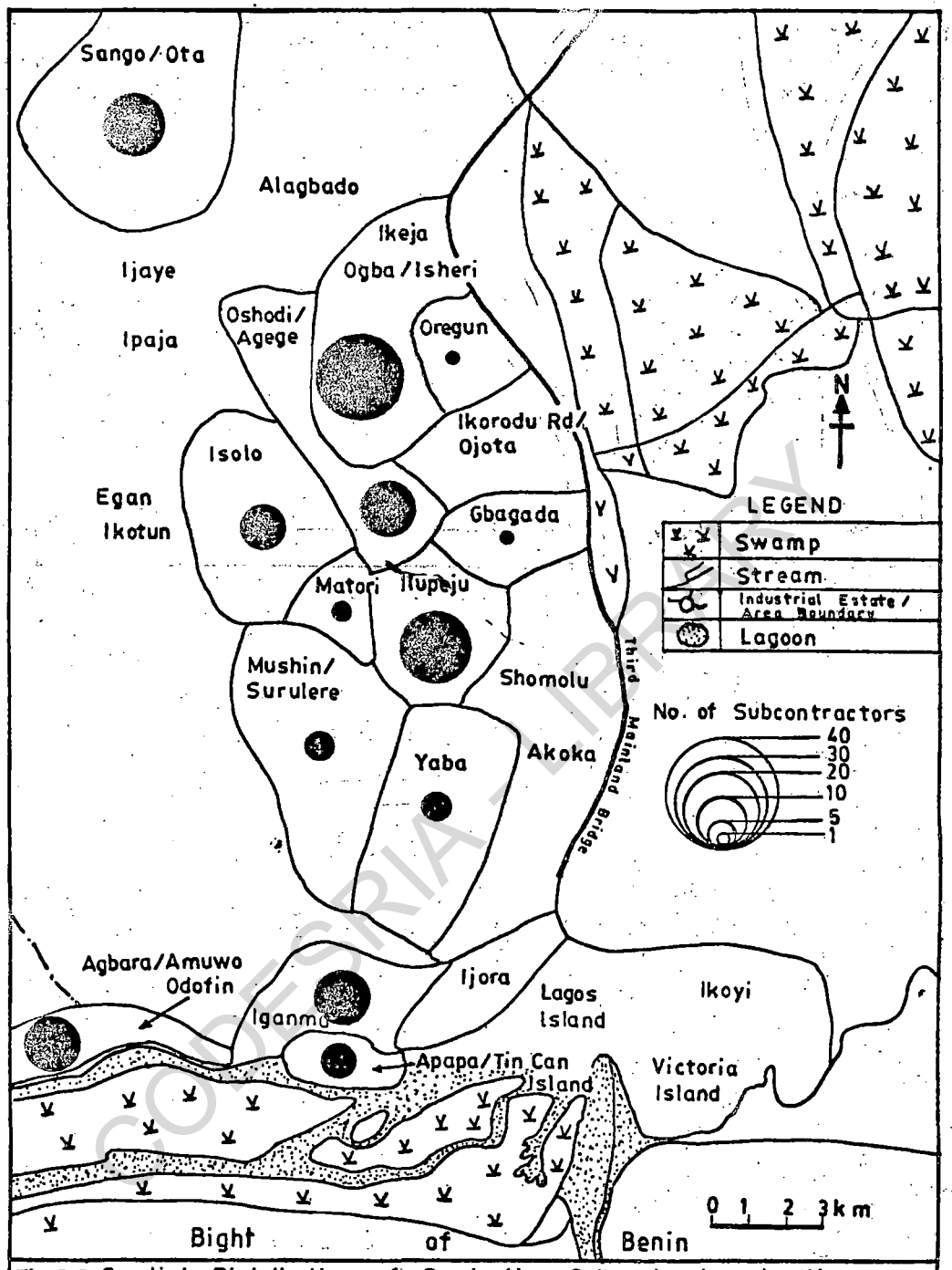


Fig.5.6: Spatial Distribution of Production Subcontractors in the Lagos Region, 1990

Source: Author's Analysis, 1996
Base Map from Surveyor General's Office, Ikeja-Lagos

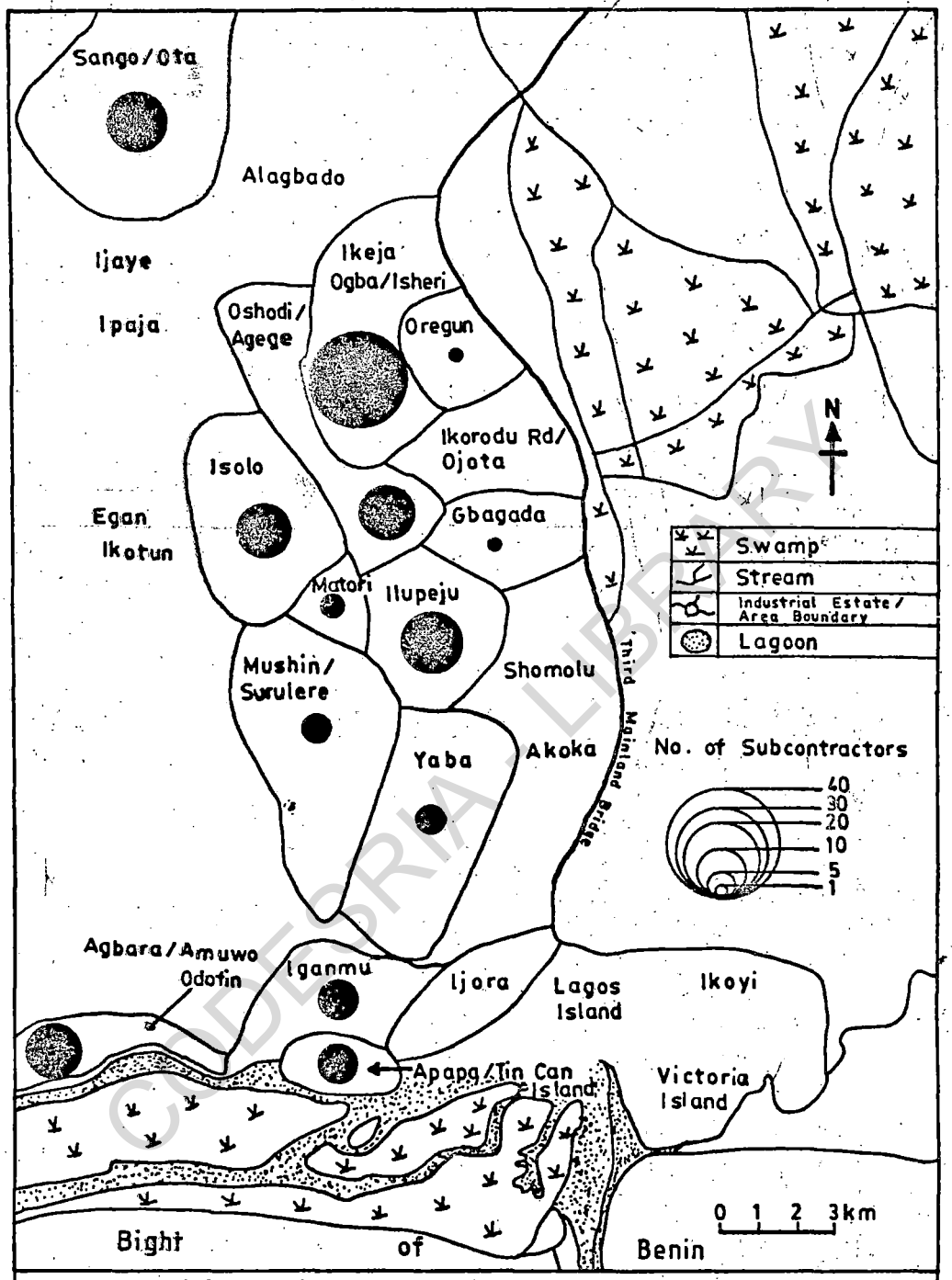


Fig. 5.7 : Spatial Distribution of Production Subcontractors in the Lagos Region, 1991

Source: Author's Analysis, 1996
Base Map from Surveyor Generals Office, Ikeja-Lagos

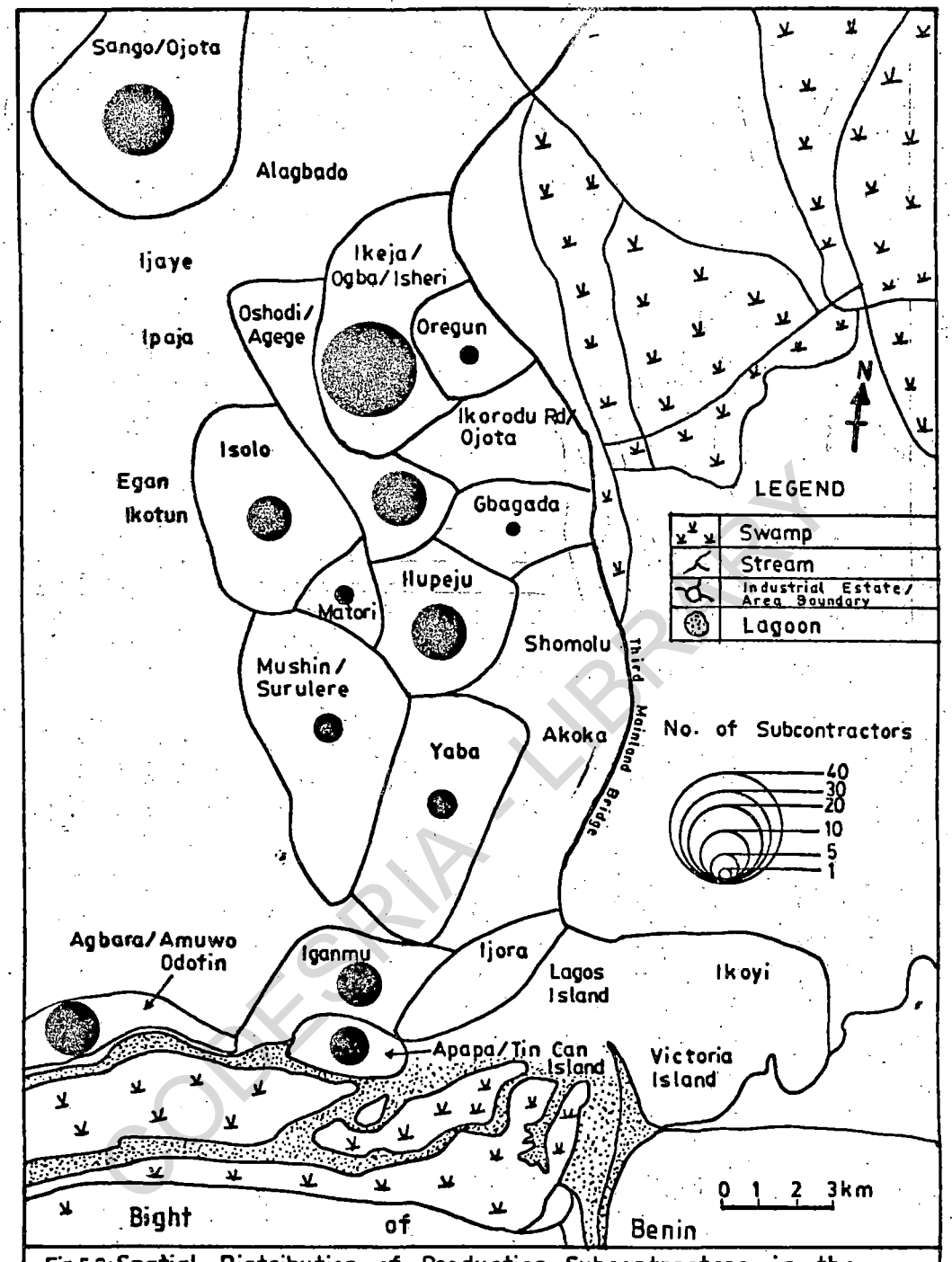


Fig.5.8: Spatial Distribution of Production Subcontractors in the Lagos Region, 1992

Source: Author's Analysis, 1996
Base Map from Surveyor General's Office, Ikeja-Lagos

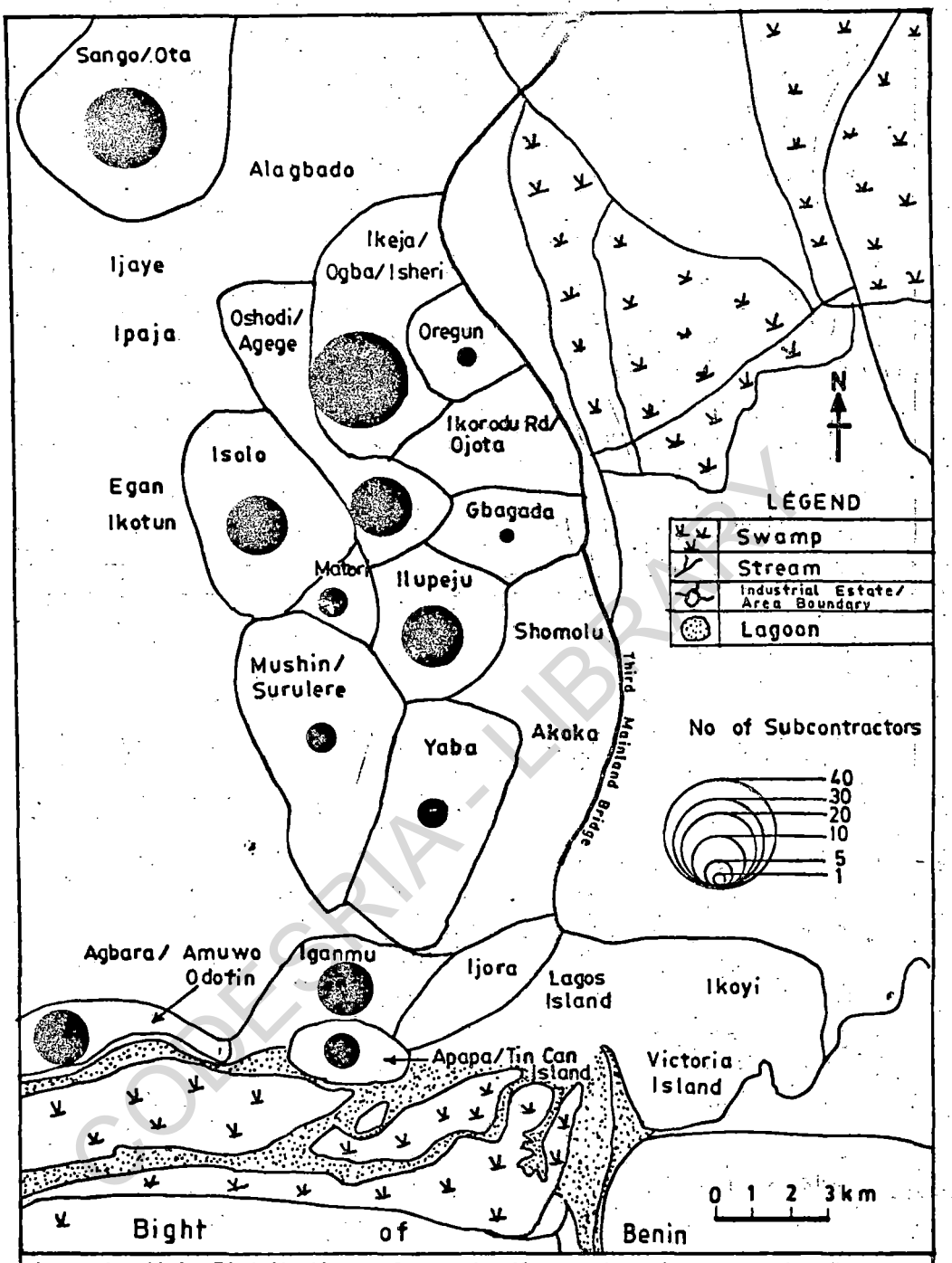


Fig.5.9: Spatial Distribution of Production Subcontractors in the Lagos Region, 1993

Source : Author's Analysis, 1995
Base Map from Surveyor General's Office, Ikeja-Lagos

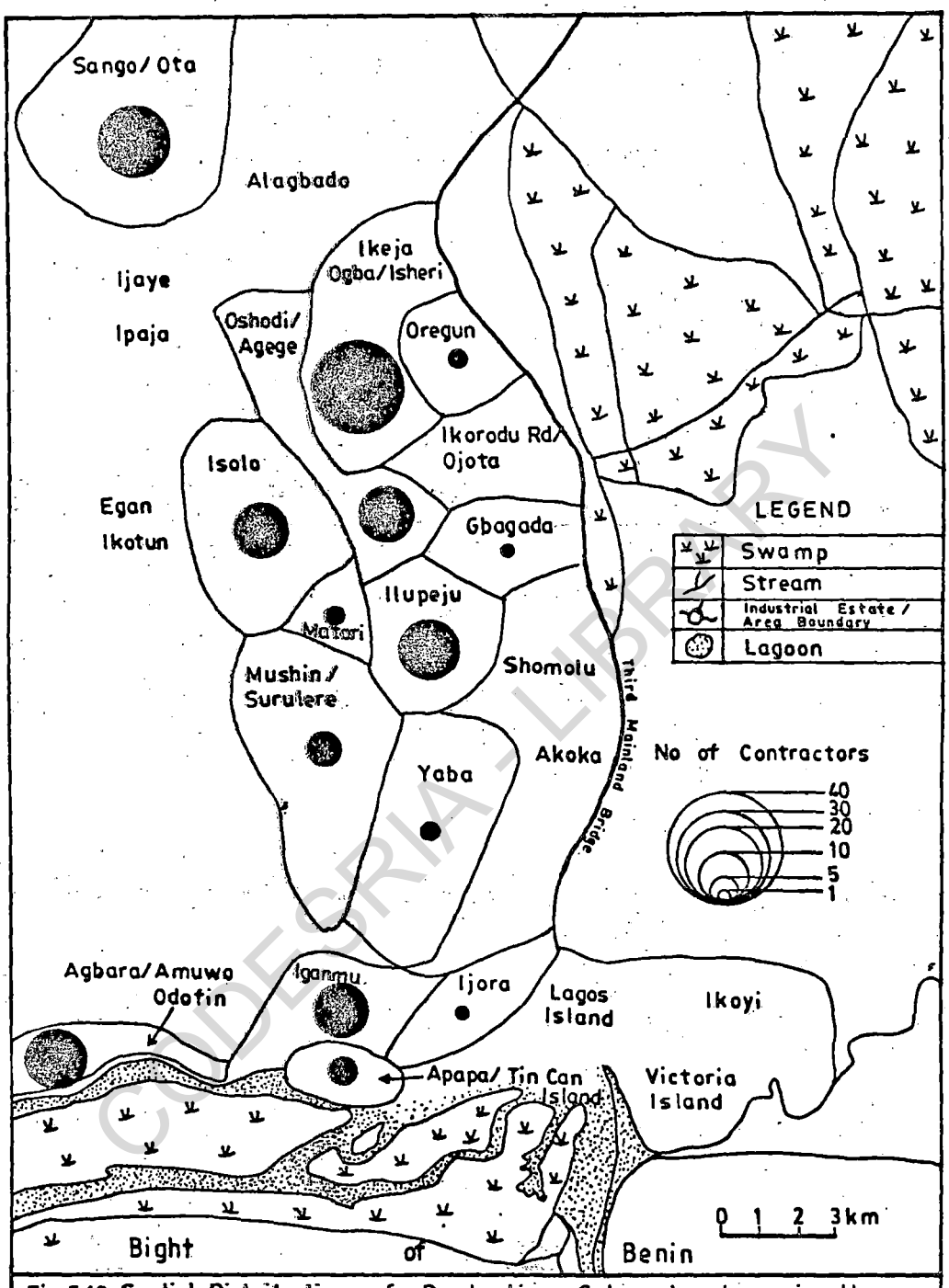


Fig.5.10: Spatial Distribution of Production Subcontractors in the Lagos Region, 1994

Source: Author's Analysis, 1996
Base Map from Surveyor General's Office, Ikeja - Lagos

Subcontractors are concentrated in Ikeja/Ogba/Isheri, Ilupeju, Sango/Ota, Oshodi/Agege, Agbara and Isolo industrial estates/areas in that order. For instance, the number of subcontractors in Ikeja/Ogba/Isheri industrial estates/ areas increased from 30 in 1990 to 35 in 1994. The corresponding figures for Ilupeju industrial estate/areas are 19 in 1990 and 17 in 1994. Agbara industrial estate/area had 11 in 1990 and 14 by 1994. Sango/Ota industrial estate/area which had 18 subcontractors in 1990 had 19 by 1994. Iganmu industrial estate/area share of production subcontractors increased from 8 in 1990 to 13 by 1994.

While Ikorodu/Ojota industrial estate/area had no subcontractor in any of the years, Ijora industrial estate/area had 1 subcontractor representing 0.7 percent only in 1994. Other industrial estates/areas have between 1 and a maximum of 4 subcontractor in any of the years. For example, Oregun industrial estate/area which had only 1 subcontractor in 1990 had 4 by 1994. Matori industrial estate/area had 2 subcontractors in 1990. The figure increased to 3 by 1994. Yaba industrial estate/area had 4 subcontractors in each of the years except in 1993 when it had 3 subcontractors.

5.2.1 Spatial Distribution (by Volume) of Production Subcontracting

Figures 5.11 to 5.15 show the spatial distribution of the aggregate volume of production subcontracting in naira from 1990 to 1994. It is obvious from the figures, that in each of the years, the distribution is such that Lagos has the largest volume of production subcontracting. For instance, in 1990, out of the total volume of production subcontracting which was N191,372,930, Lagos alone accounted for 66.5 percent. Kano, Zaria, Sokoto , in that order, accounted for 12.25 percent,10.35 percent, and 5.64 percent respectively.

In each of the years, Lagos alone accounted for over 65 percent of the total volume of production subcontracting. The share of Lagos rose to as much as 77 percent in 1993, but decreased to about 73 percent in 1994. Port Harcourt and Sagamu, in that order, accounted for 8.6 percent and 0.97 percent of the aggregate volume of production subcontracting only in 1994. The share of Zaria, which was 10.35 percent in 1990, decreased to 8.85 percent by 1994. The distribution is such that locations such as Benin, Ikorodu, Kaduna, Owerri and Sagamu each had less than one percent of aggregate volume of production subcontracting in any of the years. It must be stated that while Jos did not account for any volume of subcontracting in

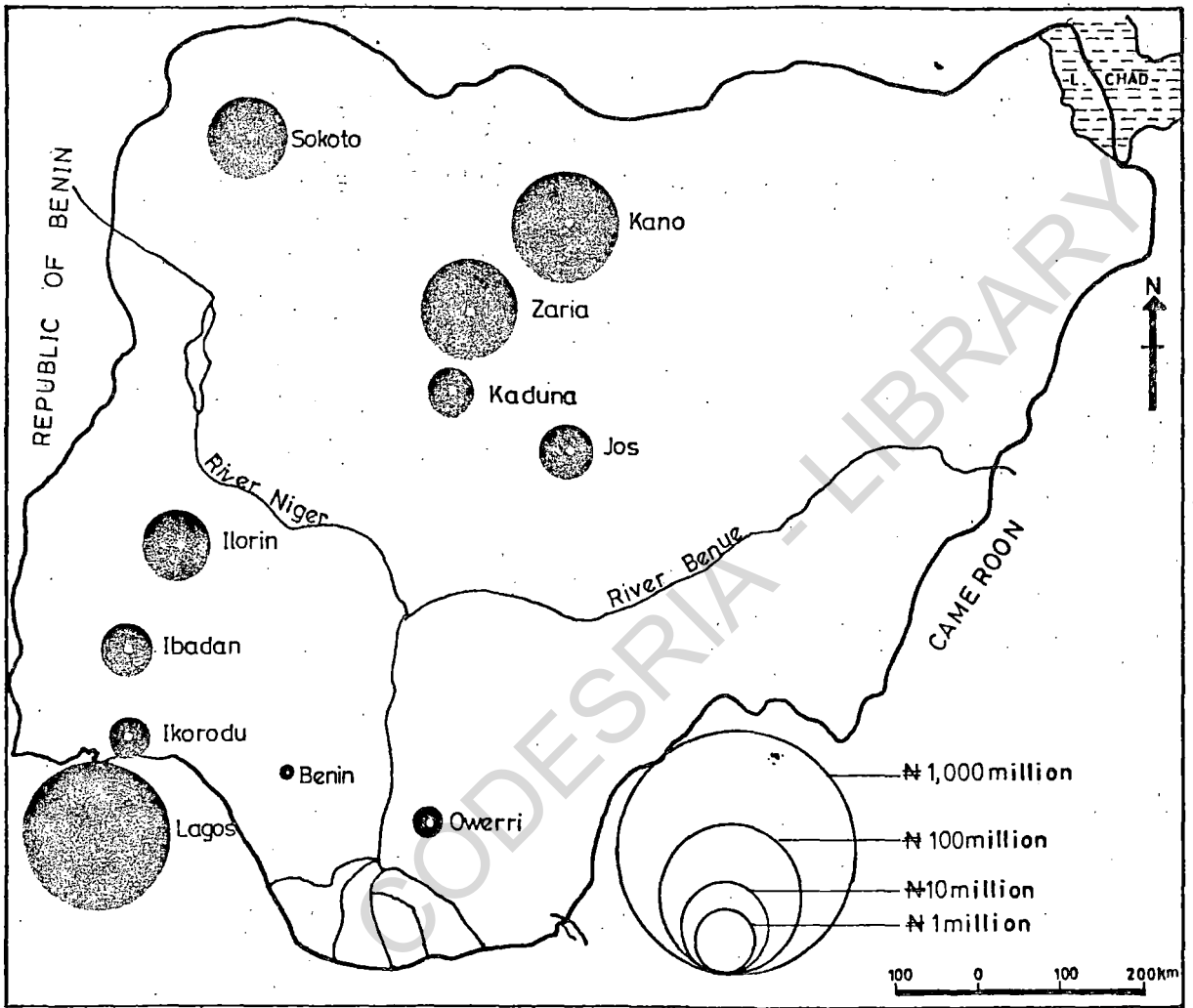


Fig. 5.11 : Spatial Distribution of the Volume of Production Subcontracting, 1990.

Source : Author's Analysis, 1996.

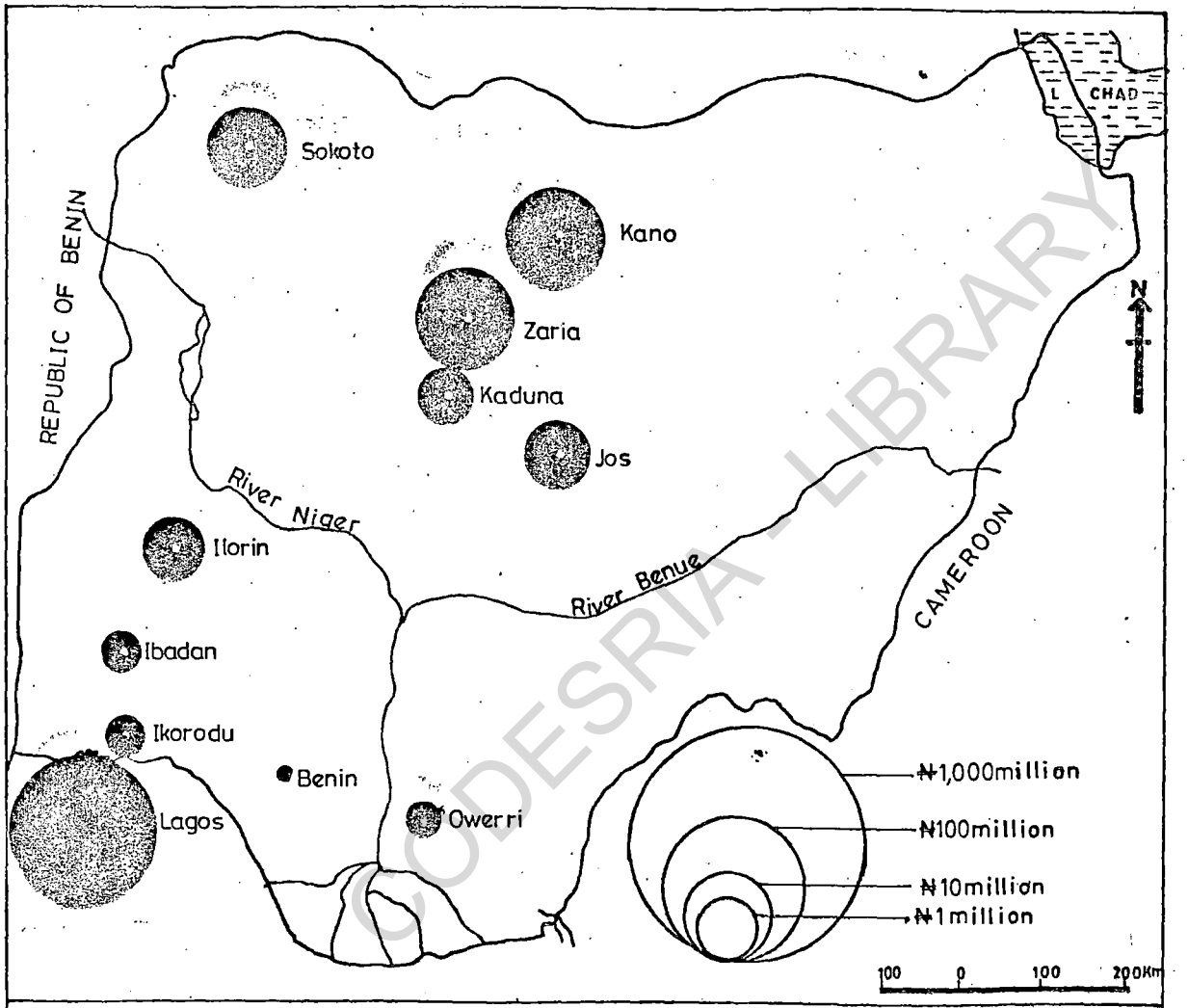


Fig. 5.12 : Spatial Distribution of the Volume of Production Subcontracting, 1991

Source : Author's Analysis, 1996.

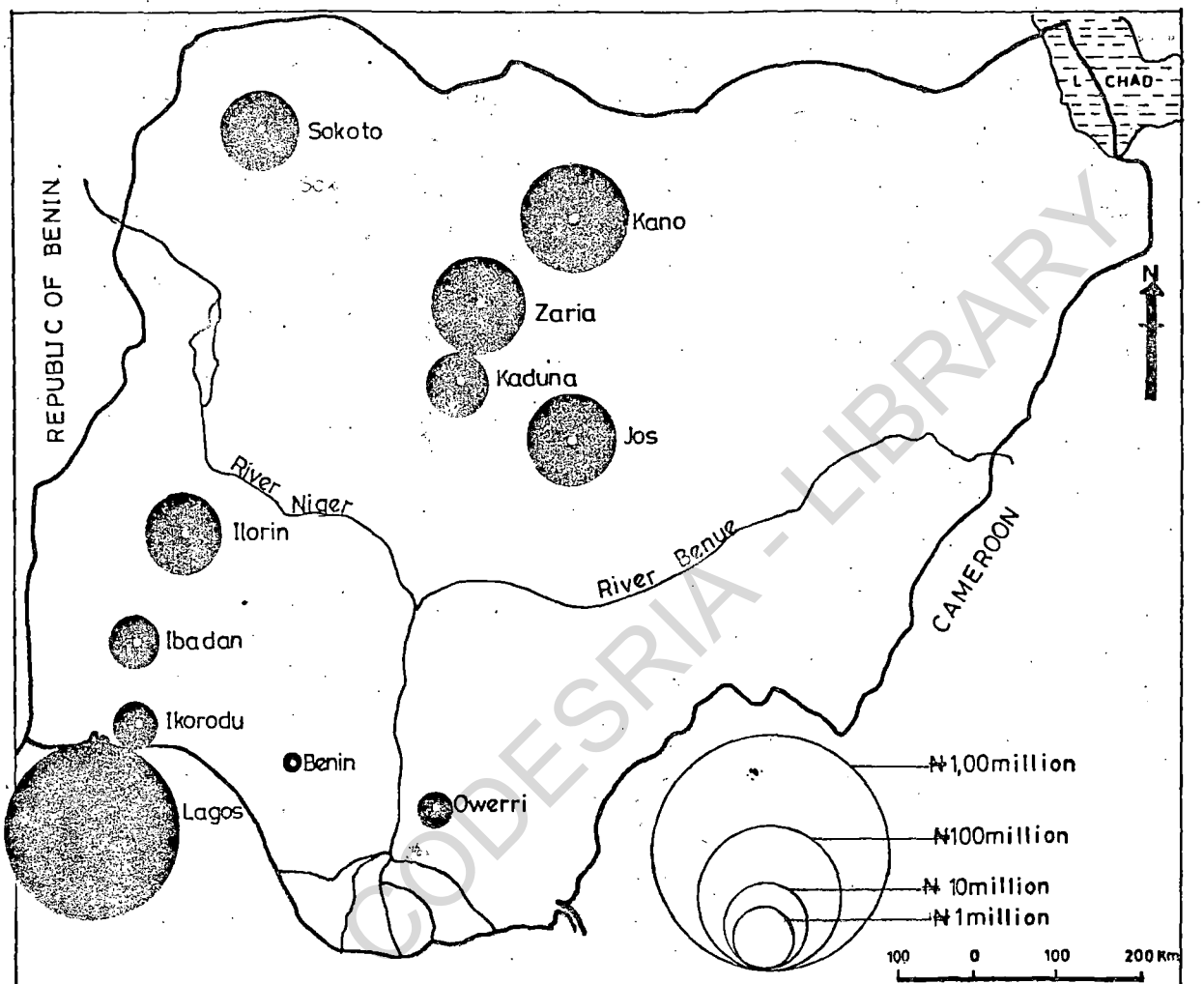


Fig. 5. 13 : Spatial Distribution of the Volume of Prodution Subcontracting; 1992

Source : Author's Analysis , 1996.

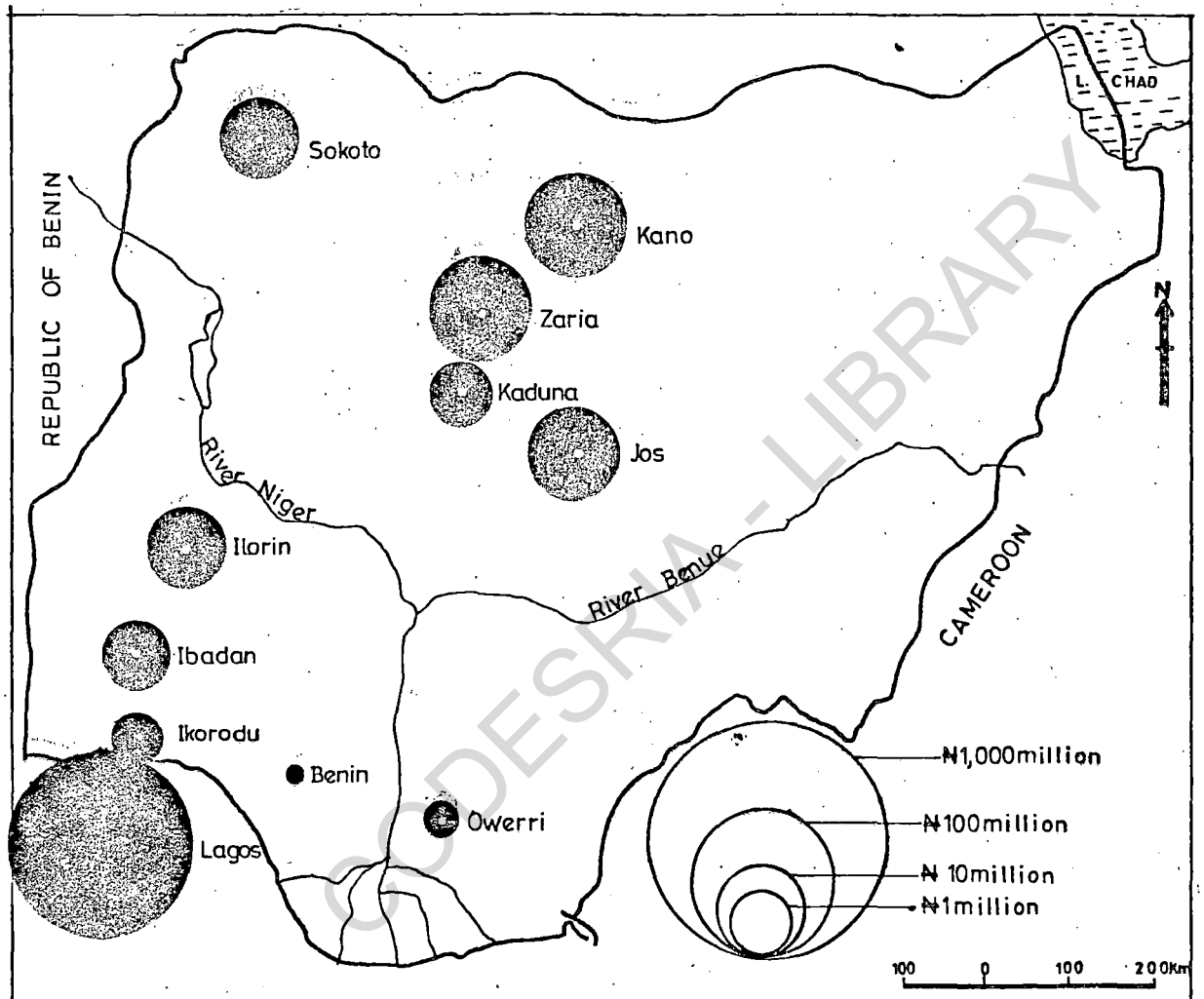


Fig. 5. 14 : Spatial Distribution of the Volume of Production Subcontracting, 1993.

Source : Author's Analysis, 1996.

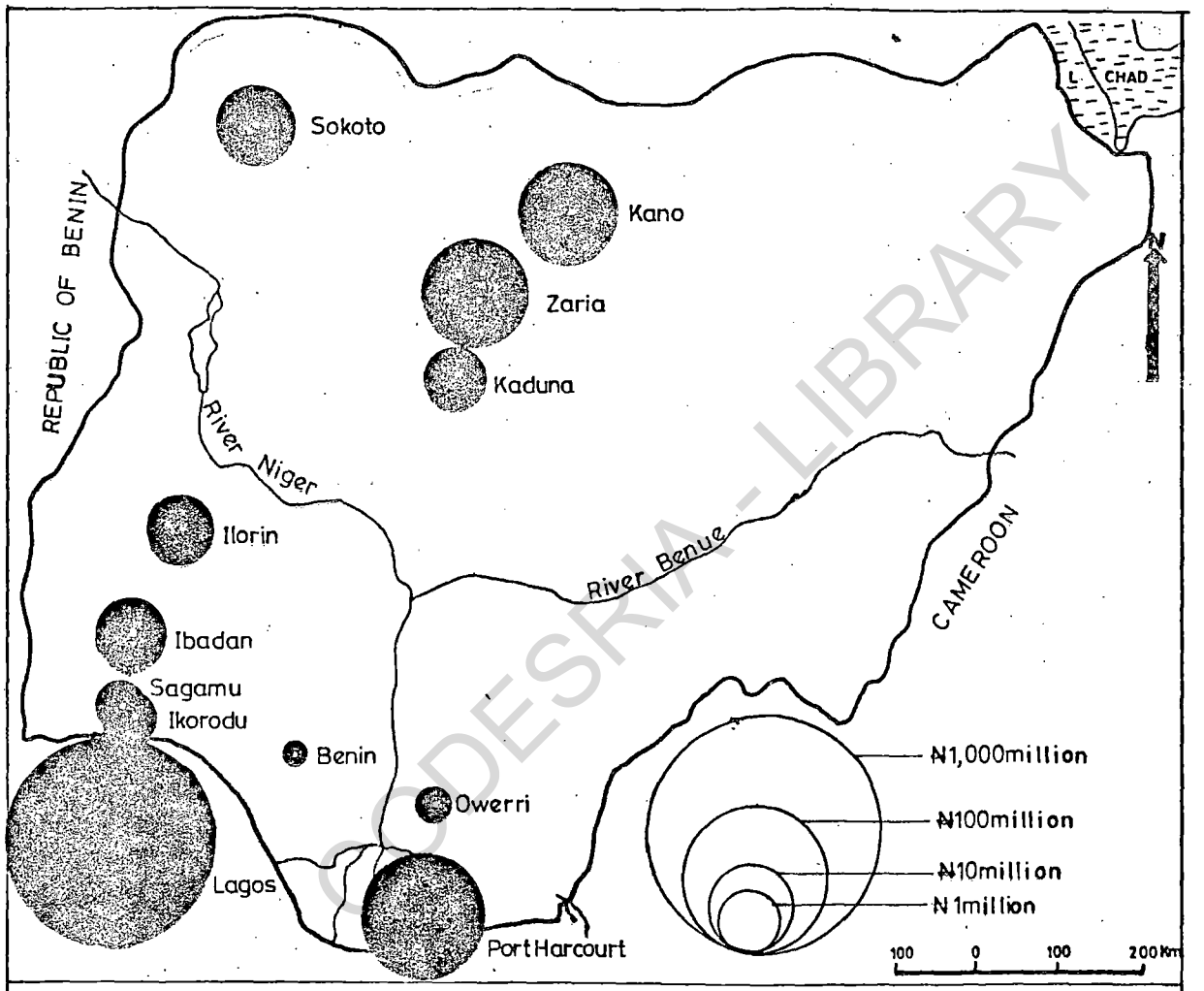


Fig. 5.15 : Spatial Distribution of the Volume of Production Subcontracting 1994.

Source : Author's Analysis, 1996.

1994, Sagamu and Port Harcourt, which have just appeared in the sub-contracting scene accounted for 0.97 percent and 8.6 percent of the volume of production subcontracting during this year.

5.2.2 Spatial Distribution (by Volume) of Production Subcontracting within the Lagos Region

Figures 5.16 to 5.20 show the spatial distribution of the volume of production subcontracting amongst the industrial estates/areas in the Lagos region. Obviously, Ikeja/Ogba/Isheri, Ilupeju, Sango/ota, Oshodi/Agege and Mushin/Surulere industrial estates/areas, in that order, are the largest concentration of the volume of production subcontracting in each of the years.

For instance, the relative share of the volume of production subcontracting in Ikeja/Ogba/Isheri industrial estate/area is not less than 23 percent of the total volume of subcontracting in the Lagos region in any of the years. The volume of production subcontracting in Mushin/Surulere industrial estate/area is not less than 13 percent in any of the years. Matori industrial estate/area accounted for not more that one percent of the total volume of production subcontracting in any of years.

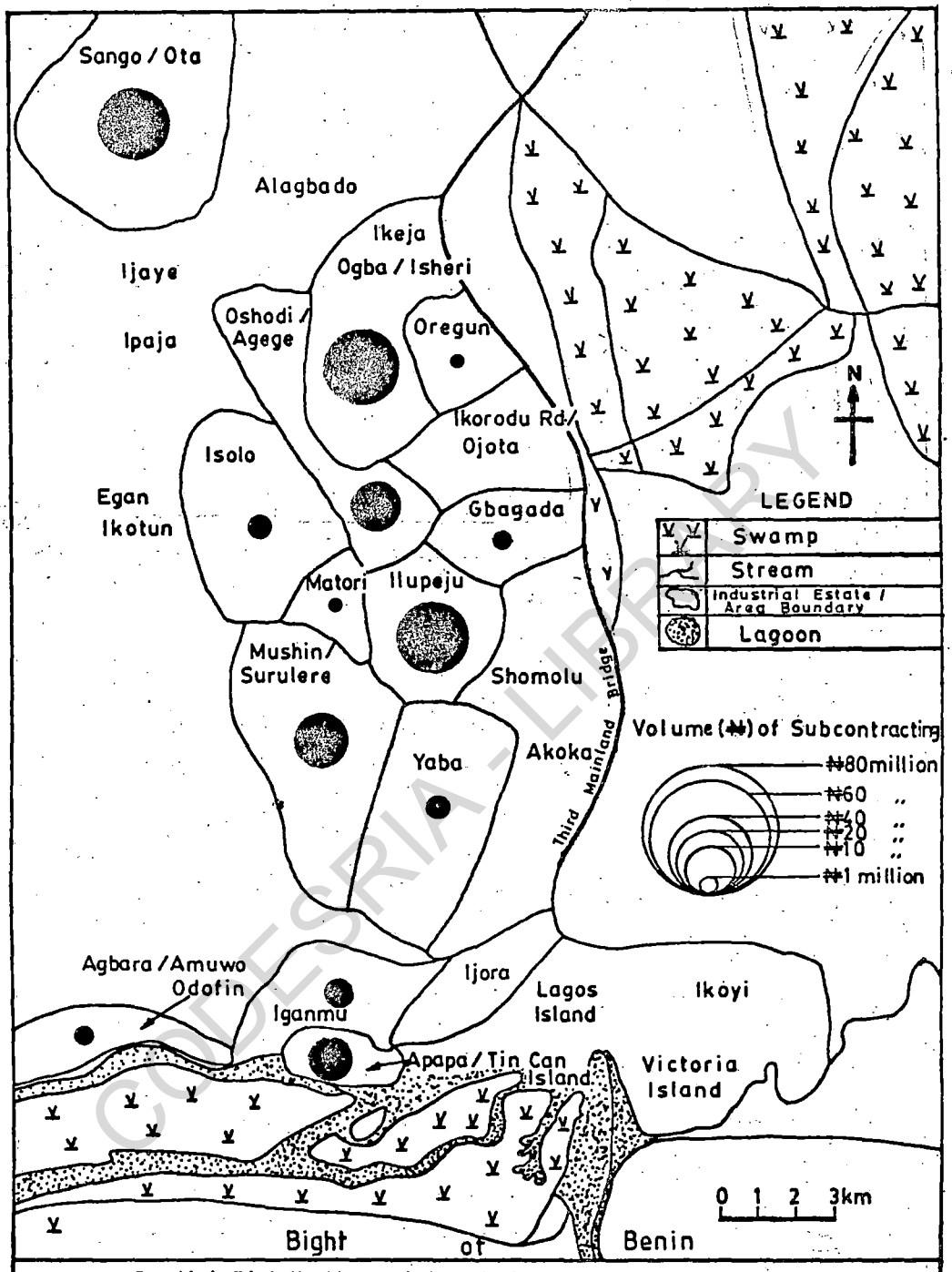


Fig. 5.16: Spatial Distribution of the Volume of Production Subcontracting in the Lagos Region, 1990.

Source: Author's Analysis, 1996.

Base map from Surveyor General's Office, Ikeja - Lagos.

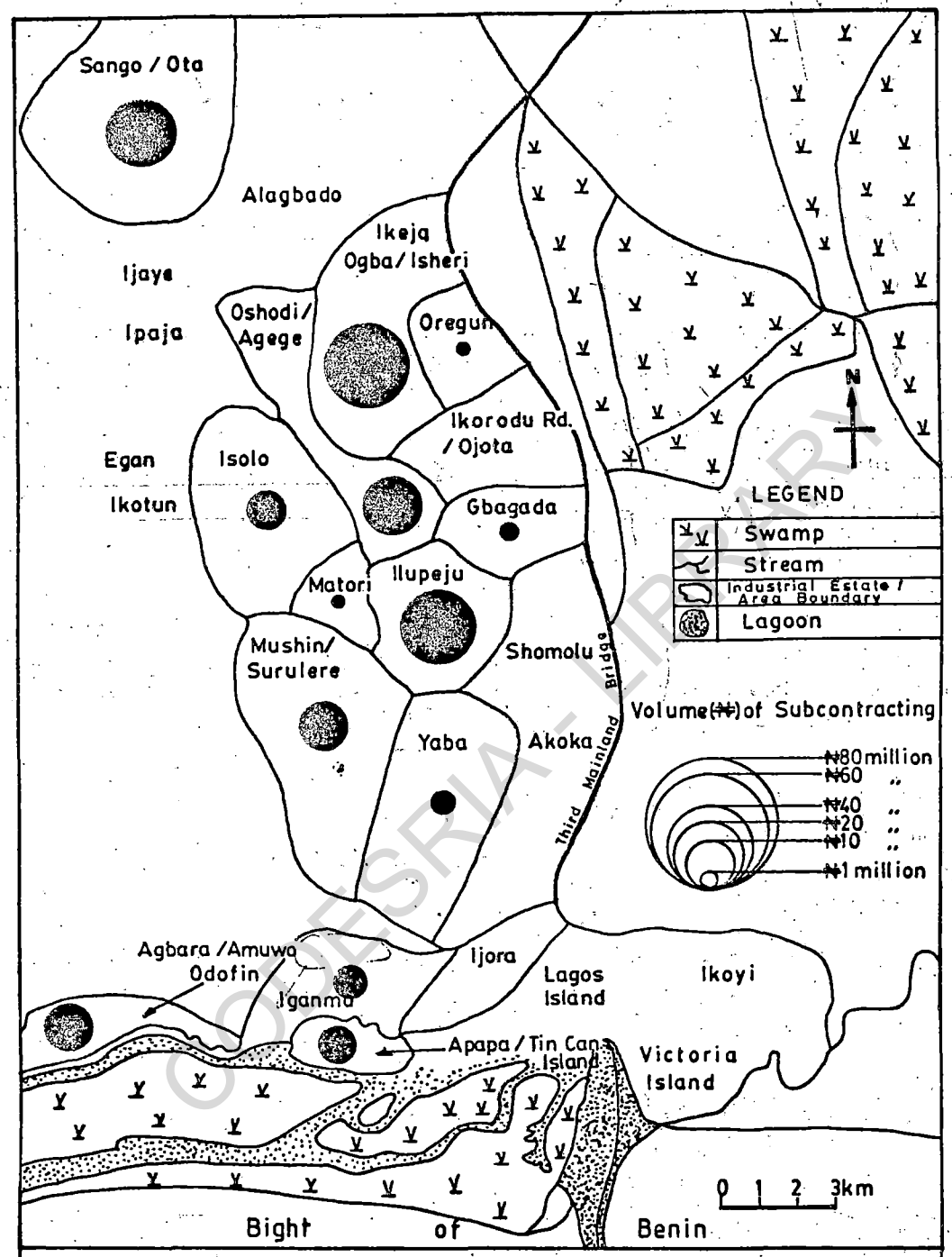


Fig.5.17: Spatial Distribution of the Volume of Production Subcontracting in the Lagos Region, 1991.

Source: Author's Analysis, 1996.
Base map from Surveyor General's Office, Ikeja - Lagos.

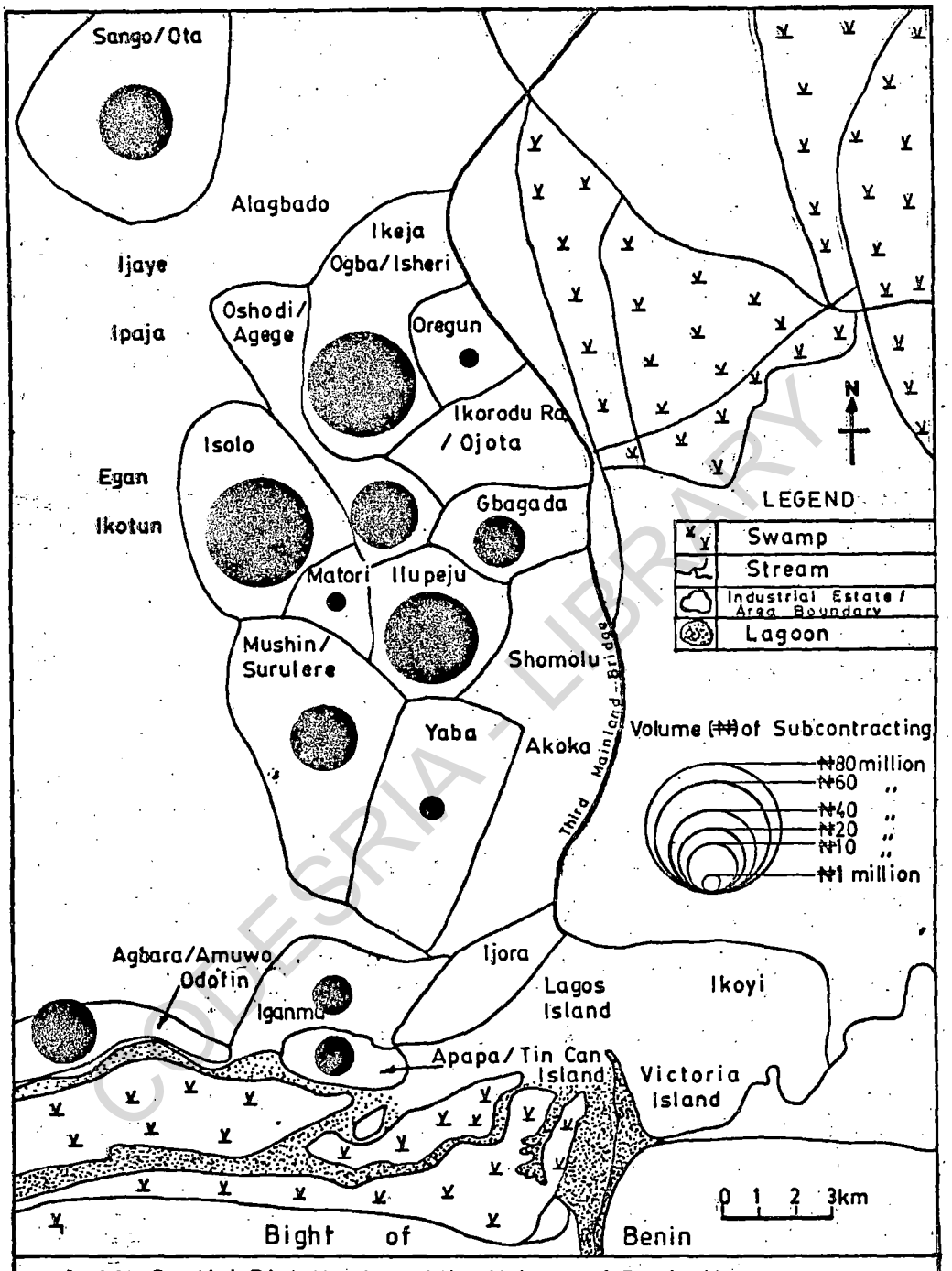


Fig. 5.18: Spatial Distribution of the Volume of Production Subcontracting, in the Lagos Region, 1992.

Source: Author's Analysis, 1996.

Base map from Surveyor General's Office, Ikeja - Lagos.

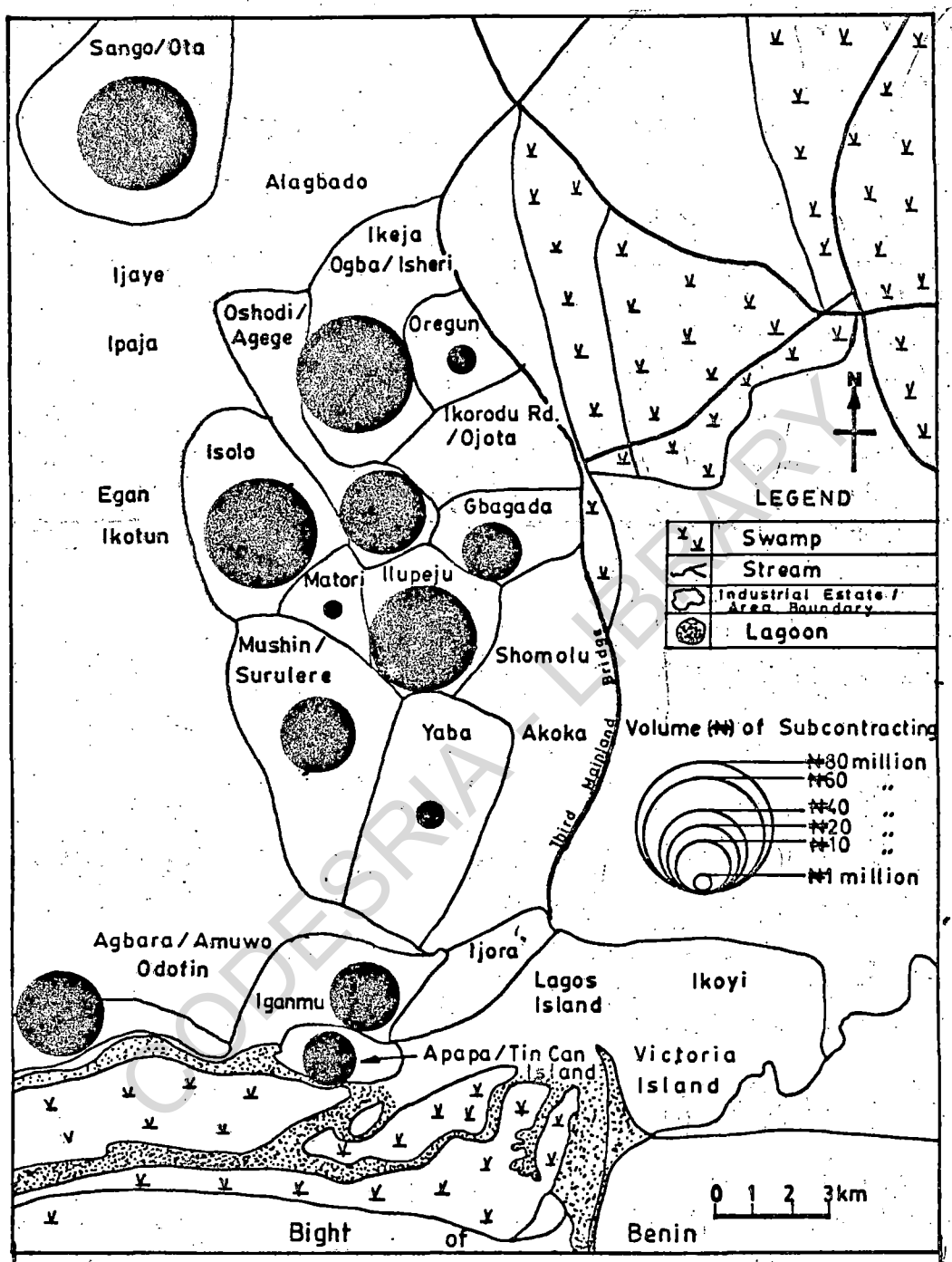


Fig. 5.19: Spatial Distribution of the Volume of Production Subcontracting, in the Lagos Region, 1993.

Source: Author's Analysis, 1996.

Base map from Surveyor General's Office, Ikeja - Lagos.

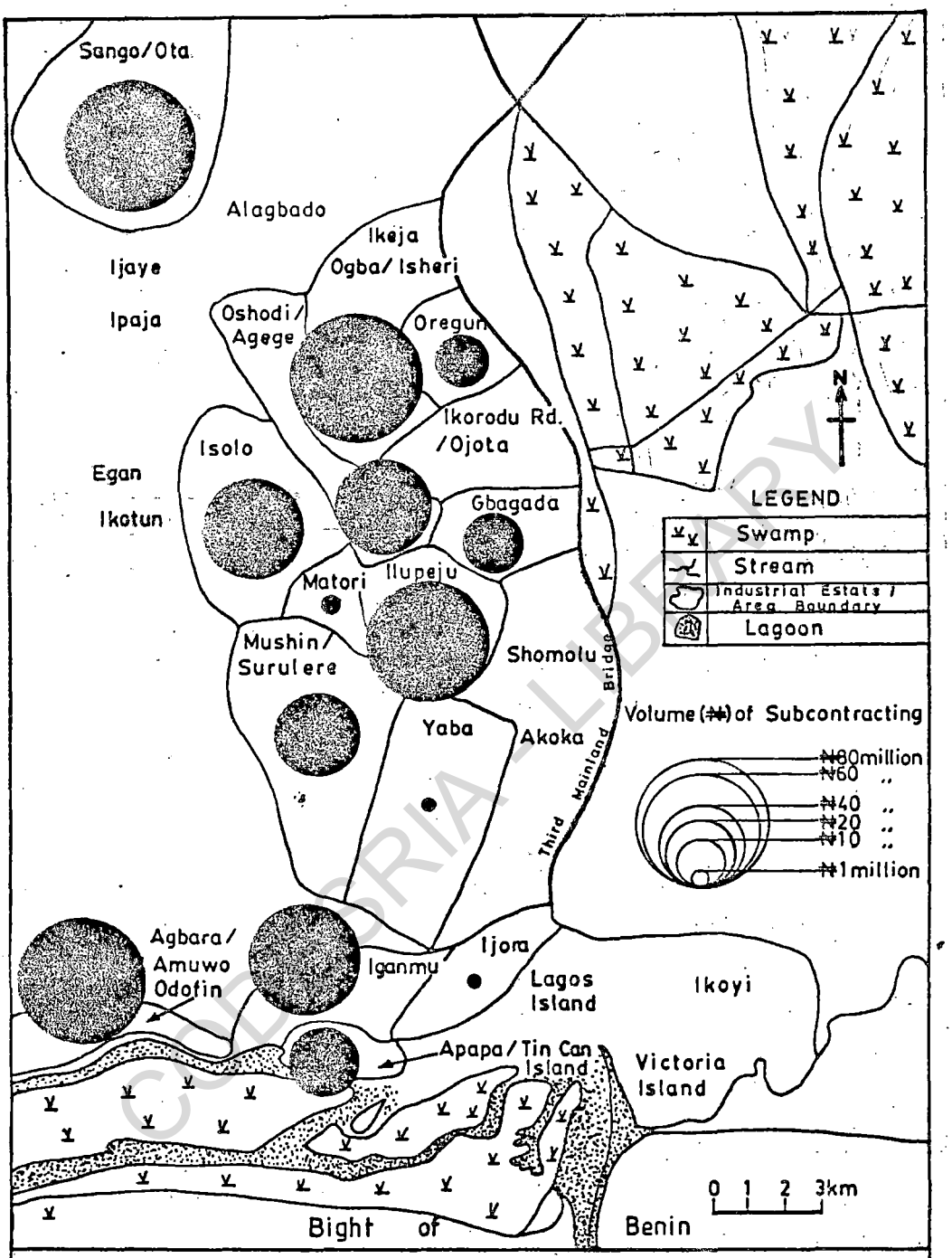


Fig. 5.20: Spatial Distribution of the Volume of Production Subcontracting in the Lagos Region, 1994.

Source: Author's Analysis, 1996.

Base map from Surveyor General's Office, Ikeja - Lagos.

5.3 PATTERN OF SUBCONTRACTING LINKAGES WITHIN THE LAGOS REGION

There are both intra-estate/area and inter-estates/areas subcontracting linkages within the Lagos region. The nature of intra-estate/area subcontracting within industrial estates/areas in the Lagos region is shown in the Table 5.1. There are intra-estate/area subcontracting linkages in seven of the industrial estates/areas. These are Ikeja/Ogba/Isheri, Oshodi/Agege,Matori, Ilupeju, Iganmu, Sango/Ota, and Agbara industrial estates/areas. There are considerable variations in production subcontracting linkages from one industrial estate/area to the other in these linkages. The relative share of Ikeja/Ogba/Isheri and Ilupeju industrial estates/areas is not less than 7 percent of the total volume of production subcontracting in the Lagos region in any of the years. The share of intra-estate/area sub-contracting in Oshodi/Agege industrial estate is less than 1 percent of the total volume of production subcontracting in the Lagos region in any of the years.

The nature of inter-estates/areas subcontracting linkages from 1990 to 1994 is shown in figures 5.21 to 5.25. A flow diagram rather than other possible methods, such as input-output analysis, is used because of the visual clarity of this method. The major flows were from Ikeja/Ogba/Isheri, Agbara

Table 5.1: Intra-Estate/Area Subcontracting Linkages in the Lagos Region

S/ No	Industrial Estate/Area	Value (N) of Subcontract 1990	(%)	Value (N) of Subcontract 1991	(%)	Value (N) of Subcontract 1992	(%)	Value (N) of Subcontract 1993	(%)	Value (N) of Subcontract 1994	(%)
1	Ikeja/Ogba/Isheri	10,686,674	(8.40)	11,312,957	(7.57)	18,437,537	(7.01)	28,715,570	(8.04)	43,220,616	(8.20)
2	Oregun	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)
3	Gbagada	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)
4	Ikorudu Rd/Ogota	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)
5	Oshodi/Agege	429,094	(0.34)	454,907	(0.30)	610,214	(0.23)	761,979	(0.21)	804,558	(0.15)
6	Matori	7,628,336	(6.0)	727,851	(0.50)	1,220,428	(0.46)	4,094	(0.001)	1,709,686	(0.32)
7	Isolo	—	(0.0)	—	(0.0)	-	(0.0)	—	(0.0)	41,565,493	(0.0)
8	Ilupeju	9,714,686	(7.6)	11,508,238	(7.70)	22,054,153	(8.39)	29,508,920	(8.26)	-	(7.88)
9	Mushin/Surulere	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)
10	Yaba	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)
11	Ijora	—	(0.0)	—	(0.0)	—	(0.0)	-	(0.0)	—	(0.0)
12	Iganmu/CBD	715,768	(0.56)	486,065	(0.33)	821,423	(0.31)	8,251,085	(2.31)	9,510,154	(1.80)
13	Sango/Ota	3,086,577	(2.43)	3,203,637	(2.14)	4,245,056	(1.61)	5,425,293	(1.52)	6,637,606	(1.26)
14	Agbara	133,496	(0.10)	142,841	(0.10)	1,628,254	(0.62)	408,421	(0.11)	5,601,737	(1.06)
15	Apapa/TinCan Is.	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)	—	(0.0)
	Total	29,311,130	(23.03)	27,836,496	(18.63)	49,017,065	(18.65)	73,075,362	(20.45)	049,850	(20.68)

Source: Author's Analysis, 1996.

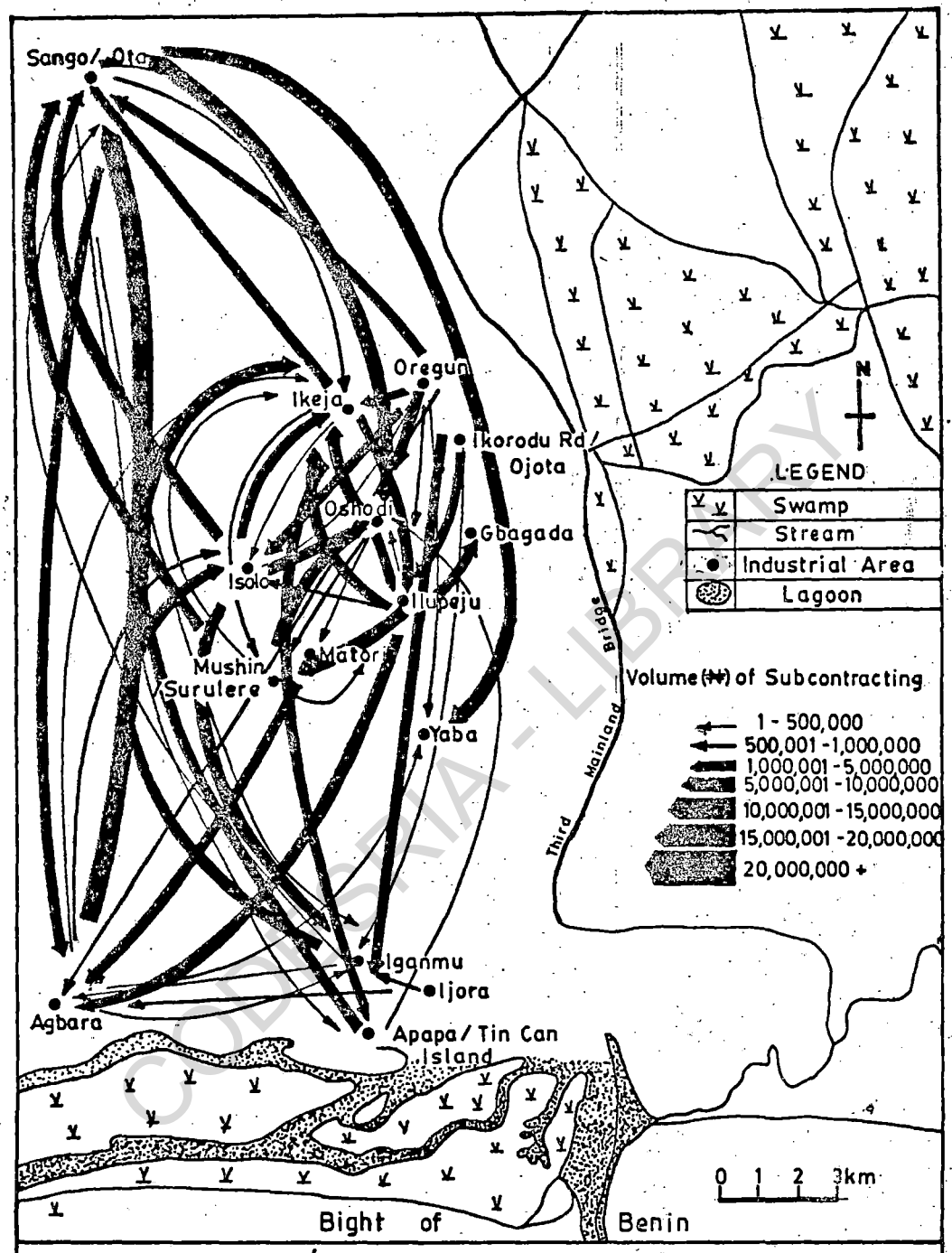


Fig. 5.21: Inter - estates/areas Subcontracting Linkages in the Lagos Region, 1990.

Source: Author's Analysis 1996.

Base map from Surveyor General's Office, Ikeja - Lagos.

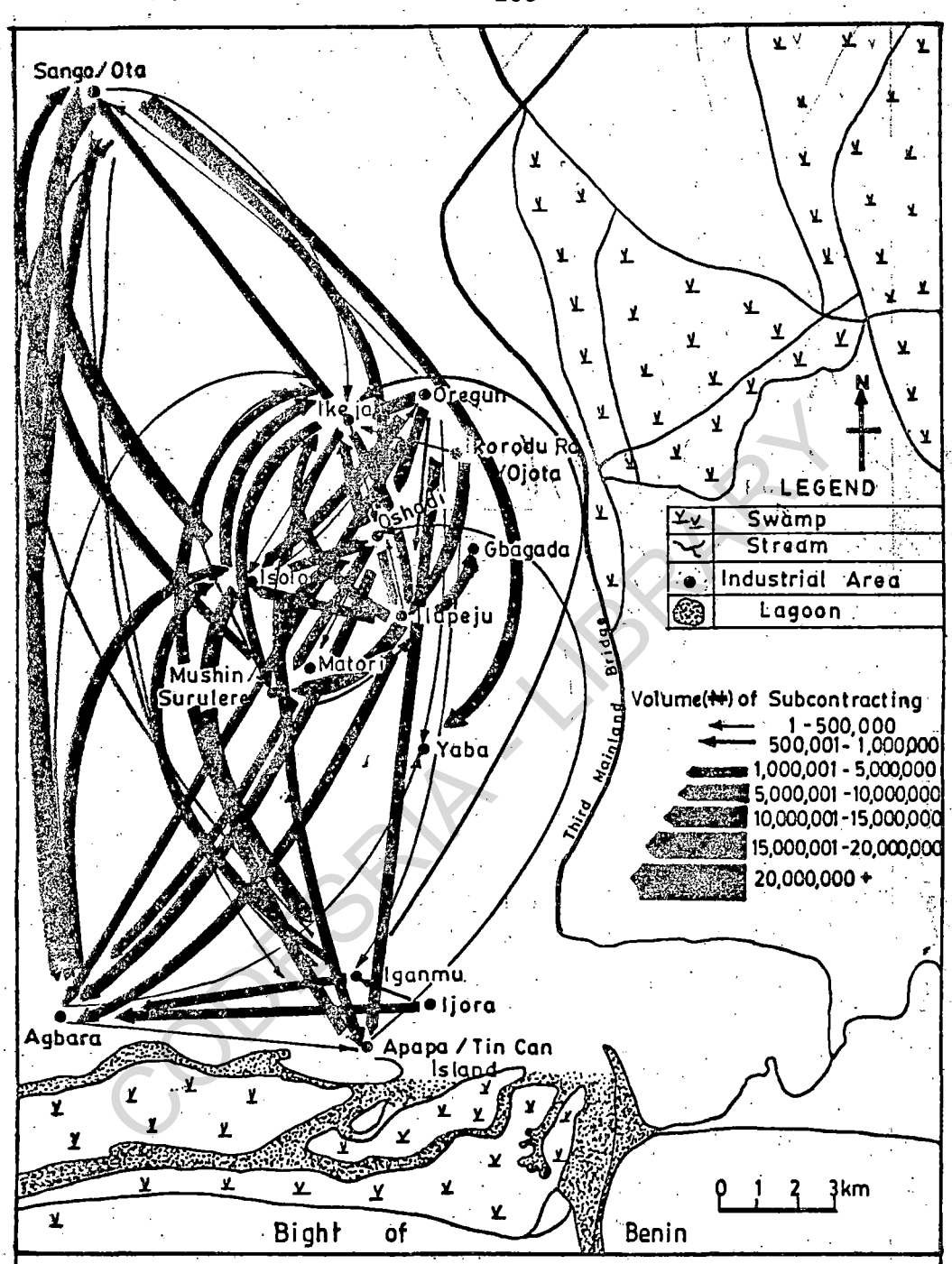


Fig.5.22: Inter-estates/areas Subcontracting Linkages in the Lagos Region, 1991.

Source: Author's Analysis, 1996.
Base map from Surveyor General's Office, Ikeja - Lagos.

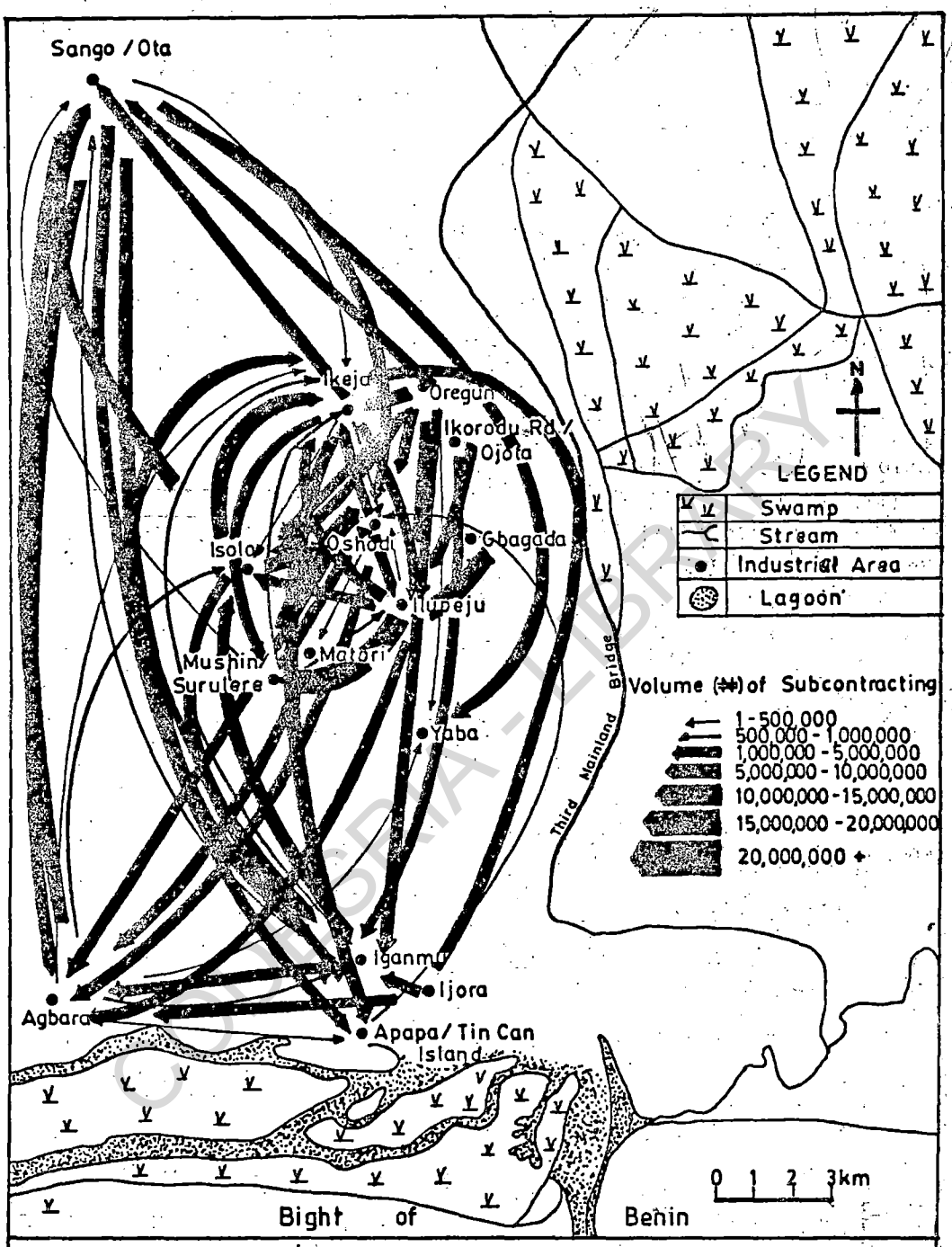


Fig. 5.23: Inter-estates/areas Subcontracting Linkages in the Lagos Region, 1992.

Source: Author's Analysis, 1996.
Base map from Surveyor General's Office, Ikeja - Lagos.

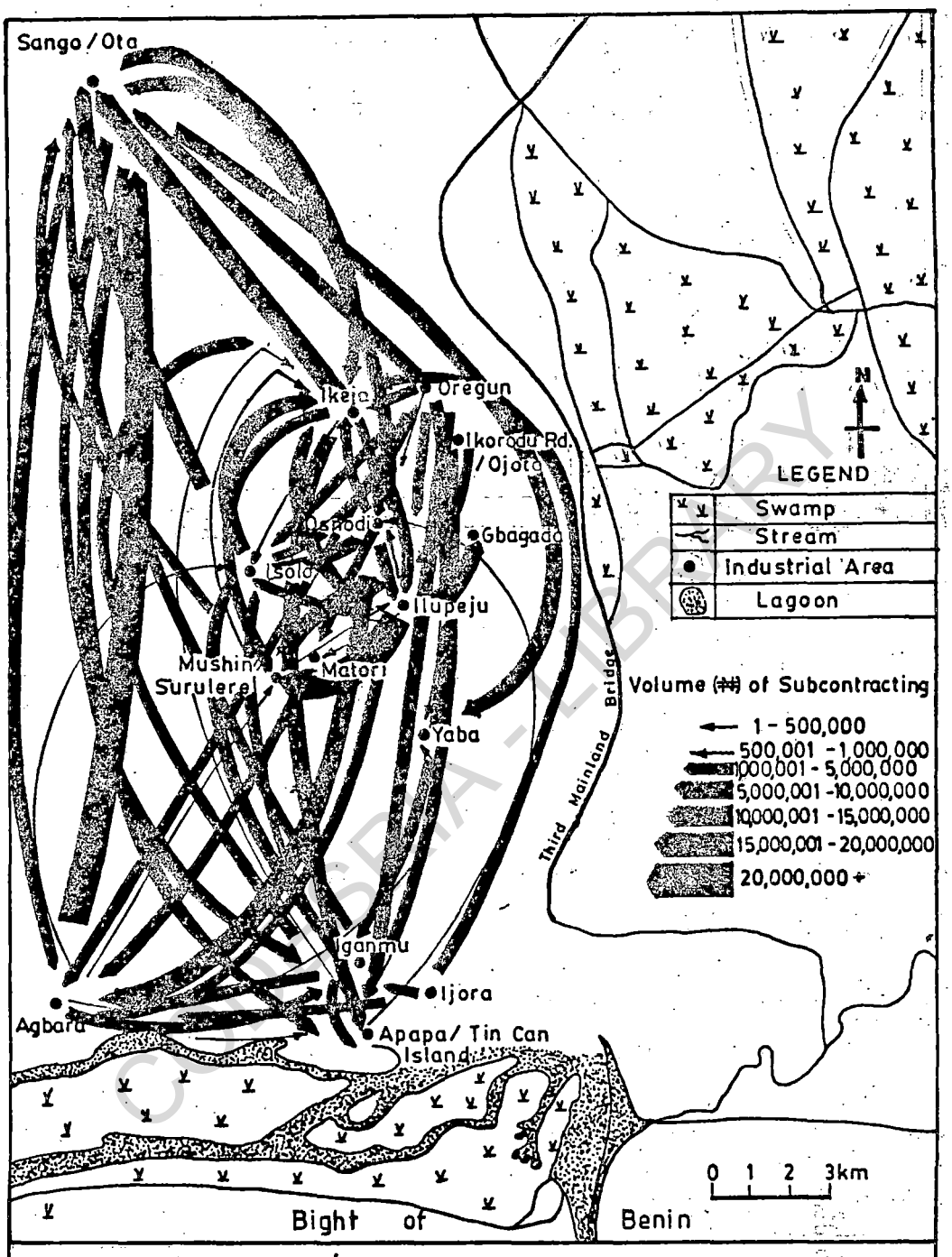


Fig. 5.24: Inter-estates/areas Subcontracting Linkages in the Lagos Region, 1993.

Source: Author's Analysis, 1996.

Base map from Surveyor General's Office, Ikeja - Lagos.

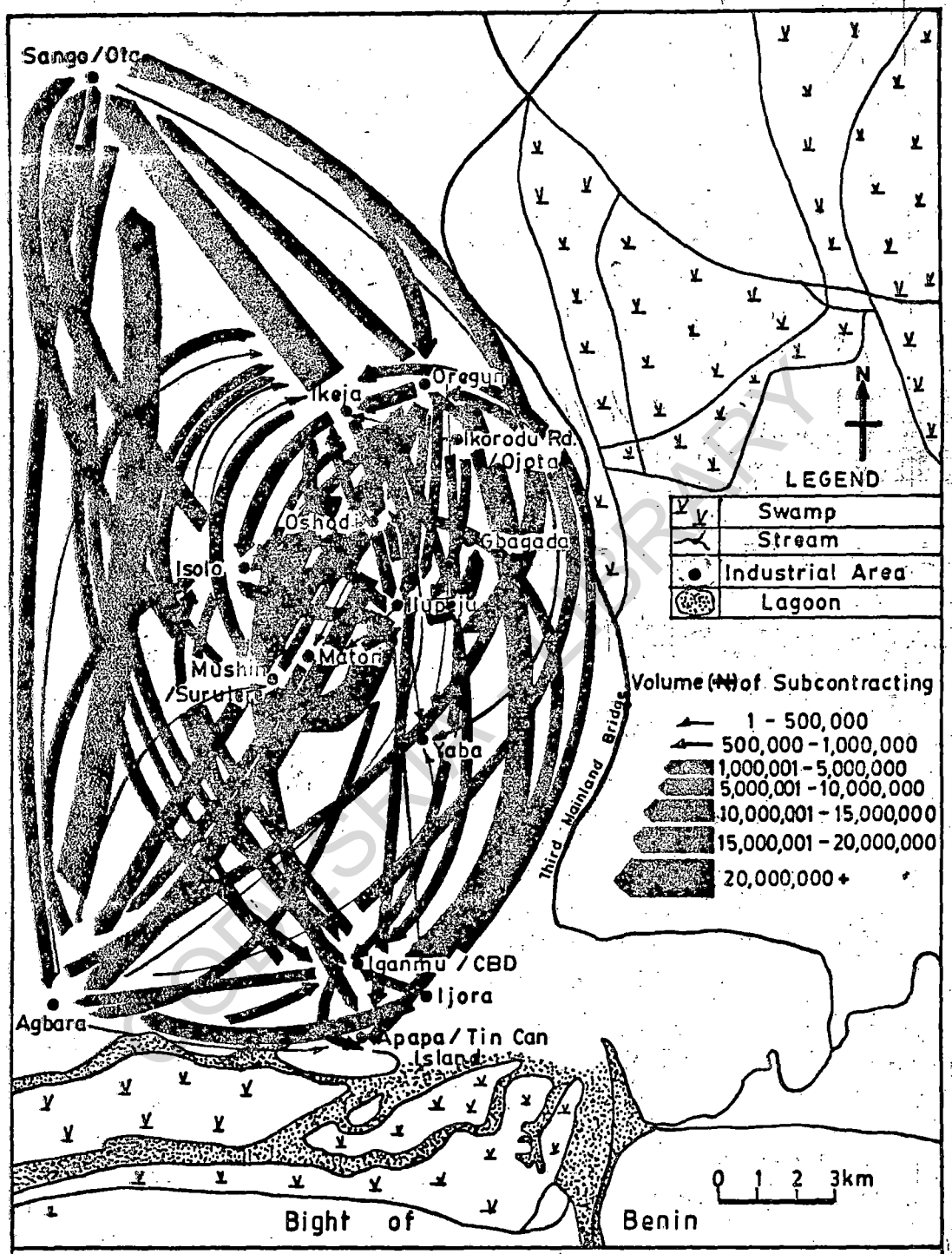


Fig. 5.25: Inter-estates/areas Subcontracting Linkages in the Lagos Region, 1994.

Source: Author's Analysis, 1996.
Base map from Surveyor General's Office, Ikeja-Lagos.

and Isolo industrial estates/areas to Sango/Ota, Oregun industrial estate/area to Agbara, Iganmu industrial estates/areas. Others were from Ilupeju industrial estate/area to Mushin/Surulere, Oshodi/Agege industrial estate area to Agbara, and Sango/Ota to Ilupeju industrial estate/area. The pattern of flow is most obvious in 1994.

Inter-estates/areas subcontracting linkages increased over the years. For instance, the flow from Ikeja/Ogba/Isheri to Sango/Ota increased from ₦3,623,460 in 1990 to ₦34,178,339 by 1994. The flow from Agbara industrial estate/area to Sango/Ota industrial estate/area which was ₦2,669,918 in 1990 increased to ₦4,223,931 by 1994. Similarly, the flow from Mushin/Surulere industrial estate/area to Ilupeju industrial estate/area increased from ₦8,295,816 in 1990 to ₦25,303,359 by 1994.

Apapa/Tin Can Island industrial estate/area subcontracting linkages from Ikeja/Ogba/Isheri industrial estate/area increased from N2,574,564 in 1990 to ₦9,654,700 by 1994. While Apapa/TinCan Island industrial estate received no subcontracting linkage from Isolo industrial estate/area in 1990, subcontracting linkage between these two estates/areas amounted to as much as ₦3,721,082 in 1994. Also, Ijora industrial estate/area which had no subcontracting linkage from any industrial estate/area from 1990 to 1993 had subcontracting linkage worth ₦111,773 from Ilupeju industrial estate/area in

1994.

Apart from the general increase in the volume of inter-estates/areas subcontracting linkages, one other feature of subcontracting linkages within the Lagos region is the complexity of these linkages over the years. In fact, the subcontracting linkages became more complex over the years. This complexity may be explained in terms of the increase in the number of flows over the years. For instance, the number of industrial estates/areas having subcontracting linkages with Ikeja/Ogba/Isheri industrial estate/area increased from 8 in 1990 to 11 by 1994, while the number of industrial estates/areas receiving subcontracting linkages from Ikeja/Ogba/Isheri industrial estate/area increased from 6 in 1990 to 7 by 1994. The number of estates/areas having subcontracting linkages with Yaba industrial estate/area increased from 3 in 1990 to 4 by 1994. Iganmu industrial estate/area had subcontracting linkages from 5 other industrial estate/area in 1990, and from 7 industrial estates/areas by 1994. Indeed, subcontracting linkages within the Lagos region became more complex in succesive years (see appendices II to VI for details).

5.4 DETERMINANTS OF THE SPATIAL PATTERNS OF PRODUCTION SUBCONTRACTING

The determinants of the spatial patterns of production subcontracting at the aggregate level are analysed using the stepwise multiple regression model.

5.4.1 Choice of variables

The aggregate number of production subcontractors, and the volume of production subcontracting in identified locations in 1994 are used in succession as the dependent variables in the analyses. The independent variables measure the size and structural characteristics of the various locations. These variables are (1) population of the centres where subcontractors are found, (2) number of industrial establishments, (3) number of educational institutions, (4) number of advertising agencies, (5) number of banks and allied institutions, (6) number of insurance/allied companies, (7) number of registered hotels/restaurants, (8) number of hospitals/medical facilities, (9) distance (km) from Lagos to subcontracting locations, (10) availability of airport, (11) availability of railways, (12) type of road link - (measured as dual-carriageway = 3, trunk road = 2, others = 1), (13) number of registered transporters/haulage companies, and (14) number of

telephone lines. Availability of airport and railway, is measured in binary, that is, 1 if available and 0 if otherwise.

The choice of these variables is based on the premise that industrial linkage stresses the importance of the existence of relatively well-developed infrastructure, such as highways, railroad lines and termini, airport, utilities, commercial facilities - such as banks etc, and research organizations such as educational institutions, as determinants of spatially linked industrial activities (see Smith 1981; Scott and Bergman, 1995). Spatially linked industrial activities tend to converge locationally around points that are maximally accessible, given the fact that linkage ties operate only over short distances.

Good transportation facilities are of importance especially in places of existing industrial concentration which may contain the pool of labour with particular skills. In addition, the spatial division of labour stresses the importance of pre-existing characteristics of specific places, and the uniqueness of labour factors as determinants of spatially linked economic activities.

Apart from the population which directly measures the size of the various subcontracting locations, the next seven variables measure the socio-economic status of the locations. The other six variables measure the accessibility of these locations. It is expected that the size, that is, the

population of locations will be directly related to the level of subcontracting activities. In other words, places of large population concentration are likely to have more production subcontracting activities undertaken in them while smaller places are likely to have less production subcontracting activities undertaken in them. The basis for this expectation is that the literature on industrial linkage suggests that certain materials and supplies may be cheaper in larger cities than in small ones, by virtue of local production, or good transportation facilities, and economies of scale which can make power cheaper as the size of the local market increases and the existence of relatively well-developed infrastructure as determinants of spatially linked industrial activities.

The socio-economic variables are the industrial support services. It is expected that places that have high scores in these variables are likely to have high incidence of production subcontracting activities. Spatial division of labour stresses the importance of pre-existing characteristics of specific places, and the uniqueness of the labour factors as determinants of spatially linked economic (industrial) activities [see Sargant, 1961; Massey, 1979, 1984; Johnson, 1989; Scott and Bergman, 1995].

Except the variable which measures the distance (Km) between Lagos and other locations where subcontractors are found, because linkage ties are

said to operate only over short distances [Wood, 1969], it is expected that all other measures of accessibility are likely to have direct relationship with the spatial distribution of subcontracting activities. The literature suggests that spatially linked industrial activities tend to converge locationally around points that are maximally accessible.

5.4.2 Test for mulitcollinearity

The stepwise multiple regression technique is used in this analysis. The variables are subjected to the "zero-restriction" analysis. This is to solve the probable problem of multicollinearity in the data. The correlation matrix in Table 5.2 shows the relationship between the two dependent variables, that is, the volume of production subcontracting and the number of production subcontractors in identified locations and the independent variables. Also, the table shows the relationship amongst the independent variables. Ten of the independent variables have pairwise correlation values more than 0.8. Only four variables, that is, distance (Km) from Lagos to subcontracting locations, availability of airport, availability of railway and type of roadlink, have very low correlation values with the dependent variables. Indeed, there is a negative relationship between distance (Km) from Lagos to sub-contracting locations and the dependent variables. The relationship between

TABLE 5.2: Correlation Matrix Amongst Variables

	Variable	Y_1	Y_2	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}
Y_1	Volume (M) of Production Subcontracting	1.000															
Y_2	Number of Production Subcontracting	0.990	1.00														
X_1	Population Figures	0.968	0.980	1.000													
X_2	No. of Industrial Establishments	0.974	0.986	0.876	1.000												
X_3	No. of Educational Institutions	0.933	0.948	0.935	0.951	1.000											
X_4	No. of Advertising Agencies	0.978	0.994	0.885	0.944	0.972	1.000										
X_5	No. of Banks/Allied Institutions	0.972	0.982	0.890	0.982	0.993	0.983	1.000									
X_6	No. of Insurance Companies	0.908	0.930	0.933	0.930	0.983	0.949	0.966	1.000								
X_7	No. of Registered Hotels/Restaurants	0.875	0.895	0.855	0.895	0.939	0.911	0.945	0.920	1.000							
X_8	No. of Hospitals/Medical Facilities	0.977	0.987	0.871	0.987	0.958	0.984	0.994	0.950	0.919	1.000						
X_9	Distance(Km) from Lagos to Subcontracting Locations	-.318	-.383	-.395	-.370	-.315	-.378	-.292	-.294	-.274	-.290	1.000					
X_{10}	Availability of Airport	0.198	0.205	0.301	0.205	0.400	0.270	0.319	0.417	0.451	0.284	0.239	1.000				
X_{11}	Availability of Railway	0.294	0.248	0.419	0.248	0.364	0.244	0.332	0.357	0.448	0.272	0.294	0.501	1.000			
X_{12}	Type of Road Link	0.344	0.333	0.419	0.333	0.467	0.381	0.364	0.418	0.419	0.330	-.324	0.339	0.141	1.000		
X_{13}	No. of Registered Transporters/Haulers	0.876	0.885	0.790	0.885	0.898	0.891	0.920	0.916	0.844	0.902	0.060	0.389	0.372	0.280	1.000	
X_{14}	No. of Telephone Lines	0.970	0.986	0.923	0.986	0.983	0.992	0.988	0.962	0.938	0.983	-.389	0.282	0.293	0.408	0.881	1.000

Source: Author's Analysis, 1996

each of the independent variables and the other ones is such that apart from those variables that have low correlation values with the dependent variables, all the other variables have high correlation values. This suggests that there is a serious problem of multicollinearity among these variables.

As indicated in chapter four, multicollinearity exits among the independent variables only where the pairwise correlation is more than 0.8. In addition to these variables, the number of industrial establishment is included in the regression model. The choice of number of industrial establishment among the variables is based on the fact that industrial activity is being considered in this study. That number of industrial establishments and eight other variables have serious problems of multicollinearity suggests that any one of these variables may as well be built into the regression model. Hamburg (1971), suggests the exclusion of one of a pair of variables which are collinear from consideration using the so-called "zero-restriction". It is based on this premise that number of industrial establishments and other four variables which have no problem of multicollinearity are included in the step-wise multiple regression model. Based on this criterion, five variables are chosen for the required analysis. These other variables are distance (Km) from Lagos to subcontracting locations, availability of airport, availability of railway, and type of road link.

5.4.3 Results and discussion

The result of the stepwise multiple regression in Table 5.3 shows that only two steps are possible. The criterion for selecting variables in the analysis is set at 0.05 range of tolerance. The result shows that only the number of industrial establishments is significant. The level of significance is as high as 0.001. The level of significance of each of the other variables, that is, availability of airport, type of road link, availability of railway, and distance from Lagos to subcontracting locations are 0.316, 0.660, 0.566, and 0.691, respectively. This implies that apart from number of industrial establishments, all the other variables are not significant in explaining the spatial distribution of number of production subcontractors.

The R value in the first step in table 5.3, is about 0.97% while R^2 is 0.98%. In the second step, R is 0.99146, while R^2 is 0.98300. This implies that number of industrial establishments alone accounts for about 97 per cent of the spatial distribution of production subcontractors in step one while the number of industrial establishments and other variables account for about 98 per cent of the spatial distribution of production subcontractors in step two. The percentage change in R^2 is 0.1137. This represents about 1 per cent of the explanation. In this case, the difference between the first and second step in the analysis is only 1 per cent.

Table 5.3: Summary of the Stepwise Multiple Regression model for the Number of Production Subcontractors

Step	Variable Description	b	Stabdard Error of b	t	Level of Significance	R	R^2	R^2 Change
1	No. of Industrial Establishments	0.204252	0.010523	19.409	0.000	0.98571	0.97163	—
2	No. of Industiral Establihsments	0.211379	0.012648	16.712	0.000			
	Availability of Airport	-5.770680	5.338824	1.081	0.316			
	Type of Road Link	-1.740372	3.794095	-0.459	0.660	0.99146	0.98300	0.1137
	Availability of Railway	-2.976729	4.947093	-0.602	0.566			
	Distance (KM) from Lagos	-0.002483	0.005983	-0.415	0.691			
	(Constant)	2.004579	6.198138	0.323	0.756			

Source: Author's Analysis, 1996

The significance of the number of industrial establishments in explaining the spatial distribution of production subcontractors is further shown by the t-values. In step one, when only the number of industrial establishment is significant, the t-value is 19.40. In step two, when number of industrial establishments and all the other variables were entered into the step-wise multiple regression model, the t-value for number of industrial establishments alone is 16.712. The t-value for availability of airport, type of roadlink, availability of railway, and distance (Km) of Lagos from subcontracting locations are 1.081, -0.459, -0.602, and -0.415 respectively.

The result of the stepwise multiple regression model for the volume of production subcontracting in Table 5.4 also shows that only two steps are possible. Only the number of industrial establishments is significant. The level of significance is 0.0001. The level of significance of the other variables that is availability of airport, type of road link, availability of railway, and distance (km) from Lagos is 0.3127, 0.8967, 0.9366, and 0.3683, respectively. This implies that apart from the number of industrial establishments, all other variables are not significant in explaining the spatial distribution of the volume of production subcontracting.

The R value in the first step is 0.97754, while R^2 is 0.95559. In the second step, R is 0.98609 while R^2 is 0.97237. This implies that the number

Table 5.4: Summary of the Stepwise Multiple Regression Model for the Volume of Production Subcontracting

Step	Variable Description	b	Stabdard Error of b	t	Level of Significance	R	R^2	R^2 Change
1	No. of Industrial Establishments	1931240.6527	125524.2978	15.385	0.000	0.97754	0.95559	—
2	No. of Industiral Establihsment	2075940.7384	154777.3241	13.412	0.000	0.98609	0.97237	0.01678
	Availability of Airport	-110422741.3	64910708.27	-1.701	0.1327			
	Type of Road Link	-6204841.669	46106172.47	-0.135	0.8967			
	Availability of Railway	-4957555.583	60143837.84	-0.082	0.9366			
	Distance (KM) from Lagos	69900.286678	72698.65537	0.962	0.3683			
	(Constant)	-5337116.822	75325988.15	-0.071	0.9455			

Source: Author's Analysis, 1996

of industrial establishments alone accounts for about 96 per cent of the spatial distribution of the volume of production subcontracting, while in step two, the number of industrial establishments and other variables account for about 97 per cent of the spatial distribution of the volume of production subcontracting. The percentage change in R^2 is 0.01672. This represents about 2 per cent of the explanation. The significance of the number of industrial establishments in explaining the spatial distribution of the volume of production subcontracting is further clearly shown by the t-value. In step one, when only the number of industrial establishments is significant, the t-value is 15.385. In step two, when number of industrial establishments and all the other variables were entered into the step-wise multiple regression model, the t-value for number of industrial establishments alone is 13.412. The t-value for availability of airport, type of roadlink, availability of railway, and distance (Km) of Lagos from subcontracting locations are -1.701, -0.135, -0.082, and 0.9455 respectively.

Whether in terms of the number of production subcontractors or the volume of production subcontracting, it is obvious from he analyses that number of industrial establishments is the only significant explanatory variable of the spatial pattern of production subcontracting. The results are significant at 0.0001 per cent level. This implies that the hypothesis which

states that the spatial pattern of production subcontractors is significantly explained by the size and structural characteristics of the locations where subcontractors are found is true. The hypothesis is accepted. This implies that the pre-existing characteristics of locations, especially the number of industrial activities and the existence of relatively well-developed infrastructure significantly determines spatially linked subcontracting activities.

CHAPTER SIX

SUMMARY OF FINDINGS AND CONCLUSION

6.1 SUMMARY OF MAJOR FINDINGS

Production subcontracting linkages started in the early 1960s, the post-independence period. The earliest stage in the adoption of production subcontracting as an industrial production technique in Nigeria was characterised by insignificant growth, and a rapid growth thereafter. However, there was marked variation in the adoption of production subcontracting by industry groups over the years.

Whether in terms of number of contractors involved or volume of production subcontracting, textiles, wearing apparels and leather industry group dominates the production subcontracting scene. While the number of subcontractors engaged by any contracting firm ranged from one to a maximum of four, over fifty per cent of the contractors engaged the services of a maximum of two subcontractors. The number of subcontractors engaged varied markedly especially in food, beverages and tobacco; chemicals and pharmaceuticals and textiles, wearing apparel and leather industry groups.

The dominant form of subcontracting is speciality subcontracting mainly carried out by independent subcontractors over short distances. Production

states that the spatial pattern of production subcontractors is significantly explained by the size and structural characteristics of the locations where subcontractors are found is true. The hypothesis is accepted. This implies that the pre-existing characteristics of locations, especially the number of industrial activities and the existence of relatively well-developed infrastructure significantly determines spatially linked subcontracting activities.

subcontracting became very important after the introduction of the Structural Adjustment Programme (SAP), and its is percieved by industrialists as very important in reducing the costs of production.

The volume of production subcontracting defined in terms of the monetary values increased and varied significantly amongst the contracting firms over the years. This study also shows that there is no significant relationship between the volume of production subcontracting and the size and structural characteristics of contracting firms.

It is only in the motor vehicles and miscellananeous assembly industry group that production subcontracting accounted for more than thirty per cent of the total costs of production in any of the years. Textiles, wearing apparel and leather industry group accounted for the largest volume of production subcontracting in any of the years. While all the industry groups are involved in production subcontracting within the Lagos region, only five of the industry groups carried production subcontracting beyond the Lagos region.

This study also shows that production subcontractors are concentrated in Lagos, Ikorodu, Sagamu and Ibadan in the Southwest; Jos, Kaduna, Zaria, Kano, and Sokoto in the north; and a few other locations such as Benin, Owerri, Port-Harcourt and Ilorin. Lagos has the largest concentration of

subcontractors in each of the years. Within the Lagos region, subcontractors are concentrated mainly in Ikeja/Ogba/Isheri, Ilupeju, Sango/Ota, Oshodi/ Agege, Agbara, and Isolo indutsrial estates/areas. In terms of the spatial distribution of the volume of production subcontracting, Lagos alone accounted for over 60 per cent in any of the years. Ikeja/Ogba/Isheri, Ilupeju, Sango/Ota, Oshodi/Agege, and Mushin/Surulere industrial estates/ areas, in that order, are the major areas of concentration of the volume of production subcontracting.

There are both intra-and inter-estates/areas subcontracting linkages within the Lagos region. Intra-estate/area subcontracting is carried out in Ikeja/Ogba/Isheri, Oshodi/Agege, Matori, Ilupeju, Iganmu, Sango/Ota, and Agabara industrial estates/areas. Inter-estates/areas subcontracting linkages, though varying amongst the estates/areas, increased, and became more complex over the years.

Finally, this study shows that the spatial distribution of production subcontracting activities is significantly explained by the pre-existing charactersitics of locations where subcontractors are found. Indeed, the number of industrial establishments is the most significant explanatory variable.

6.2 IMPLICATIONS OF THE FINDINGS

The research findings have implications for the development of indigenous independent entrepreneruship in particular and the industrial development of Nigeria in general. Although production subcontracting linkage is weakly developed and concentrated mainly in and around the Lagos region, the increasing rate of production subcontracting could be used to develop indigenous entrepreneuship. This is especially so as the dominant form of production subcontracting is specialized subcontracting carried out by independent subcontractors.

The Japanese experience shows that the promotion of industrial subcontracting in economic development is largely motivated by the participation of small entrepreneurs. Such motivation could be in either of two forms. On the one hand is the encouragement of retirees to set up small business units with the motive of producing parts or sub-assembly of products. Such retirees will be more able to bring their experiences, acquired over the years, to bear on part production or sub-assembly of products, based on mutual trust. Such encouragement could be in the form of assisting such retirees to set up small business units or providing the required capital or both. On the other hand, the government is involved in the setting up, and facilitating collaborative ventures between large and small scale enterprises, especially in the hinterlands.

6.2.1 Implications of study for policy

The policy implication of this study is that production subcontracting strategy could be used in effecting a more even distribution of industrial activities in all parts of Nigeria. No doubt, the development of transport and communication facilities will enhance the development of hinterlands subcontractors. This is because such transport facilities will enhance the operations of such subcontractors located in the hinterlands.

In addition, the government's initiative at encouraging the local manufacture of industrial products hitherto imported could be enhanced through the encouragement of production subcontractors. The subcontracting of specialized aspects of industrial production could be better explored for the development of indigenous entrepreneurship. Concerted efforts at the development of the Iron and Steel, and petrochemical industries will further conduce the environment to increased subcontracting activities. At the very least, the development of these major projects could facilitate local sourcing of parts and/or sub-assembly in basic metal, iron and steel and fabricated metal products and the industrial and domestic plastics and rubber products industries. Such arrangement could take the form of either vertical integration or horizontal integration.

As a part of the privitization and liberalization schemes, subcontracting of components or sub-assembly of products could further be harnessed to launch Nigeria into the desired goal of industrialization. The development

of the Export Processing Zone (EPZ), will facilitate the development of production subcontracting. No doubt, the encouragement of production subcontracting, especially in the hinterlands, will encourage the local sourcing of materials. Production subcontracting, is in fact, a strategy for mobilizing both human and material resources for industrial development.

The major findings in this study shows that the expected relationship between the volume of production subcontracting and the size and structural characteristics of firms does not conform with the conceptual/theoretical specifications. This is may be attributable to the low level of manufacturing activities in Nigeria. Perhaps, such other variable as the nationality of firm's owner, whether local or foreign, may be significantly related to the volume of production subcontracting.

However, the spatial patterns of production subcontracting conform with the provisions of spatio-economic developments that economic activities including industrial may be explained in terms of pre-existing characteristics of specific places. Therefore, an understanding of the networks of inter-firm relationships could be better understood through the spatial perspective. This is a clear departure from the transaction costs perspective within which earliest studies on production subcontracting have been carried out in the literature.

6.3 AREAS FOR FURTHER RESEARCH

It is obvious from the findings in this study that the size and structural characteristics of firms do not significantly explain the volume of production subcontracting. This suggests that the finding is inconclusive. However, the spatial patterns of production subcontracting, although significantly explained by the number of industrial establishments, it may be possible that if this study were carried out in the developed world the results would be at variance with the findings in this study. Also, it is possible that the finding may vary if this study were to focus on subcontracting links in all parts of Nigeria.

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APPENDIX 1

QUESTIONNAIRE

S/NO

DEPARTMENT OF GEOGRAPHY
UNIVERSITY OF IBADAN
IBADAN

Industry Group.....

Dear Respondent,

This questionnaire is designed to seek information on the theme "Spatial Pattern of Production Subcontracting in Nigeria", being a Ph.D Research in the above named department.

Please, be assured that all the information provided will be treated in confidence and used only for academic purposes.

(A) Background, Information

(1) Location(Address/Industrial Estate) .....

(2) Year of Establishment.....

(3) Capital Investment (by the end of 1994) N.....

(4) Plant size (floor space)..... sq. meters

(5) Capacity utilization.....%

(6) Staff Strength and Profile

Management	Operational/Technical	Clerical/Auxiliary	Total

(B) Subcontracting History

(7) When did your firm start subcontracting your production process?

.....year.

(8) List firm(s) (within Nigeria) under each of the different types of sub-contracting arrangements.

(i) Speciality Subcontracting i.e. the production of part of your firm's product(s) for which your subcontracting partner(s) has special skills and/or equipment.

Name of firm	Location (Town/State)	Distance from Lagos(Km)	Item Produced	Indicate year(s) in which firm was engaged
1.				
2.				
3.				
4.				

(ii) Complementary Subcontracting:- Part of your firm's production process required to meet occasional increase in demand for your product(s) without expand your production capacity.

Name of firm	Location (Town/State)	Distance from Lagos (Km)	Item Produced	Indicate year(s) in which firm was engaged
1.				
2.				
3.				
4.				

(iii) Cost-Saving Subcontracting:- Production of part(s) of your firm's product(s) for which cost of production is significantly reduced when produced by other firm(s).

Name of firm	Location (Town/State)	Distance from Lagos (Km)	Item Produced	Indicate year(s) in which firm was engaged
1.				
2.				
3.				
4.				

(9) Please, state your firm's relationship (either (1) branch subcontractor, (2) subsidiary subcontractor, (3) independent subcontractor, (4) former employee subcontractor) with subcontracting partners and the value of transaction in the past 5 years following the order in which firms are listed in question 8 above.

(i) Speciality Subcontracting.

Name of firm	Relationship with firm	Value of transaction (=#=) 1990 1991 1992 1993 1994
1.		
2.		
3.		
4.		

(ii) Complementary Subcontracting.

Name of Firm	Relationship with firm	Value of transaction (#) 1990 1991 1992 1993 1994
1.		
2.		
3.		
4.		

(iii) Cost-saving Subcontracting.

Name of Firm	Relationship with firm	Value of transaction (#) 1990 1991 1992 1993 1994
1.		
2.		
3.		
4.		

(10) What percentage of your costs of production was accounted for by subcontracting in each of the past five years.

Year	1990	1991	1992	1993	1994
Percentage					

(11) (a) To what extent has your firm's subcontracting relationships reduced your cost in past five years?

Item	1990 (%)	1991 (%)	1992 (%)	1993 (%)	1994 (%)
i Procurement and maintenance of machinery					
ii. Wages and Salaries					
iii. Labour crisis management and control					
iv. Managerial operation					
v. Staff recruitment and training					

(b) Rank in order of importance from (1) Not important (2) Important (3) Very important, the following advantages of subcontracting relationship to your firm.

Item	Rank
i. Improved labour crisis management	
ii. Reduced cost of production	
iii. Enhancement Research and Development (R &D)	

(12) What is the perceived significance/importance of subcontracting relationships in sustaining your firm's operations before and after the introduction of the Structural Adjustment Programme (SAP) in 1986 in Nigeria? tick (3) appropriately.

Period	Very Important	Important	Not Important
Before SAP			
Since SAP			

Appendix II

Volume (₦) of Subcontracting Linkages Amongst Industrial Estate/Areas in the Lagos Region, 1990

Estate/Area (Destination)

Estate/Area (Source)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A - Ikeja/ Ogba/ Isheri		4,707,885 (3.70)	= (0.0)	= (0.0)	1,048,896 (0.82)	(0.0)	3,460,824 (2.72)	1,258,676 (1.00)	257,456 (0.20)	= (0.0)	= (0.0)	= (0.0)	667,479 (0.52)	228,850 (0.18)	1,144,250 (0.90)
B - Oregun	= (0.0)		=	= (0.0)	= (0.0)	= (0.0)	476,771 (0.37)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
C - Gbagada	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	1,908,084 (1.50)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
D - Ikorudu Rd/ Ojota	(0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
E - Oshodi/ Agege	333,740 (0.26)	1,907,084 (1.50)	= (0.0)	= (0.0)		= (0.0)	2,520,402 (2.0)	38,142 (0.03)	5,395,140 (4.24)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	286,063 (0.22)
F - Matori	= (0.0)	= (0.0)	= (0.0)	= (0.0)	381,417 (0.30)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
G - Isolo	94,638 (0.07)	2,793,878 (2.20)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		667,479 (0.52)	= (0.0)	= (0.0)	= (0.0)	1,144,250 (0.90)	= (0.0)	774,360 (0.61)	= (0.0)
H - Ilupeju	2,005,530 (1.58)	624,913 (0.50)	= (0.0)	2,669,918 (2.10)	1,144,250 (0.90)	= (0.0)	= (0.0)		381,417 (0.30)	= (0.0)	= (0.0)	= (0.0)	2,479,209 (1.95)	= (0.0)	= (0.0)
I - Mushin/ Surulere	762,834 (0.60)	= (0.0)	= (0.0)	= (0.0)	1,334,959 (1.05)	= (0.0)	= (0.0)	8,295,816 (6.52)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
J - Yaba	= (0.0)	47,677 (0.04)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.01)	266,918 (2.10)	152,567 (0.12)	= (0.0)
K - Ijora	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)
L - Iganmu	= (0.0)	= (0.0)	= (0.0)	239,386 (0.19)	= (0.0)	= (0.0)	3,051,335 (2.40)	= (0.0)	= (0.0)	= (0.0)	667,479 (0.52)		381,417 (0.30)	427,026 (0.34)	= (0.0)
M - Sango/ Ota	3,623,460 (2.85)	1,716,376 (1.35)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	1,525,667 (1.20)	= (0.0)	1,412,787 (1.11)	= (0.0)	= (0.0)	429,094 (0.34)		14,776,255 (11.61)	= (0.0)
N - Agbara	= (0.0)	572,125 (0.45)	= (0.0)	= (0.0)	= (0.0)	1,144,250 (0.90)	= (0.0)	1,430,313 (1.12)	= (0.0)	= (0.0)	762,834 (0.60)	762,834 (0.60)	2,669,918 (2.10)		= (0.0)
O - Apapa/Tin Can Island	2,574,564 (2.02)	1,902,084 (1.50)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	762,834 (0.60)	= (0.0)	

Figures in parentheses are percentages

Source Author's Analysis, 1996.

Appendix III

Volume (₦) of Subcontracting Linkages Amongst Industrial Estates/Areas in the Lagos Region, 1991

Estate/Area (Destination)

Estate/Area (Source)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A - Ikeja/ Ogba/ Isheri		8,527,688 (5.71)	= (0.0)	= (0.0)	1,273,740 (0.85)	= (0.0)	5,169,928 (3.46)	2,192,652 (1.47)	454,907 (0.30)	= (0.0)	= (0.0)	795,178 (0.53)	454,907 (0.30)	227,454 (0.15)	1,073,581 (0.72)
B - Oregun	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	727,851 (0.49)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
C - Gbagada	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	2,274,535 (1.52)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
D - Ikorudu Rd/ Ojota	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
E - Oshodi/ Agege	395,769 (0.26)	2,729,442 (1.83)	= (0.0)	= (0.0)		= (0.0)	6,766,470 (4.53)	56,408 (0.04)	7,776,625 (5.20)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	245.650 (0.16)
F - Matori	= (0.0)	= (0.0)	= (0.0)	363,926 (0.0)			= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
G - Isolo	99,752 (0.07)	4,503,580 (3.01)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		1,310,132 (0.88)	= (0.0)	= (0.0)	= (0.0)	1,819,628 (1.22)	= (0.0)	1,303,708 (0.87)	= (0.0)
H - Ilupeju	2,660,876 (1.78)	745,320 (0.50)	= (0.0)	4,276,126 (2.86)	1,455,703 (0.10)	= (0.0)	= (0.0)		545,888 (0.37)	= (0.0)	= (0.0)	= (0.0)	3,002,386 (2.00)	= (0.0)	= (0.0)
I - Mushin/ Surulere	773,342 (0.52)	= (0.0)	= (0.0)	= (0.0)	2,547,480 (1.70)	= (0.0)	= (0.0)	8,752,412 (5.86)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
J - Yaba	= (0.0)	5,459 (0.004)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	2,911,405 (1.95)	236,552 (0.16)	= (0.0)
K - Ijora	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)
L - Iganmu	= (0.0)	= (0.0)	= (0.0)	636,870 (0.43)	= (0.0)	= (0.0)	5,898,507 (3.95)	= (0.0)	= (0.0)	= (0.0)	791,538 (0.53)		727,851 (0.49)	= (0.0)	= (0.0)
M - Sango/ Ota	4,726,150 (3.16)	454,907 (0.30)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	5,762,035 (3.86)	= (0.0)	1,594,018 (1.07)	= (0.0)	= (0.0)	636,870 (0.43)		5,363,909 (3.59	= (0.0)
N - Agbara	= (0.0)	1,924,344 (1.29)	= (0.0)	= (0.0)	1,819,628 (1.22)	= (0.0)	= (0.0)	1,364,721 (0.91)	= (0.0)	= (0.0)	1,091,781 (0.73)	1,091,774 (0.73)	2,547,479 (1.70)		= (0.0)
O - Apapa/Tin Can Island	3,129,761 (2.09)	1,819,628 (1.22)	= (0.0)	= (0.0)	= (0.0)	1,455,703 (0.97)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	909,814 (0.61)	98,260 (0.07)	

Figures in parentheses are percentages

Source : Author's Analysis, 1996.

Appendix IV

Volume (₦) of Subcontracting Linkages Amongst Industrial Estates/Areas in the Lagos Region, 1992

Estate/Area (Source)	Estate/Area (Destination) A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A - Ikeja/ Ogba/ Isheri		9,756,773 (3.71)	= (0.0)	= (0.0)	1,830,660 (0.70)	= (0.0)	8,571,473 (3.26)	3,008,355 (1.14)	508,512 (0.19)	= (0.0)	1,017,043 (0.39)	915,321 (0.35)	711,900 (0.27)	101,702 (0.04)	1,159,407 (0.44)
B - Oregun	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	3,051,070 (1.16)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
C - Gbagada	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	13,221,304 (5.03)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
D - Ikorudu/ Rd Ojota	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
E - Oshodi/ Agege	735,308 (0.28)	2,237,452 (0.85)	= (0.0)	= (0.0)		= (0.0)	5,980,098 (2.27)	828,874 (0.32)	10,027,199 (3.81)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	213,575 (0.08)
F - Matori	= (0.0)	= (0.0)	= (0.0)	= (0.0)	813,618 (0.31)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
G - Isolo	144,963 (0.06)	6,000,620 (2.28)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		2,166,260 (0.82)	= (0.0)	= (0.0)	= (0.0)	2,542,559 (0.99)	= (0.0)	989,674 (0.38)	= (0.0)
H - Illupeju	4,924,526 (1.87)	1,041,432 (0.40)	= (0.0)	1,220,428 (0.46)	1,830,600 (0.70)	= (0.0)	= (0.0)		813,619 (0.31)	= (0.0)	= (0.0)	= (0.0)	4,169,812 (1.59)	= (0.0)	= (0.0)
I - Mushin/ Surulere	1,220,428 (0.46)	= (0.0)	= (0.0)	= (0.0)	1,728,340 (0.66)	= (0.0)	= (0.0)	16,333,396 (6.21)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
J - Yaba	= (0.0)	6,509 (0.002)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	3,939,949 (1.50)	335,618 (0.13)	= (0.0)
K - Ijora	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)
L - Iganmu	= (0.0)	= (0.0)	= (0.0)	1,017,026 (0.39)	= (0.0)	= (0.0)	4,271,498 (1.62)	= (0.0)	= (0.0)	= (0.0)	1,108,556 (0.42)		1,017,000 (0.39)	973,291 (0.37)	= (0.0)
M - Sango/ Ota	8,627,915 (3.28)	3,051,070 (1.16)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	5,898,736 (2.24)	= (0.0)	447,523 (0.17)	= (0.0)	= (0.0)	711,916 (0.27)		5,340,721 (2.03)	= (0.0)
N - Agbara	= (0.0)	3,834,376 (1.46)	= (0.0)	= (0.0)	4,068,093 (1.55)	1,627,237 (0.62)	= (0.0)	2,135,749 (0.81)	= (0.0)	= (0.0)	1,627,237 (1.62)	2,034,047 (0.77)	3,051,070 (1.16)		= (0.0)
O - Apapa/Tin Can Island	3,915,540 (1.49)	2,034,047 (0.77)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	2,034,047 (0.77)	142,383 (0.05)	

Figures in parentheses are percentages

Source Author's Analysis, 1996.

Appendix V

Volume (₦) of Subcontracting Linkages Amongst Industrial Estates/Areas in the Lagos Region, 1993

Estate/Area (Destination)

Estate/Area (Source)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A - Ikeja/ Ogba/ Isheri		6,682,864 (1.87)	= (0.0)	= (0.0)	2,031,945 (0.57)	= (0.0)	7,579,155 (2.12)	5,201,779 (1.46)	1,523,959 (0.43)	= (0.0)	2,031,900 (0.57)	487,667 (0.14)	1,015,972 (0.28)	60,958 (0.02)	2,202,628 (0.62)
B - Oregun	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	3,555,904 (1.00)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
C - Gbagada	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	13,715,628 (3.84)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
D - Ikorudu/ Rd Ojota	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
E - Oshodi/ Agege	3,098,716 (0.86)	812,778 (0.23)	= (0.0)	= (0.0)		= (0.0)	8,737,363 (2.45)	833,097 (0.23)	15,543,566 (4.35)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	1,271,997 (0.36)
F - Matori	= (0.0)	= (0.0)	= (0.0)	= (0.0)	1,219,167 (0.34)		= (0.0)	4,572 (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
G - Isolo	861,943 (0.24)	5,549,750 (1.55)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		2,793,924 (0.78)	= (0.0)	= (0.0)	= (0.0)	2,540,876 (0.71)	= (0.0)	993,731 (0.28)	= (0.0)
H - Illupeju	6,530,920 (1.83)	1,300,441 (0.36)	= (0.0)	4,881,712 (1.37)	1,625,556 (0.45)	= (0.0)	= (0.0)		1,219,167 (0.34)	= (0.0)	= (0.0)	= (0.0)	5,689,446 (1.60)	= (0.0)	= (0.0)
I - Mushin/ Surulere	1,524,381 (0.42)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	20,319,449 (5.69)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	121,917 (0.03)	= (0.0)
J - Yaba	= (0.0)	8 128 (0.002)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	4,571,876 (1.28)	284,472 (0.08)	= (0.0
K - Ijora	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)
L - Iganmu	= (0.0)	10,159,725 (2.84)	= (0.0)	1,423,833 (0.49)	= (0.0)	= (0.0)	3,748,938 (1.05)	= (0.0)	= (0.0)	= (0.0)	1,381,768 (0.39)		1,117,570 (0.31)	3,760,351 (1.05)	= (0.0)
M - Sango/ Ota	19,230,111 (5.38)	5,283,057 (1.48)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	9,143,752 (2.56)	= (0.0)	4,013,132 (1.12)	= (0.0)	= (0.0)	1,219,167 (0.31)		11,070,636 (3.10)	= (0.0)
N - Agbara	= (0.0)	2,951,621 (0.83)	= (0.0)	= (0.0)	12,191,670 (3.41)	1,828,750 (0.51)	= (0.0)	2,743,126 (0.77)	= (0.0)	= (0.0)	2,641,528 (0.74)	2,000,000 (0.56)	3,454,306 (1.00)		= (0.0)
O - Apapa/Tin Can Island	6,705,418 (1.88)	2,031,900 (0.57)	= (0.0)	= (0.0)	= (0.0)	2,438,334 (0.68)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	2,062,000 (0.58)	2,031,990 (0.57)	159,508 (0.04)	

Figures in parentheses are percentages

Source Author's Analysis, 1996.

Appendix VI

Volume (₦) of Subcontracting Linkages Amongst Industrial Estate/Areas in the Lagos Region, 1994

Estate/Area (Source) \ Estate/Area (Destination)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
A - Ikeja/ Ogba/ Isheri		11,765,358 (2.23)	= (0.0)	608,826 (0.12)	2,313,105 (0.44)	= (0.0)	12,956,406 (2.46)	9,722,081 (1.84)	3,017,094 (0.57)	= (0.0)	4,626,210 (0.88)	1,206,844 (0.23)	1,005,698 (0.19)	100,570 (0.02)	4,179,680 (0.79)
B - Oregun	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	5,028,489 (0.95)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	2,514,200 (4.77)	= (0.0)	2,111,966 (0.40)	= (0.0)
C - Gbagada	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	14,079,770 (2.67)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
D - Ikorudu/ Rd Ojota	= (0.0)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
E - Oshodi/ Agege	673,818 (0.12)	1,609,234 (0.31)	= (0.0)	= (0.0)		= (0.0)	11,766,665 (2.23)	1,231,980 (0.23)	24,010,031 (4.55)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	502,849 (0.10)	2,246,729 (0.43)
F - Matori	= (0.0)	= (0.0)	= (0.0)	= (0.0)	955,412 (0.18)		= (0.0)	8,046 (0.001)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)
G - Isolo	10,751,803 (2.04)	5,311,090 (0.01)	= (0.0)	= (0.0)	= (0.0)	= (0.0)		5,430,769 (1.03)	= (0.0)	= (0.0)	= (0.0)	4,022,791 (0.76)	= (0.0)	2,244,557 (0.43)	= (0.0)
H - Illupeju	9,518,483 (1.81)	1,609,000 (0.31)	= (0.0)	4,881,712 (0.93)	5,229,629 (1.00)	= (0.0)	= (0.0)		1,508,457 (0.29)	= (0.0)	= (0.0)	= (0.0)	7,542,734 (1.43)	= (0.0)	= (0.0)
I - Mushin/ Surulere	1,810,256 (0.34)	= (0.0)	= (0.0)	= (0.0)	3,218,233 (0.61)	= (0.0)	= (0.0)	25,303,359 (4.80)		= (0.0)	= (0.0)	= (0.0)	= (0.0)	152,366 (0.03)	= (0.0)
J - Yaba	= (0.0)	10,057 (0.001)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	115,655 (0.02)	= (0.0)		= (0.0)	= (0.0)	502,849 (0.10)	422,393 (0.08)	= (0.0)
K - Ijora	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	111,733 (0.02)	= (0.0)	= (0.0)		= (0.0)	= (0.0)	= (0.0)	= (0.0)
L - Iganmu	4,525,640 (0.85)	24,136,749 (4.58)	= (0.0)	1,423,833 (0.27)	= (0.0)	= (0.0)	3,660,740 (0.69)	= (0.0)	= (0.0)	= (0.0)	1,709,686 (0.32)		1,206,837 (0.23)	3,318,803 (0.63)	= (0.0)
M - Sango/ Ota	34,178,339 (6.48)	6,934,187 (1.14)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	12,044,238 (2.28)	= (0.0)	5,418,248 (1.03)	= (0.0)	= (0.0)	1,659,401 (0.31)		29,208,691 (5.54)	= (0.0)
N - Agbara	= (0.0)	17,192,716 (3.26)	= (0.0)	= (0.0)	15,085,468 (2.86)	2,013,396 (0.38)	= (0.0)	3,821,652 (0.72)	= (0.0)	= (0.0)	4,022,882 (0.76)	2,514,900 (0.48)	4,223,931 (0.80)		= (0.0)
O - Apapa/Tin Can Island	9,654,700 (1.83)	5,028,489 (0.95)	= (0.0)	= (0.0)	= (0.0)	3,721,082 (0.71)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	= (0.0)	1,508,547 (0.29)	= (0.0)	205,162 (0.04)	

Figures in parentheses are percentages

Source Author's Analysis, 1996.