

TECHNOLOGY AND STRATEGY FOR ECONOMIC DEVELOPMENT IN THIRD WORLD COUNTRIES: A COMPARATIVE STUDY OF MALAYSIA AND NIGERIA

CHAPTER 1

INTRODUCTION

BACKGROUND OF THE STUDY

1. The World is said to be a global village, linked together by all forms of technologies and infrastructures. At the touch of a button, it is virtually possible to access any part of the globe. That is the extent to which technology has gone. It has transformed humanity in several ways that could not have been imagined. Perhaps, no other phenomenon has had so much impact on humanity as technology, since the advent of the Industrial Revolution (Stearns, 1998:5). Nations have emerged from a state of primitive activities to modern societies through the use of new techniques that are more efficient and effective. However today, more than ever before, there is still a sharp line of divide between nations of the west and others. While the nations of the western hemisphere have succeeded in transforming their societies taking advantage of new techniques or more precisely, new technologies, many countries in Africa, Asia and Latin America are still in the shadow of underdevelopment, probability as a result of poor understanding of technology.

2. Different people have defined technology in different ways but the basic ingredients remain the same. The Web Dictionary of Cybernetics and Systems (2002), for instance, defines technology as the body of knowledge and the systematic study of methods, techniques and hardware required for adapting the physical environment to man's needs and wants. The application of scientific knowledge to build or improve on the infrastructure of agriculture, industry, govt and daily life. Michael Osofsky (2006), an Internet source, also defines technology as application of knowledge developed by the scientists for the engineers to solve problems. These problems are usually wide and varied. They may be associated with infrastructure, agriculture, housing, unemployment and a host of others that abound in many countries today. Strategy on the other hand is simply a long-term plan of action designed to achieve a particular goal. In this case, sustainable development is the goal. The concept of Development has many dimensions. Development theorists of the 50's and 60's often

implicitly defined development as an increase in a nation's Gross Domestic Product (GDP) with the assumption that the wealth thereof, would trickle down to benefit the bulk of the people (Kiely, 1998:3). To a large extent, this may be true in developed countries but cannot be the case in Third World Countries (TWC), largely because the institutional structures are still weak. To demonstrate the invalidity of the traditional concept of development, Malcolm Wallis (1998:18) in his book, 'Bureaucracy, Its Role in Third World Development', illustrated with a paradoxical example of how in Trinidad, between 1953 and 1968, per capital income (PCI) rose by 5 percent alongside a sharp increase in unemployment and concluded that such could not be regarded as development. A more contemporary definition of development, therefore, would take into account the basic needs of the critical mass of people, which would include access to education, gainful employment, access to good food, good shelter, clean water, health facilities, infrastructures and others. Indeed, it is now fashionable to assess development in terms of Human Development Index (HDI), which measures access to good education, life expectancy and a gamut of others.

3. Nigeria, like many other third world countries emerged out of the ruins of colonialism about 47 years ago, with high hopes and aspirations that she was on her way to prosperity and development. That was not a Herculean task in view of the abundant human and natural resources available to her as at the time. However, almost 50 years later, the Country does not appear to be where she would love to be in terms of development. Many of her people still live in poverty, infrastructures in comatose and life generally unbearable for a whole lot. In fact, available statistics show that about 57 percent of the population still live below poverty line while the GDP per capital, 2006 figure is given as \$1,154(UNDP Human Development Index Report, 2006). Indeed, without undermining the veracity of these figures, a visit to many parts of the Country would readily present a true picture of poverty and underdevelopment, almost physical enough to be touched. The same goes for most of the nations of Africa except perhaps, South Africa. Ironically, many of the countries have embarked on various types of reforms, dictated by the western institutions, with huge investment in technology, yet no meaningful economic development. Nigeria has since independence in 1960, invested considerably in technology but this has not translated into any remarkable development. Many of the structures are still very weak and so the economy itself. In the last 4 years, the Country has embarked on a reform agenda tagged, National Economic Empowerment and Development Strategy (NEEDS), which is essentially anchored on liberalisation, capacity building and financial sector consolidation (Adesida, 2007:34).

However, after about 4 years of the reform, many of the indices of development, according to a report published by the Minister of Finance, are still low (www.fmf.gov.ng). Meanwhile, Malaysia that was on the same level of development with her about 50 years ago has been dramatically transformed and modestly developed, through the adoption of technology-driven suitable strategies. One then begins to wonder if the developmental efforts in Nigeria have been constructed on a solid foundation or simply put, if the strategies employed and the technologies deployed are actually sustainable, properly managed or indeed suitable for economic development. The researcher's interest in this subject has therefore emanated from the observation that random application of technology for many years has not brought development to the doorstep of Nigeria while Malaysia has been modestly developed over the same time frame, with the aid of technology, driven by appropriate strategies. This therefore calls for a comparative study between Malaysia and Nigeria.

STATEMENT OF THE PROBLEM

4. Meaningful economic development has continued to elude many third world countries, particularly in Africa, Asia and Latin America, for a long time, in spite of their huge natural resources and relatively high expenditure on technology. This problem has assumed such an alarming proportion to the extent that many of these countries are often cited as symbols of poverty and economic deprivation. Statistical revelations show that most of the poorest people in the world live in Africa, Asia and Latin America (UNDP Human Development Indicator, 2006). In these countries, majority of the people still live in squalor, infrastructures are in comatose, literacy rate is low, and unemployment is high and so crime rate. While some measure of Nominal Growth is reportedly recorded in some of these countries, they have not been able to articulate suitable strategies, taking advantage of technology to effect structural changes (UN Chronicle, 2002). Malaysia on the other hand has been able to transform rapidly within the last 30 years, taking advantage of technology. Indeed, she is presently consolidating her development and has instituted a strategic regime of full development and industrialisation targeted towards year 2020, through the continued use of suitable technologies (Mohamad, 2000:9). One then wondered how and why Malaysia could develop over this span of time, taking advantage of technology while Nigeria could not. To answer this question, the study had to make comparison between Malaysia and Nigeria, by examining the strategic structural changes that have taken place over time in the two

countries as well as the corresponding development, using defined indices of economic growth and development.

SIGNIFICANCE OF THE STUDY

5. This study is significant as it has both economic and security implications. In today's world, economic prosperity and security are like the cart and the horse, one tows the other and with either exchanging role in the relationship. Though, the study is essentially on the economic aspect, it is assumed that economic development would have security in its wake. Accordingly, the study is expected to provide a useful guide to economic and technology policy formulators in respect of technology acquisition strategies and policy direction. In particular, the Federal Government of Nigeria should find it useful at effecting policy framework towards development-driven, sustainable technology acquisition, deployment and management. Perhaps, in a more subtle way, it may gear up the policy formulators towards embarking on further studies, as time and space constraint would inevitably limit the scope of the study. In specific terms, there is a need to evolve a framework for developing a comprehensive technology culture, as this is the only way to overcome the cultural resistance of technology in Third World Countries (Mohamad, 1995:50).

SCOPE OF STUDY

6. This study explored the strategic mechanism for development, using technology as a facilitator, in a third world country like Nigeria, with adequate human and natural resources and within the context of a globalised world, drawing lessons from the policy failures of the past. In the process of making comparison between Malaysia and Nigeria, the data used covered the period spanning 1960 to date, as availability of resources permitted. This is against the background of the fact that both Countries became independent about that time and were apparently at the same level of development as at then. However, for reasons of time and space constraints, only the major dimensions of the strategic structural changes, economic growth and development were considered in detail.

OBJECTIVES OF THE RESEARCH

7. The study aimed at exploring the strategic options available to Nigeria, in her quest for accelerated development through the use of technology. To achieve this objective, it had to make comparison between Malaysia and Nigeria. The specific objectives were:

- a. To establish why technology has not brought development to Nigeria in line with the experience of Malaysia?
- b. To examine what strategies Nigeria should adopt in order to utilise the benefits of technology to accelerate her development the way Malaysia has done.
- c. To evaluate the options available to Nigeria, in her quest for development in the manner of Malaysia.

RESEARCH HYPOTHESIS

8. The hypothesis tested in this study is that, 'State investment in technologies in third world countries, can only lead to national development if there are structural changes in the economy'. In other words, if technology is not used to effect the needed structural changes, there could be nominal growth but no meaningful development, since development itself is a continuum. The hypothesis was tested in the context of Malaysia, which is known to be a Middle-Income Developing Country and Nigeria, which is a Low-Income developing one. In order to test the hypothesis, several questions had to be answered. These are listed as primary and secondary questions in the succeeding paragraph.

RESEARCH QUESTIONS

9. This study broadly attempted to answer the primary question, 'what strategies should Nigeria adopt in order to utilise the advantages of technology to accelerate development within the Country? The secondary questions the paper attempted to answer are:

- a. Why has technology not brought development to the doorstep of Nigeria in the manner of Malaysia?

- b. How can Nigeria take advantage of technology to accelerate her development as done by Malaysia?
- c. What are the strategic options available to Nigeria?

METHODOLOGY OF RESEARCH

10. Content Analysis was the prime method adopted in the study. The mechanism was as follows:

- a. Sources of Data. Data were essentially obtained from secondary sources, through published books, journals and magazines available in NDC and DSCSC libraries, as well contemporary Nigerian Newspapers and of course, Internet resources.
- b. Method of Data Collection. Secondary data were collected from published books, journals, magazines, and other Internet resources. In addition to the NDC and DSCSC libraries, reputable Internet libraries were in use throughout the study. Credible opinions were also obtained from some Resource Persons.
- c. Method of Data Analysis. Data collected in respect of the two countries were examined, compared and analysed. Unfortunately, it was not possible to download figures of investment by sector, in respect of Nigeria, from the World Bank's website, as it is commercialised and making payment from Bangladesh, through the Bank is almost an impossible task. Hence, other available indices had to be used.

LIMITATIONS

11. The major limitation of this study is predicated on the time by which the study was expected to be concluded as well as the limited number of words imposed on the report. In other words, it was practically impossible to treat all the dimensions of structural changes within the scope of time and the number of words imposed on the study. Hence, the study was essentially concentrated on the enabling policies and plans, national products and how diversified, major physical infrastructures, technology application, growth, development and

other related issues. The study also limited itself to only the major indices of development since it was not possible to discuss all of them in a short report of this nature. Inability to access primary sources of data was inevitably a constraint. However, that did not degrade the quality of the study in any significant way, since credible data were available from other sources.

CHAPTER 2

REVIEW OF LITERATURE

12. Undoubtedly, a number of scholarly studies have been undertaken in respect of subjects related to strategy, technology and development in third world countries. Many of them have suggested the use of adaptive technology, popularly known and referred to as, 'appropriate technology' for the emancipation of rural folks. Indeed, one of the authors suggested that such technologies must be low in capital, must use local materials, must be able to create jobs, must be understood, controlled and managed by the locals without expert supervision and must be flexible (Ovitt, 1989). In other words, such technologies must not depend on importation of capital and skills. Paradoxically, the same author was quick to submit that such a technology cannot bring wealth to the world's poor, as it is not likely going to produce globally competitive products, but can only bring the essential structures upon which a decent life is built; food, shelter, clean water, energy, etc (Ovitt, 1989). In the same line of argument, Luke Onyekakeyah (2007), in his article titled, 'Revamping Industrial Production in Nigeria', posited that as long as the capital element is lacking in Nigeria and the Country continues to depend on imported tools and machineries, no progress could be made. Luke seems to agree that in a contemporary world, no economy can develop without the capital element. This capital element would undoubtedly have to come through Foreign Direct Investment (FDI) in the case of developing countries. However, if the polity and the policies are right, the capital elements can be adapted for local production within a short span of time, thus, obviating the dependency syndrome. In this regard, a model that readily comes to mind is the case of Communist China, at the early stage of Mao Tse-Tung's revolution (Akubue, 2000). China, at the time, experimented with all sorts of indigenous technologies and was able to create limited number of jobs for her people. Nevertheless, she could not be said to have developed, as poverty was still very predominant in the Country. It was not until China actually effected some strategic structural changes thereby opening her economy to the outside world that she started experiencing a boom. It was then that her development started manifesting in form of high GDP, high employment rate, high HDI and efficient and sustainable infrastructure, through a sustained and diversified investment in high technology-based, exportable products and services. This was only possible through a huge outlay of capital from both local and essentially, foreign investors and relentless focus on human resources. As a pre-requisite to development, therefore, there must be structural changes that would act as impetus for technology driven and sustainable FDI's and sustained localisation of

such technologies. This was also the position of Brue (1994) in his book, 'Evolution of Economic Thought', but it is only in the realm of thought and remains to be tested and verified for Nigeria. Accordingly, the study will attempt to examine the thought of Brue that an economy cannot develop unless it is market-oriented with developed infrastructures and productive workforce. It is only then, that such an economy can attract suitable foreign capital and technology. It is on record that no identified author has ever done a comparative study between Nigeria and Malaysia in the past. As such, this study remains a forerunner in that regard.

13. The hypothesis tested is that, 'technology will only facilitate development in a country if the structures are suitable. In order to test the hypothesis, comparison had to be made between Malaysia and Nigeria. Essentially, the long-term strategic policies that shaped the structures were compared. The production structures and the enabling FDI's were also compared. Finally, the quality of human resources and the business environment that allows FDI's to thrive were compared. The point to be made is that, all the foregoing factors have been responsible for attracting technology-intensive investments, which have accelerated development in Malaysia, while in Nigeria, the reverse is the case. In the process of comparison, answers were sought to the primary question, 'what strategies should Nigeria adopt in order to utilise the advantages of technology to bring meaningful development to the Country, in line with the experience of Malaysia? It must however be noted that the words; Technology, Strategy, Development and Structural Changes were only used within the framework of the concepts defined in the subsequent segments.

CHAPTER 3

CONCEPTUAL FRAMEWORK

14. This chapter presents an overview of the pertinent concepts dealing with technology and strategy, development and structural changes. Attempt has been made to develop a conceptual framework for analysis on the basis of the review of existing theories and observations.

TECHNOLOGY AND STRATEGY

15. Technology, in its rudimentary form is as old as the earth itself. Right from time immemorial, human beings have developed the capacity to create and use tools as a means of modifying the environment for own benefit, thereby providing basic requirements such as food, shelter and warmth (Elliot, 1997:3). It was not until the 18th Century that technology actually started to reshape the world in what is known as Industrial Revolution (IR). This phenomenon which is noted to have occurred in three phases, brought with it, new methods new techniques and organization for producing goods, thereby radically altering the pattern of life of the critical mass of people, of the benefiting nations. The first phase was in Western Europe and the new USA, beginning in 1760. The second phase was in Russia, Japan and some parts of Eastern Europe, Canada and Australia beginning from the 1880s. The third and most recent started in a few Third World Countries, particularly in Asia and Latin America (Stearns, 1998:1&2).

16. Since the advent of the IR, there have been other technology-driven revolutions, though they are all constructed on the foundation of the IR. There has been computer-technology revolution, information technology revolution and of recent, knowledge-based revolution. In all these, technology has been the driving force and nations have used them to own advantage.

17. According to Wajcman (1991:14), technology has about three dimensions, Firstly, technology refers to what people know including the know-how to use it, repair it, design it and make it. Secondly, technology refers to human activities and practices such as steel making and computer programming. Thirdly, technology refers to the hardware or the sets of physical objects such as computers or cars. This definition seems to agree with the Web

Dictionary of Systems and Cybernetics, which looks at technology from the dimensions of knowledge, methods, techniques and hardware. Therefore, it was adopted in the study. However, the focus was on the knowledge, method and techniques rather than specific physical hardware. Strategy, in the context of the study, is the set of long-term plan of action, designed to achieve sustainable development, using modern technology as facilitator. It is within the framework of these concepts, that development in Nigeria and Malaysia was analysed.

DEVELOPMENT

18. Development is a process of transformation that essentially involves disruption of some ways of life and construction of new and better ways of doing things (Amadi, 2007). Joseph Stiglitz (2007), in his address as World Bank Chief Economist, defined development as a complete transformation of society; a physical and psychological movement from traditional relations, traditional way of thinking, traditional ways of dealing with health and education, traditional method of production. No wonder, Fidelis Ezeala-Harrison (1996,14), sees economic development as an embodiment of how the economic circumstances of nations and societies change over time. These circumstances may include, widespread poverty, disparities in the distribution of income and wealth, rapid population growth, urban congestion, rural desertification and environmental degradation.

19. Economic development is sometime interchanged with economic growth but they are not exactly the same. Economic growth refers to the increase in an economy's real GDP and income over time; that is, an increase in an economy's total output of goods and services over a period, usually one year. Economic development on the other hand, depends on many factors; human resource acquisition, technological deployment, capital investment, degree of exploitation of environment and the managerial know-how within the economy. Economic development must however be necessarily preceded and prompted by real economic growth (Ezeala-Harrison, 1996:3). In totality, economic development is an embodiment of all the processes through which a society, nation or region increases their income through increased productivity and how it translates into economic well being of the entire society. Thus, economic growth is necessary but not sufficient for development. It is the structural transformation that provides the sufficiency factor. These structures consist of the fundamental building blocks of the economy; the nature of its production, employment

distribution, consumption as well as its geography, environment and resource acquisition (Brue, 1994).

20. Hence, for an economy to be classified as developed, its method of production must largely change from agrarian to industrial and services. Such an economy must be characterised by efficient and effective infrastructures, it must not be monocultural and by implication not susceptible to external trade and international market shocks (Brue, 1994). It must possess a high level of human capital, capable of running efficient industries and with capacity for innovative R and D. As a rule of thumb, development is measured on a scale of two important parameters; Human Development Index (HDI) and Quality of Life Index (QLI) (Ezeala-Harrison, 1996:15). These two parameters are in turn a measure of other more physical quantities, namely; equity in income distribution, goods consumption index, level of literacy, nutrition and health, industrialisation and occupational pattern. These are the parameters that were used to examine the development relativity between Malaysia and Nigeria, but was constrained by data scarcity.

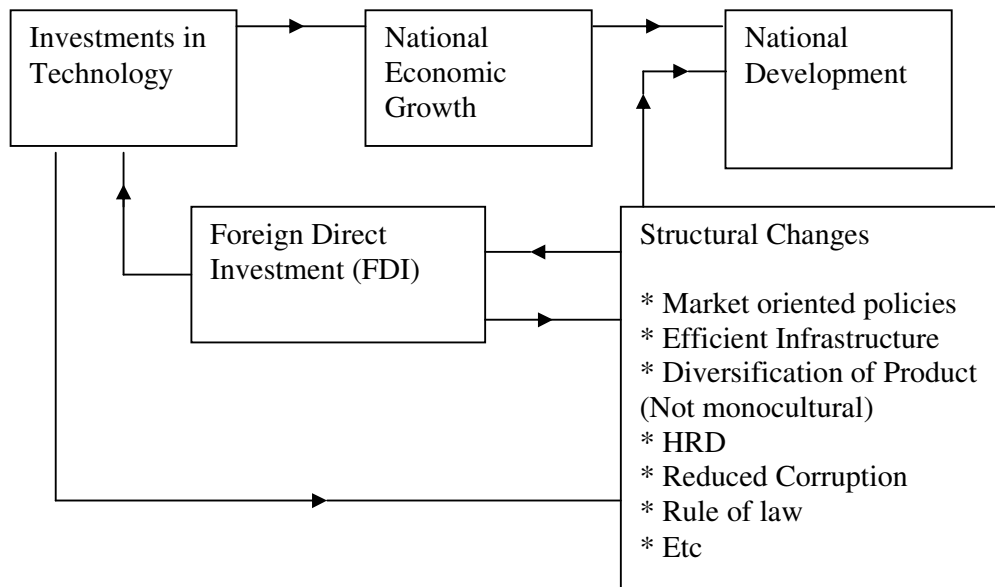
STRUCTURAL CHANGES

21. Structural change is a complex change process that must necessarily lead to radical changes in the way things are done. It could be from regulated to market-oriented economy, agrarian to manufacturing or non-farm activities, reduction in level of corruption, transformation from state to private control of means of production and even private sector control of critical infrastructure, etc. Some of these variables were considered in the study.

22. The framework of theories tested in the study is that investment in technologies may bring economic growth to the doorstep of a nation but will not translate to development until there are structural changes. Development can only manifest when there are changes in the traditional structure of an economy. These changes will result in market control of an economy, transformation of critical infrastructure, availability of productive workforce, prioritisation of industrial and services or non-farm activities sector and reduction in the level of corruption to an internationally acceptable standard. It is these structural changes that would attract foreign direct investment (FDI), thereby further reinforcing the development capacity of the economy.

23. In order to test the theory, Malaysia that is known to be an emerging developed country was compared with Nigeria, using several parameters of structural changes and the attendant economic growth and development. Thereafter, the study analysed the parameters and made deductions. The schematic at Figure 1 is the framework for the study. In simple terms, what it seeks to portray is that, state investment in technology, particularly in a state controlled economy could lead to economic growth but may not bring development into an economy unless and until such investment are driven by technology-intensive FDIs. At the same time, for such investments to be FDI dominated, all the various dimensions of structural changes listed in the box must be predominant in the economy. In other words, it is structural changes that facilitate technology-intensive FDIs and at the same time translate growth to development.

Fig 1: Schematic of Analytical Framework



24. The diagram in its simplistic form shows a continuous investment in technology as the driver of economic growth. But this cannot lead to national development unless and until all the elements of structural changes highlighted in the Structural Changes box above, are predominant in an economy. At the same time, it is these factors that drive FDIs, which further reinforces investments in technology. In a feedback mechanism, both FDIs and Investments in Technology stabilize those factors in the Structural Changes box, thereby further facilitating national development.

CHAPTER 4
TECHNOLOGY AS THE POWERHOUSE OF DEVELOPMENT-
NIGERIA COMPARED WITH MALAYSIA

25. Modern technology, if suitably injected into an economy and properly managed, will consistently lead to growth and development. However, for an economy to be developed or follow the path of development, there must be structural changes. Such an economy must have capacity to attract FDI as a result of efficient infrastructures, market-oriented policies, productive workforce, minimum corruption, prevalence of the rule of law and suitable long-term policies. While these factors are classified as facilitator of development, the real powerhouse is modern and sustainable technology that can only come with FDIs. This chapter will therefore collate and analyse data and information in respect of structural changes and the underpinning technologies in Nigeria and Malaysia, since both countries attained independence in 1960 and 1957 respectively. It will also compare the economic growth and the attendant development in the two countries.

26. To prove the hypothesis earlier proffered, the intention of the study was to attempt a correlation between investment in technology and development in the two countries. However, since the necessary data on technology investment in Nigeria was not at the disposal of the author within the time and space available, it was not possible to employ that technique. The chapter therefore sets the stage by highlighting the mechanism for the use of technology in development, it then proves the points by comparing the long-term strategic policy framework in the two countries. It also compares the strategic instruments such as; evolution of their means of production, Foreign and Domestic Investments trends and the underpinning factors, socio-economic development indicators and finally summarises the findings from all the factors compared. Relevant annexes are attached to the paper.

MECHANISM FOR THE USE OF TECHNOLOGY IN DEVELOPMENT

27. In today's economy, knowledge has become an increasingly important production factor. Statistics has shown a strong correlation between the percentage of GDP spent on R &D and GDP per capital (Pakistan Review, 2003). Science and Technology (S &T) is critical for development hence, ignoring the importance is at a nation's peril. It could only increase the gap between the developed and developing economies. It must therefore be included in

the agenda of any developing country that hopes to join the league of developed economies. Indeed, there is a need to create a fund for educational development with emphasis on technology acquisition, as this would provide a vital alternative to aid (Pakistan Review, 2003). It was not surprising therefore that UNDP and Microsoft Corporation announced a technology partnership, supported with \$1 billion and other materials, for creating and implementing ICT projects that would help developing countries achieve the Millennium Development Goals (MDGs) (Pakistan Review, 2003).

28. The role of government in technology capability development cannot be over-emphasised. However, weak institutional settings are often the limiting factor, leading to lack of coordination between government branches, inflexible institutional settings and waste of national resources. Indeed, the lack of sound technology policies to guide the development of technological capabilities in the industry sector is common in many developing countries, Nigeria being a typical example.

29. Role of Government: Government plays an essential role in developing National Technology Capability. Government provides long-term vision, coordinates the relevant stakeholders and guarantees a healthy domestic environment for the creation and use of knowledge for socio-economic development. In realisation of this, the Government of Malaysia had to privatise many of the State Owned Enterprises (SOE) as far back as the 1980s and the 1990s(Annex A).

30. Localised Solutions: Policy makers need to adopt localised solutions that correspond with a country's development stage. In other words, countries need to consider policy options that fit into their socio-economic context. Malaysia realised early that the scientific knowledge of the West could not be simply imported into the Country. Hence, she adjusted and adapted it into the special needs and requirements of the Nation. R&D is always directed, firstly to the identification of the scientific and technological knowledge that can be readily utilised. Secondly, the knowledge and its applications are usually modified to fit into the peculiar situation and needs of the Country (Mohamad, 2000). This has not been the case in Nigeria as would become evident in the study.

31. Foreign Versus Indigenous Technology: Import of foreign technology can be a short-term solution for technology capability improvement. However, there is always a dire need to

pursue long-term approach and focus on developing capability by building up a national stock of human resources. This is the only way a country can absorb and re-develop imported foreign technology, as well as develop indigenous ones. As would be evident in the case of Malaysia, the focus was on the promotion of indigenous technology through policy tools such as the control of technology import.

32. Role of Private Sector: Generally, most TWCs have very weak market mechanism and an underdeveloped private sector. The development of market mechanism and technological capability need to go hand in hand, as is the case in Malaysia. The business sector is a major source of innovation while the public organ only facilitates

33. Role of ICT: ICT has become a major driver of the knowledge economy. This sector, though still being developed, has contributed tremendously to the economy of Malaysia. In Nigeria, this is not the case, as the infrastructures are still weak but possess a tremendous potential. The rapid evolution of the ICT infrastructure in Malaysia has contributed to knowledge creation and forged a linkage between her knowledge network and the global pool. ICT could be the tool to achieve the MDG in many developing countries if well articulated (www.ias.edu/research)

LONG TERM DEVELOPMENT STRATEGIES

NIGERIA

34. Before independence, the colonial Government in Nigeria undertook no serious comprehensive development plan for the Country. It was not until 1962, that the first National Development Plan was articulated in Nigeria. The 1962-1968 plans had a fairly broad scope encompassing Government policies to achieve National Economic Objectives such as accelerated growth and high level of average material wealth. The plan included economic forecasts, private sector policies and a list of proposed expenditures. However, foreign economists whose interest in the development of Nigeria was doubtful, authored the document. For instance, while the document favoured high economic returns from private investments, indirect returns from social overheads was not an issue. In the same vein, taxes on the wealthy was discouraged for fear of dampening private initiatives. Instead, conservative fiscal and monetary policies were emphasised. Rather than encourage FDIs, foreign aid was encouraged. The resultant effect was that the infrastructures as well as the

industrial sector remained underdeveloped. Hence, little or no technology injection into the real sector. The second National Development Plan (1970-74) was characterised by post-war reconstruction efforts. This was not a problem as there was a tremendous growth in real GDP resulting from rapid oil industry growth and sharp increase in oil revenue (Ekundare: 1971). However, it was characterised by non-productive capital projects, some of which were to be abandoned later, a typical case of technology misappropriation.

35. The third National Development Plan (1975-1980) was meant to jumpstart the economy through import substitution. Amidst the euphoria of the 1974 oil boom, numerous projects were approved without proper appraisal of technical feasibilities, cost-benefit analysis and administrative arrangements required to establish and operate the projects. The net effect was that, many of the projects were abandoned as a result of budget shortfall and where they were executed, sustainability became a problem. The fourth National Development Plan (1981-85) also went the way of its predecessors due to poor conception and lack of fund. The fifth National Development Plan (1988-92) had to be postponed till 1988 as a result of regime change. In 1996, a comprehensive development vision, tagged Vision 2010 was conceptualised by the then military regime, but could not take off due to transition to democracy in 1999. In 2003, a poverty reduction strategic paper (PRSP) believed to be homegrown but initiated by the World Bank was developed. It was tagged National Economic Empowerment and Development Strategy (NEEDS). Gradual implementation of the strategy has started, particularly in the area of privatisation, financial and communication sectors reforms. Indeed, the second phase of it, (NEEDS II) is about to be implemented. Analysts are hopeful that Nigeria may gradually start to realise its dreams as some of the infrastructures are gradually taking shape. However, the present pseudo-political stability has to be improved upon.

MALAYSIA

36. Malaysia since independence in 1957 has developed ten successive plans, based on reliable data, on the size, distribution and composition of the population, as well as information on the social and infrastructural needs of its people. Milestones are usually set and are reviewed at intervals. The highlights of the plans include; the first Malaya five-year plan (1956-1960), the second Malaya plan (1961-1965), the first Malaysia plan (1966-1970), the second Malaysia plan (1971-1975), the third, fourth and fifth Malaysia plan (1976-1990)

which saw the Government privatising some of the State Owned Enterprises (SOEs)(Annex A) and the sixth Malaysia plan (1991-95), which marked the launching of the National Development Plan (NDP). The seventh Malaysia plan (1996-2000), charted a new course for the Nation. It was designed to provide sufficient skilled workers and create technology culture for structural transformation towards productivity-driven economy. The eighth Malaysia National Vision Policy (2001-2010), which is on-going, is an embodiment of market-oriented instruments but with growth and equity as its fundamentals.

37. It is worthy of note that all the phases were characterised by judicious use of fiscal and monetary polices to gradually effect substitution of imported goods for locally produced ones, the process which saw the gradual acquisition of technology. It created a conducive atmosphere for accelerated partnership between the public and private sectors of the economy. The establishment of Free Trade Zones (FTZs) was also a technology facilitator as it attracted a number of technology-intensive FDIs. However, high protection was given to local industries until such a time they developed enough capacity to compete with foreign ones. Also worthy of note is the fact that Malaysia placed a high premium on higher-level science and technology education and this gave her a leading edge in the absorption and subsequent development of technologies that were not only modern but also sustainable. Table 1 summarizes the comparison of long-term policies in the two countries

SUMMARY

COMPARISON OF LONG TERM DEVELOPMENT POLICIES IN NIGERIA AND MALAYSIA

Table 1: Long term Development Policies and Plans in Nigeria and Malaysia

Ser	Nigeria		Malaysia		Remarks
	Plan Period	Policy Targets	Plan Period	Policy Targets	
(a)	(b)	(c)	(d)	(e)	(f)
1.	1962-68	First National Development Plan-Economic Development and Private Sector	1956-65	First and Second Malay Plan- Economic Expansion, employment generation,	* In Malaysia, the policies were based on well informed, ICT assisted data * In Malaysia, there was high premium on HRD

		Empowerment	1966-70	<p>diversification of agriculture and expansion of industries</p> <p>First Malaysia Plan- Provision of Education, Health and employment creation</p>	<p>and diversification from agriculture</p> <p>* Implementation was sustained in Malaysia</p> <p>* In Nigeria, the fiscal and monetary policies were wrong as they were not based on informed data</p> <p>* In Nigeria, foreign aids as supposed to FDI's were encouraged</p>
2.	1970-74	Second National Development Plan- Post War Reconstruction	1971-75	Second Malaysia Plan-New Economic Policy, focused on poverty eradication through creation of jobs and provision of infrastructures across the length and breath of Malaysia, thereby reducing the gap between the rich and the poor	<p>* In Malaysia, emphasis was on infrastructure development and job creation</p> <p>* In Nigeria, many non-productive projects were initiated and later abandoned</p>
3.	1975-80	Third National Development Plan-Import Substitution, expansion of agriculture, manufacturing industries, transport, education, rural electrification and country development	1976-90	Third, Fourth and Fifth Malaysia Plans-Continuation of second Development Plan which resulted in privatization of State Owned Enterprises and evenly distributed provision of infrastructures	<p>* In Malaysia, policy consistency, anchored on market control, stable polity and infrastructure development encouraged capital and technology influx into the country. Social objectives were also very paramount</p> <p>* In Nigeria, plans were not based on meaningful studies and so Implementation was marred by lack of fund. Export declined and so the capacity to import materials for infrastructure development also declined</p>
	1981-85	Fourth National Development Plan- Continuation of Third National Development Plan			
	1988-92	Fifth National Development Plan-Structural Adjustment Programme; open economy based on removal of import licences, reduction of tariffs and Promotion of			

		self sufficiency in agriculture			
4.	1996-2010 2003-07	Vision 2010-Comprehensive Development Vision National Economic Empowerment and Development Strategy (NEEDS)- Public Sector reforms, privatization and Financial sector reforms	1991-95 1996-2000 2001-2010	Sixth Malaysian Plan-National Development Plan-Retained the main features of the previous plans and incorporated new strategies for balanced development Seventh Malaysian Plan-New course and strategies designed to provide skilled workers, create technology culture for transformation towards productivity driven economy Eight Malaysian National Vision Policy-Emphasized market oriented instruments with growth and equity as fundamentals	* Malaysia plans laid emphasis on human and technology capacity development, infrastructure development and free market economy * Nigeria Vision 2010, though well informed, was not implemented as a result of regime change * Nigerian NEEDS document is ongoing and could be said to have succeeded to a large extent. However, a lot still remains undone in the areas of human capacity and infrastructure development

Source: Compiled from UNDP Malaysia, 2006; Mervat Tallawy, 2003; Ekwuruke, 2006 and Ekundare, 1971.

DEDUCTION

38. Table 1 above, briefly compares the long-term policy instruments in the two countries and supports the hypothesis being propounded. Failure of long-term policies and plans in Nigeria and its successes in Malaysia has many dimensions. Firstly, while Malaysia had meticulously utilised modern technology and ICT tools as the basis for data collection and collation, which subsequently informed her policy direction, Nigeria did not, and so the policies and plans were doomed to fail. Secondly, in all the plans in Malaysia, human resource and technology development were at the centre stage, hence it was easy for Malaysia to develop and sustain a technology culture that would subsequently permeate every sector of the economy. Thirdly, structural changes which included public institutional reforms, ethical revolution, reduction in corruption level, security sector reforms, private sector empowerment, reforms in education and health, market efficiency, technology readiness, innovation, among others were consistently an integral part of the long term plans

in Malaysia. This created a thriving opportunity for inflow of capital and technology-intensive FDIs, which also affected the infrastructure. In a vicious circle, all these, added to a retinue of attractive incentives (Annex B), further encouraged more FDIs, which again brought along with it managerial skills, modern machines and technologies that were subsequently adapted for local use. The resultant effect has been rapid development. It is therefore not surprising that Malaysia is ranked No 26 out of 125 countries in the Global Competitiveness Index (GCI) in 2006 (World Economic Forum 2006). In Nigeria, that has not been the case, except of course for recent policies that seem to be attracting FDIs, thereby facilitating technology application, but mostly in the Telecommunication Sector of the Nigerian Economy. One is therefore not surprised that the GCI ranking for Nigeria in 2006 is 101 out of 125 countries (World Economic Forum 2006). Hopefully, the telecommunication sector reform would be extended to other sectors of the economy in future, but the polity must have to be stable and the policies must be market oriented.

NATIONAL MEANS OF PRODUCTION AND PRODUCT

DIVERSIFICATION

NIGERIA

39. Product diversification as well as value addition remains a significant requirement for any economy that looks forward to meaningful development, if it is not to be vulnerable to happenings and manipulations elsewhere, especially in this era of globalisation. In the case of the Nigerian economy, it has not performed impressively well in this regard. The main product of the economy has been monocultural and primary commodity-based, with very little value added. At independence in the 1960s, agriculture contributed about 61 percent of GDP, 71 percent of total export and employed about 70 percent of the working population at various capacities, even though the method of production was still very crude and labour intensive (Nwaobi: 2005). This trend continued until the oil boom of the 70s that largely shifted attention to the oil sector, instead of allowing the two sectors to grow simultaneously. The resultant effect was that the Nation could no longer feed itself and had to depend on imported food for her citizens. As if that was not bad enough, successive governments failed to divert the proceeds from the oil into any meaningful industrial or indeed agro-allied sector development. Hence, the economy has consistently depended on agriculture and crude oil export, meanwhile the agricultural practice is still largely labour intensive. Crude oil export, which by 2005 provided 95 percent of foreign exchange earnings, only marginally decreased

from about 98 percent in the 80s employs less than 10 percent of the population (Anaro: 2007). Undoubtedly, the missing link is technology.

40. A number of measures could have put the economy on a sound footing. Firstly, rather than neglect agriculture, it ought to have been developed alongside the petroleum sector using the resources available and modern technologies. Secondly, the petroleum sector itself, which is essentially a commodity sector, could have been used as a springboard for several other industrial, value added activities. With good planning, the Nation ought to have added economic values to the crude by establishing enough refineries to process the products for export. Rather, it developed the processing capacity, only large enough for its internal consumption. Sadly, even the existing refineries had remained unserviceable for long, thereby necessitating importation of fuel for internal consumption. In the same manner, the gas component, until recently had been completely flared away instead of being used to generate the badly needed electric power. To say the least, the forward and backward linkage industries have been completely neglected. It appears the planners of the economy have not been able to utilise technologies in many sectors of the economy and when they do, only the Hardware aspect of technologies is ever considered while the Know-how aspect is neglected. As a result, no innovative solutions have been recorded in most of the sectors.

MALAYSIA

41. Over the last three and a half decades, Malaysia has been largely transformed from a low value-added, farm based economy to a high value-added modern industrial economy, characterised by a decline in percentage share of agriculture and a corresponding increase in the share of manufacturing and services industry. All these have been achieved through steady growth and structural transformation driven by technology injection and increased integration with the global economy.

42. At independence in 1957, the economy was essentially agrarian, with agriculture constituting over 40 percent of the GDP while manufacturing had a token share of less than 10 percent. By 1970, agriculture contributed 24.5 percent and manufacturing 15.3 percent. The share of the manufacturing sector had steadily increased to 27 percent of GDP and 60 percent of export, while agriculture declined to 19 percent and 10 percent respectively of GDP and export in 1990. Meanwhile export itself increased to 65 percent, from its 1960

figure of 56 percent (Ali, 2004). The high point of each of the phases was the emphasis on structural transformation that would create the enabling environment for FDIs. While the administrative and organisational machineries were being continuously reviewed, massive investment was injected into infrastructure and human capacity development. Initially, infrastructural development of road and communication was focused towards linking the rural areas with urban centres in order to facilitate internationalisation of the farm products. However, the Government was quick to realise the vulnerability of the commodity market and therefore intensified its industrialisation program.

43. The structural transformation that set the stage for quick industrialisation in Malaysia did not only bring about changes in the National product but also drastically changed the occupational pattern of the labour force, with a decline in the rural labour force and expansion in the secondary and tertiary labour force. In 1970, the rural labour force was 54 percent but had drastically reduced to 16.1 percent in year 2000. Conversely, the non-agricultural labour force increased rapidly from 8.7 percent in the manufacturing sector in 1970 to 27.5 percent in year 2000(Embong, 2002:36-40). Similarly, the service sector labour force increased from 32.5 percent in 1970 to 47.5 percent in year 2000. Allied to these occupational changes was rapid urbanisation, from a statistical figure of 26.7 percent, urban dwellers increased to 60 percent between 1970 and year 2000(Embong, 2002:36-40). These changes largely resulted from steady growth in GDP (Annex C) and an all-encompassing infrastructural transformation. The role of technology in the transformation of an economy, from agrarian to manufacturing and services has been aptly manifested in Malaysia.

44. While at independence, the literacy rate in Malaysia was relatively low, it was clear to the leaders at the time, that she needed an army of well educated workforce to move the economy forward. It was also clear to them that any nation that depend essentially on commodity to drive its economy would remain perpetually in slavery. Accordingly, Malaysia has consistently invested massively in the education of her youths and developed her industrial sector through a romantic partnership between the public and private sectors of the economy. Firstly, a vibrant business environment created in Malaysia has been the delight of potential investors. Secondly, the continuous development of young, educated, productive and competitive workforce has been a kind of bait for attracting private investors. While the Government efficiently operates many public educational institutions, she offers tax holidays to manufacturers who contribute to a pool of fund for industrial training, with particular

emphasis on science and technology (S&T) education. As a result, enrolment in S&T constitutes more than half of the total for tertiary institutions. Besides, the developed infrastructures which support industrial parks, facilitate investment in manufacturing, with the Government providing incentives for R&D, local sourcing of raw materials, software development, investment in Multimedia Super Corridor projects, among others. This in turn promotes the deployment of new technologies into the economy. Interestingly, the higher the value addition, the better the incentives (Annex B). All these factors combined with a harmonious industrial relation have largely facilitated diversification of product, from low-tech to high-tech value-added industries in Malaysia. Presently, the economy is moving from product-base to knowledge base, as a result of massive investment in ICT infrastructure and ICT professionals' capacity building.

DEDUCTION

45. The foregoing goes to support the hypothesis that, though Nigeria has been investing in Technology right from independence, largely through the state and to some extent through FDIs in the oil and gas sector, this would not translate to economic development, job creation, high HDI unless and until there are structural changes in the economy. Some of these changes will include public institutional reforms, empowerment of private sector through infrastructure development, development of favourable fiscal policies and human capacity building, thereby attracting FDIs into the real sector of the economy. This is the only way to guarantee steady growth and development. Table 2, which follows in the subsequent pages, summarises the findings from comparison of national product.

SUMMARIES

PROGRESSIVE DIVERSIFICATION OF NATIONAL PRODUCT IN
NIGERIA AND MALAYSIA

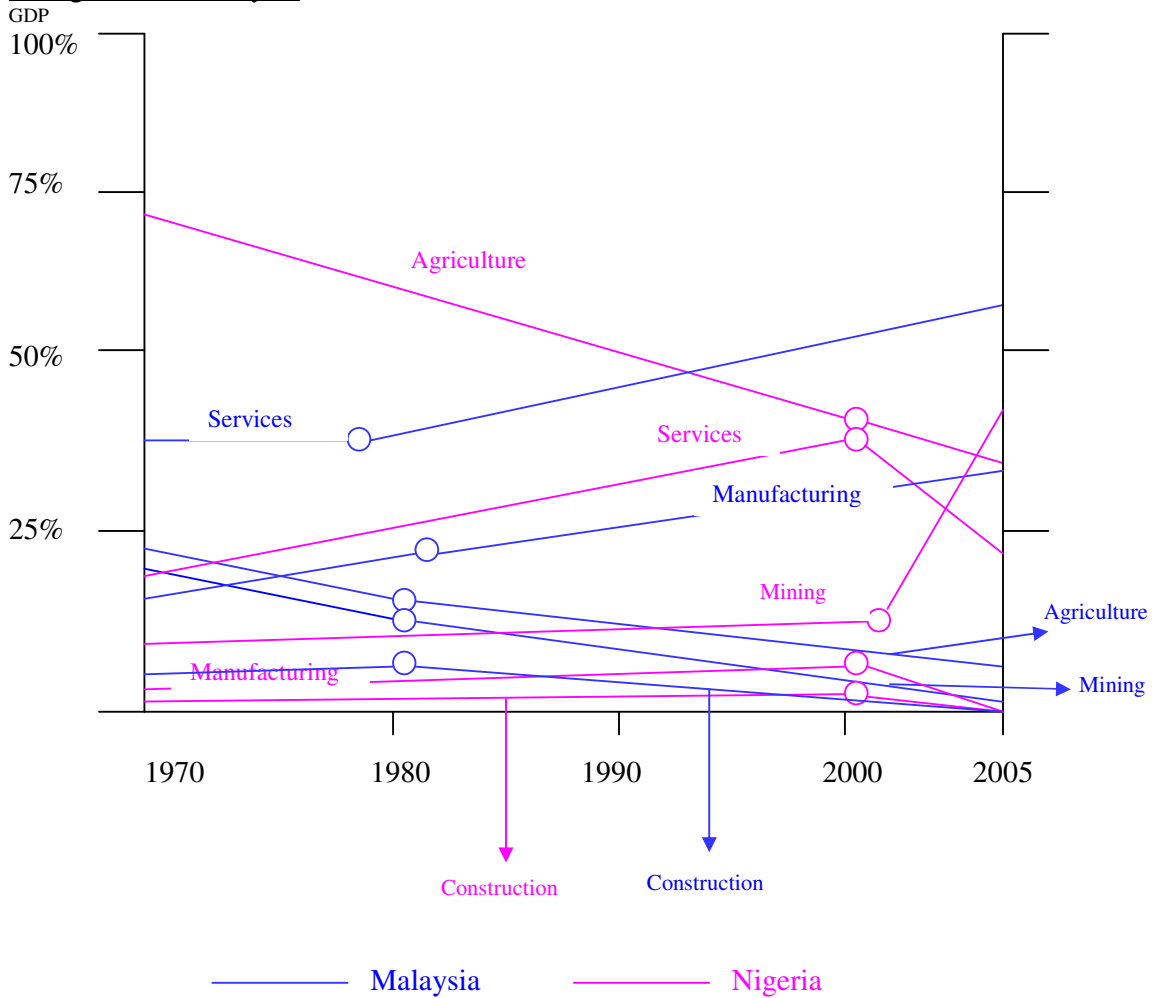
Table 2: Summary of Comparison of Progressive National Product Diversification in Nigeria and Malaysia

Ser	Year	Nigeria		Malaysia		Remarks
		Product	% of GDP	Product	% of GDP	
(a)	(b)	(c)	(d)	(e)	(f)	(g)
1.	1970	Agriculture	68%	Agriculture	24.5%	* The sectoral contribution of the primary sector in Malaysia decreased from 45% to only 10.2% from 1970-2005 *Manufacturing and services in Malaysia increased from 52% to 87.6%, from 1970-2005. * Diversification in Malaysia is facilitated through friendly investment environment, attractive incentives, productive workforce and developed infrastructure * In Malaysia, the secondary sector with better value addition and better
		Manufacturing	3%	Manufacturing	15.3%	
		Mining and Quarrying (Oil)	8%	Mining and Quarrying	20.5%	
		Services	18%	Services	36%	
		Construction	3%	Construction	4%	
2.	1980	NA	NA	Agriculture	15%	
				Manufacturing	22%	
				Mining and Quarrying	15%	
				Services	40%	
				Construction	8%	
3.	2000	Agriculture	43%	Agriculture	9.2%	
		Manufacturing	7%	Manufacturing	28%	
		Mining and Quarrying (oil)	13%	Mining and Quarrying	11%	
		Services	36%	Services	48%	
		Construction	1%	Construction	3.8%	

4.	2005	Agriculture	32.76	Agriculture	8.2%	<p>capacity to create quality job has facilitated economic development.</p> <p>* In Nigeria, the primary sector marginally decreased from 76% to 72%, from 1970 –2005, with fluctuations in between.</p> <p>* There is no steady trend in the sectoral contribution of the manufacturing and services sector in Nigeria</p> <p>* In Nigeria, the manufacturing and services sector increased from about 21% up to a peak of about 43% and went down to 26 %</p> <p>* The implication in Nigeria is that the economy is still largely commodity driven and depend largely on international market forces because the policy environment is still regulated, infrastructures in comatose and HRD is poor.</p>
		Manufacturing	2.83	Manufacturing	31.6%	
		Mining and Quarrying	39.18	Mining and Quarrying	2%	
		Services	23.75	Services	56%	
		Construction	1.48	Construction	2.2%	

Source: Compiled from the Nigeria and Malaysia Bureau of Statistics Database.

Figure 2: Graphical summary of comparison of progressive National Product diversification in Nigeria and Malaysia



Source: Compiled from the Nigeria and Malaysia Bureau of Statistics Database.

FOREIGN DIRECT INVESTMENTS AND DOMESTIC INVESTMENTS

46. Malaysia has continued to receive enormous Foreign Direct Investments (FDIs) in addition to her internally generated Domestic investments (DI), as a consequence of a well-developed infrastructure, well-educated workforce and favourable investment climate. Indeed, since 1996, FDIs and DIs have been on the galloping onward trend except for the period of recession. One striking factor about the nature of investment is that since 1990, it has been increasing in capital intensity, that is Capital Investment per Employee (CIPE) (www.mida.gov.my). Projects executed in 2005 had an average CIPE of Rm278,126(\$80,639) compared to a figure of Rm 167,638(\$48,605) in 1990 (Malaysia Industrial Development Authority: 2005). This reflects a growing trend towards more capital intensive, high technology projects. Therefore the investment figures in Annex D, can be approximately

taken as Technology Investment figures. Indeed, most investments have been in the area of Electronics and Electrical, Science Equipment, non-metals, plastic industries, R and Ds etc. The investment figure of Rm 31billion (\$8.9billion) in 2005, being 6.3% of GDP is by any standard, a record for any developing country. On the other hand, the average figure of 1.6%, in Nigeria, essentially in the oil and gas sector, could only have yielded the kind of growth recorded, in a commodity economy. The situation is even more pathetic, given that the backward linkage resources within the oil and gas sector are almost entirely sourced from abroad while the forward linkages are virtually non-existent. The telecommunication sector has however attracted some private investments in the last few years, with an astronomical growth from 69 percent in 1995 to 6,950 percent in 2005(World Bank Group, 2007). The point to be made here is that development in Malaysia, contrary to Nigeria, has been largely driven by appropriate investments with high technology content. Some of the factors that have slowed down technology-intensive investment in Nigeria, beside the absence of suitable physical infrastructure include; poor credit regime, from 9.4 percent in 1990 to a meagre 14.9 percent in 2005, hostile business environment (9 procedures in 43 days to register business compared to 2 procedures in 7 days, in New Zealand, 16 procedures to register a property, 465 days to build a warehouse compared to 52 days in the Republic of Korea. Poor tax administration is also a discouraging factor for potential foreign investors as it takes about 1,120 hrs to file and pay taxes in Nigeria compared with 94 hrs in Philippines)(World Bank Group, 2006).

47. In an opinion poll recently conducted by a reputable Nigerian Daily, Business Day, which spanned the month of June 2007, it was discovered that, Energy demand was top on the expectation list of Nigerians from the new President. Clearly, it is only through holistic structural changes, which empowers the private sector to play a leading role in the energy provision, that such demand can be met. Also high on the demand list are job creation, infrastructure development and reduction in the level of corruption. It is however, not all bad news, as it was revealed that portfolio investment and remittances into the economy in 2005 and 2006 respectively recorded about \$1.7b and \$8b, as a result of the reforms in the financial sector. This development was described by the erstwhile Minister of Finance as desirable but not dependable. She described the money as 'hot money' that could fly at the slightest suggestion of problems (Nigeria Thisday News, Feb 27, 2006). More so, as it does not come with the needed technological and managerial skills, it cannot be an instrument of technological development. In other words, transformations can only come to effect through

direct investment in technology-intensive industries and that goes to corroborate the hypothesis that is being propounded.

SOCIO-ECONOMIC DEVELOPMENT INDICATORS
IN NIGERIA AND MALAYSIA

48. Socio-economic development indicators have many dimensions. Firstly, it is a reflection of the state of well being of the people of a country under consideration and it's usually measured in terms of Human Development Index (HDI). Secondly, It is a measure of the occupational and consumption pattern of a people. Thirdly, it may also reflect the level of inequality as well as the behavioural pattern of people, among others. All these quantities, to a large extent, reflect the pattern of governance and the economic management policies and plans of a country over a period of time. For instance, for a nation where there has been stable polity and suitable economic policies and plans over a period of time, the socio- economic indices are bound to swing on the side of development. This segment will therefore compare a number of indicators in Nigeria and Malaysia, from which deductions would be made regarding the performance of Government over the last few years. The point to be made or disputed is that structural changes in a socio-economic environment will enable technology to facilitate development or simply put, it is the structural changes in Malaysia, earlier identified in the study that has brought meaningful development to Malaysia in contrast with Nigeria. Table 3 below summarises.

Table 3: Summary of Comparison of Major Socio-economic Indicators in Nigeria and Malaysia

Ser	Parameter	Nigeria	Malaysia	Remarks
(a)	(b)	(c)	(d)	(e)
	HDI			<p>* HDI is much higher in Malaysia than Nigeria, as a result of huge investment in infrastructure (education, health etc)</p> <p>* Human asset is a bait for attracting FDI in Malaysia</p> <p>* Technology intensive FDI creates wealth and development in Malaysia and enhances life expectancy</p> <p>* GDP per capital in Malaysia,</p>
1.	HDI -1975 -2004	0.448	0.616 0.805	
2.	GDP per capital (pp US\$-2004)	1,154	10,276	
3.	Life Expectancy at birth	43.3	73.4	
4.	Combined school enrolment: primary secondary, tertiary (%) -2004	55 55	73 73	

5.	Adult literacy Rate-1990 -2004	48.7 -	80.7 88.7	about nine times that of Nigeria
6.	Population living below \$1 per day (%)-1990 to 2004	70.8	2	
	<u>Priorities in public spending</u>			* Expenditure on Education and Health in Malaysia testifies to the Government commitment. Slightly above UN recommendation * Military expenditure in Malaysia on the downward trend, in favour of the real sector
7.	Pub exp on health (% of GDP)-2004	1.3	2.2	
8.	Pub exp on education (% of GDP) -1991 -2004	- -	5.1 8.0	
9.	Mil exp (% of GDP) -1990 -2004	- 1.0	2.6 2.3	
	<u>Flow of Capital</u>			* In Malaysia, FDI inflow increased in real terms, but not as a percentage of GDP. This is because the GDP had increased geometrically over the period
10.	FDI inflow (% of GDP) -1990 -2004	- 2.6	5.3 3.9	
	<u>Energy</u>			* In Nigeria, traditional fuel is still the major source of energy while in Malaysia, it has almost given way to technology driven sources. A vivid manifestation of changes in the consumption pattern. * Electricity, which has been proven to have a direct correlation with industrialization, has a per capital value in Malaysia, almost nine times that of Nigeria, thereby facilitating industrialization in Malaysia * Electricity consumption increased almost 5 folds in 25 years in Malaysia as result of the private sector investment. * In Nigeria, it is still dominated by the public sector
11.	Electricity consumption per capital (kwhr) - 1980 -2003	162 -	740 3,196	
12.	Traditional fuel consumption (% of total energy)	82.9	6.5	
	<u>Technology diffusion and creation</u>			* Advanced telecommunication infrastructure in Malaysia (Multimedia Super Corridor) * High penetration of both telephone and Internet in Malaysia facilitate Governance as well as private sector businesses, thereby creating wealth and reducing time on task in the public sector. * Poor telecommunication infrastructure in Nigeria
13.	Telephone mainlines (per 1,000 pple)-1990 -2004	3 8	89 179	
14.	Cellular subscriber (per 1,000 pple) -1990 -2003	0 71	5 587	
15.	Internet users (per 1,000 pple) - 1990 - 2003	0 14	0 397	

	<u>Inequality measures</u>			* Paradoxically, income distribution in Nigeria is slightly more even than in Malaysia despite the enormous wealth in Malaysia. This may be due to the problem of economic based racial discrimination against the Bumiputras, which the Government of Malaysia is understood to have been addressing for long. All the same, a member of the poorest 10% in Malaysia is far richer than a corresponding member in Nigeria, judging from the GDP differential. However, Malaysia will still need to intensify her equity driving policies if she is to attain the status of a developed nation by the year 2020.
16.	Share of income (%) poorest 20%	5	4.4	
17.	Share of income (%) poorest 10%	1.9	1.7	
18.	Share of income (%) Richest - 10% - 20%	33.2 49.2	38.4 54.3	
	<u>Water and Sanitation</u>			* Access to water and sanitation in Malaysia is almost 100% as a result of efficient infrastructure * Access to water and sanitation in Nigeria in the last 15 years has only increased marginally by 17% as a result of either absence or inefficiency of infrastructure, which could be a consequence of poor understanding of technology
19.	Population with sustainable access to improved water source (%) -1990 -2004	41 48	98 99	
20.	Population with sustainable access to improved sanitation (%) -1990 - 2004	39 44	- 94	
	<u>Commitment to Health</u>			* High investment in health infrastructure in Malaysia is a major facilitator of HRD, which in turn promotes the development of economic activities (Annex E).
21.	Health expenditure per capital (ppp US\$)-2003	1.3	374	
22.	Physicians (per 100,000 pple)-1990-2004	28	70	
	<u>Demographic Trend</u>			* Urban population has doubled in 30 years in both countries * In Nigeria, this is because agriculture and attendant infrastructure is neglected in rural areas and people are attracted to oil wealth and existing infrastructure in the cities. Unfortunately, the sector creates only few jobs. Accordingly, poverty is perpetuated in the cities and existing infrastructure is overstretched. * In Malaysia, industrial activities, with attendant job opportunities attract people to the cities, thereby alleviating poverty
23.	Total population (millions) -1975 -2004	58.9 128.7	12.3 24.8	
24.	Urban population (% of total) - 1975 -2004	23.4 47.3	37.7 66.3	

	<u>Gender Equality</u>			* The female economic activity rate is virtually the same in the two countries contrary to expectation. The low female activity rate in Malaysia can only be a consequence of the cultural and religious limitations imposed on females
25.	Female Economic Activity Rate (% age 15 and older)-2004	45.6	46.1	
	<u>Structure of Trade</u>			
26.	High tech export (% of manufactured exp) -1990 -2004	- 2	38 55	High tech export in Malaysia is facilitated by FDIs

Source: Compiled from UNDP Human Development Report, 2006

SUMMARY OF FINDINGS FROM COMPARISON

49. The summary of findings from the various variables compared in respect of the two countries is at Table 4 below.

Table 4: Summary of Findings from Comparison

Se r	Parameters	Malaysia	Nigeria	Role of Technology	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
1.	Long Term Development Strategies	* Pursued long term development strategies since independence * Consistent growth * Has confidence of Foreign Direct Investors	* Attempted several long term development strategies since independence * Constant Regime changes hampered implementation * Dearth of investment except in the low value-added oil sector * Recent FDIs in Telecommunications * Sinusoidal economic growth	* Technology supports growth and development in Malaysia as a result of structural changes * In Nigeria, Technology investment, essentially in oil sector with minimum value addition and weak fwd and backward linkages	* Policy induced structural changes in Malaysia gave impetus to technology enthronement
2.	Production	* Diversified	* Largely	* All sectors	Production

		<p>product with strong export orientation</p> <ul style="list-style-type: none"> * Moved from agrarian to industrial and services * Moving towards a knowledge economy 	<p>monocultural (oil) or primary product dependent</p> <ul style="list-style-type: none"> * Majority of citizens in rural, agrarian employment * Unsuccessful product diversification * Weak industrial sector * Services sector recently driven by telecommunications 	<p>in Malaysia driven by modern technology</p> <ul style="list-style-type: none"> * Production in Nigeria creates only a few jobs, hence low savings and low investment in Technology 	<p>diversification is resultant from friendly investment climate, attractive incentives, efficient infrastructure and young and productive workforce. In Nigeria the reverse is the case.</p>
3.	Infrastructure	<ul style="list-style-type: none"> * Infrastructure are modestly developed * Largely driven by the private sector 	<ul style="list-style-type: none"> * Infrastructure are generally weak * Largely dominated by the public sector 	<ul style="list-style-type: none"> * Technology has been the driving force for infrastructure development in Malaysia * Dearth of capital and technology has hampered infrastructure development in Nigeria 	<p>Strong and efficient in Malaysia but weak in Nigeria</p>
4.	FDIs	<ul style="list-style-type: none"> * Driven by well developed infrastructure, educated workforce and favorable climate * About 6% of GDP * Increase in capital intensity * High in technology 	<ul style="list-style-type: none"> * Dearth of FDIs due to poor infrastructure, unskilled workforce and unfavorable climate * Less than 2% of GDP * Essentially in oil sector, low value added, backward and forward linkages, non existent 	<ul style="list-style-type: none"> * Technology intensive FDIs in Malaysia has resulted in growth and development * Poor technology content in Nigeria has resulted in limited growth and poor development 	

5.	Public service delivery	<ul style="list-style-type: none"> * Efficient * Semblance of private sector (Malaysia Incorporated) 	* Poor service delivery	<ul style="list-style-type: none"> * Malaysia has largely stimulated the public sector through efficient use of technology input while in Nigeria reverse is the case 	<ul style="list-style-type: none"> * Supportive Government policies in Malaysia include, liberal equity policy, attractive tax incentives and expatriate employment policies * Policies in Nigeria are not private sector friendly
6.	HRD	<ul style="list-style-type: none"> * Improved literacy with quality manpower * Improved health indicators * Improved life expectancy 	<ul style="list-style-type: none"> * Improved literacy but severe dearth of quality * Poor health indicators * Low life expectancy 	<ul style="list-style-type: none"> * Modern techniques driven by technology has lead to improved HRD in Malaysia * Investment in HRD in Nigeria is poor 	<ul style="list-style-type: none"> * The educational sector in Malaysia has been continuously restructured in line with modern practice to ensure ready availability of manpower for the modern knowledge economy * Modern infrastructure in the health sector has also facilitated high HDI
7.	Growth and development	<ul style="list-style-type: none"> * Accelerated growth but with inequality. Problem of inequality continuously in focus 	<ul style="list-style-type: none"> * Sinusoidal economic growth with increased inequality 	<ul style="list-style-type: none"> * Steady growth in Malaysia is driven by technology occasioned by structural changes while in 	<ul style="list-style-type: none"> * Development in Malaysia is derived from steady growth and equity driven policies * Growth in

				Nigeria occasional growth is driven by increase in the oil price	Nigeria is sinusoidal as it is commodity dependent. It creates very few jobs.
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Source: Compiled from various Internet and other sources cited in the text.

50. It can therefore be concluded from the above analyses that development in Malaysia has been largely due to the application of technology-driven strategies that facilitated structural changes, thereby enabling the private sector to take control of the economy. These strategies include HRD, infrastructure development and promotion of FDIs, among others. In Nigeria, this has not been the case.

CHAPTER 5
STRATEGIC OPTIONS AVAILABLE TO NIGERIA

51. The challenges that have confronted Nigeria's development since independence are diverse and enormous. The unacceptable state of the economy is most galling, given the Country's enormous endowments of natural and human resources. This is moreso, given the fact that a Country like Malaysia with similar colonial heritage, attributes and natural resources endowment has recorded significant successes in the development of her economy since independence in 1957, when she was almost at par with Nigeria. This underscored the need to study the underlining reasons why Malaysia has consistently advanced her economic development, using technology as a driver why Nigeria has not.

52. An hypothesis was propounded to the effect that technology could only play a role in an economy if and when the appropriate structures, productive manpower and conducive environment are in place or when there are structural changes in the socio-political economy of a nation. In order to test the hypothesis, a number of factors characteristic of the two economies were compared and analysed. These include the long-term development policies, structure of production or progressive diversity of production, inflow of FDIs and a general survey of socio economic indicators in the two countries.

53. These comparison arose from a primary question, 'what strategies should Nigeria adopt in order to accelerate development in the Country? The secondary questions were:

- a. Why has technology not brought development to the doorstep of Nigeria in the manner of Malaysia?
- b. How can Nigeria take the advantage of technology to accelerate her development as done by Malaysia?
- c. What are the strategic options available to Nigeria?

FINDINGS

54. The findings from the study, as summarised below, apparently confirms the hypothesis and provide answers to the questions:

- a. The remote causes of underdevelopment in Nigeria is rooted in the legacies of decades of dictatorial misrule and political instability, which has resulted in either poor conception of policies, poor implementation or indeed policy summersault. However, this is not the object of the study.
- b. Structural impediments in Nigeria has largely hampered the enthronement of technology through private sector- led FDIs and DIs. These structural impediments include weak and inefficient institutions and infrastructures, excessive Government control, unmotivated, unprofessional and inefficient public service, poor HRD, weak budgetary and fiscal management organ of Government, lack of transparency and accountability, isolation from the global system and poor incentive structure.
- c. Most important infrastructures in Nigeria are either inefficient, weak or non-existent. For instance, in the energy sector, the per capital availability is one of the lowest in the world. Hence, majority still depend on traditional energy sources. In the same manner, teledensity is extremely low, health infrastructures are weak, water supply is poor, road, rail, air and port facilities, among others are in bad shape. All these sectors are still dominated by inefficient State Operated Enterprises (SOE). Hence the capacity of the economy to attract technology intensive FDIs outside the oil sector, has been impaired. Indeed, many of the existing investors have had to relocate.
- d. ICT infrastructures are not developed in line with global practices. ICT has become the major driver of the global economy and may be a major tool for achieving the MDG. In Nigeria, the per-capital expenditure on ICT is still very low.
- e. Human resource development, which is a major technology driver, is not given priority in Nigeria. Though, there has been a steady increase in school enrolment and literacy rate, there is severe dearth of quality manpower, capable of

running a modern technology-driven economy. If the nation is to achieve any meaningful result in this area, emphasis must be laid on science education from the elementary school and children encouraged as such. For instance, it is surprising that Nigeria, like many other African countries does not participate in the International Mathematical Olympiad, which is aimed at fostering a spirit of competition in mathematics among the youths. No doubt, mathematics is the basis for science and technology emancipation and can only be neglected at a nation's peril. Indeed, Nigeria would need to build a stock of skilled manpower, capable of adapting the remnant of existing imported technologies for local use in the manner of Malaysia, where quality manpower has been a major facilitator of FDI

f. There has been no adoption of localised solutions that correspond with the nation's development stage. R&D is not given a pride of place and when they do in few cases, the result is not commercialised because of weak institutional settings. Increased dependence on imported technologies, particularly in the energy sector has lead to the collapse of many infrastructures. A vivid case in point is the collapse of many of the refineries as well as many of the power infrastructures. As if that is not bad enough, the nation has just launched a communication satellite with the assistance of China without the required follow up technology. It is only a matter of time before the ground station becomes unserviceable.

g. Structural impediments have disabled Nigeria from attracting technology intensive FDIs into the real sector of the economy. Accordingly, the economy has consistently depended on primary products. Several attempts have been made to diversify the economy but without focus on value-addition. Again, the prevailing policies are not conducive for value- added investments.

h. Public-private sector collaboration is very weak.

j. Manufacturing capacity has been sinusoidal and not based on innovative solutions. Infrastructure deficiency has made the sector very uncompetitive.

k. There has been sinusoidal growth in the economy as a result of over dependence on commodities. This has exacerbated the situation of inequality

55. The options available to Nigeria, which is the object of this chapter would provide answers to the question, ‘what strategies should Nigeria adopt in order to take advantage of technology to accelerate her development?’

THE WAY FORWARD

56. Essentially, the economy, which has remained commodity driven, would need to be progressively diversified to manufacturing and value-added services. This process must be driven by technology application. To achieve this, the Government would need to partner with the private sector. While the Government would provide suitable long-term policies, the private sector would act as the driver of the economy. As a starting point, all major infrastructure facilities would have to be privatised. Interestingly, that process started a few years back but has not made any rapid progress. There is also the need to reform the educational sector in line with global practices. Incentives must be given to private sector operators who are able to complement Government effort especially for industry-specific human capacity development. In summary, the following reforms need to come to effect.

a. Market-Oriented Long-Term Policies. Nigeria needs to develop long-term Policies that focus on market economy with the private sector as the main driver and technology as the development engine. At the same time, the public sector needs to be restructured for better efficiency, reduced corruption and must partner with the private sector. Policies must be well informed and ICT driven. Of particular importance is the fiscal and monetary policy focus. This must be directed towards encouraging savings, in order to facilitate financial sector support to the investing community. However, all these can only take place in an atmosphere of stable polity.

b. Accelerated Human Resource Development. There is a dire need to focus more attention on manpower development with particular emphasis on science and technology. Educational budget would need to be increased, possibly in line with UNESCO recommendation, and with funds set aside for technology acquisition. Indeed, this must be integrated with the national science and technology policy, with more attention towards the software as supposed to the hardware. Similarly, there

must be emphasis on R& D, which must be directed towards usable science and technology knowledge. ICT must also be given priority.

c. Development of Infrastructure. Immediate attention needs to be paid to the infrastructures of power supply, telephone lines, water supply, road transport, waterways, air transport, port facilities, etc. Indeed, there may be a need to declare a state of emergency in these sectors. Ultimately, however, the Government would need to liberalise the sectors with private investors playing a major role.

c. Diversification Through FDIs. The Government would need to focus attention on non-oil related, technology-intensive FDIs, with the establishment of Free Industry Zones (FIZs) that would facilitate manufacturing of exportable goods. Mouth watering incentives must also be provided to the investors in proportion of value addition, technology addition and export orientation. Investors must be encouraged to establish in less urban areas, in order to create jobs, alleviate poverty in the rural areas and discourage migration to the urban centres. That presupposes that agriculture, which would provide the raw material in the rural areas, would have to be given a boost, through the availability of necessary infrastructure.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

CONCLUSION

57. The World has never witnessed socio- economic development the way it did in the last century. Many nations have been transformed from primitive society to developed ones, where the citizens are healthy, educated, gainfully employed and resourceful. Yet, many others, particularly in Africa, Latin America and Asia are still in the dilemma of how to develop. Nigeria happens to fall into the latter category.

58. The case of Nigeria is a paradox of a nation so richly endowed with a variety of resources, yet, with the majority of her people living in poverty. On the other hand, a nation like Malaysia, with a similar colonial history and same condition of development about half a century ago, has been transformed to a middle-income country in just about 50 years. This therefore informed the need to carry out a comparative study of the developmental history of Nigeria and Malaysia.

59. An hypothesis was formulated and comparative studies carried out. From the studies, it was discovered that Malaysia's development has resulted from a sustained use of technology, a process that has been facilitated by stable, market-driven, long-term policy focus. Also germane to the development of Malaysia has been her sustained focus on quality Human Resource and persistent drive to upgrade her infrastructure. Consequently, for a long time, the nation of Malaysia has been one of the preferred destinations for value-added, technology-intensive FDIs. The economy has therefore been resultantly transformed from commodity base to a technology driven one and it's moving towards a knowledge economy. Therefore, if Nigeria must follow the path of Malaysia's development, she must be open to structural transformation. This transformation would have to be holistic and would cut across

all facets of the nation's socio-economic environment. Firstly, the long term policies must shift from Government regulation to market orientation, with particular attention on science and technology biased Human Resource development. She would also need to pay attention to infrastructure development, with the sector completely liberalised. Finally, the economy would have to be diversified through the establishment of FIZs and provision of mouth-watering incentives for investment in technology-critical, high-quality, export-oriented manufactured goods. This paradigm shift cannot be momentary. It would have to be in phases, with realistic targets set and periodically monitored. These are the only ways Nigeria can take the advantage of technology to transform her economy in the 21st century. The time to start is now.

RECOMMENDATIONS

60. In summary, based on the foregoing, the study recommends that:
- a. Nigeria should develop market- oriented long-term policies, with focus on HRD.
 - b. Nigeria should liberalise her infrastructure sector so as to attract technology-intensive FDI's into the sector.
 - c. Nigeria should diversify her economy through the establishment of FIZs and provision of incentives for technology critical investments.
 - d. Nigeria should focus attention on high quality, technology value-added, export-oriented manufactured products.