CODESRIA

Thesis

By

PATRICK E.

OTAIGBE

The Federal University of Technology, Akure, Nigeria

High-Level Manpower Production and Utilization in Manufacturing Industries: a Study of South Western Nigeria 1975-1995

1999

HIGH-LEVEL MANPOWER PRODUCTION AND UTILIZATION IN

MANUFACTURING INDUSTRIES:

A STUDY OF SOUTH-WESTERN NIGERIA 1975-1995

BY

PATRICK E. OTAIGBE

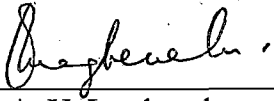**A Thesis in the General Studies Unit**

**Submitted to the School of Post-Graduate Studies
towards the Degree of Doctor of Philosophy
(Management Science)**

**The Federal University of Technology,
Akure, Nigeria**

CERTIFICATION

We certify that this study was executed by Mr. Patrick. E. Otaigbe of the General Studies Unit,

Federal University of Technology, Akure.

Dr. A. U. Inegbenebor
Associate Professor of
Management
(Supervisor)

G. T. Fatunla (Mrs)
Associate Professor of
Economics.
(Co-Supervisor)

DEDICATION

Dedicated to my parents Mr and Mrs Ilegbedion Otaigbe

ACKNOWLEGDEMENT

ABSTRACT

This study examined the production and utilization of high-level manpower in South-Western Nigeria from 1975 to 1995. In doing this, the study also reviewed and analyzed the historical development of university education and high-level manpower production in Nigeria between 1960 and 1995. The objectives of the study are: (a) to examine the production of high-level manpower by tertiary institutions in Nigeria, particularly the universities; (b) to examine the requirement and absorption rate of such high-level manpower produced by employers of labour, particularly the manufacturing sector; (c) to estimate the relationship between high-level manpower production, requirement and absorption rate in the manufacturing sector; (d) to examine the disparities between high-level manpower production, requirement and utilization with regards to the manufacturing industries and (e) to make suggestions for removing the imbalance between production and utilization of high-level manpower in Nigeria, if any. Primary and secondary data were collected through sets of structured questionnaires from government departments, ministries, manufacturing companies and universities in South-western Nigeria.

Analysis of the data showed that for most of the period covered by the study, requirement for high-level engineering manpower in manufacturing industries in South-western Nigeria exceeded their production by the nation's university system. Requirements by industries also exceeded their absorption. This indicates that there was no overproduction of engineers during the period. The study however revealed that there was overproduction in Administration and Social Sciences fields. The study further revealed that between the period of 1975 and 1995, the average annual capacity utilization in manufacturing industries was low. The imbalance between the production of high-level manpower requirement and absorption by manufacturing industries could be attributed to: (a) poor manpower planning (b) low industrial installed capacity utilization.

A number of public-policy options were suggested for possible implementation to address areas of imbalance in output and utilization of high-level manpower in Nigeria. To address this problem of imbalance, government should think of the possible adoption of "Manpower Requirement Approach" in its high-level manpower planning process. The present planning method in educational sector which ignores growth indicators in the economy can only worsen the problem of graduate unemployment in the long run. Therefore, Government should as a matter of policy encourage intersectorial professional dialogue between educational planners, manpower experts and economic planners to bring about a co-ordinated manpower and economic plan for the country. Government should discourage the present craze for mere acquisition of certificates rather than skill. Government should encourage manufacturing companies to finance research and development efforts locally so that high-level manpower can be employed.

CONTENT

LIST OF TABLES

xii

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 Historical Background

In Nigeria, government has been making several and continuous efforts to accelerate the rate of economic, social and industrial growth of the country. The main purpose of these efforts has been to raise the standard of living of Nigerians. In order to achieve the needed development, Nigeria has to overcome many constraints, one of which is the shortage of manpower with suitable skills, abilities and experience. It has been recognized that the shortage of suitable manpower is an obstacle to economic development in the country.

It was in the realization of these facts that the Federal Government of Nigeria (FGN) decided to establish the National Manpower Board in 1962 and put in place a National Policy on Education (NPE) in 1977 and another one on science and technology in 1986. These efforts were to aid and accelerate the pace of manpower development in the country. The establishment of more universities in the 80's was also a means to achieve rapid high-level manpower development.

Diejamaoh (1983) described manpower development as the process which leads to the formation of values and attitudes, the development of skills, and the knowledge of

a people, and thereby contributing to the enhancement of and development in the quality of the nation's human resources on which national development ultimately depends.

The importance of manpower development in national development has been discussed at length by several scholars. Harbison (1973) held that:

"Human resources - not capital, not income, nor material resources - constitute the ultimate basis for the wealth of a nation. Capital and natural resources are passive factors of production; human beings are the active agents who accumulate wealth, exploit material resources, build social, economic and political organizations and carry forward national development. Clearly, a country which is unable to develop the skill and the knowledge of its people, and to utilize them effectively in the national economy would be unable to develop anything else" (p 143).

Other scholars such as Schultz (1961), Tobia (1964), Yesufu (1961), Becker (1975) and Diejamaoh (1979) agreed with Harbison that manpower development is vital to the overall national development.

The NPE (1977) and Diejamaoh (1982) held that the process of manpower development falls into two broad categories:

> (a) formal education, and
>
> (b) non-formal education.

Formal education usually takes place in primary and secondary schools, teacher training and technical colleges, and higher education in universities and polytechnics. Non-formal education is sometimes referred to as out-of-school education. It covers all forms of training and instruction outside of formal educational institutions.

According to Umo (1985), one of the least controvertible functions of formal schooling is the preparation of the students for the job market. The expected economic benefits of educational investments are deemed to be realised if education leads to lucrative employment. In Nigeria, investment in education has grown at phenomenal rate in the last decade. Recent estimates show that by the year 2000, about 2 million secondary school graduates would be job seekers, while about 100,000 university graduates would be turned into the labour market annually (Umo, 1985). The National Universities Commission's (NUC) 1992 Annual Report puts undergraduate enrollment in Nigerian universities at about 191,000 and graduate output at about 85,639, while the United Nations (UN, 1991) report on human resources development puts Nigeria's expenditure on education at 1.4 percent of Gross National Product (GNP) and 12 percent of her total public expenditure. Given the ever increasing resources being committed by government and individuals on education, fear

is being expressed by both policy-makers and concerned citizens as to whether the Nigerian economy has the capacity to absorb the output of educational institutions in the country (UN, 1991). It means then that there is anxiety about the problem of graduate unemployment in the country. Aluko (1994) argued that the problem of graduate unemployment is becoming a source of embarrassment to Nigerians.

Accordingly, Nwachukwu (1981) and Aluko (1994) contended that the biggest problem facing Nigeria concerns need to achieve efficient and effective high-level manpower utilization. Aluko (1994) further argued that the country has reached a stage in its high-level manpower production that efficient high-level manpower utilization could contain its high-level skill needs with very little help from foreign countries. This was confirmed by the First National Rolling Plan (1990/92) which observed that the simultaneous existence of high-level manpower unemployment and vacancy rates in various occupations was, to a large extent, attributable to the lack of alignment of education and training programmes strictly to the manpower requirements of the labour market. The Plan put 1992 gainful employment at 39.6 million as against 37.8 million in 1990.

1.2 High-level Manpower

The term high-level manpower has been defined by Oladeji (1994) as essentially the final end product or output of the various training and development processes of men and women for the acquisition of various high-level skills through the formal or non-formal educational system. In the same vein, the NPE (1977 section 5, p. 22) noted that high-level manpower production was a function of high-level training and development for the acqusition of specialized skills for the population. The policy went further to state that high-level manpower and professional production within the context of the need of the economy would continue within the university system and that it would be rooted in a broad-based, strong, scientific background. The document showed clearly that high-level manpower production was a sole responsibility of the university system. It referred mainly to university graduates as high-level manpower while those of other tertiary institutions were referred to as middle-level manpower or sub-professionals. The policy further stated that to achieve high-level manpower production there was a need to intensify and diversify university programmes. It can be said from the above that as a matter of policy in Nigeria, high-level manpower is defined basically in terms of university graduate and its production is mainly by the university system.

1.3 High-level Manpower Utilization

High-level manpower utilization can be defined as the demand, effective and efficient mobilization and development of trained personnel. Nwachukwu (1981) defined manpower utilization as including the efficient deployment of an individual in order to enable him contribute the most that he is capable of providing to society. This, he claimed could be achieved by:

(a) assigning the employee to the task for which he was trained;

(b) providing the necessary support (maintenance) required by an employee in order to enable him put forth adequate effort and,

(c) providing graduate salary structure (inducement) that would reflect the demand and supply in the free market economy. This means a graduate in professional fields like business administration, medicine and engineering would receive more wages than non-professional graduates such as those in liberal arts disciplines as incentives.

Others like Onah (1994) and Ajakaiye (1994) were of the view that in a country where there was apparent scarcity of qualified manpower and at the same time cases of poor

high-level manpower utilization, there was the need for matching high-level manpower with appropriate job opportunities. This, they argued, should be the approach, if the Nigerian labour situation was to bring about effective and efficient high-level manpower utilization.

To systematise the information flow to help employer select the right calibre and amount of labour and the employment seeker also to select the employment of his choice, government established an appropriate machinery under the Ministry responsible for labour matters. The Employment Exchanges and Labour Offices for low and intermediate level labour force, and the Executive and Professional Registries for the high level management were established for job intermediation.

Table 1(a) shows figures of Professional and Executive high-level job seekers registered by Unemployment Registry of the Ministry of Labour between 1984 and 1989 in Nigeria.

Table 1(a):   Professional and Executive high-level job
               seekers Registered by Labour Unemployment
               Registry in Nigeria between 1984 and 1989

Year	Registered		Vacanices Notified	Placed	Found work
	Male	Female			
1984	1063	381	368	19	10
1985	1455	577	585	84	15
1986	1783	546	453	117	14
1987	8900	2017	268	175	29
1988	3001	1045	493	282	106
1989	6687	1086	754	576	79
Total	22,889	5652	2921	1253	253

Source: Federal Ministry of Budget and Planning, Lagos -
           1990

We can see the pattern and trend of registration, vacanices declared, number placed on jobs and those that found work at the professional and executive levels between 1984 and 1989.   Male and female registration totalled 28,541.   Vacanices notified at the registry was 22,921. The agency was able to place only 1253 of the applicants for the period of 1984 and 1989.

1.4 Statement of the Problem

Some scholars believe that there is high-level graduate unemployment in the country. Idowu (1987) described graduate unemployment as one of the problems of our time. He concluded that:

> hitherto, the acquisition of a degree was considered as a sure passport to a paid employment either in public or the private sector. The situation is no longer the same. University graduates are now faced with a gloomy labour market situation (p 183). On the other hand Diejamaoh (1982) held the opinion that Although the precise magnitude of unemployment and underemployment is not known, the gravity of the situation can be gauged by the facts that whereas in the 1970's most university graduates were employed within the first three months of graduation, it is now very common for most graduates, even post-graduates, to be unemployed for period exceeding one year (p.10).

They (Idowu and Diejamoah) speculated that there appeared to be a high rate of over-production on the supply side. According to them, their speculation arose from the proliferation of universities in Nigeria and, on the demand side, the dismal performance of the Nigerian economy in the past decades.

While discussions are currently going on about graduate unemployment in the country, there is yet another belief that Nigeria lacks the qualified manpower to handle most `of the key technical and managerial positions in her industries. UNESCO (1973) reported Nigeria is one of the developing countries deficient in technological manpower supply.

The manpower budget in the Third National Plan document, (1975-80) showed that graduates from Nigerian universities would only provide about half of the demand for high-level manpower. Analysis of the Fourth National Plan's (1980-85) requirements for high-level manpower also showed that, for several and critical manpower categories, the additional requirements for the period far exceeded the total stock of such manpower. Also, the First National Rolling Plan (1990-92) estimated that the requirements for some selected categories, particularly in technological and scientific occupations, would exceed the projected stock for the period.

These problems of graduate unemployment and lack of sufficient high-level manpower as claimed by individuals and public agencies give conflicting signals about high-level manpower development and utilization. There seems to be a contradiction or paradox. The paradox is: the

concurrent existence of shortage of high-level technical and managerial manpower in the face of graduate unemployment in the country. This paradox provokes certain research questions:

(a) why is there graduate unemployment at the same time as shortage of high-level manpower in the country?;

(b) is graduate unemployment a result of over-production of graduates by tertiary institutions, particularly the universities?;

(c) is graduate unemployment a result of lack of absorption of university graduates by employers?;

(d) is there graduate unemployment in technical and managerial disciplines? and,

(e) what is the link between high-level manpower production and utilization?

1.5 Objectives of the Study

The objectives of this study are as follows:

(a) to examine the production of high-level manpower in engineering, Administration and Social Sciences by tertiary institutions in Nigeria, particularly, the universities;

(b) to examine the absorption rate of engineering,

administration and social sciences high-level manpower produced by employers of labour, particularly the manufacturing sector of the economy;

(c) to estimate the relationship between high-level manpower production and absorption rate in the manufacturing sector of south western Nigeria,

(d) to examine the disparities between high-level manpower requirements, production and utilization with regards to the manufacturing industries in the zone;

(e) to make suggestions for removing the imbalance between production and utilization of high-level manpower in Nigeria's manufacturing sector if any.

1.6 Hypotheses

In view of what has been discussed so far, the following hypotheses will be tested:

(1) H_o = that university graduates production in Engineering and Administration/Social Sciences in South-western Nigeria cannot meet manufacturing industries high-level manpower requirements in those fields.

(2) H_o = the low level of absorption of graduates of Engineering and Administration/Social

Sciences by manufacturing industries in South-Western Nigeria does not negatively affect the production of graduates in these fields.

(3) H_o = that the low absorption in Engineering and Administration/Social Sciences in manufacturing industries in South-western Nigeria results in a slack in absorption (which is the difference between requirement and absorption) and inspite of this slack, production of graduates of Engineering and Administration/ Social Sciences is not negatively affected.

(4) H_o = that the number of universities established in South-western Nigeria positively affects the production of high-level manpower in Engineering and Administration/Social Sciences.

1.7 Significance of Study

The study would enable us evaluate the level of high-level manpower production by the nation's higher institutions, particularly, in the specific areas of technological and managerial occupations. Technological occupations incorporate fields such as electrical and mechanical engineering while managerial occupation

incorporate social sciences disciplines such as business management, accounting, economics and sociology. These have been described as areas of high national manpower needs and, the absorption or utilization of such manpower produced. The findings will enable us make a meaningful assessment of some of the beliefs, conclusions and generalized notions held both by policy-makers and public affairs commentators. Some of these are firstly, that there is high-level graduate unemployment in Nigeria. Secondly, that Nigeria lacks the high skilled technical and managerial manpower to man her industries. Thirdly, that Nigeria's low pace of economic and technological development is as a result of lack of the needed manpower to serve as a catalyst in these areas of her national development.

The study will determine the relationship between high-level manpower production and its utilization, thereby providing empirical estimate for meaningful policy appraisal and formulation. In addition, the findings of this study will enable producers and users of high-level manpower in the country have estimate of macroeconomic variables which could be manipulated to match high-level manpower production with its utilization.

1.8 Limitations of the Study

The major limitation that was encountered during the study was that of data and information.

It is a common knowledge in Nigeria that data are not always readily available or released to researchers and other corporate bodies for use as most organizations treat their records as secret. Finance was another problem area. A lot of money was required for travel and postage during data collection. Movement of University graduates in and out of South-west was a problem.

South-west receives and sends graduates to other parts of the country. Also a good percentage of students from the East and North are produced in South-west.

CHAPTER 2

LITERATURE REVIEW

2.1 Importance of Manpower Development

Although early economists knew that the dexterity and skill of the population was a major determinant of the wealth of that nation, the systematic study of manpower was started only recently. The study of manpower as a field emerged with manpower strigency practiced by the nations involved in the Second World War (Ginzberg and Smith. 1967). They argued that a further stimulant to the development of the field had been the wide-spread concern and efforts in the last three decades to speed up the economic development of many old and new nations.

In the 1950's, economists began to doubt the theory that output was a function of land, labour, capital and entrepreneurship alone. This doubt arose as a result of many developments in the international economic scene. First, there was the rapid recovery of many countries particularly Germany from the ravages of the Second World War. Secondly, there was the unparalleled rapid growth of some countries such as the United States of America. Finally, after returns from factor inputs of production have been allocated out of total output, there was still some residue left. This residue could only be accounted for by embodied human capital (Harbison, 1973). This led

to the recognition of the importance of manpower development, particularly that of education. The contribution of embodied human capital was first elaborated upon by economists such as Theodore Schultz (1961), Fredick Harbison (1962) and Gary Becker (1975). Schultz (1961) elaborated on the importance of investment in man and this led to the recognition of the importance of manpower development in the development process. Harbison (1967) observed that the wealth of a nation was as dependent on the accumulation of "human capital" as upon the accumulation of material capital. Schultz (1961) and Harbison (1967) argued that human capital formation, which is closely associated with investment in man, is the acquisition and increase in the stock of people with the skills, education and experience which are critical to national development. Nevertheless, Schultz was concerned about the concept of human capital. He observed that:

> Our values and beliefs inhibits us from looking upon human beings as capital goods, except in slavery, and this we abhor ... hence, to treat human beings as wealth that can be augmented by investment runs counter to deeply held values. And for man to look upon himself as capital good, even if it does not impair his freedom, may seem to debase him (p.4).

The above statement suggests that Schultz was looking at the human capital concept from cultural and moral point bearing in mind, perhaps, the damage that slave trade had done to mankind. Since capital goods are a store-up effort of man, it may sound odd to see man as capital. This has not in any way contradicted Schultz's belief in human development.

It was the realisation of the need for accumulation of human capital necessary to accelerate socio-economic development that led to the renewed emphasis particularly in Europe and North America on manpower planning in the late 1950's. For example, late President Kennedy observed in the first Manpower Report in the United States of America in 1963 that:

"Manpower is the basic resources. It is the indispensable means of converting other resources to mankind's use and benefit. How well we develop and employ human skills is fundamental in deciding how much we will accomplish as a nation" (p.6).

It was as a result of the importance of human capital or human resource concept as a means of accelerating the process of national development that the Federal Government of Nigeria set up the Ashby Commission on higher education in 1960. In the same vein, Awokoya (1964), Yesufu (1964) reached a consensus that investment in training and

educating Nigerians (that is investment in human capital) was a pre-requisite for national development.

Regardless of the acceptability or otherwise of the term labour force as "human resources" it has gradually become accepted by many that there is a direct and causal relationship between trained and skillful labour force and the level of economic development in a country. It is implicit that the ability and skills of the labour force are directly related to the educational level and the investment that society makes in education (Olutola, 1986). However, the connection between levels of education and level of income is usually based on a simple interpretation of social phenomenon. The tendency, David (1960) noted, was to consider a rise in educational standard as the result, or as the concommitant of economic progress rather than seek to determine with any precision the interrelationship between society's investment in education and its economic growth.

Nevertheless, as the awareness of human resources development as an investment grows, the awareness that a society may be able to manipulate its investments in facilities and opportunities for education and training, in fashion similar to its allocation of capital investments in new plants and machines, so as to influence its future

economic growth along certain lines, is gradually being accepted, at least as a possibility (Olutola, 1960).

Manpower development relates to the training and development of labour through the acquisition of skills either through formal education, that is schooling or informal education, that is, on-the-job-training, apprenticeship system or both in order to increase output (ILO World Labour Report, (1984). To initiate an effective manpower development programme, a systematic analysis is a pre-requisite. According to the (ILO) report, first a reference period is defined, usually corresponding to a development plan period. Then the shortage or surpluses of skills in the labour force during the reference period are determined by finding the difference between the present demand for, and supply of various skills in the economy. Calculation would then be based on the level of output envisaged during the reference period, the demand for the various types of skills needed throughout the planning period is projected. Against this is set the present supply, less an estimate of those who would either die or retire, plus the number of individuals who are in training giving a net balance.

Policy decisions are being made to influence training so that the shortage of manpower skills needed during the

plan period is eliminated. The policy decision has to ensure that the correct form of education is given to the right proportion of the students so that the required proportion of the labour force that should possess given skills acquire the skills and are able consequently, to achieve the objectives of the development plan. Tobia (1964) and Fapohunda (1978) argued that within the framework of national planning, certain goals are set, rates of growth are given and priorities are stipulated, and that manpower resources had to be planned to synchronise with other resources to achieve the given rate of growth, pre-set goals and objectives. Tobia (1964) also argued that if there were no economic development plan, a manpower programme would be isolated and be indefinite. In the absence of a controlling development plan, however generalised and complete, a detailed manpower programme may actually lead the labour force in the wrong direction. He concluded that even though a development plan is a pre-requisite for the successful functioning of a manpower programme, there cannot be development planning without a manpower planning programme.

2.2   Manpower Planning in Nigeria

The central objective of manpower planning is to construct a strategy of human resources development which is consistent with a country's broader aims of social,

political and economic development. At the very minimum, according to Harbison (1964), manpower planning includes planning of formal education system, planning of in-service training and adult education, analysis of the structure of incentives and utilization of manpower as well as surveys of manpower requirement. Ojo (1986) described manpower planning as the process of determining the policies and programme that would develop, utilize and distribute manpower with a view to achieving a country's broader aims of socio-economic and political development. Harbison (1964) and Ojo (1986) stated that the problem with which manpower planning was concerned included:

(i)   the analysis of unemployment and underemployment and appropriate measures for alleviating them;

(ii)   identifying the requirements for manpower for various sectors of the economy; developing the necessary organisations and institutions to be responsible for the execution of manpower programmes and,

(iii)   developing management and labour techniques, working conditions and industrial relations in order to ensure maximum productivity.

All aspects of manpower planning enumerated above come within the broad jurisdiction of the National Manpower Board in Nigeria.

Manpower planning and general development planning are two inter-related activities as the former can only be undertaken meaningfully in the light of well-defined socio-economic objectives. Since manpower requirements should be based on societal goals, it follows that such requirements change in objectives and conditions, including structures and changes in economy (Meier, 1983).

Nigeria's attempt at a comprehensive and systematic general national economic development planning started after the Second World War (1939-45). Since then, Nigeria has undertaken several development plans. Although national development planning in Nigeria started in 1945, manpower planning did not start until about 1959/60 when the Ashby Commission was set-up. Certain factors which precipitated the need for a systematic manpower planning in the country shortly before and after independence in 1960 made Fashoyin (1986) to remark that manpower planning became a major issue in the country. These factors are summarized as follows:

(1) the World Bank Economic Mission to Nigeria in 1955 was a stimulus to manpower planning in the country. The mission noted in its report that Nigeria's economic growth has been left to the effort of expatriate entrepreneurs, administrators and technicians. It

observed that it was time to increase the number of adequately trained Nigerians to be able to effectively and meaningfully contribute to the country's economic growth.

(2) it was hoped that the skilled manpower required for the implementation of the nation's development programme after independence would come from the United Kingdom or other European countries. However, it was difficult to recruit sufficient number of such high-level manpower such as engineers, technicians, administrators necessary for the implementation of the programmes. It was observed that there was high labour turnover of expatriates recruited and those recruited were sometimes second rate yet were highly paid (Tomori, 1988).

(3) it became obvious that after independence, key positions both in the private and public sectors of the economy be Nigerianised as a matter of political importance and National prestige (Yesufu, 1962).

(4) as a result of school-leavers- unemployment problem which became serious in the early 60's, large numbers of youth drifted to the urban areas from the rural areas in search of paid employment and,

(5)   there was the need to provide skilled manpower for the
       expanding economy and to gear the educational system
       to meet such need. A host of these problems led to
       the setting up of machinery for manpower planning in
       the country.

2.3 Machinery for Manpower Planning

One of the most fortunate things that happened to
Nigeria in the few years immediately before independence
was the realisation on the part of its leaders that freedom
from colonial rule was bound to lead to a revolution of
expectations on the part of the people.

Since the most visible mark of new status was the transfer
of governmental control to Nigerians, it was obvious that
Nigerians would increasingly look to the governments for
fulfillment of those expectations, both social as well as
economic. Yesufu (1964) noted that the experience gained
since the development plan of 1945, and the difficulties of
Nigeriansing the civil service, showed clearly that one of
the major difficulties which the country had to overcome,
if it were to progress and meet the aspiration of the
people, was the development of its human resources,
especially through education and training. It soon became
clear, that the need for trained manpower went beyond the
requirement of Nigeriansing and prestige purposes. Rather
it was a pre-requisite for rapid economic development.

How much education, and what type of education and training?. This question had to be answered quickly and action had to be taken promptly. It was in anticipation of solving the problems of the adverse effect of the shortage of high-level manpower and the increasing need to develop them that led the FGN to set up a Commission headed by Sir Eric Ashby in April, 1959. The main assignment of the Commission was to conduct an investigation into Nigeria's need in the field of post-school certificate and higher education over the next twenty years (Ashby Report, 1960).

A leading manpower expert, Fredrick H. Harbison was invited by the Commission, to prepare a special report on high-level manpower for Nigeria's future development. Harbison on behalf of the Commission carried out a survey of Nigeria's high-level manpower needs. His report and recommendations were accepted by the Commission. The Commission's recommendation was that Nigeria should establish at once appropriate organizational arrangements to assess continuously manpower needs and to formulate programme for effective manpower development throughout the federation. (Ashby Report, 1960).

2.4   National Manpower Board (NMB)

Ashby Commission submitted its report in 1960 and the National Economic Council (NEC) considered and adopted its recommendations.

Following the adoption of the Commission's recommendations in 1962, a NMB was established. The Board was expected to give full consideration to all aspects of manpower development programme throughout the federation with special reference to the following:

(1) the periodic appraisal of requirements for manpower in all occupations and in all productive activities throughout the federation. In particular, assessments should be made of manpower requirements of all development projects;

(2) the periodic analysis of the cost of formal education (both capital and recurrent) and the determination of the order of priority in expenditures for education to promote the economic, political, social and cultural development of the country;

(3) the development of measures for in-service training of employed manpower in the government service, in private industry and commerce, and in educational institutions;

(4) the appraisal of wages and salary scales in government service and in education in relation to the demand for high-level manpower

(5) the formulation of policy on government scholarships and fellowships for study in Nigeria and abroad;

(6) the development of policies concerning Nigeriansation in employment, policies governing the entry and employment of expatriate in both government and private employment in the country;

(7) the periodic assessment of unemployment to underemployment in major occupations and activities and,

(8) the integration of manpower planning with broader planning for economic, social and political development of the country.

The above were the mandate of the Board as approved by the NEC, the Federal and Regional Governments and which were published in the sessional paper N0. 3 of 1961.

Alongside the NMB was the Regional Manpower Committee (RMC). There were four Manpower Committees; one for each of the three regions and one for the federation. The Regional Manpower Committees were set up:

(1) to assess the manpower requirements of the various arms of the public sector within the region and the manpower implications of the development programmes and to supply information to the NMB;

(2) to examine from the regional point of view, the implication of the results of the work

and the recommendations of the NMB and,

(3)   to advise the NMB on matters referred to the Committee by the Board.

2.5 National Universities Commission (NUC)

The National Universities Commission (NUC) was established in 1962 following the recommendations of the Ashby Report on higher Education in Nigeria. It was one of the organizational arrangements recommended by the Commission. The NUC, then an administrative department under the Cabinet office was directly responsible to the Prime Minster. At inception, the role of the NUC was advisory to the FGN on the financial needs and development of university education in the country.

The Commission was reconstituted in 1968; and up to 1974, it served as the interim NUC. This action was informed by the need for proper planning and co-ordination of higher education and also, as a response to the state structure adopted in the country. The reconstitution, however, addressed more the issue of membership of the Commission than it did its functions and power (NUC, 1992).

Decree No. 1 of 1974 gave birth to the National Universities Commission as a statutory body. The decree gave the Commission broad responsibilities and functions

essentially related to the co-ordination, development and financing of Nigerian universities, specifically, the statutory Commission was charged with the following functions:

(1) to advise on the establishment and location of new universities and other degree granting institutions;

(2) to prepare, after appropriate consultations, periodic master plan for the balanced and co-ordinated development of all the universities;

(3) to estimate and request from government, annual and quinquennial grant for the universities, and to distribute this in accordance with a set formula;

(4) to collate, analyse and publish information relating to university development and education in Nigeria;

(5) to develop general programmes to be pursued by universities in order to ensure that they are fully adequate for national needs and objectives;

(6) to recommend the establishment of new facilities or postgraduate institutions in existing universities;

(7) to undertake periodic review of the terms and

conditions of service of personnel in the universities;

(8) to act as an agency for channeling of external aid to the universities in Nigeria, considering the country's foreign policy and security;

(9) to take into account, in advising the Federal Government such grants as may be made to the universities by state governments, persons and institutions both at home and abroad and,

(10) to make such other recommendations to the Federal Government or to universities relating to higher education as the Commission may consider to be in the national interest.

The NMB and its secretariat, the regional/state manpower committees and NUC were the important organizational arrangements as part of the machinery for manpower planning, which grew out of the recommendations of Ashby Commission.

2.6 The National Board for Technical Education (NBTE)

The National Board for Technical Education was established by the FGN in 1977. The major responsibility of the Board was to advise the government and co-ordinate all aspects of technical and vocational education falling

outside the scope of universities, and to make recommendations on the national policy necessary for the full development of technicians, craftsmen and other middle-level and skilled manpower. To this end, the Board was expected to draw periodic master plans for the balanced and co-ordinated development and expansion of technical and vocational education in the Polytechnics, Colleges of Technology, Trade Centres and other vocational and technical institutions as well as establishment and location of new ones.

2.7 Nigeria Council for Management Education and Training (NCMET)

The Nigeria Council for Management Education and Training was established in 1962. Its major objective is to coordinate and obtain agreement concerning future programmes of management education and training, including their subject, location, standard, capacity, frequency, duration, type and cost.

To provide secretariat facilities to the Council, a Centre for Management Development was established during the second development plan period. The Centre was expected to strengthen existing approaches to management education in the country.

The Administrative Staff College of Nigeria (ASCON) was also established in 1973 to provide higher management training for senior executives in public and private sectors of the economy. The College grants scholarships and travel fellowships in areas of public administration.

2.8 Labour Supply and Structure of Employment

The manpower of a country can be defined as the totality of the country's human resources available for productive purposes. This depends on the population census (McBeath, 1978). According to the officially accepted figure of the 1963 census, the population of Nigeria was 55.7 million. Because net immigration was very low in Nigeria, its population increase was due mainly to natural growth rate, that is, the excess of births over deaths (Ekanem, 1972). Since the 1963 census figures were not accepted by the generality of Nigerians the exercise was seen as a failure. Although the 1991 census which put the population of Nigeria at 88.5 million people is less controversial than the 1963 figures, it has also been criticized as unrealistically lower than normal, especially with the population of females falling below that of males contrary to daily observations.

In Nigeria, the labour force is defined as those who are between the ages of 15 and 60 years while in the developed countries it is those between 15 and 65 years who

are employed and those who are unemployed but willing and able to work but unable to find job at the ruling wage rate (Fapohunda, 1978).

The First National Rolling Plan 1990-92 shows that 53 percent of the population was of working age while 41 percent was in the labour force and that the labour force participation rate (LFPR) (that is, the population of the working age that is in the labour force) was 81 percent. The country's LFPR for rural and urban areas (separately and combined for both sexes) during the 1992/93 fiscal year are presented in table 1(b). The Table shows that the LFPR were higher for male than for female within all age intervals in both rural and urban sectors of the economy while the 45 - 54 years age-bracket had the highest LFPR of 80% for combined sexes.

Table 1(b): Labour Force Participation Rate for Rural and Urban Sectors of Nigeria, 1992/93 (Percentage)

AGE	URBAN		RURAL		URBAN & RURAL		COMBINED
	MALE	FEMALE	MALE	FEMALE	MALE	FEMALE	MALE AND FEMALE
15-19	45.1	23.2	82.5	54.6	73.6	50.8	62.2
20-24	99.4	73.3	98.9	72.7	90.0	72.8	85.8
25-44	99.0	79.2	99.0	71.0	99.0	72.0	86.5
45-54	97.8	78.1	98.0	72.1	98.0	72.8	87.0
55-59	96.0	83.4	96.0	68.4	96.0	69.7	85.2
TOTAL	87.4	67.5	94.8	67.7	91.3	67.6	81.3

SOURCE: Federal Office of Statistics, Lagos, 1993.

Estimate of Nigeria's Rolling Plan 1990-92 put the size of gainfully employed people at 37.81 million in 1990 with an expected annual growth rate of 1.6% during the plan period. At this growth rate, it was expected that the number of gainfully employed people in the country would be about 39.66 million by 1992. Table 2. shows the Sectoral Distribution of those that would be in Employment between 1990-92.

The employment scene is characterized by a shortage of certain skills particularly in the high-level and intermediate level categories as well as a substantial amount of not apparent but nonetheless real surplus labour supply. According to the authors of the Guidelines for the Fourth National Development Plan 1981-85 and The Third National Development Plan, the non-fulfillment of many of the projects in the Second National Development Plan was due to lack of executive capacity, shortage especially in urban centres. Fapohunda (1975) claimed that this was due to rapid expansion of the economy; the indigenisation decree; the expatriate quota allocation system and the unstable/inconsistent educational policy of the Nigerian government.

Table 2: Sectorial Distribution of Gainful Occupation, 1990–1992

Industry Group	Estimated Empolyment 1990		1992		Additional 1990–1992	
	No. '000	% Share	No. '000	% Share	No. '000	% share
Agriculture	22,954	60.71	23,705	59.86	751	41.95
Mining & Quarrying	189	0.50	198	0.50	9	0.50
Manufacturing & Craft	3,781	10.0	4,158	10.50	377	21.06
Building & Construction	398	1.0	396	1.00	18	1.01
Electricity, Gas & Water	454	1.20	475	1.20	21	1.71
Distribution	6,103	16.14	6,435	16.25	332	18.55
Transport & Communication	567	1.50	594	1.50	27	1.51
Services	3,384	8.95	3,639	9.50	255	14.25
Total	37,810	100.00	39,600	100.00	1,790	100.0

SOURCE: The First National Rolling Plan (1990-92), Federal Ministry of Budget and Planning Lagos, p (

2.9 Education and Manpower Development

Majasan (1978) and Fafunwa (1984) argued that the expansion of education institutions and undertaking of the programmes in post-independence Nigeria were not related to specific manpower needs of the country's development plan. None of the projects aimed at producing a specific number of manpower that would be required to achieve a given specific project. In other words, the philosophy behind the educational programme and project undertaken was "supply creates its own demand" - just provide the people with any education and they will be able to find jobs. Training was not undertaken with any specific employment or development objective in mind.

The focus of this study is on the development of formal education as a source of manpower supply. Harbison (1961) posited that formal education had a vital bearing on the development and utilization of human resources and that it was a major determinant of who got what jobs. Education is a major generator of skills and knowledge for the labour force. Thus, education influences attitudes, (positively and negatively) towards work and commitment to national development. Oladeji (1994) contended that Nigeria's commitment to the development of human resources has been largely limited to the development of formal education to the neglect of non-formal education. In the

same vein, Onwuka (1981) noted that the analysis of the development of Nigeria's educational system was almost synonymous with the analysis of the development of the country's formal educational system.

Education, for sometime enjoyed fairly high rating in Nigeria's socio-economic development effort. Education ranked fifth in the first National Development Plan (1962-68) with an allocation of 10.3% of gross public sector investment of about #1.4 billion. During the second National Development Plan, (1970-74) the sector attracted more emphasis by ranking second with an allocation of 13.5% of the public sector investment of #2 billion. Although education received a boost in fund allocation of #2.463 billion out of an estimated public sector investment of #30 billion during the third National Development Plan (1975 - 80), it again ranked fifth with a share of 8.2% of overall plan allocation at the Federal level while it ranked third at the state level where its share was about 12%.

2.10   Secondary Education

Secondary education in Nigeria is made up of three major types of institutions, they are; secondary schools, technical and vocational institutions and teacher training colleges. Between 1960 and 1975 secondary schools had a significant increase from 135,434 to 606, 752 an increase

of 348.0% while the number of teachers increased from 6,735 to 21,771 which was an increase of 223.3%. By the 1976/77 session, students' enrollment in secondary schools had risen to 810.909 representing a further increase of over 400% in two years. Since then, there has been a steady increase in secondary school enrollment in the country as presented in table 3. As at 1994 students' enrollment in secondary schools alone had reached 3,123,277.

The number of technical and vocational training institutions were more than double while student enrollment in the institution almost quadrupled between 1960 and 1975 (Table 3). The number of teachers also increased considerably during this period. The number of technical and vocational institutions rose to 101 while the number of teachers and students rose to 1,139 and 24,647 respectively in 1975. Despite these increases, the number of students enrolled in technical and vocational schools has always been very low, relative to other types of institutions at the secondary level. It could be argued that this phenomenon reflects the apparent bias against technical and vocational education in Nigeria.

Table 3 : Numbers of Schools, Students and Teachers in Post-primary
Institutions in Nigeria, 1960 - 1994.

Year	Secondary Schools			Technical/Vocational			Teacher Training Colleges		
	No of Schools	Students Popula-tion	No of Teachers	No of Schools	Students Popula-tion	No of Teachers	No of Schools	Students Popula-tion	No of Teachers
1960	833	135,433	6,735	29	5,037	351	315	32,339	1,829
1965	1,382	209,015	10,855	63	12,645	760	195	30,926	1,925
1970	1,155	310,054	14,091	66	13,645	845	160	32,314	1,857
1975	919	606,752	21,771	101	24,647	1,139	201	3,209	78,377
1980	6,092	2,794,498	44,108	208	72,136	7,467	236	260,037	83,231
1985	5,991	2,941,781	67,621	190	76,434	9,109	243	254,238	60,463
1990	6,001	2,901,993	91,432	300	76,425	12,937	**	**	**
1995	6,009	3,123,277	147,530	300	74,862	12,462	**	**	**

Sources: (i) Federal Ministry of Education, Lagos, various annual reports.
(ii) Federal Office of Statistics, Lagos.

** Not Available. (Teacher training colleges phased out in the zone).

In the areas of teacher training, there was a continuous decline in the number of teacher training colleges in Nigeria throughout the 1960s because of government's desire to consolidate and standardize teacher education with a view to improving the quality of teacher's training institutions in the country (Third national Development Plan, pp. 240). As part of the consolidation, the Grade II Teacher Training programme was phased out throughout the country. The number of Teacher Training Colleges started to rise again from 1970. It reached a total of 201 in 1975 and 243 in 1985. By 1994, the number of Teacher Training Colleges had almost been phased out as a result of government policy to make the National Certificate in Education (NCE) the minimum qualification for teachers in primary schools in the country.

2.11 Higher Education

The development of higher education in Nigeria started in 1932 with the establishment of Yaba Higher College. And in 1948, the University College Ibadan was established. The development of university education in Nigeria since 1960 in quantitative terms is presented in Table 4. The number of universities rose from 3 to 31 during the period covered by the table. Between 1961 and the late 1980s, students' enrollment in the arts, sciences and social sciences declined in relative terms while enrollment in medicine and related disciplines, administration and education increased. Table 5 shows enrollment in Nigeria

Table 4: "Students' Enrollment and Teachers' Population in Nigerian Universities, 1960/61-1993/94 Session

Academic Years	No.of Universities	No. of Students	No. of Teaching Staff	Students/Teachers Ratio
1960/61	2	1,395	*	*
1965/66	5	7,709	1,209	6.4
1970/71	6	14,468	2,255	6.5
1975/76	9	31,511	3,668	8.6
1978/79	13	48,641	*	*
1985/86	24	135,670	10,977	12.3
1993/94	31	191,670	11,031	17.37

SOURCES: (i) Federal Ministry of Education, various report.

(ii) NUC various annual reports.

* Data not available.

universities by disciplines for selected years between 1960 and 1994.

Although the training of high-level manpower is the major occupation of universities, they have been training intermediate manpower by awarding non-degree diplomas and professional certificates. The diplomas and certificates are awarded in a wide range of disciplines and include the certificates in education, sub-professional teaching diplomas and diplomas for agricultural assistants, para-medical personnel and library assistants. The distribution of university products by disciplines for selected years is presented in table 5. The Table shows that students' enrollment for Arts dominated university education with 27.7% of total followed by the sciences which had 22.3% while the social sciences ranked third with 20.0% during the 1961/62 academic year. However, Arts lost the lead in students' enrollment figure to the sciences in the 1973/74 when the latter accounted for 15.8% of total enrollment. Education and Arts ranked second and third with 15.1% and 14.7%. Although the sciences lost the lead in students' enrollment to education during the 1983/84 session, the former took-up the lead again with 19.5% followed by education (15.6%) and social sciences (14.2%) in 1993/94 academic year. The most spectacular increase in students' enrollment in Nigerian universities during the period was in Administration where its relative share in total annual students' enrollment rose from 0.6% in 1961/62 to 6.8% in the 1993/94 Session.

Table 5: Enrollment in Nigeria Universities By Discipline for Selected Academic Sessions

Disciplines	1961/62		1973/74		1983/84		1993/94	
	No. of Students	% of Total	No. of Students	% of Total	No. of Students	% of Total	No. of Students	% of Total
Arts	828	27.7	3,980	14.7	5,545	14.4	27,625	14.1
Sciences	668	22.3	4,269	15.8	6,877	14.1	37,405	19.5
Medicine and Related Disciplines	260	8.7	3,251	12.0	6,752	13.9	18,621	9.7
Engineering/ Technology	199	6.6	2,414	8.9	2,878	5.9	18,475	9.6
Agriculture	111	3.7	1,997	7.4	3,266	6.7	14,996	7.8
Social Sciences	599	20.0	2,788	10.3	6,565	13.5	27,272	14.2
Adminstration	19	0.6	1,485	5.5	2,205	4.5	13,201	6.8
Education	200	6.9	4,094	15.1	7,622	15.6	29,557	15.4
law & Others	109	3.4	2,090	7.7	5,234	10.8	13,156	6.8
TOTAL	2,993	100	27,025	100	48,641	100	191,670	100

SOURCES: NUC Annual Report

2.12   Manpower Shortages

Available literature on high-level manpower planning and development in Nigeria explicitly indicate that there are shortages of high-level manpower in Nigeria. (National Manpower Board 1968/69); Yesufu, Diejomaoh and Oduah (1973); Udoji Commission (1975) also noted such shortages in their reports. The third National Development Plan 1975-80 "Manpower Budget" and National Rolling Plan 1990-92 also show excess demand of high-level manpower over the supply in some occupations.

Folayan (1986), contended that analysis of the trend of educational development in Nigeria would indicate considerable progress in the training of both the intermediate and high-level manpower since independence. However, due to the rapidly expanding demand for these categories of manpower, there has always been an excess demand for them, and thus manpower constraint has remained a bottleneck to development efforts.

2.13   Impact of Education Expansion

The story of Nigeria 's educational system in the past twenty-five years is, for the most part, one of phenomenal expansion. This is more or less true of all categories of educational institutions (primary, secondary, vocational, teacher training and university) and in terms of all conceivable indices (number of institutions, enrollments,

output of graduates and public expenditure). For the greater part of the period, data of variable quality on number of institution and enrollments have been generated from a variety of sources. The data are used to depict the key elements of education expansion during the period, according to types of educational institutions.

Generally speaking and from analysis, education expansion has proceeded well beyond the capacity of the economy to absorb the manpower output of our educational system. Co-existing, however, with the resultant manpower underutilization (unemployment) is the paradoxical situation of shortages of manpower especially of the skill types as revealed by the analysis of the survey data of this study and previous manpower studies conducted by National Manpower Board and Federal Ministry of National Planning (1980-85). Such an absurd conjuncture suggests strongly that some, even if not all, of the (unemployment) underutilization is attributable to defects in the educational system. Diejomaoh and Orimolade (1971) had ascribed the paradox partly to "the quality of output of our educational system" and the "lop-side structure of courses taught in our university and other institutions".

For a start Ikpeze (1980) noted that at the tertiary level which is the apex of the nation's educational system

the expansion of university education has proceeded without adequate attention to either the long-standing problem of lop-sidedness in the structure of courses taught or to the total number of graduates produced in relation to the absorptive capacity of the economy. Regarding the structure of courses, as noted earlier, the National Manpower Board's recommendation is that enrolment into science-based courses be combined with its liberal-arts counterpart in the ratio of 60:40. This pattern has not been adhered to. Since 1981 the ratio has been in the region of 51:49.

With respect to the staggering numbers of university output yearly, the blame must be laid at the doorstep of the politically-motivated and oil-financed profileration of universities of the past decades. Diejomaoh (1982) has attempted to allay the fears that have been expressed concerning undue proliferation of universities.

According to him Nigeria should have at least thirty universities by 1990 if Nigeria is to reach the student enrolment target of 250,000 in the degree courses by the same year 1990. However, in view of the palpable reality of graduate underutilization (unemployment) across the country today and the apparent failure of oil-money of the 1970's and 80's to sustain the economy, it is difficult to see how a case can be made for further expansion of

university education as Diejomaoh's (1982) argument tend to suggest. Indeed, on the ground of economy alone, Ikpeze (1986) argued that a case can be made for some contraction, in the form of either mergers or closure of universities.

2.14   Approaches to Educational Planning

It is important to examine some various approaches for educational planning to combating educated unemployment (underutilization) in Nigeria. In manpower literature some approaches have been discussed and or actually tried in practice. However, in this study, the purpose is therefore to examine and consider some of the actual or potential impact of implementation of these approaches and attendant issues on Nigeria in solving some of the problems of graduate unemployment.

2.14.1   Contraction of Education

Since education expansion has been suggested to be a significant cause of educated unemployment, the first policy option should be the contraction of education. In considering this option, Todaro (1977) argued that indiscriminate and costly education expansion will lead to further rural-urban migration and unemployment he argued further that government over-investment in post-primary educational facilities often turns out to be an investment in idle human resources. He concluded that this is not

only bad economics; in the long-run it is also bad politics. A number of authorities have accordingly advocated restraint in education expansion. For example, India's intellectual unemployment, according to Blaug (1971) warranted a deceleration of secondary and university education. With respect to Nigeria, Callaway (1960) wrote that one step towards the solution of the employment problems of young school leavers, therefore, should be a reduction in the rate of increase in the cost of primary education. To accomplish this, he suggested a raise in the school starting age and increase in school fees to encourage high rate of withdrawal. Falae (1971) then concluded that the decision to contract education is not as difficult as knowing at what point to stop. Angaye (1984) and Okoye (1985) among others have both called for a stop to be put to the proliferation of universities in Nigeria. But on the contrary, the proponent of contraction at whatever level of the educational hierarchy must remember that an important objection to such policy is that it would aggravate income inequalities. Studies, such as Tinbergin's (1975) and Ahluwalia's (1976), confirm that there is a positive correlation between education expansion and improvement in income distribution. Thus, whatever gain is derived from education contraction may be lost in terms of reduced egalitarianism. Society is usually unwilling according to Ikpeze (1986) to accommodate the

possibility of a trade-off between the goals of full employment and grater quality in the distribution of income.

2.14.2 Manpower Requirement Approach to Educational Planning

Whether to contract or expand education cannot be divorced from the choice of an approach to educational planning. There are three widely recognised approaches – the Social Demand Approach (SDA), the Manpower Requirement Approach (MRA) and the Rate of Returns Approach (RRA) (Blaug, 1986). One of the policy options under review is the adoption of the Manpower Requirement Approach to educational planning. This would appear to make sense, given that there is an asymmetrical relationship between the manpower output of the education sector and manpower utilization in the economy.

As Blaug (1966) pointed out, that adherents of one approach may denigrate the application of other approaches. This is of course unwarranted since the three approaches should ideally be used to compliment one another. This was also shown in Umo's (1987) analysis of educational objectives of Nigeria's third National Development Plan that a combination of Social Demand Approach and Manpower Requirement Approach were used. Although the SDA appeared to have the upper hand in the process.

In the Nigerian context, preference for SDA has been on the desire to equalize education opportunities and thereby redress imbalance in geographical and sex distribution of education (Umo, 1981). It must however be noted that SDA implies at least one other objective whose merit has not been explicitly mentioned, that is, the free-choice principle in higher education. For instance the United States of America (USA) pursues the free-choice principle; but its economy can absorb all the products of the educational system. The Nigeria economy, by contrast, has demonstrated a very low absorptive capacity.

2.14.3   Raise the Vocational Content of Education

It has often been argued that vocational content of education be raised. The third development plan was to address such raise in vocational education by:

(i)   re-orienting curricula to make general education more responsive to socio-economic condition in the country.

(ii)   providing career and occupational guidance.

(iii)   expanding vocational training programmes (Federal Republic of Nigeria, 1975). Action has been taken to bring about increase in the facilities and enrolment of technical colleges, polytechnics and science-based university education. The introduction of the 6-3-3-4 system is meant to

rescue the secondary school student from the straight-jacket of the grammar school type of education and offer him the opportunity to acquire congnative skills.

It must be noted that the evidence on the efficiency of vocational education in combating educated unemployment has been, to a great extent mixed. The strategies of third national development plan of re-orienting curricula to make general education more responsive to socio-economic conditions, etc, is derived directly from the assumption that by "limiting western-type education, instructions in African schools includes unrealistic job expectation and disdain for manual work among school leavers and that the solution lies in raising the vocational content of the curricula".

Foster (1965) in attempting to verify this assumption with respect to Ghana found it inapplicable. He attributed the failure of the thesis to what he called the "vocational school fallacy in development planning". Blaug (1971) then concluded that if such findings by Foster are representative of Africa as a whole the popular notion that the curriculum is a major determinant of the vocational aspiration of the students will have to be abandoned ...".

In the same view, World Bank study (1978-1982) on the diversification of school curricula has served to draw attention to a number of obscure and grey areas in matter of vocational content and curriculum diversification. Pscharopoulos and William chose Tanzania and Colombia for the World bank study of diversified secondary education. The two countries were chosen because both have well-run diversified curricula and are sufficiently different politically and economically to test the notion that diversification may work only under special circumstances. The findings of the study were that:

(i)   diversified curricula are difficult to implement especially if a country lacks instructional material, laboratories, and trained teachers.

(ii)   curriculum diversification is expensive. It is therefore important to weigh the social benefits of vocational education against the costs.

(iii)   diversified training does not raise the graduate income beyond what ordinary secondary education can do.

(iv)   vocation students do not in the end achieve a better match between their jobs and their qualifications than do other students.

2.15   Structure of Nigerian Industries

Modern industry is a product of the phenomenon known as industrialization, a process which developed alongside

scientific and technological development. Industrialization is generally defined as the process by which inanimate energy or mechanical power replaces human energy in production.

Many authors have emphasised the benefits of industrialization to both the advanced and developing nations. These benefits include increased employment opportunities, a more favorable balance of payments, higher incomes and standards of living and the diffusion of technical and managerial skills (Sullivan and Ikpeze, 1980). It was hoped that in Nigeria, industrialization would move the country from dependence on petroleum towards diversified and a stable economy. Of course, added to above is the classical notion that industrialization makes for mass production which correspondingly leads to the abundance of goods and services. According to Adejugbe (1979) and Sullivan and Ikpeze (1980), the problems militating against Nigeria's industrialization efforts include shortage of financial capital, lack of entrepreneurship, poor management, undeveloped technology, inadequate socio-economic infrastructure, shortage of technical manpower and foreign domination. Although the foregoing are common problems of third world industrialization, they may not apply to all countries equally. For instance, Ukaegbu (1988) argued that it would

be erroneous to postulate that there was a shortage of scientific and technological manpower in Nigeria when many scientific and engineering graduates and graduates in other areas of technical education were unemployed. He argued further that the problem of lack of financial capital did not apply to Nigeria between the middle and the late 1970s when the oil boom provided ample revenue for the country. It could be argued also that the indigenous businessmen lack financial capital, but it is equally true that the same period of oil boom saw the growth in the number of Nigerian millionaires, who preferred to invest their money in commerce rather than the industry. Therefore, neither the affluent Nigerian government of the oil boom days nor the affluent indigenous businessman of the same period invested their financial resources in solid industrialization.

The problem of foreign competition which follow investment by multinational corporations is acknowledged, and dates from colonial times. The neglect of indigenous production techniques, superficial transfer of technology, over-pricing of industrial equipment, centralization of research and development (R & D) facilities and activities in the advanced countries and, the repatriation of huge profits from host countries are among the many negative consequences of multinational corporations which are documented in development literature.

Turner (1978), Williams (1977) and Akeredolu-Ale (1971) posited that the dominant influence of multinational corporations has prevented the development of an indigenous enterpreneurial class which can combine capital and labour for industrialization. The absence of indigenous entrepreneurial class coupled with the other problems of the multinationals mentioned above affect the structure and operations of Nigerian industries and influence the nature of utilization of scientific and technological labour for national development.

2.16   Characteristics of Nigerian Industries

Modern industries in Nigeria are largely the result of colonial preoccupation with expanding markets and maximizing profit. Consequently, the history of modern industry in Nigeria differs from that of its counterparts in advanced countries of the West. While industries in the West aimed at generation, accumulation and reproduction of capital, Nigerian industry is premised on import-substitution. To achieve this objective, industrial equipment and raw materials are imported and transported to Nigeria, installed and used for routine production activities, either by multinational corporations, the State, or indigenous private businessman. Consequently, Nigerian industries are characterized by their inability to revolutionize production.

In Nigeria like many other developing countries, the industrial sector has been monoplized by multinational corporations. In recent times, however, many of these emerging countries have been involved in state industrial enterprises with certain motives. According to Walsted (1980), state industrial enterprises are established for certain standard reasons. The first reason is that the running of industrial enterprises is risky for indigenous private investors, therefore, only the State can support the industrial development of the nation, particularly in the area of technological advancement. Another reason in favour of State industrial enterprises is the distrust of indigenous private investor whose enrichment could create power base. The third reason is nationalism. In the case of nationalistic motive Walstedt (1980) further argued that public enterprises view themselves as extensions of the State rather than as essentially independent business entities. But upon closer examination between the structure and operations of the multinational and State industries within the developing countries, Ukaegbu (1985) argued that State industrial enterprises depended on the multinationals for supply of operational infrastructures (technology). Therefore, both have similar physical structural characteristics.

2.17   Manufacturing Industries in Nigeria

Manufacturing in Nigeria consists largely of a handful of factories producing construction materials, clothing, textiles, footwear and processed food using simple assembly processes (Cody, et al, 1980 and Schultz, 1973). Nigerian manufacturing industries also, consist largely of assembly plants with little backward linkage in the economy, since the bulk of input are imported (Adejugbe, 1979). Apart from their assembly line structure, Nigerian industries have another negative characteristic, that is, lack of raw materials. The crisis in the flour mill industry in Nigeria typifies this scenario (Ijomah, 1988).

Furthermore, Thomas (1975), in a study on comparative analysis of Nigerian manufacturing industries, contended that their general structure lacked high-level technological requirements. He added that despite the relative simplicity of their operations, the performance of the manufacturing industries was further hindered by lack of ancillary or feeder industries that efficiently produced intermediate inputs and spare parts for manufacturing. Feeder industries, according to Thomas (1975), are particularly important because the potential economies of scale of a new technology are left unexploited because the needed cooperating inputs were unavailabe locally or constrained by foreign exchange.

Problems of feeder or ancillary industries is clearly demonstrated by the difficulties faced by Nigeria's automobile industry which are as a result of some omissions in policy establishing the country's iron and steel industry. The National Petroleum refineries are also faced with this lack of feeder industries. Anya (1982) noted that although Nigerian iron and steel industries were programmed to produce a mix of finished products, it was later realised that the programme did not include the production of sheet metal which is an important component of the vehicle assembly industry. The implication of this singular situation for Nigeria, Ukaegbu (1988) concluded, was the continued technological dependence through the continued importation of finished parts for vehicle assembly. Consequently, the technological manpower in the automobile industry will continue to perform routine assembly tasks.

2.18 Manpower Utilization in Nigerian Manufacturing Industries

Industries can be classified according to whether they predominantly use materials—technology or knowledge—technology. Technology involves both mechanical and intellectual process (Steer, 1981). According to Hickson, et al (1969), material technology is concerned with the type of material used in the work flow while knowledge technology focuses on the amount, quality, level,

sophistication and dispersion of information relevant to decision-making and production in an organization.

A close examination of the structure of Nigerian industries will show that material technology is more dominant than knowledge technology in the work flow. Packaged equipment and other inputs are imported and installed thereby providing little opportunity for search for sophisticated production information which is the basis for knowledge technology. There is a consequence of the import substitution ideology of Nigeria industrialization which focuses on mass production of consumer goods. And of course, mass production is the product of mechanization.

According to Ukaegbu (1988) although the effect of mechanization and production on the socio-economic state of people are unequivocally desirable, it has some undesirable consequence on the potentialities of human individuals. As has been stated, Nigerian industries are assembly-line in structure. This tends to condition the work behaviour and define the extent of utilization of human intellectual and physical potential. Walker and Guest (1952) highlighted some well-known characteristics of assembly-line work behaviours, namely work is repetitive, machine-placed, require minimum use of skill, and high degree of pre-determined techniques. Furthermore, the minute subdivision

of products calls for a limited degree of know-how by the workers.

It is important to state that the issue here is not that mechanization and division of labour are bad per se, rather, the issue is that deploying highly skilled scientific and technological professionals to carry out fragmented, automated, routine and highly repetitious tasks results in skill wastage. Odufalu (1985) posited that the primary work activities of Nigerian scientists and engineers in industries are production function such as maintenance, routine analysis, installation, extraction of raw material and supervision of production activities.

The routine nature of the jobs of the professionals engaged in the actual production in manufacturing organizations is evidenced by their constant presence on production lines. They are in constant motion between their factory offices and their production lines. They are also in constant communication with production and maintenance technicians. It is, therefore, difficult to distinguish a scientist/engineer from a technician because their functions are similar (Ukaegbu, 1982). He also noted that in many instances, lower-level technician can be seen working side by side with higher degree holder - bachelors, masters and doctorate degrees,performing the same tasks.

In other words, variations in the level and content of education have little or no meaning in Nigerian manufacturing industries. From the above, it could be safe to say that there tends to be a mismatch between the individual's training and the tasks they perform in Nigerian manufacturing industries.

This routine structure of the task of industrial scientists and engineers is common in developing countries. Evan (1969) observed that in less industrialized countries, most engineers perform various production functions, whereas in the industrialized countries, a higher proportion is engaged in research and development.

2.19   Conceptual Framework

2.19.1   Background

The level of output of a country depends on the endowment of natural resources, the amount and quality of labour and the level of technology it possesses. The level of output and its composition can be modified by other factors such as international trade (Fapohunda, 1978). But classical economists think of output as a function of land and labour. Since the amount of land in the world is fixed, its supply is perfectly inelastic. Given a unit of land, the application of more labour to work it will at first, result in increasing returns and further increase in the

application of labour on the same land will, eventually lead to diminishing returns.

Later, economists such as Keynes, thinking about how to increase the rate of development of a country assumed that the important factors of production was capital. According to the Keynesian economists, increase in the rate of growth of the economy was possible only through an increase in the rate of capital accumulation. In the simple Keynesian economic analysis, an increase in the rate of development meant an increase in savings or capital investment.

Historically, labour has occupied a dominant position in discussions of the factors of production. Smithson, (1982) argued that its importance in the production processes might well have been over emphasized. Indeed, the medieval economists, and much later John Locke, considered labour to be the sole source of value, that is, the only productive input. In English classical economics, this labour theory of value continued to dominate. Adam Smith (1763) stressed the importance of the labour input in the production process, particularly in `primitive' societies, as well as the effect of division of labour on the economic process. David Ricardo while not maintaining a strict, uncompromising labour theory of value, stressed more than Adam Smith the importance of labour in production. Thomas

Malthus (1823) who was responsible for the "iron law of wages" was the first to discuss the importance of other factors of production (land, labour, capital and entrepreneur). The labour theory of value reached its height with Karl Marx (1910) who attributed all value to labour. Indeed, Marx viewed capital as nothing more than the stored-up productive power of labour.

The current view of labour as a factor of production comes from the Neo-classical (or marginalist) economists. For example, the work of Alfred Marshal (1920) and John Bates Clerk (1899) altered the view of the factors of production by considering the marginal productivity of the factors. This led to the marginal productivity approach to the valuation of labour and formed the basis for the analysis of more recent writers.

Given a generalized production function of the form:

$$Q = f(K, L, M) \quad \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \quad (1)$$

where:

Q   =   output per period

K   =   Units of capital

L   =   Units of labour

M   =   Units of land.

Qualitative improvement in any of the factors would be observed via an increase in the product (output) for which

they are used. Differentiating (i) totally, we have:

$$\frac{dQ}{\partial} = \frac{dQ}{\partial K}dK + \frac{\partial Q}{dL}dL + \frac{\partial Q}{\partial M}dM > 0 \ \ldots \ldots \ (2)$$

From (2) above it would be very difficult to ascertain the contribution of a particular factor to the increase in output. For this reason in equation (2) one can vary the factor under consideration while holding others constant. One would then obtain:

$$\frac{\partial Q}{dK} = MPP_k \ (Marginal \ Physical \ Product \ of \ K) \ \ldots \ (3)$$

$$\frac{\partial Q}{dL} = MPP_L \ (Marginal \ Physical \ Product \ of \ L) \ \ldots \ (4)$$

$$\frac{\partial Q}{dM} = MPP_M \ (Marginal \ Physical \ Product \ of \ M) \ \ldots \ (5)$$

Assuming perfect competition in both the resources and product markets, a profit maximizing firm would pay a factor the value of its marginal physical product which is called the marginal revenue product of that particular product.

2.19.2   Labour as a Factor of Production

As a factor of production, labour is normally defined as the services of human input in the production process, receiving compensation in the form of wages (or salaries) based upon labour's marginal productivity (Ferguson, 1975).

Smithson (1982) posited that this simple definition was, however, somewhat misleading for two reasons. Firstly, he argued that a worker did not in general, supply raw, human generated labour power but rather the ability to apply effort. He contended that both a ditch-digger and a corporate executive supply labour, but the quality of labour services they supply and their compensation differ greatly. Becker (1975) has shown that the quality of labour services supplied is itself determined by the stock of abilities the individual has acquired. Hence, labour might be more appropriately viewed as a flow of services supplied by a given stock of human capital. The effectiveness of the stock of human capital is itself determined by the amount of education, training, health maintenance and mobility applied to basic human input. Thus, the distinction between capital and labour is blurred since both involve the services generated from a given stock as well as an investment decision based on anticipated returns. It should be noted, however, that this capital theoretical view of labour can be carried only so far. One important distinction is that physical capital can be transferred or sold while human capital is very difficult to transfer.

A second difficulty with the simple definition of labour Smithson (1982) argued further, was that it tended to imply that labour is a factor which is entirely variable

(that is the amount of labour employed can be changed in the short-run). However, Walter Oi (1962) pointed out that labour might be better viewed as a fixed or quasi-fixed input. To the extent that there existed cost to the firm in addition to direct wage expenditure (e.g. training cost), the cost of releasing and re-hiring worker is increased; thus, labour input may well have behaved more like a fixed input.

2.19.3   Labour Maximizing Decision

Ekeland and Herbert (1962) posited that the amount of labour actually used in the production process is determined on the basis of maximizing decisions by both the individual labour supplier and the firm. They argued that the individual first determines the level of investment to make in human capital on the basis of maximization of life-time returns (essentially the same as the firm capital investment decision) and then determined the level of flow of services from that stock, the individual would provide to the market based on the utility-maximizing choice between income and leisure. The firm determined the amount of labour that it would employ based on a profit-maximizing decision considering the marginal productivity of labour and the level of necessary firm - specific investment in labour.

2.19.4   Labour in Manfacturing Process

Labour is an indispensable input in the manufacturing process. Varying quantities of labour, in combination with other inputs, can be used to produce a given output. Thus, the demand for labour like other inputs in manufacturing is a derived demand. It is dependent upon the demand for the commodity which labour assist in producing. At the level of the firm, the demand depends upon the techniques the firm employs in production (which determines labour's marginal product), the condidtion in the product market (which determine the price of the product and the demand for the product) and condidtions in the factor market (which determines the wage rate and the relative price of other factors of production). The necessary condition for profit maximization requires that the marginal product of labour should be equal to the wage rate.

Thus, the major determinants of demand for labour at both the microeconomic and macroeconomic levels are the wage rate, output and technology of production. However, output is in turn determined by a series of factors including supply factors such as labour itself, capital, raw materials and spare parts availability and demand factors such as the price of manufactured goods, the size of the market and the income level of consumers.

2.19.5   Manpower Projection Methods

Manpower, which is developed through 'human capital formation', means more than population of labour force. "Manpower in the economic sense is the managerial, scientific, engineering, technical, craftsmen and other skills which are employed in creating, designing, developing organizations, managing and operating productive and service enterprises and economic institutions". Yesufu (1962, p. 209), Folayan (1986) noted that to do this there must be manpower planning. Manpower planning, he said, is the process of determing the policies and programmes that will develop, utilize and distribute manpower with a veiw to achieving a country's broader aims and socio-economic and political development.   For planners to undertake manpower projection, there should be an inventory of manpower for the base year.   Manpower inventory can be obtained through national population census Diejomaoh (1982).   The census is expected to provide information on the labour force, its composition by level of training and education as well as occupational distribution.   By and large, the census is usually comprehensive and reliable enough in advanced countries for such purpose.

There are several methods of estimating manpower requirments.   Some of the most commonly used ones are:

(a)   *The employer's opinion method*

This is the simplest method of estimating future requirement. It involves the aggregation of employers' response as to the magnitude of the various categories of manpower needed at some specified future date. Data are usually collected by the use of survey questionnaire directed to employers and sometimes supplemented by interviews. The establishment surveyed may be asked to indicate existing manpower shortages as well as anticipated requirements. The figure for each category of manpower which is required in the economy is finally adjusted to take account of estimated withdrawal through resignation, retirements and deaths, to arrive at a net forecast of the increase in effective damand for manpower at the target year (Yesufu 1969). The additional manpower required can then be translated from the broad occuptional categories into eductional levels. The employers' opinion method is commonly used in developing countries due to its simplicity. It does not rely on comprehensive data which are often unavailable in such countries. Yesufu (1969) observed, that unlike other sophisitcated techniques. its operation does not depend on a set of questionable assumptions. The National Mnapower Board (NMPB) 1963 and 1977 and Ghana in her two major manpower surveys of 1960 and 1968 have used the method.

The approach however, has some deficiencies. First, it is only useful for forecasting short-term trends, say one to three years; it is quite unreliable for a long-term estimates that may cover a life span of 5 - 15 years. For example, a rapidly growing and changing economy like in Nigeria where new establishments emerge constantly, it becomes difficult to estimate the type and size of establishment that will be in existence 10 or 20 years hence. Another deficiency of the method is that employers' specification of their future manpower requirements may be susceptible to some degree of guesswork as most of them are unwilling or unable to estiamte what their employment will be in the long-run (Abban 1969).

(b) *Harbision's Rule-of-Thumb*: This method is used in manpower planning process. The approach is used to determine output and employment in various sectors of the economy with the assumption that third-level eductional manpower (people who completed higher education) should grow twice as fast and second-level educated manpower (those who completed secondary education) three times as fast as GNP. Assumptions are made about the appropriate levels of formal education for each occuption and estimates of the required number of persons by educational levels are then made. Harbision (1960) applied the rule-of-thumb when he projected Nigeria's manpower requirements for the decade 1960-70 for Ashby Commission.

The major weakness of the approach arises from two of its basic assumptions. These are that every rate of economic growth demands definite skill requirements (fixed input co-efficients) and that these skills requirements in turn make definite call on the educational system thereby implying very rigid relationship between occupation and education. The later assumption, also known as the non-substitutability assumption does not hold in real life (Stolper, 1966). In serveral occuptional categories, there is usually a wide range of substitution among persons with various levels and kinds of education and training. Umo (1986) concluded that except for certain professions such as Medicine and Law, there is usually no rigid relationship between educational background and occuptional affiliation.

(c) *The Parses-Mediteranean Regional Project, (Parnes-MRP)* model is yet another approach. The model links manpower requirement to productivity. It is designed to identify high-level manpower constraints that could hinder production. Several variants of the method have been used by many countries, particularly those in the MRP (Damachi and Diejomaoh 1978). The stages in this method are as follows:

(i)   A manpower inventory is made for the base year;

(ii)   the target output, usually as set forth in a development plan, is broken down by sectors which may be further subdivided by industries;

(iii)   The aggregate employment for the economy as well as for each sector or industry is estimated on the basis of some assumption about productivity;

(iv)   The occuptional structure of the labour force is converted into an educational structure by applying a standard measure of the educational requirements, for successful performance in each occuption. Allowance are then made for deaths, retirement, emigration, so as to derive the forecast of the demand for educated people in the target year on the achievement of the projected output.

(v)   The orders of magnitude for the expansion of the educational system are then established to close the gap between demand and presently-expected supply.

Umo (1986) argued that the most serious deficiency of this method is its great demand on empirical data which are either non-eixstence or unreliable in the developing countries.   Furthermore, although the productivity criterion may be appropriate for estimating high-level manpower in certain sectors like manufacturing, construction and mining, it is not useful for sectors such as public health, general activities of government and many kinds of services where productivity is difficult to quantify.

(d)   *The Tinbergin Econometric Model.*

The Tinbergin econometric model assures the existence
of direct and quantifiable relationship between stock of
secondary and higher education output and given rate of GNP
(Harbision 1973).   Thus, with the use of a simple model of
the input-output type, the required secondary and higher
educational outputs are related directly to given rates of
economic growth without the use of the intermediate step of
calculating occupational requirements.   Then, the number of
persons required from each educational level is calculated
from linear equations, which relate the stock of those
completing a given level of education and the number of
students in each level to the aggregated volume of
production.   Its purpose is to suggest the structure of the
educational system that is needed so as to let the economy
grow at a certain rate and how such structure should change
with changes in the growth rate.

A major criticism of the Tinbergin econometric model
particularly from the point of view of the developing
countries is the need for comprehensive data.   Furthermore,
the implicit assumption of the model that technology and
productivity remain constant over time according to
Diejomaoh and Damaechi (1978) is questionable.   So also is
the assumption that the number of persons with secondary
education and higher education is proportional to the
volume of production in the same time period.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Area of the Study

The study covered manpower production and utilization in south-western Nigeria: Ondo, Osun, Oyo, Ogun, Lagos, Edo and Delta States. This region or zone put together has two of the six industrial zones in the country, namely, Lagos and greater Lagos zone and Warri-Sapele zone (Aboyade, 1968). This implies a high concentration of industrial establishments requiring high-level manpower in the constituent states of this zone. The states also have a high concentration of government ministries, departments, agencies and parastatals at federal, state and local government levels also requiring high-level manpower. Put together, the states have twelve of the thirty six universities in the country. Each of the states has an average of two universities producing graduates (high-level manpower). Only university graduates are included in the study as high-level manpower. The reason for including only the university graduates in the study stems from the Federal Government of Nigeria's (FGN's) classification of university graduates as high-level manpower. Graduate of other tertiary institutions such as Polytechnics, Colleges of Technology and Colleges of Education are classified as sub-professional, intermediate or middle-level manpower.

(National Policy on Education, 1977). The professional bodies are also not included in the study because their training is usually through the non-formal educational process which takes the form of on-the-job-training, in-service training, apprenticeship and articleship. For example, the Institute of Chartered Accountants of Nigeria (ICAN,1983) report on education and accelerated training of Accountants in Nigeria stipulates that to become a member of the Institute, the candidate or applicant must undergo a period of articleship regardless of candidate's or applicant's previous qualification. This is true of other professional bodies such as the Institute of Bankers and Society of Engineers.

The study focused on two specific areas of manpower requirement in the country. These are Engineering and Managerial(social sciences) fields. These areas in the Second National Development Plan (1970-1974) were highlighted as some of the areas where the country relied on expatriates for high-level manpower. The Plan asserted that between 30 and 40 percent of employees in each of these occupational groups were expatriates. The Plan also noted that 28 percent of senior managerial and adminstrative employees were expatriates.

Subsequent National Development Plans, 1975-80 and 81-85, showed manpower shortages in the same area of technical

and managerial occupations. For example, the 1990-92 First National Rolling Plan estimated about 17 percent shortages in national manpower requirement in 1992 for electrical, mechanical and chemical engineering occupations in the country. The Rolling Plan also estimated 18 percent shortage for administrative officers, accountants and economists. UNESCO's (1993) labour statistics confirmed these shortages in Nigerian manpower requirements in these areas of technical and managerial occupations.

Manpower production and utilization broadly include a number of variables such as national population, state of the economy, level and type of education, level of technological and industrial development, quality and quantity of trained manpower produced, national manpower requirement and utilization. The aspect that is considered in this study is the quantity of trained manpower output (particularly from the universities) which constitutes supply side and absorption or utilization of the trained manpower by industries which is the demand side. This is limited to the occupations already identified and the university graduates in these occupations. The reason for choosing these variables is based on the paradox of concurrent graduate unemployment and shortages of high-level technical and managerial manpower in the country as discussed earlier.

3.2 Choice of Manufacturing Industries

Manufacturing is chosen because it is one of the high priority sectors to which great effort has been devoted by government (Fourth National Development Plan (1980-85) and First National Rolling Plan (1990-92)). Apart from agriculture, manufacturing offers the greatest prospect for rapid development and transformation of Nigerian economy. As emphasised in the policy document on the new Industrial Policy (1988), government regards industrialization as a sine-qua-non in the total national effort to achieve greater self-reliance and self-sustained growth and as a means of achieving a balanced economy. In any case, the role of manufacturing cannot be over-emphasised in any economy.

3.3 Choice of Period Covered

The period 1975-1995 was chosen for the study for the following reasons: Firstly, after independence in 1960 there was the Nigerianization policy of the Federal Government. This was backed-up in 1972 with the indigenization decree which was reviewed in 1986. The policy and the decree were to enable Nigerians take-over management positions and enterprenurial leadership from expatriates both in the private and public sectors of the Nigerian economy. This was bound to have some effects on the manpower requirements of the country. Secondly, the

period experienced some level of relative economic growth due to the oil boom in the mid-1970s up to about the 1980s, then followed a slump in the economy from the early 1980s. By 1986 the Structural Adjustment Programme (SAP) was put in place and this was later coupled with the deregulation of economy. The commercialization and privatization decree of 1988 was also promulgated during the period of 1975-1990. There was what economic observers describe as a kind of cyclical movement in Nigerian economy during the period (Business Times, 1992). Thirdly, during the period in focus (1975-1995) the number of universities in the southwestern zone of the country increased from four to twelve-meaning increases in the number of technological and management graduates produced. Fourthly, the period is also considered long enough for the graduates produced during the period to have completed their pupilage, apprenticeship, articleship and internship in their various fields of specialization to enable them practice. Most of the graduates who qualified between 1975 and 1995 should have secured employment and are likely to still be in service in their respective places of work. Finally, the period is also long enough to provide data for good and reliable statistical analysis.

3.4 Data Collection

Data were collected from universities and manufacturing enterprises in south-western Nigeria. The

study was based on random sampling of manufacturing companies from the states. The requirement and absorption of high-level manpower of the companies were obtained. The annual production or output of graduates of the specified disciplines to be examined in the study was also obtained from the universities, ministry of education within the south-western states and the Nigerian Universities Commission (NUC).

Primary data were obtained by means of a structured questionnaire. Two hundred and fifty copies of questionnaire schedule were administered to randomly selected manufacturing enterprises in the states covered by the study. The services of field assistants were used in some cases to administer the questionnaire. By the nature of the questionnaire, the managers or head of personnel departments were able to provide reliable information on variables such as high-level manpower requirement, employment rate of graduates, up-grading of employee, in-service-training, labour turn-over of senior administrative and technical staff, the rate of use of National Youth Service Corps (NYSC) members etc. The data collected were supplemented with information from company records.

Secondary data were also obtained from the universities, the National Universities Commission (NUC) and high-level Manpower Unemployment Registry of the

Federal Ministry of Employment and Productivity and the National Manpower Board. From these sources, data on the number of graduates turned out in the specific field were obtained. National projection on manpower requirement and number of registered unemployed graduates were also obtained for the period covered by the study. Relevant secondary data were collected from the various state Chambers of Commerce and Industry as well as the Federal Office of Statistics.

3.5 Survey Instruments

Two sets of questionnaires were designed for the study survey to collect the relevant data. The first set was distributed to the heads of personnel departments of the manufacturing companies included in the survey which were randomly selected for the study. Two hundred and fifty of questionnaire 1 (Appendix I) were distributed to the companies and a total of two hundred and twenty four were duly completed and returned for analysis. Questionnaire 1 which was distributed to the head of personnel of manufacturing industries contained thirty seven questions and was divided into three sections A, B and C. Section A asked question to facililate the collection of information about the companies. Section B sought information about the company's employment while sections C dealt with questions on Capacity utlization and

high-level (graduates) manpower utilization. Questionnaire I was administered with the help of field assistance.

The second questionnaire was distributed to the twelve universities in the South-west zone covered by the study. The questionnaire which was administered by the researcher himself was distributed to the head of Examination and Records division of the Registry of each of the universities in the zone. All the universities responded to the survey.

3.6 Analytical Techniques

The analytical techniques used for this study are the multiple regression, simple proportion, tabular, graphical analysis and descriptive statistics. Tabular and multiple regression techniques were used in analysing manpower production and its absorption and also the relationship that exist between them. Graphical and descriptive statistic techniques were used in analysing the disparities that exist between production, requirement and absorption.

(1) The Multiple Regression Analysis

Multiple regression analysis entails the use of the ordinary least squares (OLS) and the maximum likelihood method (MLE) techniques to estimate the functional relationship between variables, that is, the dependent and independent (explanatory) variables. For example a simple

linear multiple regression equation of the implicit form can be specified as:

$$Y = f (X_1, X_2 \ldots\ldots\ldots X_n, e) \ldots\ldots\ldots (5)$$

Equation (5) can take the linear form expressed by equation (6):

$$Y = a_0 + b_1X_1 + b_2X_2 + \ldots b_nX_n \ldots\ldots\ldots\ldots (6)$$

where Y =   dependent variable

a_0 =   the intercept (a constant)

$b_1b_2 \ldots b_n$ =   regression coefficient to be estimated

$X_1, X_2, \ldots X_n$ =   the set of independent variables and,

e =   error term.

Other than the regression equation given above, Kmenta (1971) explained that there are some other simplifying assumptions that are important and crucial to the estimation of the regression parameters. They are:

(a) The mean $E(Y_1)$, lie on a straight line which is known as the true (population) regression line;

(b) Normality, that is, the error term is normally distributed;

  (c) No exact linear relationship exists between the explanatory variables; that is, there is no multi-collinearity among the independent variables,

  (d) The explanatory variables are measured without errors;

  (e) Homoscedasticity, that is, $E(e_t)^2 = (\sigma^2)$;

  (f) Zero mean, that is, $E(e_t) = 0$ and

  (g) Non-auto regression, that is,

  $E(e_t \; e_t + S) =$ for all and for all $S \neq 0$.

With the above assumptions, the OLS techniques which is used to minimize the sum of square deviations of the observed values from their means can be used to estimate the parameters of equation (6) as given by equation (7):

$$Y^* = a_0^* + b_1^* x_1^* + b_2^* x_2^* + \ldots b_n^* X_n \; e^* \quad \ldots\ldots\ldots \text{(7)}$$

where : Y^* $=$ an estimator of Y;

   a_0^* $=$ estimator of a_0

   $b_1^*, \; b_2^*, \ldots b_n^* \; = \;$ estimators of $b_1, \; b_2, \ldots b_n$ respectively and

   e^* $=$ an estimator of e

These estimators are regarded the best unbiased linear estimates of the Parameter they represent. The maixmum likelihood method (MLE) is another method for obtaining estimates of the parameters of a population from a random sample. The maximum likelihood method chooses among all

possible estimates of the parameters those values which makes the probability of obtaining the observed sample as large as possible (Koutsoyiannis, 1973).

3.7 The Specified Model

Usually, a nation's manpower production function describes the mathematical relationship believed to exist between the quantities of manpower produced and the set of explanatory variables influencing the quantity during a particular period of time. In order to subject the mathematical relationship to economic analysis, the investigator needs to specify a mathematical model to determine the nature of relationship between the variables.

In deciding the set of explanatory variables to include in this model, consideration was given to the underlying economic assumptions and theory, the operation of the Nigerian economy and the realities of the situation in terms of what is feasible within the limits of available time-series. Thus, data on relevant variables such as production, requirement of university graduate Engineers and number of universities are fitted into an a'priori equation of the form:

$$N_P = \alpha - \beta N_R - \mu N_A - \lambda N_s + \delta N_u + U \quad \ldots\ldots\ldots (11)$$

where : N_P =   Production of universities Engineering graduates (dependent variable)

α =   Intercept term.

β =   Coefficient of university graduates engineering requirements by manufacturing industries;

N_R =   Requirement of University Graduate Engineers by manufacturing industries (independent variables);

μ =   Coefficient of absorption

N_A =   Absorption of Engineering graduate by manufacturing industries (independent variable);

λ =   cofficient of slack in university Graduate Engineers absorption by manufacturing industries;

N_S =   slack in universities graduate Engineering absorption ny maufacturing industries (indpendent variables);

δ =   Cofficient of number of universities producing Engineering graduates;

N_U =   Number of universities producing Engineering graduates;

U =   Stochastic disturbance term.

This to help test whether the production of Engineering graduate by the universties cannot satisfy the needs for Engineering graduates by manufacturing industries and whether there is low absorption of Engineers by the manufacturing industries; Also to test whether production of adminstration and social sciences graduates by the universities cannot satisfy the need for them by manufacturing industries, and whether there is low absorption of adminstration and social sciences graduates by the industries. Data on relvant variables such as production, requirement and number of universities producing adminstration and social sciences graduates are fitted into an a-priori equation of the form:

$$N_{AP} = k - mN_{AR} - pN_{AS} - dN_{AB} + qN_{AU} + U \quad \dots\dots\dots\dots\dots \quad (12)$$

Where:

N_{AP} = production of universities adminstration and social sciences graduates (dependent variables);

K = Intercept term;

M = Cofficient of Requirement of university admin/social sciences graduates by manufacturing industries;

N_{AR} = Requirement of adminstration/social sciences graduate by manufacturing industries (independent variables).

d   =   Coefficient of Absorption

N_{AB} =   Absorption of admin/SS graduates by manufacturing industries;

P   =   Cofficient of slack in absorption of adminstration/social sciences graduates by manufacturing industries.

N_{AS} =   Slack in absorption of Admin/Social Sciences by manufacturing industries (independent variables).

q   =   Cofficient of number of universities producing adminstration/Social Sciences graduates.

N_{AU} =   Number of universities producing adminstration/Social Sciences graduates.

U   =   Stochastic disturbance term.

3.8. Evaluation Criteria

The estimated regression models were evaluated using the following criteria:

(a)   the coefficient of multiple determination (R^2) or adjusted R^2 (R^2) gives the extent to which variability in the dependent variables is explained by variations in the independent variables. The R^2 criterion makes adjustments for differences in the degree of freedom, and given by the formula:

$$R^2 = R^2 - \frac{K}{n-k-1}(1 - R^2) \quad \dots\dots\dots(13)$$

where: K is the number of independent variables and,

n is the number of observations.

(b) the "F-ratio" indicates the significance of the overall hypothesized model. It shows whether or not the independent variables have significant effect on the mean of the dependent variable. The ratio is computed by using equation (14).

$$F = \frac{\text{Regression sum of square}/k}{\text{error sum of square}/n-k-1} \quad \text{............(14)}$$

where: k and n are as defined above.

(c) the "t-ratio" show the significance of the individual regression coefficients.

It is expressed as:

$$t = \frac{b_1}{s_{b_1}} \quad \text{.................. (15)}$$

where s_{b1} is the standard error of the estimated coefficient, b_1. An explanatory variable is adjudge significant if its computed "t" ratio is greater than or equals to the tabulated "t" ratio at a given level of significance. As a rule-of-tumb, however, a

regressor is assumed significant at 5.5 percent level of significance if its estimated coefficient is twice its standard error.

Other statistical criteria used to evaluate fitted regression models are the Durbin-Waston Statistics (D-W), to test for serial correlation in the residuals; the correlation coefficient (r) to test the multicollinearirty among the independent variables and the means square error (MSE) to measure the dispersion of the estimators around the true value of the parameters.

3.9 COMPUTER PROGRAMME USED

COMPUTER PROGRAM FRONTIER VERSION 4.1

The computer programme Frontier Version 4.1 which was used in the analysis was written by T.J Coelli (1996). It can be used to obtain maxium likelihood estimates of parameters. The maxium likelihood estimates provides better estimates than ordinary least squares (OLS), and hence better estimates of parameters than OLS. The program can accommodate panel data, time series data as well as cross sectional data.

In estimating the maxium likelihood estimates, the programme follows a three-step procedure which are listed below.

(1) Ordinary Least Squares(OLS) estimates of the functions are obtained.

(2) A two-phase grid search of Y (gamma) with the B parameters set to the OLS values and the B_o and σ^2 parameters adjusted to the corrected ordinary least squares.

(3) The values selected in the grid search are used as starting values in an iterative procedure, using the Davidon-Fletcher-Powell Quasi-Newton method, to obtain the final maxium likelihood estimates.

CHAPTER 4

DATA ANALYSIS

4.1   DATA PRESENTATION

This chapter deals with the presentation, analysis, results and discussion of the data collected from field survey conducted for this study.

First, an attempt was made to discuss the descriptive analysis of the information and primary data obtained from the field survey, while the empirical result will be discussed later.   The discussion and tabulation (where necessary) of the primary data will involve using such descriptive tools as percentages, frequencies, means etc as mentioned in chapter three.

In discussing the survey data, information collected on manpower production and utilization were categorised into three main groups viz: Engineering/Administration graduate production, Graduate requirement by manufacturing industries and Actual number of graduates employed in those disciplines by manufacturing industries for the period covered by the study.   The grouping was based on share similarities between the characteristics within the groups.

4.1.2   Response rate to the questionnaire I

Due to the wide geographical spread of the manufacturing industries in the South-western zone of the

country, the area covered by the survey study, 250 questionnaires were distributed to the respondent industries randomly selected.

Table 6: Analysis of Returned Questionnaire by State.

State	Questionnaire distributed	Questionnaire Returned	% of total Questionnaires Returned
Lagos	50	50	20.20
Ogun	35	33	13.22
Oyo	46	41	16.4
Osun	28	23	9.2
Ondo	31	29	11.6
Edo	30	23	9.2
Delta	30	25	10.0
Total	250	224	89.6%

Source: Field Survey, 1997.

Of the 250 questionnaires distributed as shown in table 6, 224 were returned. This represents 89.6% rate of responses. This percentage of returned questionnaire was considered sufficient for analysis for the study, as this represents a good proportion of the questionnaire distributed. It was observed that the highest rate of response and return of questionnaires occurred in Lagos with a 100 per cent, Ogun 99 percent, Ondo 93.54 per cent and Oyo 89.12 per cent, of the questionnaires distributed in these States respectively. Edo, Delta recorded the lowest rate of returned questionnaires.

4.1.3 Size of manufacturing establishment

For the purpose of analysis the respondent industries were categorised into five sub-groups based on the numerical strength of the company's employees. Group one is the 0 - 50 categories. Thirty four or 15.2% of the companies that responded to the survey questionnaire fall within this category. The others were the 51 - 100 group which was forty one or 18.3% followed by the 101 - 150 which accounted for forty-six or 21%; then the 151-200 group was sixty-three or 28.1% and lastly the above two hundred group which also accounted for thirty-nine or 17.4%. Table 7 shows that Group 4 the 151 - 200 dominated the survey with 63 or 28.1% followed by the 101-150 group with 46 or 21%; then the 51 - 100 with 41 or 18.3%. Then those above 200 employees and finally the 0 - 50 groups. Further examination of Table 7 shows that 34 or 15.2% of the respondent companies fall within the small-scale business, that is, the 0 - 50. MAN (1988) described manufacturing establishment with less than 50 employees as small scale. While Central Bank of Nigeria (CBN 1989) described small scale business as those with not more than four employees and #500,000 worth of asset. The Third National Development Plan (1975 - 80) defined small scale business as that which has not more than ten employees and is endowed with not more than N600,000 worth of assets. There is strictly no universally accepted definition of

small scale business as this varies from time to time depending on the economic situation in a particular place. Groups 2 to 4 which is the 51 to 100 and 101 - 150 employees which fall within the medium-scale took the lead with 150 or 67.4% of the establishment included in the sample survey while above 200 employees or large scale was 39 or 17.4% of the respondent companies.

Table 7:   Size of Manufacturing establishment by number of employee

Group	No. of employees	No. of Establishment	%
1	0 - 50	34	15.2
2	51 - 100	41	18.3
3	101 - 150	46	21.0
4	151 - 200	63	28.3
5	above 200	39	17.4
Total		224	100.0

Source: Study field survey, 1997.

4.1.4   Number of years in Business operation by manufacturing establishment

Analysis of the status of the companies that responded to the survey shows that nine or 2% of the companies started operation less than five years as at the time of the survey. 17 or 7.6% has operated for more than six but less than ten years while 24 or 10.7% has operated for more

than eleven but less than fifteen years. Thirty six or
16.1% has operated for more than sixteen but less than
twenty years, while those that have operated for more than
twenty years dominated the sample with 138% or 61.6%,
(Table 8). Those that have operated for more than twenty
years were mainly located in Lagos, Ogun, Oyo and Delta
States.

Table 8: Number of years in operation by manufacturing
establishment

Year of Establishment	No. of Establishment	%
0 - 5 years	9	4
6 - 10 years	17	7.6
11 - 15 years	24	10.7
16 - 20 years	36	16.1
above 20 years	138	61.6
Total	224	100

Source: Study field survey, 1997.

4.1.5 Ownership of manufacturing establishment

Table 9 shows the distribution of the respondent companies
in the study survey according to ownership. Sixteen or
7.1% of the 224 companies that responded were wholly owned
by the various tiers of government, local,state and
federal, while twenty-seven or 12.1% are jointly owned by
government and private foreign and local investors.

Private Nigerian entrepreneurs only owned 84 or 37.5% of the establishment that responded. Further analysis shows that the private Nigerian (only) owned companies were mainly in the wood products and furniture, rubber and plastic products industries followed by paper and printing products. Others are the private jointly owned by Nigerian and foreign entrepreneures. This constitutes 43.3% or ninety seven companies mainly in areas of Food product and Beverages, pharmaceutical products, chemical and petroleum products, etc.

Table 9: Ownership of manufacturing establishment South-Western Nigeria

Ownership	No. of Establishment	%
Government	16	7.1
Quasi-Government	27	12.1
Private (Nigerian only)	84	37.5
Private (Foreign/Nigerian)	27	43.3
Total	224	100

Source: Study field survey, 1997.

4.1.6 Types of manufacturing establishment by industry

The study survey focused on manufacturing industries' high-level manpower requirement and utilization. Therefore

it was only manufacturing companies that were included in the sample survey. Table 10 shows the analysis of the industrial group and manufacturing types included in the survey. The two hundred and twenty four manufacturing establishments that responded have been analysed and grouped into thirteen industrial groups as shown in Table 10. Chemical products industries accounted for thirty or 13.4% of the total number of manufactring establishments surveyed. This was followed by wood product and furniture which took twenty nine or 12.9% of the sample. Rubber and plastic followed with twenty six or 11.6%. Food product and beverages has twenty three or 10.3% of the total manufacturing establishment that responded to the survey questionnaire. Tobacco had fourteen or 6.3% while Textiles and wearing apparels, petroleum products and fabricated metal products accounted for thirteen or 5.8% respectively in the study. Cement, brick and concrete products, electrical products were ten establishments or 4.5% each. Leather products and footwear, and transport equipment were 2.7% and 1.8% respectively. Further analysis shows that most of the manufacturing establishments that responded were of the light industries. Except for a few of the fabricated and transport equipment group which was about 7.6% of the 224 manufacturing establishment that responded.

Table 10:   Type of Manufacturing Establishments by industry

Industrial Group	No. of Establishment	%
1. Food products and Beverages	23	10.3
2. Tobacco	14	6.3
3. Textile and wearing apparels	13	5.8
4. Leather products and footwear	6	2.7
5. Wood products and furniture	29	12.9
6. Chemical products	30	13.4
7. Petroleum products	13	5.8
8. Cement, bricks and concrete products	10	4.5
9. Rubber and plastic products	26	11.6
10. Pharmaceutical products	17	7.6
11. Paper and printing products	16	7.1
12. Fabricated metal products	13	5.8
13. Electrical products	10	4.5
14. Transport equipment	4	1.8
Total	224	100.0

Source: Study field survey, 1997.

4.1.7 Graduate Production

(a) Engineering

Manpower output in the various fields by universities in South-Western zone of the country in the field being studied is presented in table 11. Between 1975 and 1980, there were a total of four universities in the South-western zone producing an average of about 263 graduates in engineering fields per year. The total cumulative production of engineering graduates of all the universities for the period between 1975 and 1981 was 1607. Each of the universities produced an average of 395 Engineering graduate per year for the same period. The following period of five years, that is, 1981-85, the number of universities jumped from four to ten. This increase in the number of universities also saw increases in the number of engineering graduates output. The total annual average production of engineers by all the universities for the period 1981-85 went up to 635, an increase of 237 percent over the period of 1975-80. A further increase in the number of universities was also experienced during the period of 1986-90. The number of universities again rose from ten to twelve and annual production of engineers by all the twelve universities increased to 1044 graduates, an increase of 164.4% over the period of 1981-85.

For the period of 1991-95, engineering graduate output increased only marginally to 1093. Although there was no increase in the number of universities during this period, the cumulative productiuon by all the twelve universities for the period went to 5465 as against 1607 graduate engineers in 1975-80 period.

Figure 1 shows the trend in engineering manpower production by universities in South-western Nigeria between 1975-95. The total number of engineers produced by all the universities in the zone during the period of 1975-95 was 15,445, an annual mean production of 735 engineers with a standard deviation of 365.3.

Table 11: High-level university graduate manpower
          production in South-western Nigeria
          Engineering and Social Sciences
          1975-1995

Year	No. of universities producing graduates	No. of Engineers produced	No. of Social Sciences graduates produced
1975	4	264	460
1976	4	279	489
1977	4	281	471
1978	4	280	556
1979	4	207	671
1980	4	269	1151
1981	4	319	1625
1982	10	638	2495
1983	10	779	1900
1984	10	742	2109
1985	10	698	1835
1986	11	1061	1980
1987	11	1049	1849
1988	12	988	1794
1989	12	1090	2217
1990	12	1034	1910
1991	12	1011	1946
1992	12	1064	2074
1993	12	1121	2137
1994	12	1097	2007
1995	12	1174	2108
Total	12	15445	40984
Mean		735.4	1951
SDV		356.3	1725

Source: (i) Field Survey, 1997
         (ii) NUC various annual reports.

(b)   Administration and Social Sciences

Table 11, also shows the number of social science graduates produced between 1975 and 1995. On the average, 634 social sciences graduates were produced annually by all the universities in the zone between 1975 and 1980. This figure rose to 1992 between 1981-85 with a total production of 9964 for the period and 1950 graduates between 1986-90. The production for the period of 1991-95 was 2054 graduates on the average. Figure 2 shows the trend in social sciences graduates production in South-Western zone of Nigeria between 1975 and 1995.

(c)   Trend in Graduate Production

The production pattern of both engineering and social sciences graduates in the zone during the period followed the same trend. Both disciplines show a steady increase from a mere 264 engineering and 460 social sciences annual graduate production in 1975 by the four universities to an annual production of 1174 engineering and 2108 social sciences graduates by the twelve universities in the zone by 1995. Figure 1 shows that engineering production went up sharply in 1982 from the 1981 production level of 319 graduates per annum to 638. It rose from there to 779 in 1983 and dropped slightly in 1985 and again rose to all time high of 1174 graduates in 1995. This is also true of the social science production, (Figure 2). Production also rose sharply in 1980 from 671 to 1151 and to 2495 in 1982 and remained high through 1995.

Fig 1   ENGINEERING MANPOWER PRODUCTION AND UTILIZATION
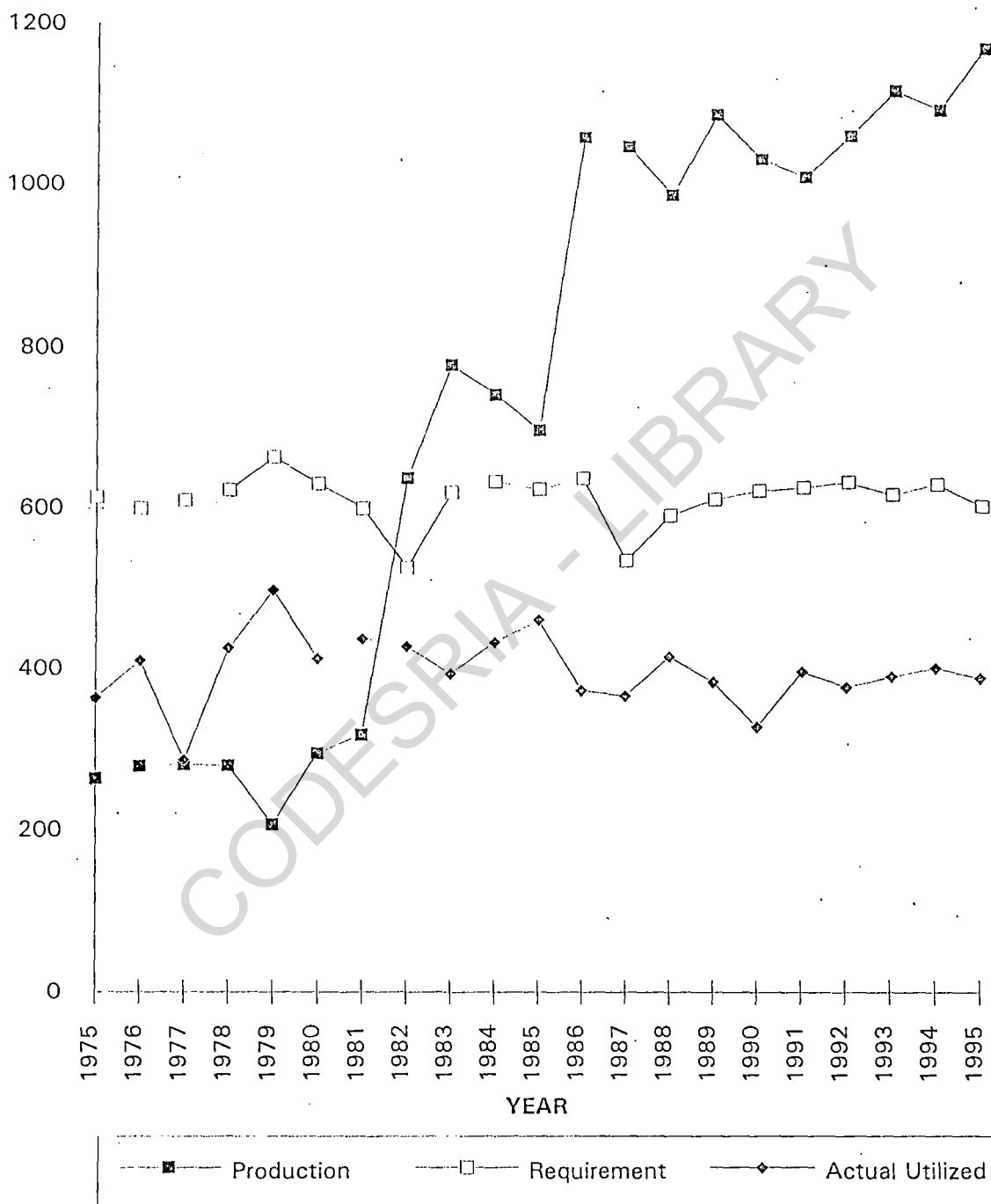
Fig. 2   ADMINISTRATION/SOCIAL SCIENCES PRODUCTION AND UTILIZATION
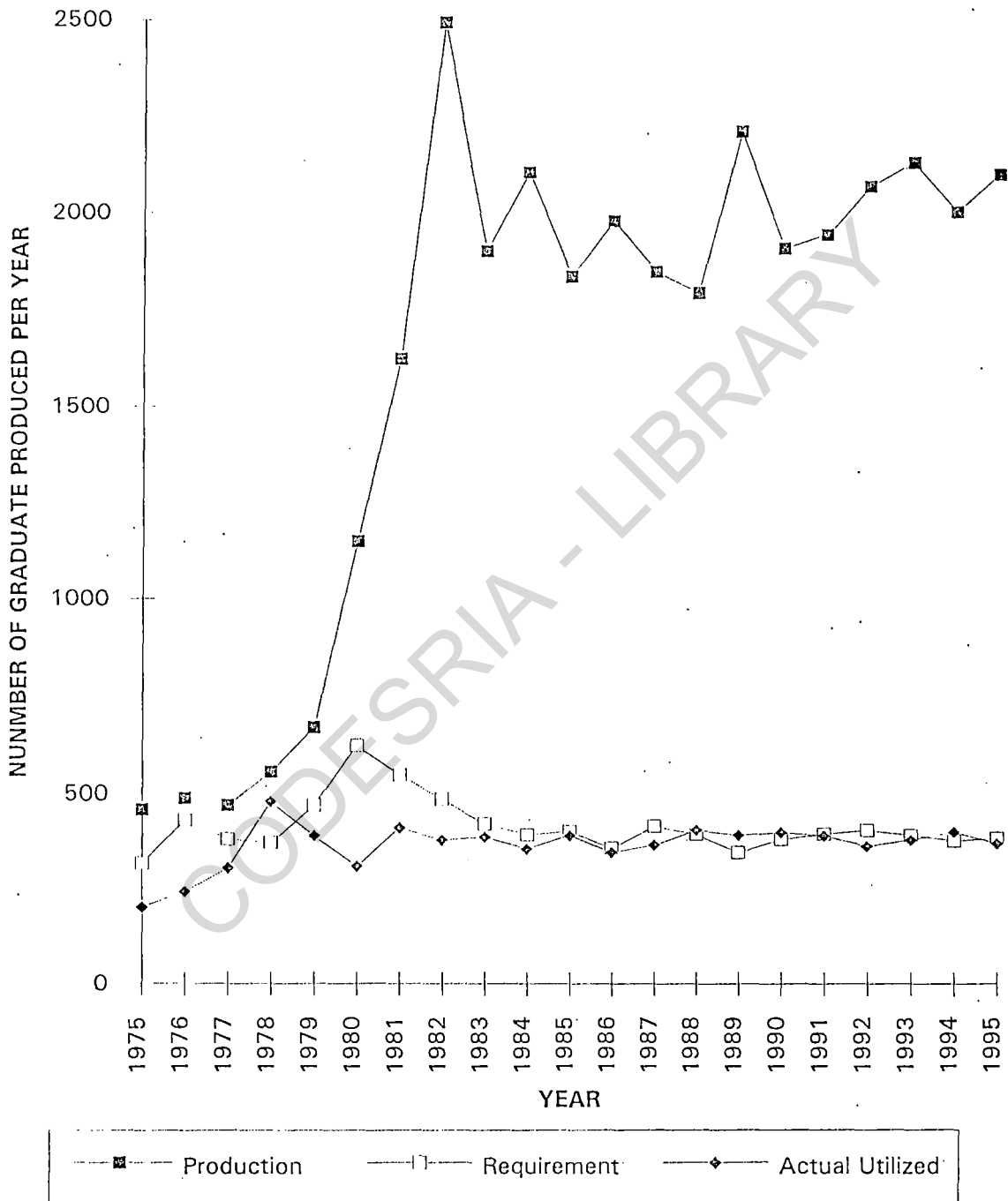
4.1.8   Graduate Manpower Requirement by Manufacturing
         Industries

   (a) Engineering

      Information   on   graduate   high-level   manpower
requirement   in   Engineering   was   sorted   by   the   survey.
Analysis of data shows that manufacturing industries'
requirement in high-level engineering manpower was fairly
consistent for the period covered by the study, (Table 12).
Further analysis of the table reveal that there was no
appreciable difference between 1975 requirement of 614 and
that of 1995 of 604.   There were slight drops in
requirement from the 600 level to 527 in 1982, 536 in 1987
and 592 in 1988.   Figure 2 shows the trend in high-level
engineering   manpower   requirement   by   manufacturing
industries in South-western Nigeria.

   (b) Social sciences

      Table 13   shows data on manufacturing industries high-
level manpower requiremnt in social sciences disciplines.
Analysis of data revealed that manufacturing requirement in
the social sciences disciplines was not as consistent as
its engineering counterpart.   Requirement fluctuated
between 317 and 471 between 1975 and 1979, 394 and 632
between 1980 and 1985.   From the period of 1986 and 1995
the fluctuation was between 347 and 417 graduates required.
The two years of 1980 and 1981 recorded the highest
requirement of social sciences graduates by manufacturing

Table 12: Graduate production, requirement, actual absorption and slack in absorption in Engineering Fields by Manufacturing Companies in South-western Nigeria 1975-1995

Year	Production	Require-ment	Actual Absorp-tion	Rate of Absorption (%)	Slack in Absorption (%)
1975	264	614	364	59.3	40.7
1976	279	600	410	68.3	31.7
1977	281	610	587	96.2	3.8
1978	280	623	426	68.4	31.6
1979	207	664	499	75.2	24.8
1980	269	631	413	65.5	34.5
1981	319	600	438	73.0	27.0
1982	638	527	429	81.4	18.6
1983	779	620	394	63.5	36.5
1984	742	634	434	68.5	31.5
1985	698	624	462	74.0	26.0
1986	1061	638	374	58.6	41.4
1987	1049	536	367	68.5	31.5
1988	988	592	416	70.3	29.7
1989	1090	612	384	62.7	37.3
1990	1034	623	392	62.9	37.1
1991	1011	627	397	63.3	36.7
1992	1064	634	378	59.6	40.1
1993	1121	618	391	63.2	36.8
1994	1097	631	402	63.7	36.3
1995	1174	604	389	64.4	35.6
Total		12862	8683		
Mean		612.4	413.5	69.8	31.9
SDV		30.5	52.8	8.4	8.4

Source: Field Survey, 1997

Table 13:   Graduate production, requirement, actual
absorption and slack in absorption in Administration
Fields by Manufacturing Companies in South-western
Nigeria, 1975-1995

Year	Production	Require-ment	Actual Absorp-tion	Rate of Absorption (%)	Slack in Absorption (%)
1975	460	317	201	63.4	36.3
1976	489	432	243	56.3	43.7
1977	471	381	3.6	80.3	19.7
1978	556	372	480	129.0	**
1979	671	471	391	83.0	17.0
1980	1151	623	309	49.6	50.4
1981	1625	549	412	75.0	25.0
1982	2495	487	379	77.8	22.2
1983	1900	423	388	91.5	7.5
1984	2109	394	356	90.4	9.6
1985	1835	403	392	97.3	2.7
1986	1980	357	346	96.9	3.1
1987	1849	417	367	86.0	12.0
1988	1794	396	407	102.8	**
1989	2217	347	394	105.3	**
1990	1910	382	401	105.0	**
1991	1946	397	392	98.7	1.3
1992	2074	407	364	89.4	10.6
1993	2137	394	381	106.3	**
1994	2007	379	403	94.0	6.0
1995	2108	386	371	96.1	3.1
Total		8714	7683		
Mean		415	365.9	89.3	12.6
SDV		67.4	58.9	17.8	14.7

Source: Field Survey, 1997.

**   No Slack

industries in the South-western zone. The total cumulative requirement for all the establishment that responded to the questionnaire was 8714 with a mean of 415 and a standard deviation of 67.4 for the period of twenty years covered by the study. Figure 5 shows the trend in social sciences graduate requirement in the manufacturing industries in South-western zone of Nigeria.

4.1.9 Graduate manpower absorption by manufacturing industries

(a) Engineers

Data on graduate absorption by manufacturing industries was analysed. For engineering manpower, absorption was lower than requirement for the twenty years period covered by the study. Engineering manpower absorption fluctuated between 364 and 587 from 1975 to 1980 and between 394 and 462 from 1981-85. From 1986 to 1995 the annual absorption rate was fairly consistent as shown in Table 12. The highest absorption recorded was in 1977 with 587 followed by 1979 with 499. The lowest absorption recorded was 364 for 1975. The total cumulative absorption for the period between 1975 and 1995 by all the companies that responded to the survey was 8683 graduates with a mean of 413.5 and a standard deviation of 52.8. Figure 1 shows the trend in engineering manpower absorption by manufacturing companies in South-west.

ABSORPTION RATE ENGINEERING AND ADMIN/SS 1975-95
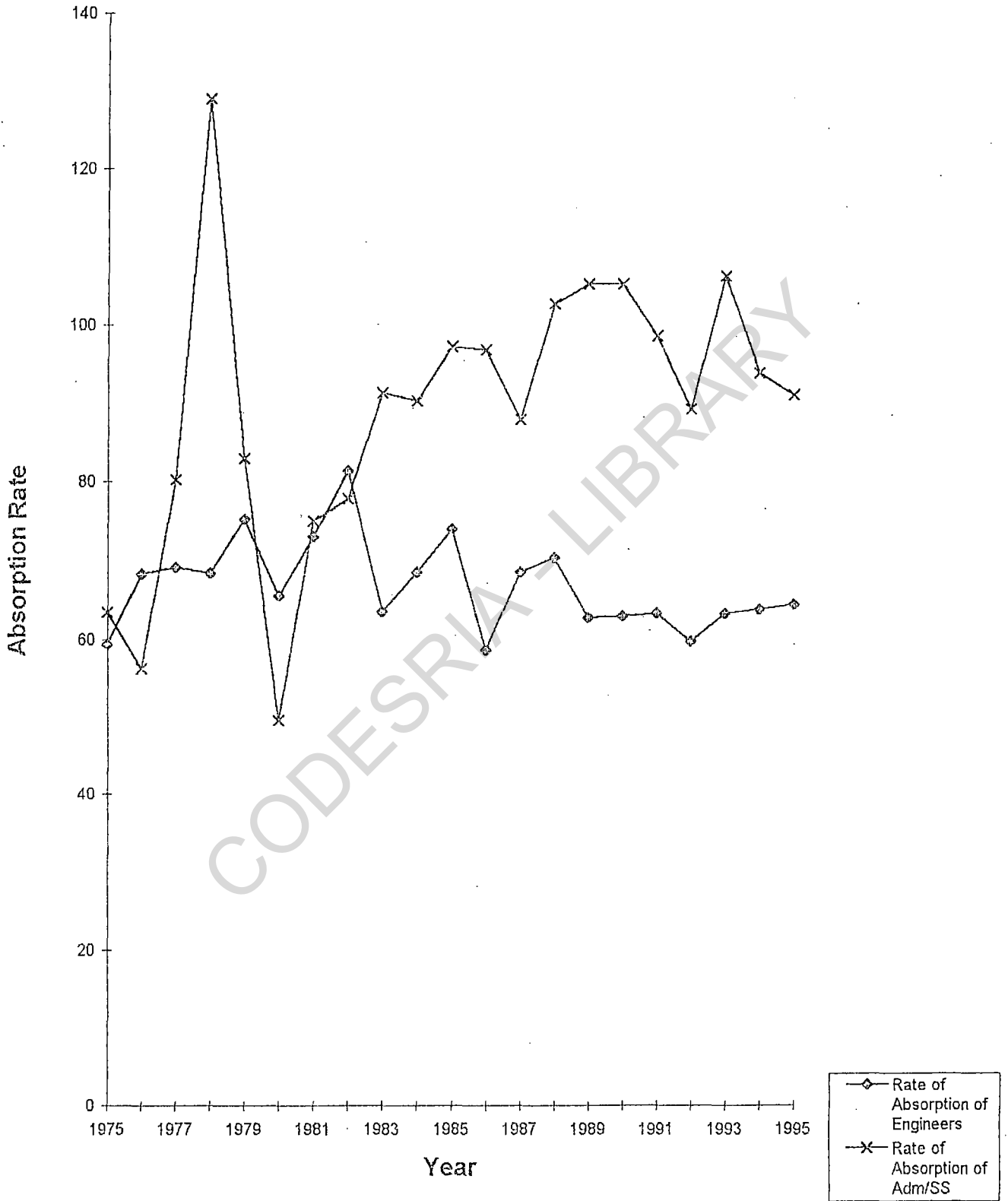
Fig. 3 Absorption Rate Engineering and Admin/SS 1975-95

The rate of engineering graduate absorption for the period covered by the study was further analysed. The analysis revealed that for most part of the period 1975-95 absorption rates of engineering graduates in the manufacturing companies was lower than their initially installed capacity requirement. A further examination of the data on Table 12 shows that a slack exists between requirement and absorption of engineering graduates. The average annual absorption rate recorded for the period 1975-95 was 69.8% with a standard deviation of 8.4%. Figure 1 shows the trend in engineering absorption. Table 12 also shows that there was an average annual slack of 31.9% with a standard deviation of 8.4%.

(b) Social Sciences

The absorption of social sciences graduates by the companies was also analysed. The analysis shows that absorption of graduates in social sciences disciplines was lower than their production and requirement during the period of the study. A close examination of the data revealed that between 1975 and 1980 annual average absorption by all the companies stood at 321 graduates. For the year 1978, absorption was higher than requirement for the manufacturing companies. 1981 to 1985 the average annual absorption was 385 graduates. Between 1986 and 1990 the absorption rate fluctuated between 346 and 407, with annual average of 383 for the period. The highest

absorption for that five year period was in 1988 with 407 graduates absorbed. For that year, absorption was equally higher than requirement. The 1991-1995 period has annual average absorption of 382 graduates with 1994 having the highest for that period. The total social sciences graduates absorbed by the respondent manufacturing industries for the period 1975-95 was 7683 with a mean of 365.9 and a standard deviation of 58.9. Figure 2 also shows the trend of absorption of social sciences graduates in South-west zone.

For administration and social sciences graduates the rate of absorption on the average per year for the period 1975-95 was 89.3% with a standard deviation of 17.8%. The absorption rate was lower than initially installed capacity utilization of manpower requirements of those disciplines, except for the years of 1988, 1989, 1990 and 1993 where absorption was slightly higher than requirement. Figure 3 shows the trend of absorption of graduates in both fields - engineering and social sceicnes.

(c) Slack in Graduate absorption

Analysis of data shows that there were slacks in the rate of absorption of graduates requirements by manufacturing companies. In the case of engineers there was no time throughout the period covered by the study that actual absorption equalled the initially established requirements of the companies as shown in Table 12. The

highest absorption rate achieved during the period for engineers by the manufacturing industries was 81.4% for 1982 and the lowest was 59.3% for 1975. The slack in absorption is derived from the difference between requirement and absorption by the manufacturing industries. This slack is so calculated because the requirement is assumed to be the initially installed full capacity utilization manpower establishments or requirement for the various disciplines. The average annual slack for engineering graduate for the period 1975-95 for all the industries was 31.9% with a standard deviation of 8.4%.

For social sciences graduates there were no slacks in 1978, 1988, 1989 and 1990 for these four years absorptions were more than initially established requirement in manpower. The annual average slack in social sciences disciplines was 12.6% while the standard deviation was 14.7%. For this group of high-level manpower the slack was highest in 1980 with 50.4%; Table 13 shows slack in social sciences absorption.

4.1.10 Capacity Utilization

During the study, data was collected from manufacturing companies' capacity utilization for the period. Table 14 shows the result of the level and pattern of capacity utilization by manufacturing industries.

Table 14:   Capacity utilization by manufacturing industries

Level of capacity utilizat ion by: 1	Food product 2	Beverag es and tobacco 3	Textiles and weaving apparels 4	Leather products and footwear 5	Wood product and furniture 6	Chemical product 7	Petroleum product 8	Cement and brick product 9	Rubber and plastic product 10	Pharma ceutical product 11	Paper Products 12	Fabricat ed metal product 13	Electr ical produ cts 14	Transport equipment 15	Total	%
75% and above	2	2	2	-	5	-	1	8	10	1	32	1	-	-	14	15.2
50% but below 75%	14	11	2	1	7	4	3	1	6	6	1	1	1	-	57	25.4
35% but below 50%	5	2	3	2	7	16	10	1	12	13	2	11	6	2	91	40.6
Below 35%	2	-	6	3	6	10	-	-	1			11	.3	2	42	18.8
Total	23	15	13	6	25	30	13	10	26	17	16	13	10	4	224	100

Source: Study field survey 1997

35

A total of 224 companies responded to the questionnaire on capacity utilization. Analysis of the data shows that 34 or 15.2% of the 224 respondent companies operated at 75% or above. Of the remaining, 57 or 25% operated at 50% but below 75% capacity utilization and 91 or 41% operated at 35% but below 50% while 41 companies or 18.6% operated below 35% capacity utilization. Further analysis showed that those that operated above 75% capacity utilization were mainly in the cement and brick products, Rubber and Plastic products and wood and furniture industries. For those above 50% but below 75% capacity utilization, food, beverages and tabacco were prominent in this group. The data analysis further shows that those above 35% but below 50% were mainly chemical, pharmaceutical, rubber and plastics, fabricated metal and petroleum products. The below 35% capacity utilization were mainly paper products, chemical products and textiles and wearing apparels. The analysis shows that wood and furniture product was relatively high in the four categories of capacity utilization levels.

4.1.11 Deployment of high-level manpower

(a) Engineers

Data on the deployment of university and polytechnic (HND) engineering graduates to functional areas in the manufacturing industries was collected during the study

field survey. The data was analysed. Result of the
analysis of deployment of university graduate engineers of
the 224 companies that responded to questionnaires is
presented in table 15. Seven possible functional areas or
types of assignments were identified by the study. The
first area of assignment was the buying and stock control
functions. Data analysis shows that 271 or 4% of the 6703
university graduate engineers assigned by the 224
manufacturing companies were performing buying and stock
control functions in their various companies. Further
analysis revealed that the food, beverages and tobacco,
pharmaceutical and chemical products manufacturing
companies took the lead in assignment of engineers to these
functional areas. The second area of assignment is the
production operation, production design, planning and
control type functions. In this functional area, 1325 or
21% of the engineers were assigned. In this area the
petroleum products, followed by food, beverages and tobacco
industries, wood and furniture companies ranked highest.
For quality control functions 1764 or 26% of the engineers
were assigned to this area. Food, beverages and tobacco
products then followed by petrolem products, wood and
furniture products. In all the industries assignment of
engineers to quality control function was relatively high.
In the area of training 882 or 13% were assigned by the
companies to perform training function in the 224

Table 15 : Deployment of University Engineering Graduate to Functional areas in the manufacturing industries

Types of Assignment	Food products 1	Beverages and Tobacco 2	Textile and Wearing Apparels 3	Leatherproduct and foot wear 4	Wood product and Furniture 5	Chemical products 6	Petroleum product 7	Pharmaceutical products 8	Rubber and plastic products 9	Paper and printing products 10	Cement and Brick products 11	Fabricated metal products 12	Electrical product 13	Total Eng. Deployed	%
1. Buying and Stock control	46	26	13	6	18	24	11	31	19	20	8	21	28	271	4
2. Production operation production design, planning & control	144	141	73	32	133	131	147	123	68	93	34	87	119	1325	21
3. Quality Control	219	207	69	67	158	157	184	155	127	110	67	107	137	1764	26
4. Training	113	94	38	29	84	87	74	38	62	74	39	69	81	882	13
5. Marketing, Sales etc	53	50	12	6	42	29	33	21	30	38	52	41	68	475	7
6. Administration	170	122	77	39	120	127	145	155	97	81	72	76	97	1375	20
7. Transport	88	72	44	32	54	42	46	26	43	38	41	51	38	610	9
Total	833	712	326	211	608	597	640	549	446	454	313	452	568	6703	

Source: Study field survey, 1997

companies. Again food and beverages products industries assigned more engineers in this functional area. Marketing and sales function took 475 or 7%. Analysis shows that 1375 or 20% of the engineers were assigned to perform administrative functions in the 224 companies while 610 engineers were also assigned to transport functional area.

A casual look at Table 15 revealed that quality control attracted the assignment of more engineers in the manufacturing industries included in the survey. This area accounted for 1764 or 26% and was followed by administration which accounted for 1375 or 20% of all the engineers assigned. Production operation, design, planning and control functions came third in rank with 1325 or 21%. Training was fourth with 882 or 13% followed by transport function with 610 or 9%. Marketing, sales and buying and stock control followed with 475 or 7% and 271 or 4% respectively. Analysis also shows that food products industry assigned a total of 833 engineers to the seven functional areas. This was the highest among the thirteen industrial groups surveyed. This was followed by beverages and tobacco which assigned a total of 712. Wood and furniture industries assigned 608 engineers while petroleum products 640, chemical products 597 also did, by electrical products industry with 568. Leather products and footwear assigned the least number of engineers with 211. On the whole, administration, training, transport, buying and

stock control, marketing and sales together accounted for 3613 or 53.9% of the total 6703 engineers assigned in the industries during the period. These non-production functional areas were assigned more than half of the total number of engineers employed by these manufacturing industries. The implication of this is that more than half of the engineers in these industries are performing non-production functions.

(b) Deployment of Polytechnic (HND) Graduate
     engineers

Table 16 shows the pattern of deployment of polytechnic (HND) engineering graduates along side with their university counterparts in the manufacturing companies. Again, seven possible types of area of assignment were considered as in Table 16. A total of 5281 HND engineers were assigned in 224 companies covered by the study. Analysis shows that in the case of polytechnic engineers, production operation, production design, planning and control functions were assigned the highest number of 1225 or 23% of the total. This was followed by quality control function with 1012 or 19% of the total. The other functional areas were assigned HND engineers as follows: Marketing and sales function was assigned 799 or 15%, Administration had 915 or 18%; this was followed by transport with 639 or 12% and training functions which was assigned 319 or 6% of the polytechnic engineers on the

whole. A further analysis also revealed that production operation, design, planning and control and quality control functions were assigned the highest number of HND engineering graduates in the 224 companies that responded to our questionnaires. These two functional areas were assigned a total of 2237 or 42.4% of the 5281 engineers assigned by the manufacturing companies. This number that was deployed to these functional areas was less than half of the total. The non-engineering functions had 3044 or 57.6% deployed to it. These areas are the buying and stock control, training, administration, marketing and transport functions. The polytechnic engineers like their university counterparts are more than half deployed to the non-production functions of the manufacturing activities as well.

Table 16 also shows that beverages and tobacco industries deployed the highest number of 506 polytechnic graduates and this was followed by wood and furniture products industries with 480, electrical products had 431, petroleum and chemical products had 452 and 450 respectively. Leather products and footwear recorded the least with 223 graduates.

Table 16: Deployment of Polytechnic Engineering Graduate to Functional areas in the manufacturing industries

Types of Assignment	Food products 1	Beverages and Tobacco 2	Textile and wearing Apparels 3	Leather product and foot wear 4	Wood product and Furniture 5	Chemical products 6	Petroleum product 7	Pharmaceutical products 8	Rubber and plastic products 9	Paper and printing products 10	Cement and brick products 11	Fabricated metal products 12	Electrical product 13	Total Eng. Deployed 14	%
1. Buying and stock control	48	32	27	19	42	39	28	31	24	27	17	23	32	372	7
2. Production operation production design, planning & control	126	134	66	53	97	140	111	83	101	92	61	76	88	1225	23
3. Quality control	84	92	67	40	93	74	92	71	79	91	72	78	79	1012	19
4. Training	16	21	34	13	29	23	32	22	29	24	23	26	22	319	6
5. Marketing and Sales	79	84	28	19	63	67	72	47	62	61	67	81	79	799	15
6. Administration	82	86	63	42	89	68	74	68	69	71	41	83	79	915	18
7. Transport	61	57	42	37	67	47	43	39	51	47	37	59	52	639	12
Total	460	506	327	223	480	450	452	361	415	413	318	426	431	5281	100%

Source: Study field survey, 1997

(C) Deployment of university administration and

social sciences graduates

Data on deployment of graduate of administration and social sciences was analysed. The analysis revealed the pattern of deployment of this categories of graduates in the manufacturing companies. The 224 companies that was included in the study survey deployed a total of 5771 graduates in social science disciplines. Table 17 shows a breakdown of the result of the analysis. For graduates in the social science disciplines nine possible functional areas of deployment were identified in the manufactruring industries for them. Table 17 shows these areas and types of assignment to which the graduates were deployed. Administration which includes legal, insurance, etc was deployed 1399 or 24.2% of the total. This accounted for almost one-quarter of the total. Marketing, marketing research, sales and public relations had 1289 or 22.3% of the total deployed to it as well. Finance, accounts, internal audit followed with 923 or 16% while buying and stock control and personnel (welfare and security) had 693 or 12% and 866 or 15% deployed to them respectively.

The analysis further revealed that only 28 or 0.5% of social science graduates were deployed or assigned to perform product operation, production design, planning and control functions in the 224 manufacturing companies surveyed by this study. Quality control functions had only

16 or 0.3 deployed while 38 or 0.7% was deployed to transport services areas by the companies. A comparison of the deployment of engineers and social sciences graduates by the 224 manufacturing industries shows that the number of engineers and social science graduates deployed to perform administrative functions were equal. We can see that 1375 engineers were deployed to perform administrative and its related functions while 1399 social sciences graduates were deployed to the same functional areas by the manufacturing companies. On the other hand, only 44 social science graduate (Table 17) was deployed to perform production and its related function while 2237 engineers (Table 15) were also deployed to those functional areas by the manufacturing companies as well.

Table 17: Deployment of university Adm/SS graduates in Manufacturing industries in South-western Nigeria.

	Types of assignment	Food product	Beverages and Tobacco	Textile and wearing apparel	Leather product and footwear	Wood product and furniture	Chemical product	Petroleum product	Pharmaceutical products	Rubber and plastic product	Paper and printing products	Cement and brick product	Fabricated Metal product	Electrical product	Total	%
1	Buying and Stock control	74	49	38	34	81	37	62	37	92	68	37	37	47	693	12
2	Production operation (design planning & control)	–	–	–	6	2	–	–	–	4	11	5	–	–	28	0.5
3	Quality Control	–	2	2	2	3	–	–	–	2	4	1	–	–	16	0.3
4	Training	67	48	57	31	46	26	27	19	54	67	33	23	21	519	9
5	Personnel (welfare and security)	103	94	32	24	121	78	69	57	86	64	39	41	58	866	15
6	Marketing (Market research, sales & Public Relations	153	142	85	58	127	112	107	84	114	97	73	58	79	1289	22.3
7	Administration (legal, insurance and others	154	127	118	79	126	108	102	101	113	110	69	107	94	1399	24.2
8	Finance, Account, Internal Auditor	112	97	34	29	78	64	59	81	79	71	34	64	67	923	16
9	Transport	–	–	2	2	3	1	–	6	3	2	12	4	5	38	0.7
	Total:	663	559	368	265	584	426	426	385	545	494	303	334	371	5771	100

Source: Study field survey, 1997

4.1.12 Graduate recruitment by manufacturing companies

Information on graduate recruitment by the manufacturing companies was collected. Analysis shows that none of the 224 companies that responded to questionnaire expressed any difficulty in the recruitment of graduates in any of the fields included in the study both for the university and the polytechnic. The survey revealed that on the average about 4.5% of the production unit high-level technical workers in the 224 companies were non-university and non-polytechnic graduate engineers. They are technicians merely designated engineers, either because of their long experience or as a result of long services with the company, 53.6% of the companies expressed their preference for university graduate engineers while 41.1% of them were for polytechnic and 5.3% others were indifferent to the question of preference. Cases of expatriate quota were very insignificant as less than 3.7% of the companies used expatriates. Most of the companies included in the survey expressed satisfaction with the quality of graduates being produced from Nigerian universities.

4.2.1 Regression Results

Table 18 below presents the results of the regression analysis for the university engineering graduate production

Table 18: Maximum likelihood Estimate of the frontier Model

-Engineering

Variables	Param-eters	Coefficients	t- values Calculated	critical t-values at 5% level	Expected Signs
Constant	α	0.8385** (0.1709)	0.4906	2.12	-
Requirement	N_R	-0.1585** (0.3299)	-4.817	2.12	-
Absorption	N_A	-0.1157** (0.2273)	-5.088	2.12	-
No. of university	N_u	0.5831** (0.1534)	3.801	2.12	+
Slack	N_s	0.1121** (0.5636)	2.990	2.12	-
Variance	$\sigma 2$	0.1485 (0.1055)	0.1407		
	r^2	0.7821 (0.2960)	0.6150		

** Significant at 5% level

++ Not significant
degree of freedom (df) = n - k = 16

n = 21, k = 5

The figures in parentheses are the standard errors.

Table 19 also present the results of the regression analysis for university admin/social sciences graduate production.

Table 19: Maximum likelihood Estimate for the frontier

model Admin/Social Sciences

Variable	Parameters	Coefficients	t-values Calculated	criticalt values at 5% Level	Expected Signs
Constant	k	-0.1651** (0.2019)	-8.178	2.12	-
Requirement	N_{AR}	0.3772** (0.7247)	5.205	2.12	-
Absorption	N_{AB}	0.3024 (0.2851)	1.061	2.12	-
No. of universities	N_{AU}	0.2212**	7.090	2.12	+
Slack	N_{AS}	-0.1726++ (0.1389)	-0.124	2.12	-
Variance	σ2	0.4898 (0.1096)	0.446		
	r^2	0.7991 (0.3751)	0.2973		

** = Significant at 5% level

++ = Not significant

df = n - k = 16

n = 21, k = 5

The figures in parentheses are the standard errors.

4.2.2 Test of hypothesis

This was done to determine the reliability of using

the correlation coefficient of the regression equation to

make decision. In testing hypothesis, t-test of

significance was adopted. We use standard error of the

estimated parameter to divide the coefficient of the estimated parameter. The resulting t-value (given the df) of the model utilized. If the computed t-value is greater than the critical t-value then that coefficient should be deemed statistically significant i.e.

if: $t = \dfrac{\hat{B} - B}{Se\ (\hat{B})} >$ critical t-value the estimated coefficient is then significant.

where:

$\hat{B}$ =   Estimated parameter

B =   True population parameter

$Se(\hat{B})$ =   Standard error of estimated parameter.

Based on this, if our null-hypothesis is that $(\hat{B})$ estimated parameters is not statistically different from zero, we must reject such hypothesis.

4.2.3   Null-hypotheses

(1) H_o = that university graduates production in Engineering and Administration/Social Sciences in South-western Nigeria cannot meet manufacturing industries high-level manpower requirements in those fields.

(2) H_o = the low level of absorption of graduates of Engineering and Administration/Social Sciences by manufacturing industries in South-Western Nigeria does not negatively effect the production of graduates in these fields.

(3) H$_o$ = that the low absorption in Engineering and
      Administration/Social Sciences in manufacturing
      industries in South-western Nigeria result in a
      slack in absorption (which is the difference
      between requirement and absorption) and inspite
      of this slack, production of graduates of
      Engineering and Administration/ Social Sciences
      is not negatively affected.

(4) H$_o$ = that the number of universities established in
      South-western Nigeria positively affects the
      production of high-level manpower in Engineering
      and Administration/Social Sciences.

4.2.4   DISCUSSION

The regression result for the model represented by
equation (II) has R^2 of 0.7821 which shows a high "goodness"
of fit, which indicates that about 78.21% of the variation
in the production of high-level manpower in the series is
explained by the independent variables. All the estimators
of the independent variables in the model are significant
and as such they can be reliably used to make references
about the model. The estimator of two of the independent
variables (Requirement N$_R$ and Absorption N$_A$) carry negative
signs. This is in absolute agreement with our postulation
in the a priori equation. This means that if the effect
of other independent variables in the model are held

constant and requirement (N_R) varies. The partial estimator
for this variable implies the if (N_R) increases by 100%,
about 15% of that 100% will affect the production of
graduates of Engineering negatively. By the same token
all other independent variables in the model are held
constant and N_A is allowed to vary, the partial estimator of
the N_A variable means that if N_A increases by 100% about 11%
of that 100% will negatively affect production of
Engineering graduates. Again if all other independent
variables are held constant and slack (N_S) is allowed to
vary the estimator of the slack variable can be interpreted
to mean that if slack increases by 100% about 11% of the
100% will positively affect production. However, this is
in sharp contrast with our earlier postulation in the a
priori equation (II).

If all other independent variables in the model are
held constant and the number of universities (N_U) is allowed
to vary the partial estimator of N_U variable can be deemed
to mean that if the number of universities (N_U) increases by
100% about 58% of that 100% will positively affect
production.

Because of the high R^2 multicollearnity can be
suspected but such a suspicion must be discarded because
the variables are individually statistically significant.

The regression result for the model represented by
equation (12) has R^2 of 0.7991 which shows high "goodness"

of fit, indicating that about 79.91% of the variation in the production of high-level manpower in the series is explained by the independent variables. All the estimators of the independent variables except the ones for absorption (N_{AB}) and slack (N_{AS}) are significant and as such can be reliably used to make inferences about the model. The estimator of one of the independent variables Requirement (N_{AR}) carries a positive signs. This is in absolute disagreement with our earlier postulation in the a priori equation (12). This means that if the effects of other independent variable in the model are held constant and requirement (N_{AR}) is allowed to vary the partial estimator for this variable implies that if requirement (N_{AS}) increases by 100% about 37% of that 100% increase will on the average influence production positively. By this same token, if all other independent variables in the model are held constant and the number of universities (N_{AU}) is allowed to vary the partial estimator of the (N_{AU}) variable can be interpreted to mean that if N_{AU} increases by 100% about 22% of that 100% increase will on the average influence production of high-level administration/social sciences manpower positively. Holding all other independent variable in the model constant and absorption (N_{AB}) is varied then the partial estimator of (N_{AB}) variable can be regarded to mean that if (N_{AB}) increases by 100% about 30% of that 100% increase will on the average affect

production positively. However, the estimator preceding this variable is not significant.

Regarding the slack (N_{AS}) variable, if all other independent variables are held constant and this variables changes the partial regression estimator of (N_{AS}) variable can be interpreted to mean that if (N_{AS}) increases by 100% about 17% of that 100 % increase will on the average impact production negatively. However, the estimator of this variable is not statistically significant. The variable with estimators that are individually statistically significant must be regard as not collinear.

4.2.5 Correlation matrix

In order to further study the relationship among the variables, it is useful to examine the correlation between each pair of variables included in the model. Presented below is a correlation matrix or table which indicates the coefficient of correlation between each pair of variables. The matrix displayed in Table 20 below is table of coefficient of correlation for engineering graduates production.

It is observed that the correlation between the current level of universities established for engineering graduates production is .972 indicating a strong positive relationship between the variables. The correlation between the current level of absorption and production is

-.545 indicating a moderately strong, but negative relationship between them. The correlation between the current level of engineering graduates requirement to production is -.097 indicating a negative and very weak correlation between the variables.

Table 20:   Correlation Matrix - Engineering graduates

	N_p	N_R	N_A	N_s	N_u
N_p	1.000				
N_R	-.099	1.000			
N_A	-.545	.140	1.000		
N_s	.441	.432	-.832	1.000	
N_u	.972	-.132	.489	.372	1.000

For administration and social sciences graduate the correlation between the variables was also examined to further analyse the relationship between them.   Table 21 shows the correlation matrix for the variables in the model. Again, the correlation between number of university and production of administration/social sciences graduate is .879 indicating a strong positive relationship between them.   The correlation between the current level of requirement to production is -.012 indicating a negative but very weak relationship between the variables while absorption to production is .369 indicating a positive but weak correlation between them.   The correlation between

current level of slack and requirement is .684 indicating a strong and positive relationship between them. The correlation between absorption and requirement is .035, this indicate a weak positive correlation between them.

Table 21: Correlaton matrix - Admin/Social Sciences

	N_{AP}	N_{AR}	N_{AB}	N_{AS}	N_{AU}
N_{AP}	1.000				
N_{AR}	-.012	1.000			
N_{AB}	.369	.035	1.000		
N_{AS}	-.466	.684	.315	1.000	
N_{AU}	.879	-.352	.325	-.717	1.000

4.2.6 Disparities between graduate production, requirement and utilization

This study has examined the disparities between production, requirement and absorption of graduate high-level manpower in South-western Nigeria. Analysis of data on those variables revealed that there are disparities between production, requirement and absorption. The analysis shows a wide gap exists between university graduate production in engineering fields and utilization (absorption) of graduate engineers by manufacturing companies. There is also a wide difference between requirement and utilization. Figure 4 shows the disparities between production, requirement and

utilization. Between 1975 and 1982 requirement for engineering graduates by manufacturing companies was higher than production and utilization. For the same period utilization was higher than production. Thereafter from 1983 production went up above requirement and utilization and remained higher through to 1995. Requirement was higher than utilization throughout the period of 1975-1995 covered by the study. For the period, the average annual production of engineers was 735 requirement was 612 and utilization (absorbed) 416, these were in aratio 1: 0.83 : 0.56.

Administration and social sciences graduate production, requirement and utilization have similar disparities. Figure 5 shows the disparity between production, requirement and absorption in social sciences. From 1975 to 1995 production was higher than both requirement and absorption. Requirement was higher than absorption between 1975 and 1987, but from 1988 to 1995, there was a significant difference between requirement and production. While production of graduates had upward slope their requirement and absorption sloped down. The ratio of production to requirement and absorption was 1 : 0.21 : 0.18. The study revealed that there was a wide difference between production, requirement and absorption in engineering field. While in administration/social sciences fields the difference between requirement and absorption was very marginal but between production and requirement and absorption was quite significant.
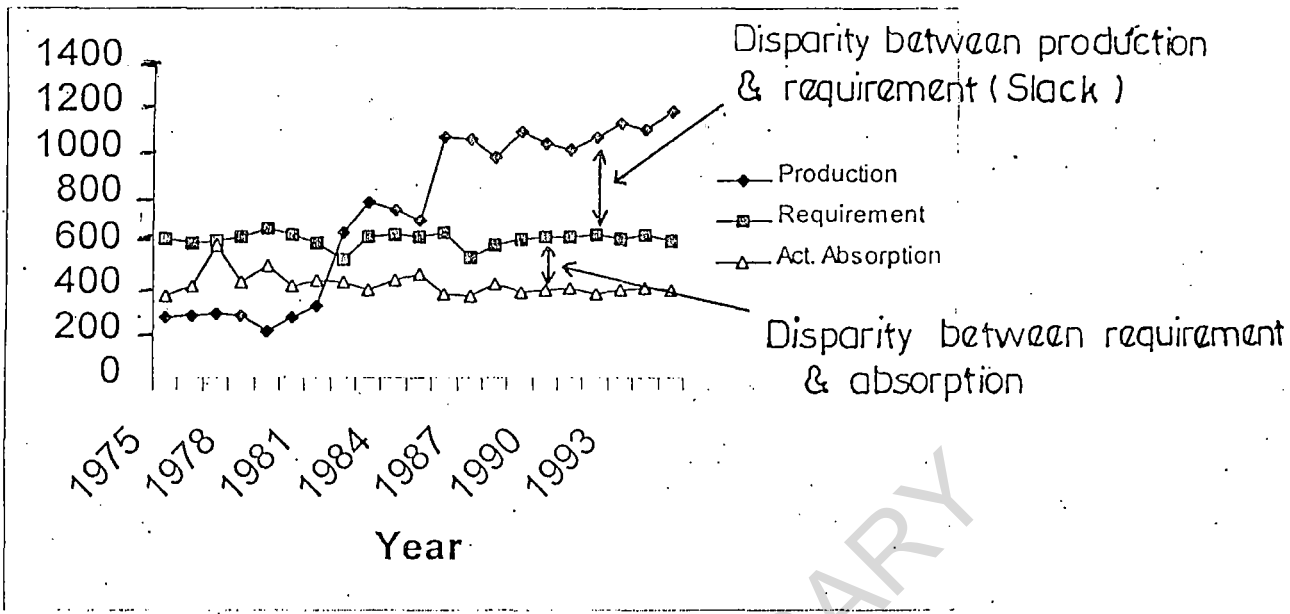
Fig. 4   Graph of Graduate Production, Requirement, Actual Absorption and slack in absorption in Engineering Fields by Manufacturing Companies in South-western Nigeria (1975-1995).
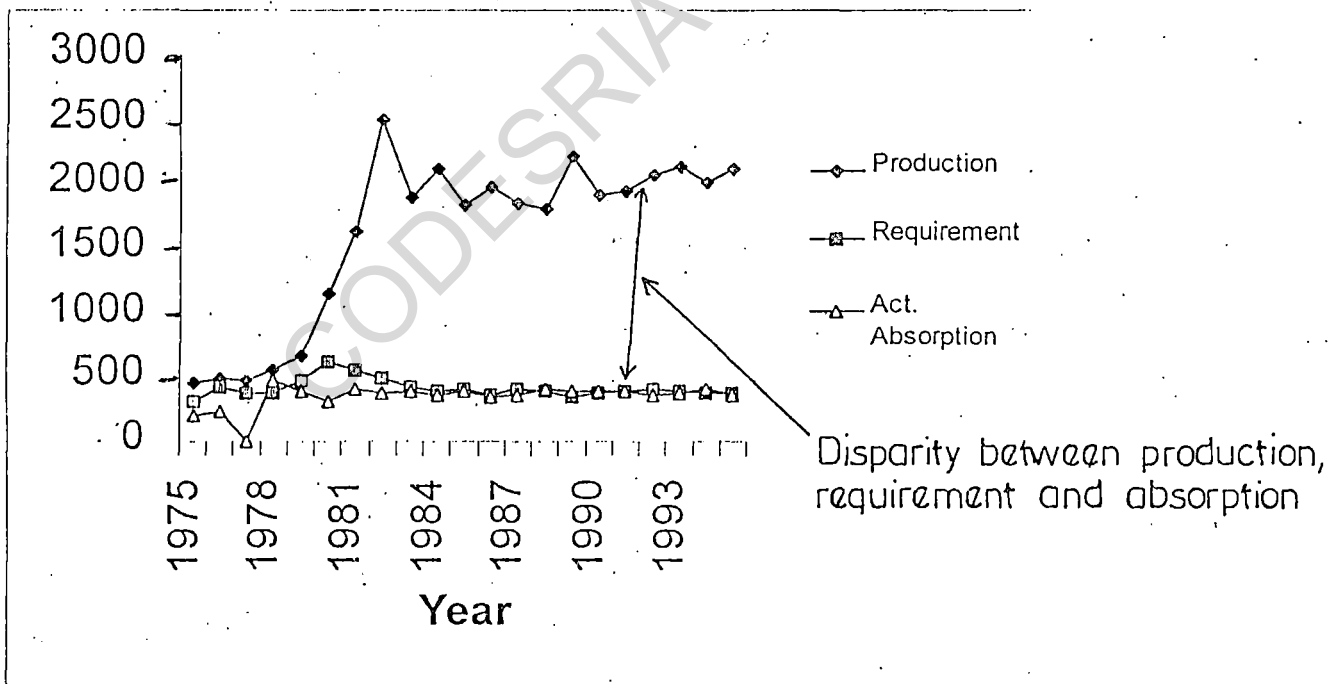
Fig. 5   Graph of Graduate Production, requirement, actual absorption and slack in absorption in administration fields by Manufacturing companies in South-western Nigeria (1975-1995)

4.3   Demand and Supply Factors in Highlevel Manpower

It can be said here that the process of tackling graduate unemployment as a result of overproduction in the LDCs is usually characterized by some intriguing paradoxical situations. They appear disturbing as automatic adjustment to equilibrium or eventual elimination of the surplus skilled manpower is made virtually impossible. The two paradoxical situations that are considered here are: (1) The persistent high demand for higher education and consequently increased supply of educated manpower inspite of graduate unemployment, which is referred to in the literature as demand-unemployment paradox (RAO (1972). And (2) there is the rapid expansion of education facilities by governments to meet the growing demand for education despite the unemployment problem or when such higher education policy is tantamount to over-investment in university education (RAO 1972). This is referred to as the supply-unemployment paradox. For the demand-unemployment paradox, the demand expressed by potential students and their families is usually emphasized. Theoretically, economic rationality requires that as wage rate or expected earnings decline, the demand for education should fall. Some explanation is necessary, therefore, if, despite graduate unemployment, there is a persistent high demand for education.

One probable interpretation of this scenario in Nigeria is the argument that the demand for education is not just for the sake of employment but that it is a kind of consumption good, and this demand would persist as long as the psychic satisfaction or non-pecuniary benefits pay off the cost. This view is rather unsustainable given the level of development and living standard of the LDCs. As argued by Edward and Todaro (1973), a country like Nigeria cannot afford the luxury of treating education as a consumption good. An average parent looks at education as an investment from which some returns are expected.

The other interpretation which appears more plausible as they acknowledge the investment aspect of education as of utmost importance and at the same time see education as facilitating access to the modern or wage employment sector. (Edward and Todaro, 1973) explained the demand-unemployment paradox by means of the cost-benefit analysis framework. The demand for education is assumed to be jointly and severally influenced by the urban-rural wage differential, the probability of obtaining modern-sector employment, the different private costs and the opportunity cost of education. A scenario, supposedly describing labour market situation in the LDCs is also advanced by Edward and Todaro (1973).

Another way of looking at the situation is what is

referred to as the Educational Displacement Phenomenon. It is a process by which, through education, access to modern sector for employment is secured and to safeguard being displaced by the educated ones, the next level of education is demanded as a terminal point or as an intermediate stage. Thus, it would therefore seem the demand for higher education will, in most cases, be promoted by unemployment at the lower level of education. The most probable underlying motivating force for the educational displacement phenomenon in the demand for higher education may be the consequence of job upgrading by employers or the desire to safeguard being displaced out of the graduate labour market by the more educated ones and finally poor employment prospect for university graduates particularly those with the first degree (Idowu (1987).

Another interpretation of the demand-unemployment situation as it effects Nigeria relates to the private rate of returns to university education. The relative high private rate of returns to higher education in the LDCs has been documented in the literature (Hinchliffe (1971). A number of reasons could be adduced for the attractive rate of return to university education after discounting for employment problem, namely, unemployment at lower level of education (hence low opportunity cost of university education), heavy subsidy of university education, attractive earning of university graduates etc. Looking at

the demand for university education from economic
perspective, one may find that for quite some time to come,
the pressure on demand for university education may
continue to mount despite the seeming unemployment problem.

4.4   Labour Absorption theory of Manufacturing Industries

It is a truism that the manufacturing sector plays a
vital role in the socio-economic development of any
country.   As a country develops, labour moves from
traditional sector (mainly agriculture) into the modern
sector (manufacturing and services).   The ability of the
manufacturing sector in Nigeria to absorb the "surplus
labour" in the economy is however, grossly limited by
capital, raw materials, technology, skill and market
constraints.   This inability of manufacturing sector to
play its historical role of labour absorption has
intensified the under-utilization problems in the country.
In view of this, a detailed analysis of demand for labour
in the manufacturing sector is important in the design of
a national employment policy.

The share of the manufacturing sector in the GNP and
total employment has also been regarded always as one of
the indicators of the level of development of a nation
(Squire 1979).   In the developed countries, manufacturing
sector employs between 20% and 35% of the total labour
force while between 25% and 45% of the GNP comes from this
sector.   In the Less Developed Countries (LDCs) the

manufacturing sector employs between3% and 25% of labour force and accounts for between 2% and 20% of GNP (Squire et al, 1980). Thus, it is characteristically assumed that as a country's development of the manufacturing sector increases its share in both the GNP and total labour employment increases.

In Nigeria, analysis of the rate of growth of manufacturing output and employment during the past twenty years has not been very impressive. Manufacturing value added increases at an average annual rate of 12.5% between 1960 and 1973, 26.5% between 1973 and 1983 (i.e. the oil boom) and 3.9% between 1983 and 1993. The rate of growth has slowed down remarkably in recent years. The rate of growth of manufacturing employment has been less impressive as well. Using the Federal Office of Statistics (FOS 1993) industrial survey data, manufacturing employment grew by an average annual rate of about 3% between 1983 and 1993 (FOS 1995). This was far less then NMPB projection of 8.5% for the period between 1983 and 1993. Thus, the rate of labour absorption by the manufacturing sector has also greatly diminished in recent years. The share of manufacturing employment in the total labour force is still far below expectation. According to the labour force projections, (NMPB 1995) less than 20% of the labour force is engaged in manufacturing, craft and processing. The percentage is considerably lower if we consider only the manufacturing establishment employing ten or more persons.

Table 16:   The Structure and Growth of Employment in Nigeria
Manufacturing Industries 1983 – 1993.

		Percentage Distribution of Employment			Average Annual Growth Rate		
		1983	1989	1993	1983	1989	1993
1	Food Products	14.5	16.7	14.9	17.2	1.5	9.1
2	Breverage/ Tobacco	5.9	4.3	9.1	7.0	20.8	13.7
3	Textiles/Wearing Apparel	28.2	24.8	22.6	11.1	1.9	6.4
4	Leather/Foot wear Products	3.3	2.6	1.9	8.3	-1.8	3.1
5	Wood products and Furniture	9.2	8.8	6.6	13.0	-1.9	5.3
6	Paper products and printing	7.5	7.2	6.6	12.9	2.1	7.4
7	Chemical products	5.1	4.0	7.0	8.6	16.1	12.3
8	Petroleum products	0.3	1.3	0.9	51.6	-3.1	21.2
9	Rubber/Plastic products	8.4	6.8	6.1	9.0	1.6	5.3
10	Pottery products	1.1	0.8	0.9	5.6	6.5	6.0
11	Brick/Cement products	3.2	5.3	4.0	26.1	-2.1	11.1
12	Fabricated metal product	10.1	11.3	10.5	16.6	2.2	9.2
13	Non-electrical Machinery	0.5	0.5	1.3	11.2	31.2	20.8
14	Transport equipment	0.6	1.8	5.1	42.5	28.4	35.3
15	Professional goods and others	0.9	0.5	0.4	2.0	-2.4	-0.2
16	Electrical Machinery	1.2	1.2	2.1	13.5	16.5	15.0
	Total	100.0	100.0	100.0	14.00	3.8	8.8

Sources: Industrial Surveys, 1980-1995 (Lagos FOS)

Looking at the distribution of employment within the manufacturing sector, Table 22 shows the percentage distribution and average annual growth rate of employment according to industry group in the manufacturing sector. The table indicates that the average annual rate of growth of manufacturing employment which was about 14% from 1975 to 1983, slowed down considerably to about 3% between 1983 and 1990. The table clearly shows that employment in the sector is dominated by a handful of industry group most of which are of the light and low-technology industries. These are food products, textiles, fabricated metal works and beverages industries which together accounted for over 50% of the total employment. But the transport equipment (mainly vehicle assembly) recorded the highest rate of growth in employment followed by petroleum products, non-electrical machinery, electrical machinery, beverages and chemical products industries. However these industries still account for less than 30% of the total employment in the manufacturing sector.

The manufacturing sector performed below expectation in high-level manpower absorption on account of a number of constraints during the period of 1975-1994 (CBN report 1994). The economic recession which set in during the early years of the 1980s, particularly during the Fourth National Development Plan (1981-1985) had a very destablising effect on the growth of the Nigeria economy

particularly on the manufacturing sector which hitherto depended solely on imported raw material and other inputs to survive and grow. The country up to that period 1981-1985 pursued the policy of import substitution under which assembly and packaging type industries which were heavily dependent on imported inputs thrived. Consequently, with the collapse of the oil sector at the time which was the main source of the country's foreign exchange, the sector became unable to secure enough foreign exchange to import raw materials and other industrial inputs, which it so badly required. The result was that many manufacturing establishments shut down while others operated at ridiculously low level of their installed capacities. Labour was laid off and the level of unemployment grew. Production cost grew astronomically due to low capacity utilization and high cost of foreign exchange.

A major structural weakness of the country's manufacturing sector has continued to be the disporportionately large share of the light industries in the sector's gross output, value-added and employment. Available information indicates that in recent years, only food, Beverage and Tobacco industrial group accounted for over 25% of total manufacturing value-added, whereas most of the other industrial group including wood and wood products pulp and paper products Non-metallic Mineral products, Glass, Pottery, etc has less than 8%.

The imbalance in the structure of our manufacturing sector was also clearly demonstrated through a comparison of figures on manufacturing value-added with those of such other developing countries as Mexico, Korea and Turkey. It was revealed that whereas in Nigeria, low-technology industries such as food, Beverages, Textiles and few others together contributed a high proportion of manufacturing value-added, in the case of most of the other countries and particularly Korea and Turkey, the distribution of value-added is more widely spread and covers some of the intermediate and capital goods industries such as Manufacturer of Machinery including electrical appliances, transport equipment, etc.

CHAPTER 5

SUMMARY AND CONCLUSION

5.1 Summary

The primary objective of this study was to examine high-level manpower production and utilization in South-Western Nigeria between 1975 and 1995. This is against the background of concurrent existence of over-production of high-level manpower and shortage of high-level manpower. Specifically, the study has looked at educational development in Nigeria with particular reference to the rate of expansion of educational facilities and the rate of graduate output at the secondary and tertiary levels of education in Nigeria. Two areas of high-level manpower were of particular interest in this study, that is, technical-engineering discipline and managerial-management discipline. Their production and utilization were critically examined and analysis in relation to their absorption in the manufacturing industries made. Graduate engineering, management and social sciences manpower production and utilization in the industries were analysed using variables like production, requirement, absorption, number of higher institutions producing graduates in the various fields etc to explain whether there is over-production, shortage or underutilization of high-level manpower in these disciplines in South-western Nigeria's

manufacturing industries. During the study a survey of the various theoretical frame of manpower development was carried out to further throw light on the concepts of manpower production and utilization process. The study also carried out a general survey of available literature in manpower and utilization and particularly as it relates to Nigeria.

Two sets of data were employed in this study. The first set, which formed the bulk of data used, was obtained from sample survey of randomly selected manufacturing industries in the study area. These were the primary data. The second set of data (secondary) came from universities in the study area, the National Universities Commission (NUC) and the various ministries and parastatals. Various techniques were employed in the analysis of data collected. These include tabular, graphic, descriptive statistics and multiple regression analysis.

Analysis of data revealed that there was a very sharp increase in the establishment and investment in university education during the period of 1975 and 1990 as the number of university rose by about 250 percent over the 1975 level. The consequence of this was that the average annual output of engineering graduates from the universities rose sharply by about 237 percent while those in the management (administration and social sciences) field on the average increased by about 300 percent during the period as well.

Analysis of manufacturing industries' engineering manpower requirement and university engineering graduate output shows that, given the right and enabling economic environment for the industrial sector to operate, the present level of engineering graduate output of our university will not be able to meet the industrial requirement in engineering manpower. The study analysis revealed that 15445 university engineers were produced between 1975 and 1995 and manufacturing requirement of engineers for the same period was 12862 which was 83.27% of the total output leaving only 16.72% for the other sectors of the economy. The industries were able to absorb only 67.5% or 8683 of its engineering manpower requirement during the period an indication that there is no over-production in engineering manpower fields. On the other hand, the study revealed that in management, administration and social sciences fields, production far exceeded requirement and absorption for the period covered by the study. Of the 40,984 administration/social sciences graduates produced during the period, only 8714 or 21.26% was required and only a meager 18.74% was absorbed.

It was found that there are still shortages in engineering manpower requirement in the economy. Looking at the vast potentials of the Nigeria economy and particularly the industrial sector, every thing being equal ceteris peribus the present level of our university engineering graduate output will not be able to meet the

national requirement in that field.

The study analysis further revealed that the absorption or employment rate of both engineering and administration/social sciences graduates by the manufacturing industries is quite low. It was found also that requirement far exceeded absorption between 1975 and 1980, even before the economic recession of the early 1980's that has been the trend.

It was revealed that the presence of polytechnic (HND) engineering graduates does not have an effect or constitute any threat to the absorption or employment of university engineering graduate in the manufacturing industries as they are not substitute for engineers in the industries.

On the whole the quality of engineers produced by the universities was found to be acceptable to the manufacturing industries. In terms of utilization of engineers in the industries it was found that 53.7% of the engineers deployed in the industries performed non-production functions. The remaining 46.1% were deployed or assigned to carry out routine or mundane production functions. This was found to be due to the nature and structure of the Nigerian manufacturing industries that is characterised by simple assembly-line activities. During the period food products industries employed the highest number of engineering graduates with 12.4% followed by Beverages and Tobacco with 10.6%; then

wood product and furniture 9.07%, petroleum products 9.5%, pharmaceutical products with 8.1% and the least was the Leather products industry. The trend was the same for administration and social sciences graduate employment in those industries.

It was found during the study that a strong and positive correlation exists between the number of universities established and graduate output. There is a moderately high but negative correlation between absorption and production of engineers while in the case of administration/social sciences the relation is weak and positive. The study further revealed that the relationship between requirement and production for the disciplines included in study was very weak and at the same time negative. It was found that there is a negative and weak correlation between number of universities and requirement in manpower for both engineering and administration/social sciences. On the whole, it was found that the relationship between requirement and absorption of high-level manpower in the fields of engineering, administration and social sciences by manufacturing industries and production of graduates of the same disciplines by the universities in South-western Nigeria was generally weak and negative.

5.2 Conclusion

The importance of qualified manpower in the social, political and economic growth and development of any nation can hardly be overstated. Of all the factors that are necessary for unleashing all forces of economic growth and development, none is perhaps more important than qualified manpower. The basic factor in an economy's development is the rate at which the country produces people with imagination and vision, education, theoretical and analytical skills. Thus no nation is known to have a record of sustained economic and social development without ample supply of qualified personnel to man their development efforts. The economic significance of Japan, North and South Korea, Sweden, etc is attributable to the quality of personnel despite the lack of any mineral resources of special significance in these countries. They have proved that investment in human capital holds the key that unlocks the forces of economic growth and development. The apparent scarcity of qualified manpower has been said to have acted restrictively in many ways in delaying the social and economic development of Nigeria. The country's effort to produce ample supply of qualified manpower necessary for a successful economic take off has necessitated the establishment of more than thirty universities in the country. There are indications of graduate unemployment in some disciplines in Nigeria. To

153

deal with this social, political and economically explosive issue of educated unemployment, a number of possible public-policy measures have been offered and critically examined with a view to drawing attention to their attendant implementation problems, uncertainties and unresolved issues.

This study has explored the phenomenon of educational expansion in Nigeria between 1960 and 1995. It has also examined and accounted for the asymmetry between the manpower output of the educational system particularly the universities and their absorption by the economy especially the manufacturing sector. Basically, whereas the post-independence pre-occupation of public-policy with manpower production was deliberate only little attention, in terms of forethought and conscious planning, was devoted to employment prospect. Our finding shows that the absorption rate of high-level manpower in the manufacturing industries is very low and at the same time capacity utilization in the industries is low. The implication of this relationship is that increase in employment is only possible when there is increase in manufacturing capacity utilization. Output in this sector is constrained by both demand and supply factors. On the demand side, the high prices of certain manufacturing products had greatly reduced the demand for these products and some firms have to produce at less than full capacity because of

insufficient demand for their products. This has resulted in retrenchment or unwillingness of such firms to employ more hands. On the supply side manufacturers face serious raw materials and spare parts constraints. The scarcity of foreign exchange in the country has made it almost impossible for virtually all firms to operate at full capacity for lack of raw materials. Thus, a well articulated policy aimed at increasing the demand for and supply of domestic manufactures should be formulated and implemented.

Finally, given the lean financial resource expected of both the private and public sectors for some years to come, emphasis should henceforth be placed on labour-intensive industries and labour-intensive techniques, and on industries with the highest degree of forward and backward linkages, in order to maximise labour utilization in the manufacturing sector. Concerted effort should be made to align educational policy with those of employment not only for the modern sector employment but also for the informal sector employment as well.

5.3 Recommendations

This study has examined the high-level manpower production and utilization in South-western Nigeria with special bias to engineering and managerial manpower. It has been identified that there is over-production and

underutilization of high-level manpower in the country. Some of the reasons for the underutilization include:

(a)   over-establishment of institutions of higher learning – the universities;

(b)   poor manpower planning;

(c)   apparent lack of close relationship between academic preparation and job placement;

(d)   placement of graduates in jobs that do not challenge their abilities;

(e)   poor salary structures that do not reflect demand and supply;

(f)   inability of the economy to stimulate industrial growth.

From all these it is clear that the analysis of graduate unemployment situation requires probing into the country's education and labour market system. The need for government action cannot be over-emphasised to make reasoned policy decision on the country's graduate production. As a matter of deliberate policy, government should think of possible adoption of "Manpower Requirement Approach" in its high-level manpower planning process. This approach attempts to derive educational output from a set of economic growth projections. Income growth forecasts are used to predict sectorial distribution of output and unemployment in some years to come. This sectorial employment distribution can then be converted

into occupational distribution in terms of total labour force. The distribution of labour force by level of training can then be computed from the distribution of workers occupation. The resulting estimates of the required number of workers classified by educational level is then used in conjunction with existing position and expected retirement ratio to generate a plan necessary to determine involvement in various types of educational institutions. A pre-condition for the effective use of "Manpower Requirement Approach" is that there should be a free flow of information between all the institutions and agencies involved in economic and educational planning in the Country. A national data bank will also be necessary and useful in making data readily available to planners in all the sectors.

Furthermore, there is a need to curb the craze for certificates or what has been described as "credentialism"; not only as a means of reducing excess demand for education, but as a device to improve the quality of cognitive job contents of formal education. It is well known that the craze for accumulation of certificates has a negative impact directly on educational quality and indirectly on labour productivity. Employers can be encouraged through Industrial Training Fund (ITF) to embark on more intensive on-the-job-training for their workers. This can achieve the dual effect of reducing

demand, pressures on formal education while at the same time give raise to a more functional education needed for sustained job retention and high productivity.

The present limited labour absorption potentials of the manufacturing sector of the economy indicates a need to re-orient the economy's path of growth from capital intensive to a labour intensive one.

There is an urgent need for a policy to re-orient educational investment programmes in directions that will be in alignment with the labour absorption capacity of the economy. The existing planning method in the educational sector which ignores growth indicators in the economy can only worsen the problem of graduate unemployment in the long run. Intersectoral professional dialogue between educational planners, manpower experts and economic planners appears to be imperative if the negative effects of imbalance between educational output and employment opportunities are to be eliminated in Nigeria. There is a need also for a policy to back-up a job information service to help graduates to locate job-opportunities all over the country. Governement should in all future national economic planning process give priority attention to youth entrepreneurship development so that young graduates can become job creators for themselves and other people rather than being job applicants.

5.4 Area of Further Research

This study has examined high-level manpower production in the fields of engineering and management by the nation's university system and the utilization of such high-level manpower by the manufacturing industries in the south-western Nigeria. It has been found that there is over-production of university graduates in some fields of study in the universities. Efforts should be made to rectify this imbalance between production and utilization. This imbalance calls for further research into the area of manpower planning methodology for the country. This will throw more light on the planning of manpower to meet the country's need and avoid excess production of high-level manpower that the economy cannot absorb.

REFERENCES

1.   Abiola, E. O. (1979), A Textbook of West African History, (A.D. 1000 to the Present day) Omolayo Standard Press and Book shop Co., Ado-Ekiti.

2.   Adam, Smith (1763), An Inquiry into the Causes and Wealth of Nations edited by R. H. Cambell 1976.

3.   Adejugbe, A. (1979), 'Manufacturing', In: Structure of the Nigerian Economy. Edited Olaloku et al. London MacMillan.

4.   Ajakaiye, O. (1994). A Macro-economic Model for simulation Employment and Manpower Implication of Macro-economic policies in Nigeria. National Manpower Board, Lagos.

5.   Akeredolu-Ale, E. O. (1970), Value, Motivation and history in the development of private entrepreneurship: Lesson from Nigeria's experience. Nigeria Journal of Economic and Social Studies.

6.   Aluko, S. (1994), An Appraisal of University System in Nigeria: University Management and Productivity. A paper presented at a Workshop held at the Federal University of Technology, Akure.

7.   Ahluwalia, M. S. (1976), "Inequality, Poverty and Development". Journal of Economic Development, Vol. 102.

8.   Amjad, R. (1987), Human Resources Planning: The Asian Experience (edited by Amjad Rashid (ILO), New Delhi.

9.   Ashby, Eric ; (1960), "Investment in Education", Report of the

      Commission on Post-School certificate and Higher Education in

      Nigeria, Federal Ministry of Information, Lagos.

10.   Angaye, G. S. (1984) "Self-Reliant Education and Development

      Strategies in Nigeria" in Nigerian Economic Society Annual

      Conference Proceedings.

11.   Anya, A. O. (1982) Science Development and the future: the Nigerian

      CASE. Nsukka, Univeristy of Nigeria Press.

12.   Awokoya, S. O. (1969), "The Structure and Development of Nigeria

      Education" in Manpower Problems and Economic Development in

      Nigeria,(edited) T. M. Yesufu, Oxford University Press, Ibadan.

13.   Bowman, M. J. (1965), "From guilds to Infant Training" in Education

      and Economic Development; (edited) Anderson C. A. and Bowman,

      M. J., Aldine Publishers Co., Chicago.

14.   Becker, C. S. (1975), Human Capacity, National Bureau of Economic

      Research, New York.

15.   Blaug, M. (1970), An Introduction to the Economics of Education,

      Pengiun, Harmondsworth.

16.   Blaug, M. (1986), "An Approach to Educational Planning" Economic

      Journal Vol.77.

17.   Callaway, A. C. (1960) "School leavers and the Developing economy

      of Nigeria". In: Nigerian Institution of Social and Economic Research

      (NISER), Ibadan.

18. Clark, J. B. (1899). The Distribution of wealth: A Theory of wages, interest and profits. New York: The Macmillian Co.

19. Cody, J. Hughes, H. and Wall, D. (1980) Policies for Industrial progress in Developing Countries, Oxford Press London.

20. Daniel, W. W. (1977), Introductory Statistics with Appilcation, Houghton Mifflin Co., Boston.

21. David, H. (1960), "Higher Education and American Economy" in Education and Manpower, (edited) Henry David, Colombia University Press, New York.

22. Diejamaoh, V. P., Orimolade, W. A. T. (1971). "Unemployment in Nigeria: An Economic Analysis of Scope, Trends and Policy Issues". Nigreian Journal of Economic and Social Studies. Vol 13 No.2.

23. Diejamaoh, V. P. (1979), "Planning for Nigeria's Manpower requirements: Myth. realities and priorities" Keynote Address to the National Mnapower Conference on relaxing the manpower constraints to Nigeria's Economic Development.

24. Diejamaoh, V. P. (1982), "Manpower Development in Nigeria": Journal of Management in Nigeria, Vol. 18, No. 11.

25. Diejamaoh, V. P. (1984), "Perspectives and Priorities for the fifth National Development Plan; 1986 - 1990 - A new overview", Paper presented at the Conference on the Plan at NISER, November, 25 - 29, Ibadan.

26. Diejamaoh, V. P. (1982), "Planning for the Nigeria Economy by the Year 2000": Proceedings of Conference of the Nigeria Economic Society, University of Benin, May 23, Benin City.

27.   Ekanem I. I. (1972), <u>The 1963 Nigerian Census: A Critical Appraisal</u>, Ethiope Publishing Co., Benin.

28.   Ekeland, R. B. and Hebert, R. F. (1962), <u>A History of Economic Theory and Method</u>, New York.

29.   Fafunwa Babs, A. (1964), "Educational Philosophy and Structure for EconomicDevelopment" in <u>Manpower Problems and Economic Development in Nigeria</u>, T. M. Yesufu (ed.) Oxford University Press, Ibadan.

30.   Fafunwa Babs, A. (1971), <u>History of Nigeria Higher Education</u>, Macmillan and Co. Nigeria.

31.   Fafunwa Babs, A. (1984), "Development of General Studies in Nigerian Universities, a paper presented at Conference of General Studies Units of Nigerian Universities, Nsukka.

32.   Fagbamiye, E. O. (1986), "Egalitarianism and Formal Education in Nigeria" in <u>Manpower Development and Utilization in Nigeria</u>, Falayan O et. al., Lagos University Press, Lagos.

33.   Falae, S. O. (1971) "Unemployment in Nigeria" <u>Nigerian Journal of Economic and Social Research</u> Vol. 13.

34.   Fapohunda, E. R. (1979) "Population, Labour Utilization and Manpower Development". In Olaloku, F. A. et. al (eds) Structure of the Nigerian Economy. Macmillian Publishing Co.

35.   Fapohunda, J. O. (1975), <u>The Effect of Changing Manpower Environment in the Nigeria Economy</u>. PERMAN Vol. 2, No 1.

36. Fapohunda, J. O. (1978), "Manpower Development in Nigeria's Economic Planning , Proceedings of the Workshop on Development Planning Strategy for the 1980's; Ondo State Component of the Fourth National Develpment Plan, 1980 - 85, Ministry of Finance and Economic Development, Akure.

37. Federal Republic of Nigeria (1975), Third National Development Plan: 1975 - 80, Federal Ministry of Economic Development, Lagos.

38. Federal Republic of Nigeria (1980), Fourth National Development Plan: 1980 - 85, Federal Ministry of Economic Development, Lagos.

39. Federal Republic of Nigeria (1970), Seocnd National Development Plan: 1970 - 74, Federal Ministry of Information, Lagos.

40. Federal Republic of Nigeria (1975), Guideline to Third National Development Plan: 1975 - 80, Federal Ministry of Economic Development, Lagos.

41. Federal Republic of Nigeria (1965), Rural Development Survey,Federal Ministry of Economic Development, Lagos.

42. Federal Republic of Nigeria (1975), "Manpower Budget" Third National Development Plan, Federal Ministry of Economic Development, Lagos.

43. Federal Republic of Nigeria (1965), The Employment Market Infromation, Federal Ministry of Labour, Lagos.

44. Federal Government of Nigeria Paper, No. 3, 1961.

45.   Fashoyin, T. (1986), "Recruitment and Selection in Nigeria", in
      Manpower Development and Utilization in Nigeria: Problems and
      Policies, by Folayan Ojo, Adeyemo Aderinto and Tayo Fashoyin,
      Lagos University Press, Lagos.

46.   Ferguson, C.E. (1975), The Neoclassical Theory of Production and
      Distribution, Cambridge University Press, London.

47.   Foster, R. J. (1965) Education and Social Change in Ghana. Routledge
      and Kegan Paul.

48.   Ginzberg, E. and Smith, H. A. (1967), Manpower Strategy for
      Developing Countries: Lesson from Ethiopia, Columbia University
      Press, New York.

49.   Harbison, F. H. (1961), Human Resources Approach to the
      Development of African Nations, American Council on
      Education, Washington D.C.

50.   Harbison, F. H. (1964), "The Objective, Machinery and Methodology
      of Manpower Planning" in Manpower Problems and Economic
      Development in Nigeria, (edited) T. M. Yesufu, Oxford University
      Press, Ibadan.

51.   Harbison, F. H. and Myths, C. A. (1961), Education, Manpower and
      Economic Growth, MacGraw-Hill Book Co., New York.

52.   Harbison, F. H. (1967), Educational Planning and Human Resources
      Development, Paris: UNESCO 11 EP.

53.   Harbison, F. H. (1973), Human Resources as the Wealth of Nations,
      New York University Press, New York.

54. Hickson J. D., Pugh, D. S. and Pheysay, D. C. (1969) " Operations Technology and Organizational Structure" An emperical reappraisal. Administrative Science Quarterly.

55. Idowu, S. O. (1987), "Graduate Unemployment Paradoxes the LDC: Implication for Research in Nigeria", Nigeria Journal of Economic and Social Studies, Vol.29, No. 2.

56. Ijomah, B. I. C. (1988) "Technological Development: A False start in Africa". A paper presented at the 1988 General Assembly of the Socal Science of Nigeria, Ibadan.

57. Ike, V. C. (1976), University Development in Africa: The Nigeria experience, Oxford University Press.

58. International Bank for Reconstruction and Development, (1955), The Economic Development of Nigeria, John Hopkins Press, Baltimore.

59. International Labour Organisation (ILO) (1981), World Labour Report, International Labour Office, Geneva.

60. Institute of Chartered Accountants (1983), The Education and Training Regulation, Lagos.

61. Koutsoyiannis, A. (1979). Theory of Econometrics, Macmilliam London.

62. Lewis, L.J. (1965), Society, School and Progress in Nigeria, Oxford Pergamon, Lagos.

63. Lewis, W. A. (1969) Some Aspects of Economic Development, Ghana Publishing Corporation.

64. Malthus, T (1823), <u>Measurement of value</u> (reprinted) Augustus Kelley. 1951.

65. Marx, K (1910), <u>Theories of Surplus Value</u>, Moscow, progress Publishers 1963.

66. Marshall, A (1920), <u>Principles of Economics</u>: An Introductory Volume. London: Macmilliam 8th Edition of Marshall.

67. Meier, H. (1983), "Innovation and the Better use of Human Resources" <u>Human Resources. Employment and Development</u>, (Ed) Paul Streeten and Maier International Economic Association held in Mexico City.

68. Mendez, S. (1983), "Problem of Labour Utilization in the long-run", <u>Human Resources, Employment and Devlopment</u>, (Ed) Paul Streeten and Maier International Economic Association held in Mexico City.

69. McBeath, G. (1978), <u>Manpower Planning and Control</u>, Communica-Eroupa.

70. National Manpower Board, (1967), <u>Labour Forces Survey</u>, Lagos.

71. National Universities Commission, (1992), <u>This is NUC</u>, Abuja.

72. National Manpower Board, (1971), <u>Survey of Manpower Shortages</u>, Lagos.

73. Ndebbio, J. E. U. (1987), "Employment Generation and the size of Industries in Nigeria, The case of Cross River State", <u>The National Journal of Economic and Social Studies</u>, Vol. 29. No. 2.

74. Nigerian Economic Society (1985) <u>Commnique Issued at the End of 1985 Annual Conference</u>.

75. Nwachukwu, C. C. (1981) High-level Manpower Utilization in Nigerian Organization: Challenges to Management Institutions. In Management Training and Development. Gaskiya Corp. Ltd, Zaria.

76. Onah, F. E. (1994), Employment Prospects and Training Needs for Self-Employment in Nigeria, National Manpower Board, Lagos.

77. Oladeji, S. I (1994), Absorption of Educated Mnapower in Nigerian's Informal Sector, National Mnapower Board, Lagos.

78. Olutola, A. (1986), "Some Relationships Between Manpower and Educational Planning", in Manpower Development and Utilization in Nigeria: Problems and Policies by Folayan Ojo, Adeyemo Aderinto and Tayo Fashoyin, Lagos University Press, Lagos.

79. Okuboyejo, N. A. A. (1964), "Economic Development and Planning in Nigeria" in Manpower Problems and Economic Development in Nigeria, T. M. Yesufu (edited), Ibadan.

80. Ojo, F. (1986), "Nigeria's Manpower Planning Experience", in Manpower Development and Utilization in Nigeria: Problems and Policies, by Folayan Ojo, Adeyemo Aderinto and Fashoyin, Lagos University Press, Lagos.

81. Okoye, C. C. (1985) "Restructuring our Manpower Development Policies and Programmes to meet market Requirement" NISER Annual Conference Proceedings

82. Onwuka, U. (1981), Curriculum Development for Africa, Africana-FEP Publishers Limited.

83.   Pissarides, C. A. (1976), Labour Market Adjustment: Microeconomic Foundations of short-run neoclassic and Keynesian dynamic, Cambridge University Press, Cambridge.

84.   Ricardo, D., (1821) Essays on profit in work a compillation of Ricardo; edited by Piero Sarffa Vol i-xi. Cambridge University Press. 1951.

85.   Runyon, R. R. and Haber, A. (1977), Fundamentals of Behavioural Statistics, Addison-Wesley Publishing Co. Massachusetts.

86.   Schatzl, L. (1973), Industrialization in Nigeria: A spatial Analysis. Welt Forum Verlag, Munich.

87.   Schultz, T. W. (1961), "Investment in human Capital" Amreican Economic Review reprinted in Mark Blang, (ed) Economics of Education, Penguin Books, 1968 Baltimore.

88.   Smithson, C. W. (1982), Labour as a Factor of Production McGraw-Hill, New York.

89.   Sullivan, B. C and Ikpeze (!980) "Problems of Industrial growth in Nigeria", In: E. C. Amucheazi ed. Readings in Social Sciences: Issues in National development, Enugu fourth Dimension.

90.   Steer, R. M. (1981), Introduction to organisational Behaviour. Santa Monica, Good Year.

91.   Squire, L. J. (1979) "Labour Force, Employment and Labour Market in the Course of Economic Development". World Bank Staff Working Paper No. 336.

92.   Squire L. J. Cody, H. Hughes and D. Wall (1980) (eds.) Policies for Industrial Progress in Developing Countries. World Bank 1980.

93. Tinbergin, J. (1975) <u>Income Distribution Analysis and Policies</u> North-Holland.

94. Thomas, B. D. (1975). <u>Capital Accumulation and Technology Transfer: A Comparative Analysis of Nigeria Manufacturing Industries.</u> Praeger. New York.

95. Tobia, G. (1964),"New Markets for Manpower Planning" in <u>Manpower Problems in Economic Development in Nigeria,</u> (edited) T. M. Yesufu, Oxford University Press, Ibadan.

96. Todaro, M. P.(1985) <u>Economics for a Developing World,</u> Longman London.

97. Tomori, S. (1988), "Industrial Development and Employment in Nigeria", <u>Manpower Supply and Utilization in Nigeria, Ghana and Sierra-Leone</u> (edited) by Damachi,G. F. and Ekwensi, K. International Institute for Labour Studies, Geneva.

98. Tuner, T. (1977) Commercial Capitalism and the 1975 Coup, In:<u>Soldiers and Oil: The Political Transformation of Nigeria</u> K. Panter-Brick (edited) London Frank Cass.

99. Ukaegbu, C. C. (1982) Job Satisfaction Among Nigeria Scientists and Engineers: Aspects of Utilization of Scientific and Technological Manpower. Unpublished Ph.D dissertation, North-western University, Everton. Illinois, U.S.A.

100. Ukaegbu, C. C. (1991) Structure of Nigerian Industries and Utilization of Scientific and Technological Manpower, <u>Nigerian Journal of Economics and Social Studies,</u> Vol. 33. Nos. 1,2,3.

101.   Umo, J. U. (1985), "Education - Employment Connection: The
        Nigerian Experience", <u>Nigerian Journal of Econimcs and Social
        Studies</u>, Vol. 27. No.1.

102.   Oi, W. (1962), "Labour as a Quasi-Fixed Factor", <u>Journal of Political
        Economy</u>, Vol. 70, pp. 538 -555.

103.   Walker, C. J. and R.H. Guest (1952). <u>The man on the Assembly line</u>.
        Harvard University Press, Cambridge Mass.

104.   Walstedt, B. (1980) <u>State Mnaufacturing Enterprises in Mixed
        Economy</u>. John Hopkins, Baltiomore.

105.   Williams, G. (1977) "Class relation in a neo-colonial: the case of
        Nigeria", In: <u>Afrcian Social Studies: Radical Reader</u>, Waterman edited.
        New York Monthly Review.

106.   World Bank (1982) Study on Diversification of School Curricula,
        <u>World Bank Research News</u>.

107.   Yesufu, T. M. (1964), "Nigeria Manpower Problems: A Preliminary
        Assessment", <u>Nigerian Journal of Economics and Social Studies</u>, Vol.
        4, No. 3.

108.   Yesufu, T. M. (1964), "Organizing for Manpower Planning in
        Nigerian", in <u>Manpower Problems and Economic Development in
        Nigeria</u> (Edited) T. M. Yesufu, Oxford University Press, Ibadan.

109.   Yesufu, T. M.; Diejamoah, V. P. and Oduah, F. I. (1973), "Manpower
        in the Public Service", <u>Report of the Manpower Task Force, Udoji
        Commission</u>, Lagos.

110.   United States Department of Labour (1963) "Employer Manpower
        Planning and Forcasting, Manpower" Research monograph No. 19, PP
        1-6.

APPENDIX I

QUESTIONNAIRE (1)

(This is to be administered to the manufacturing companies)

SECTION (A)

1. Name of Establishment: ....

2. Location/Address(No.and Name of Street) : . . . .

    ....

    (i) Town: .... (ii) State : ....

3. Year of Establishment: ....

4. Year Operation Started : ....

5. Products Manufactured : ....

6. Size of Establishment : No.of Employees in the Establishment

             (i) 0 - 50   ( )

             (ii) 51 - 100   ( )

             (iii) 101 - 150   ( )

             (iv) 151 - 200   ( )

             (v) 200 and above   ( )

7. Ownership : (i)   Government   ( )

             (ii)   Quasi-Government   ( )

             (iii)   Private (Nigerian Only)   ( )

             (iv)   Private (Foreign Owned)   ( )

             (v)   Private (Nigeria/Foreign)   ( )

8. Is this Establishment only a branch of the company in Nigeria? Yes ( ) No

9.   What is the total number of the following?

     (i)   Unskilled workers..

     (ii)   Intermediate semi-skilled workers...

     (iii)   Polytechnic (HND) graduate staff ....

     (iv)   University (Degree) graduate staff...

     (v)   Professional without degree (e.g. ICAN, ACA, etc) ....

10.   What is the total number of engineers employed? ....

11.   What is the total number of managers employed? ....

12.   How many of the following categories of senior staff do you have in your employment?

     (i)   university graduate engineers ....

     (ii)   polytechnic graduate engineers ....

     (iii)   engineers with other qualifications..

     (iv)   polytechnic graduate mangers ....

     (v)   managers with other qualifications ....

13.   Which of the following criteria do you consider most important in the selection of senior management staff?

     (i)   Loyalty   ( )

     (ii)   university degree/polytechnic/professional qualifications with considerable years of experience   ( )

     (iii)   Relationship with top management (kinship or friendship)   ( )

     (iv)   University degree and ability to handle different operations   ( )

     (v)   university degree and Loyalty   ( )

SECTION (C)

14. Is your establishment operating at full installed capacity? Yes ( ) No ( )

15. If (No), why?

....

....

16. What is the estimated rate of capacity utilization?

    (i)   Above 75% installed capacity   ( )

    (ii)   Above 50% but below installed capacity   ( )

    (iii)   Above 35% but below 50% installed capacity   ( )

    (iv)   Below 35% installed capacity   ( )

17. How many of the following categories of staff would you need if you were to be operating at full installed capacity?

    (i)   university graduate engineers ....

    (ii)   university graduate managers (Social Sciences / humanities)

    ....

    (iii)   polytechnic graduate engineers ....

    (iv)   polytechnic graduate managers (Social Sciences)

    ....

    (v)   other workers ....

18. How many of the following categories of workers do you actually have now?

Category	No. Actually Employed
(i) university graduate engineers	....
(ii) polytechnic graduate engineers	....
(iii) university graduate managers	....
(iv) polytechnic graduate managers	....

19. Does your company use NYSC graduate? Yes ( )   No ( )

20. If Yes, how many have, you retained in the past 3 years? ....

21. Please indicate the number of your graduate engineers who perform the roles

    listed below:

Assignment	Univ. Graduate	Polytech Graduate
(1) Buying and stock control	-------	-------
(2) Production operations (Production design, planning & control)	-------	-------
(3) Quality control	-------	-------
(4) Training	-------	-------
(5) Personnel (welfare & security)	-------	-------
(6) Marketing (market research, sales and public relations)	-------	-------
(7) Administration (Legal, insurance, transport and other roles)	-------	-------
(8) Finance, Accounts & Internal audit	-------	-------

22. Please indicate the number of your graduate managers who perform the roles

    listed below:

Assignment	Univ. Graduate	Polytech Graduate
(1) Buying and stock control	-------	-------
(2) Production operations (Production design, planning & control)	-------	-------
(3) Quality control	-------	-------
(4) Training	-------	-------
(5) Personnel (welfare & security)	-------	-------
(6) Marketing (market research, sales		

and public relations)   -------   -------

(7)   Administration (Legal, insurance,

transport and other roles)   -------   -------

(8)   Finance, Accounts & Internal audit   -------   -------

23.   What roles are the engineers currently in your employment assigned?

    (i)   University Graduates : ....

    ....

    (ii)   Polytechnic Graduates : ....

    ....

24.   What roles are the manager currently in you employment assigned?

    (i)   University Graduates : ....

    ....

    (ii)   Polytechnic Graduates : ....

    ....

25.   Have you problems recruiting university graduate engineers? Yes ( ) No ( )

26.   If Yes, what is the nature of the problem?

    (i)   non-availability of such graduates   ( )

    (ii)   high wages demand by such graduates   ( )

    (iii)   any other reasons ....

    ....

    ....

27.   Have you problems recruiting university graduate Managers? Yes( ) No ( )

28.   If Yes, what is the nature of the problem?

    (i)   non-availability of such graduates   ( )

    (ii)   high wages demand by such graduates   ( )

    (iii)   any other reasons ....

....

....

29. What do you prefer for your technical operations?

(i)   university graduates   ( )

(ii)   polytechnic graduates   ( )

(iii)   others   ( )

30. What do you prefer for your management operations?

(i)   university graduates   ( )

(ii)   polytechnic graduates   ( )

(iii)   others   ( )

31. What proportion of your supervisors/managers are non-university or non-polytechnic graduates? ....

32. Please explain why you use non-university and non-polytechnic graduates in these positions? ....

....

....

33. Do you have expatriate quota for the following categories of staff

        (i)   Engineers   ( )   How many   ( )

        (ii)   Managers   ( )   How many   ( )

34. Which special field of engineering does your company require for its operations? ....

35. Are you satisfied with the quality of Nigerian university graduates?

     Yes   ( )   No   ( )

36. IfNo,why?..

....

37. What is the discipline of the university graduates that your company employs

as supervisors/managers for general administration?

(i)   graduates of business administration/management ( )

(ii)   graduates of any social sciences   ( )

(iii)   graduates of any discipline   ( )

Thank you, Sir.

APPENDIX II

QUESTIONNAIRE (2)

(To be administered to universities)

1.   Name of the university : ....

2.   Year of establishment : ....

3.   Type of university: (i)Specialized ( )(ii) traditional( )

4.   Size : Student population: (i)   1,000 - 5,000   ( )

                                   (ii)   5,500 - 10,000   ( )

                                   (iii)   10,500 - 15,000   ( )

                                   (iv)   15,500 - 20,000 & above   ()

5.   Number of faculties and schools in the university : ....

6.   Does the university have the following faculties or schools:

      (i)   Engineering   Yes   ( )   No   ( )

      (ii)   Social Sciences   Yes   ( )   No   ( )

7.   Does the university award degrees in the following fields:

      (i)   Engineering   Yes   ( )   No ( ) since when ....

      (ii)   Social Sciences   Yes   ( )   No ( ) since when ....

8.   Number of degrees awarded in the following fields from 1975-1990:

Year	Engineering	Social Sciences
1975 - 1980	....	....
1981 - 1985	....	....
1986 - 1990	....	....

9.   Do you adhere strictly to the federal government policy of 60:40 of science

      to arts in admission? Yes ( )   No ( )

10.   If No, why? ....

      ....

Thank you, Sir.