

Nigerian National Merit Award

AWARD WINNERS' LECTURE

Infrastructure As A Basis for Industrialization

Delivered at

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Nigeria Prize for Science Award

By

Professor Bart O. Nnaji, FAS, FAEng, OON, NNOM

William Kepler Professor of Engineering

and

Director, United States National Science Foundation Center for *e-*

Design

University of Pittsburgh, USA

And

Chairman/Chief Executive Officer

Geometric Power Limited

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Preamble

Distinguished Ladies and Gentlemen,

It gives me great joy to present my National Merit Award Winner's lecture at this University. I am quite impressed at the growth of this institution and have admired this state for finding the will to provide the resources necessary to build the physical infrastructure of this institution. Many a time I have wondered when I would have the opportunity to step into this institution to compare whether the inside matches the beauty of the outside. I therefore would like to thank the Governing Board of the Nigerian National Merit Award for providing me with the opportunity to make this comparison. I would also like to express my gratitude to my beloved country, Nigeria for finding me worthy of this highest honor of intellectual achievement for the nation. For those of us who labor in the vineyard of academia, there is no greater reward than your people's recognition of your intellectual contribution to humanity. I would also like to thank Kogi State University and my good friend, Professor Idachaba- the Vice-Chancellor, as well as the state governor for hosting this lecture.

Introduction

In the mid-90s, I participated in the Vision 2010 Committee. The Committee decided not to spend its time lamenting on Nigeria's past inadequacies, but rather to concentrate on where we are, where we want to go, and how to get there. We all found it quite refreshing. It was not because we wanted to forget the past, or that we were ignorant of the importance of history in shaping the future. It was rather that Nigerian can get bogged down with the past and forget about looking how to navigate the challenges that exist in order to land us safely into a brighter future. For this reason, I will start by looking at where we are, politically, economically, and industrially.

Increasingly, more Nigerians are moving from rural communities to urban centers. Still, over two thirds of Nigeria's population resides in rural areas. With the draw of oil induced income gap between the rural and the urban dwellers, it has become very difficult to justify why anyone would want to stay in the village where there is no infrastructure for advancement. A World Bank study on Nigeria states that "increasingly, poverty in the country is wearing a rural face. From 28.3 percent in 1980, poverty among the rural population grew to 51.4 percent in 1985. It has since risen to 69.8 percent in 1996. Poverty tends to affect men and women differently. Women are generally less educated, more vulnerable, deprived and powerless than their male counterparts. Poor people experience insecurity and vulnerability (drought, desertification, flooding, deforestation, diseases, volatile commodity markets etc.); lack of empowerment to influence public policies

according to their priorities; and lack of opportunities for income generation and benefits from markets. Access to education, safe water supply, sanitation, health, modern energy, telecommunications and roads are important in reducing vulnerability and increasing prosperity.”

We can look at our large rural population with the perspective of the glass being half-full or half-empty. The large rural population can be an asset. Many evolving countries engage in various kinds of gimmicks to attract their people to the rural settings to decongest the urban areas and stimulate development of the rural areas. Nigeria can take advantage of the existing situation and *take development to the people*. President Obasanjo has said he wants to see the country’s economy grow at 10% a year. However, the Governor of Central Bank of Nigeria earlier this month said that this 10% economic growth is not feasible this year. He attributed this to the drop in oil output. He however said that “non-oil sector will probably grow by 10%, but we may not get aggregate growth of 10%”. The country is therefore capable of achieving this growth rate but must be poised to encourage development in rural areas as well as in urban settings. All Nigerians must be empowered to see themselves as productive entities in the countries growth engine.

With a population of more than 140 million people, Nigeria is the largest country in Africa. It is often said that for every 6 Black people, one is a Nigerian. It accounts for 47 percent of West Africa’s population and 41 percent of the region’s GDP. Nigeria’s population is made up of about 200 ethnic groups, and 500 indigenous languages. These are all blessings and at

the same time burdens for the country. Failure by the country can translate into failure for the sub-region; while success can mean significant advancement for the Sub-Saharan Africa and the entire people of African Descent.

Although much work remains to be done, Nigeria has started to put in place the building blocks for becoming an industrializing economy.

In April 2003, Nigeria successfully held its second consecutive national elections, further consolidating the transition from military to democratic rule that began in 1999. Its international standing has increased as the country moved from dictatorship to democracy and started implementing economic reforms. Nigeria is a leading player in the Commonwealth, in the New Partnership for Africa's Development (NEPAD), and in the Economic Community of West African States (ECOWAS). The government efforts in the fight against corruption are improving the country's international image through Transparency International surveys and other results. Streamlined due process procedures at the federal level are ensuring that public money cannot be disbursed for investment spending unless procurement procedures have been respected. The government is also committed to forcefully implementing the Nigeria Extractive Industries Transparency Initiative (NEITI). For the first time in Nigeria's history, a financial audit for the oil and gas sector over the period 2000-2004 has been completed and made public. Now, we are beginning to hear that the Economic and Financial Crimes Commission is determined to root out looters of the economy from

contesting in the 2007 elections. At the very least, there is an oasis of probity visible from the vantage view point of the Nigerian masses.

The Nigerian Economy

Nigeria is a mono-product economy that depends heavily on the oil sector, which contributes 95 percent of export revenues, 76 percent of government revenues, and about a third of gross domestic product (GDP). With its large reserves of vibrant human and natural resources, Nigeria has the potential to build a prosperous economy, reduce poverty significantly, and provide the health, education, and infrastructure services its population needs. Despite the country's relative oil wealth, poverty is widespread — about 37% of the population lives in extreme poverty.

Nigeria's macroeconomic performance over the last two years has been commendable. World Bank statistics shows that the economic reform efforts are showing positive results including:

- In 2005, growth continued to be strong at 7% for the economy as a whole and 8% for the non-oil sector. In the first quarter of 2006, the Nigerian economy grew by 8.3%.
- In 2005, the country achieved debt reduction from \$35 billion to \$5 billion.
- In January 2006, the country received its first credit rating (BB-) from Fitch and Standard and Poor's.
- Year-on-year inflation fell from 28% in August to 12% by December 2005.

- The country introduced a Fiscal Responsibility Bill and a Public Procurement Reform Bill.
- A bank consolidation program was implemented strengthening the financial sector and enhancing its ability to provide credit to the private sector.
- The import tariff regime has been liberalized reducing the number of tariff bands from 19 to 5 and lowering the average tariff from about 29% to 12%.

Nigeria is taking strides in the implementation of its economic reform program — the National Economic Empowerment and Development Strategy (NEEDS), which was launched in 2004 to boost growth and to help achieve the Millennium Development Goals (MDGs). Some of the objectives of the NEEDS initiative include gaining:

- i) improved basic services for human development;
- (ii) improved environment and services for non-oil growth; and
- (iii) enhanced transparency and accountability for better governance.

The various state governments have followed suit by implementing their own State Economic Empowerment and Development Strategy (SEEDS).

The Nigerian government has therefore set in motion many of the reforms necessary to lead the country to steady economic growth in the range the President envisions and subsequently take the country on the path of industrialization. While these are indeed tremendous achievements, the country remains largely a single product economy. There is little chance that

Nigeria can achieve mid-level economy with its population without significant diversification of both its export products and its domestic consumer products. I often cite the case of Germany as illustration of a diversified economy: In Germany, there are over 2 million different products sold by the country each year, and automobiles of all kinds are just one single product. We have to remember that Germany is that country that produces Mercedes Benz, BMW, Porsche, and Volkswagen and yet all these constitute a single product. A country such as China which is a relatively new economy, can boast of a diversified economy where its exports to United States alone annually amounts to over 10 billion dollars in electronic components, electrical equipment and parts, 10 billion dollars in toys, games and sporting goods, 8 billion dollars in apparel ,fabrics and fibers (other than footwear) 7 billion dollars in footwear, 5 billion dollars in machinery equipment and parts, 4 billion dollars in mineral, chemical, plastic, and rubber goods (including fertilizer), 3 billion dollars in leather goods (other than footwear), 3 billion dollars in furniture, bedding and lighting, 2 billion dollars in food, agriculture, forest products, 8 billion dollars in other goods. This amounts to a total of over 58 billion dollars in exports to only the United States of America alone. In all these economies, enabling infrastructure is taken for granted.

In the case of Nigeria, this enabling infrastructure is the major bane for industrialization. Infrastructure goes beyond what we typically view as infrastructure. It can include physical security, transport, ICT,

telecommunication, water, health, education, financial, power, and technology.

In order to appreciate the impediment of infrastructure to industrial development, let us look at the case of two friends who studied chemical engineering and went on to receive MBAs from a prestigious university in America. Kaoglu is Turkish while his friend John is a Nigerian. John was always coming first in class while his friend Kaoglu was usually second. Both had made a pact upon leaving school that they will both set up in their various countries a plastic pipe manufacturing business after 5 years of gaining experience from a pipe manufacturing company in America.

Industrialization Requirements

The Nigerian returned to Nigeria and proceeded quickly to employ his skills to building a company he called Niger Plastic Pipes Limited (NPPL), whose primary purpose is to manufacture plastic pipes for domestic use and export. His Turkish counterpart established a company he called Istanbul Polymer Pipes (IPP) with the same objective.

In the first place, John found no difficulty in registering Niger Plastic Pipes as a limited liability company. His challenges however started after he developed a bankable business plan. He found that he could not borrow money because he had no collateral. After trying for about a year, the

Managing Director of a bank who knew his father, mother and grand parents on both sides decided to take a chance on him, but for a price...his interest rate will be 21%! He was so excited he immediately called his friend in Turkey who told him that he had gone very far in building his factory...that with his bankable business plan, his education etc, the Turkish Small Business Administration was able to guarantee a loan for him at a significantly reduced rate of $\text{libor} + 2\%$ which came to approximately 5% after all costs had been calculated. Immediately he knew that he would have serious problem competing with his friend in the International market selling plastic pipes. He however felt that he could balance out with labor costs, he employed frenetic energy to catch up.

He acquired land but suddenly just when he was about to clear the land, the youths of the area appeared! He had to negotiate with them, and it took him the greater part of one month to arrive at an agreement which included employing 20% of his staff from the local area. The community leaders would send him those to employ whenever they wanted, regardless of his requirements.

He quickly ordered his equipment. When they arrived at the port, he found that he had to pay huge bribes to clear them from the port.

He was counting on the local Government to provide him with access road to his factory especially with the investment he was bringing to the area. He was surprised to find out that he had to build a half kilometer access road to

his factory which would cost him a lot of money if he were to tar it. He therefore decided to compromise and use gravel.

He finally brought his equipment and proceeded to build his factory. In the business plan, he was counting on the Electric Power Company to provide him with adequate, reliable quality electricity for his factory. The location of his factory is near the urban area so it has public electricity.

In his plan he needed to hire two expatriate engineers. One key requirement for them was healthcare of the quality obtained in their country, United Kingdom. He found that he could not obtain anywhere, the sort of quality healthcare his expatriate engineers would trust. Therefore, for very simple illnesses, they would have to be flown abroad for treatment. But, he was determined to get this industry started especially since he could get rid of the expatriates after a couple of years of training the local staff at his plant.

He employed four engineers to understudy the two expatriates. He found that on paper, they all looked very good, each had a first class or second class upper in engineering, but after their first month of working in the company, he discovered that two of them did not really understand basic engineering and with the stories he heard, he concluded that they must have obtained their certificates by “sorting out” their lecturers. The other two had basic theoretical knowledge and were willing to learn. The company decided to invest further resources in training them.

The location of NPPL is such that they could get easy access to telephone services but it would take up to a month to connect them, unless they provided cash incentives to the workers, which they did, and were quickly connected. They found however that they would receive bills which were very bloated and management could not understand how they incurred such large bills. After some investigations, they found out that their lines had been compromised and they had other non-company users on the same line, but they had to pay!

Finally, NPPL quickly discovered that they could not rely on the public electricity company. Their process would suddenly be interrupted without notice, requiring the scraping of all the raw materials in the production process and subsequent delay in order to clean the equipment for new raw materials after the plant cools down. Each interruption cost then about two hours. So they decided to invest in generators. Their calculation showed that they needed about half a mega watt of electricity to operate their manufacturing plant. They decided to invest in engines totaling one mega watt. For reliability, they bought three engines (1 x 400KVA engine, and 2 x 300KVA engines).

John was now happy because he believed that he was in control of his future. However, he subsequently realized that he was now also in the power production business and had to deal with the logistics of diesel delivery to run his generators. He also quickly found out that the diesel suppliers would collude with his staff to under-supply him with diesel at the same price.

After operating his generators for a few months, he found that it cost him approximately N35.00 (Thirty Five Naira) to generate one unit of electricity whilst supply coming from the public electric company or a private electricity producer dedicated for that purpose where available could sell him electricity for one quarter of that amount! After about two years of struggles with finance, road, boreholes for water supply, telecommunication, the youths, retraining of staff, and supply of electricity, his company was now operational, and producing plastic pipes.

After about 6 months of commercial operation, a gang of 20 armed youths raided his plant. They came prepared with a vehicle and tools to cart away the company safe and dispossessed every worker with whatever money they had. They also took the vehicles of the top management staff and vanished. All reports to the police and efforts to find the robbers and recover their property came to futility. The next morning after the robbery, the two expatriate staff announced their immediate departure back to the United Kingdom for good!

Our friend, the dedicated Nigerian investor John has now been “baptized” in the challenges of doing business in Nigeria. He decided to take a vacation to Turkey to see how his friend was doing. On arrival there, he realized that his friend had been producing pipes for 3 years and was getting electricity at less than a quarter of his price in Nigeria. He had superbly trained technical staff as well as staff at all other levels. Kaoglu also informed him that the Turkish government had eagerly provided all sorts of incentives for him,

including the access road, pipe-borne water, significantly reduced taxes, and that he never has any fear for his life or property.

John became certain that his friend's company IPP was now way ahead of NPPL. The company was now expanding with much support from the relevant authorities in Turkey. Their product was internationally competitive, having being produced with world standard input in infrastructure and the low cost of money. NPPL could no longer compete with IPP.

John took time to reflect on his predicament and his experience. He thought to himself, it certainly was not his intellectual capability that was the problem since he was ahead of his friend in school; it was not his energy level or his business acumen either since he performed better than his friend Kaoglu at the American Pipes Company, so he concluded that it must be the Nigerian environment. He then narrowed it down to lack of adequate infrastructure in most of the relevant areas.

John started to consider the option of returning to America where he would still command high salary in the private sector. But then he began to wonder whose responsibility it is to rescue the 140 Million Nigerians, many of whom have the same basic intellectual capability as him, though without the good fortune of having studied abroad. He felt that if all those who met with his experience just cut and run, the country would never develop, therefore Nigeria would continue to flounder, and so would Africa, and so would the

Black race. John being a focused man and a believer in his country Nigeria decided he would go back and face the challenges with greater caution and mitigate against them.

Infrastructure Needs

Let us examine the infrastructure challenges that John's business faced and how to address them in order to create a more conducive environment for similar investments and industrial development in Nigeria.

Infrastructure Needs: Physical Security

First, is the need for physical security. Every day, there are stories of armed robbery attacks in various parts of the country. Obviously, the level of youth unemployment is at the root of the problem, but so also is inadequate and ineffective security apparatus put in place by government. About a month ago, a very distinguished and highly respected seventy year old woman and a close family friend had a harrowing experience when her car was snatched by armed robbers while fuelling her car at a petrol station. A week before that, a banker working on a project with our company also had the misfortune of having his car snatched by hoodlums. These are people I know, and I am sure that we all have similar stories of people you know too. We are happy when there are no loss of lives from such incidents. Two months ago, the bankers in the city of Aba where we are building an

independent power plant decided to close their businesses due to incessant armed robbery attacks! Although the Federal Government has since responded to the Aba issue, it seems as if the robbers simply relocated their operations elsewhere.

Infrastructure for security of lives and property is therefore a critical element in development. Such infrastructure would include equipment for the police, vehicles, radio communications, training, uniforms, weapons with bullets, appropriate salaries and welfare packages to prevent the police from transforming from being your protector to your oppressor in order to make ends meet.

Infrastructure Needs: Transportation

Transportation of goods and services including easy mobility for people constitutes a critical infrastructure requirement for industrialization. Light goods can be transported by roads, but heavy goods and equipment would need to go by other means such as rail transport or by the water ways. I am happy to hear of President Obasanjo's announcement of a 25 year plan to connect all states of Nigeria with efficient railway network. It will go a long way in reducing cost of long distance transport as well as road accidents with attendant congestion on the highways.

In the case of water ways, the seaways must be developed. That means the river Niger, river Benue and other larger rivers in Nigeria should be dredged

thereby making it possible for people and goods to be transported by marine vehicles.

One must commend the Federal Government's reform of the airline industry by placing an age limit on commercial aircrafts that can operate within the country. However, most travelers to the USA still have to go through Europe! This is an unacceptable way for business travelers to make use of their time and resources. Reliable, cost effective, direct flights from Nigeria to USA and similar countries should be facilitated in order to reduce the cost of travel and related loss of valuable resources. In addition, direct flights from Europe and America to other destinations in Nigeria other than Lagos, Abuja, Kano and Port Harcourt should be developed, preferably by our operated airlines.

Finally, the Federal Government must do all in its power to improve the quality of the national road network. Nigeria has a reasonably good road network. However, much of the road network has become dilapidated due to inadequate maintenance. Furthermore, infrastructure should be put in place to have periodic locations for addressing the problems of travelers including for decency, restrooms, emergency aids for accident victims, facilities for towing and repairing broken down vehicles, security along the public highways, adequate police patrol, etc

Infrastructure Needs: Information and Computer Technology

Tremendous effort has been made by the Federal Government through the Ministry of Science and Technology to provide structure for the country's ICT infrastructure. The private sector has also been fully engaged in this area. One can say that it is one of the infrastructural areas in which Nigeria has seen a tremendous boom in the last ten years. Still, much remains to be done. For example, primary, secondary and tertiary institutions in the country need easy access to computing technology and the internet. This will go a long way in giving them exposure to the world and preparing them to compete with their counterparts in other parts of the world.

Infrastructure Needs: Water

Less than fifty percent of Nigeria's population has access to quality potable water. Even less, has access to pipe-borne water. It is remarkable that in many cities in this country, pipe-borne water was available thirty years ago. The same communities in urban areas that had this pipe-borne water no longer have such access. It has become commonplace for people to expect that individuals and businesses will provide their own water by drilling bore holes. It is government's responsibility to provide water; otherwise it should privatize water provision to ensure the availability of clean water for businesses and residential homes.

Infrastructure Needs: Health Care Delivery

In the area of health care, a lot of Nigerians are walking time bombs. Even simple medical check-ups seem untenable to some people. Many Nigerians do not perform basic medical check-ups, partly because of the cost and partly because of superstition. Many still believe that only native doctors – “Babalawos” --- that perform incantations with the spirits have an answer to their illnesses. Wealthy Nigerians go abroad each year or many times a year to perform their own medical check-ups. Unfortunately, this is a serious drain on the economy. If Nigeria had some first-class hospitals specializing in a variety of illnesses, these people could have saved themselves and the nation a lot of money. It is not expected that the government will be the sole provider of these hospitals. There can be public and private sector partnership hospitals; and there can also be purely private sector hospitals. Some young Nigerian doctors that I know in the U.S have begun the effort of building one such hospital. They received funding from the U.S department of Trade to do a feasibility study more than a year ago. Since then, they have lined up private finance to build the hospital. The hospital makes economic sense in its location near Port Harcourt and in terms of the technical capability of its medical personnel. We eagerly await the completion of the hospital. Incidentally, the hospital will benefit from the power plant being built by our company, Geometric Power Limited, in Aba which will provide reliable electricity to the hospital. As you can imagine, you do not want to be on an operating table when power goes out in a hospital. Private groups and the government should do all that can be done to create such medical facilities around the country. In cases where people cannot afford to pay, the national health insurance scheme can come to the

rescue. With the leadership of NAFDAC ,it will be possible to deliver reliable drugs to hospitals and pharmacies in the country to support healthy healthcare delivery.

Infrastructure Needs: Education

The country's educational system has severely degenerated. I am pleased to see the effort of the federal government in trying to uplift and restructure the educational system. However, we must recognize that many teachers received education during the "hand out era" and were not able to realize that it is necessary to read books aside from the ones recommended by their teachers and the ones in the syllabus. They, in turn have conveyed this poor practice to the students they teach, engendering a belief in these same principles amongst their own students. They understand the hand-out syndrome. You therefore have students being taught by these teachers who do not have the building blocks for imparting knowledge. We also have schools that do not have the minimum level of equipment and therefore cannot teach the basic skills required for students at the various grade levels. Thus there has been a proliferation of private schools, especially by people who are frustrated with the quality of service coming from government-supported schools. There was such a time that if you went to a government college you would have received first-class education. This is no longer the case. The minimum that state governments and the federal government should do is to ensure that schools under their care meet minimum international standards of quality. Otherwise, those schools should be

privatized so that either private groups or religious institutions can take them over and elevate their quality. Another aspect of education that has diminished or disappeared is vocational education. In developed countries, workers trained in vocational institutions like electricians, plumbers, artisans and mechanics represent a significant percentage of the workforce. In the past, in Nigeria, these workers took different levels of City and Guild certification. Today, the institutions that produce these workers that form the bedrock of operational society infrastructure are few and far between. There is a significant need for reestablishment of such educational processes. It is not everyone that can pass through or even would like to pass through tertiary institutions as currently instituted.

Infrastructure Needs: Financial

I can testify that the consolidation of the banking institutions has been good for undertaking privately-financed medium to large projects in Nigeria. Two years ago, only a few of the 89 banks then could finance projects of a hundred million dollars or would even be willing to undertake such projects. Today, virtually all of the existing banks can actively participate in such projects. In addition, the controls set up by the regulatory financial institution which is the Central Bank of Nigeria and the other economic reform initiatives of the government have helped in pointing the financial infrastructural development for private sector project finance in the right direction. The banks, however, will need to employ their 10% after tax

profit intended for investment SMEs to finance bankable projects to begin to stimulate diversity in the creation of new industries in Nigeria.

Infrastructure Needs: Electricity

After food and water, electricity is perhaps the next most important infrastructure motivated need of humans. In a developing economy, this need is particularly acute since there is no way to stimulate development without an adequate supply of electricity. John, as I described earlier, experienced this firsthand. As at this moment, Nigeria has about 4000 MW (four thousand megawatts) of available generating capacity. It plans to have about ten thousand megawatts by December 2007. This represents more than a 145% (one hundred and forty-five percent) increase. But more importantly, the Government has embarked on the unbundling of NEPA, now Power Holding Company of Nigeria. This includes the creation of 11 distribution companies, 1 transmission company and 6 generating companies, all from existing NEPA (PHCN) assets. In addition, the government through the reform program is allowing the establishment of Independent Power Providers (IPPs). It has set up a number of institutional enablers for a market-driven power sector, including the creation of the National Electricity Regulatory Commission, NERC.

These are all excellent developments. It is a result of these reform initiatives by Government that our company, Geometric Power Ltd, began the 140MW power plant project in the industrial city of Aba, Abia State. This power

plant will generate power that will supply electricity for the entire city of Aba, including industrial, commercial and residential customers. The design configuration will guarantee absolute reliable electricity for the city and ensure that the electricity requirements by industries will be reliably and qualitatively met at a fraction of what it costs them to self-generate their own electricity. We expect that city of Aba will wake up one day and discover that it has become the first city in Nigeria to have absolute reliable electricity in the country.

Our company is also facing some of the challenges that John faced. And like him, we are determined to surmount the obstacles. We have been able to line up the top International investors to support the project as well as our own local banks. Some of the International investors include the International Finance Corporation (IFC) of the World Bank Group, the World Bank itself, The European Investment Bank (EIB), Emerging Africa Infrastructure Fund, and InfraCo, a UK based infrastructure development investor. Locally, we are also working with major banks such as Diamond Bank, First Bank and UBA.

Infrastructure Needs: Technology

This is an area where Government can do much to provide momentum for Nigeria to catch up in various areas, and move ahead swiftly in some others. Although Nigeria has universities and national laboratories, the efforts of these institutions have not been felt in the generation of new products that

result in commercial industrial ventures --- in the same way as Microsoft operating system became a worldwide product phenomenon, various drugs that we consume to heal ourselves came out of the research laboratories in many Western nations. Products such as cell phones, automobiles, refrigerators, aircrafts etc, all came from research laboratories of universities, national laboratories or company laboratories in the Western world. There is nothing stopping Nigeria or Nigerians from coming up with original products in the same manner.

We have not developed the culture of developing new products, industries, and manufacturing; due in part to lack of enabling infrastructure. Now, we must understand that technology leads to products, products lead to companies, and companies employ people. You would have professionals, managers, construction workers, scientists, and lawyers etc. who are employed in the productive sector. When people are employed you have prosperity because it is prosperity that makes it possible for people to have money to spend and in a prosperous society the government is able to collect taxes because people can now feel comfortable paying taxes. You have better quality of life, people live longer. You have high quality of education because people can now afford to pay for the education of their children. You have stable government because people are not too cantankerous about what people at the center of power are doing because they can see the result of what the people at the center are doing.

So this is a cycle since a society that is prosperous and knowledgeable is going to be able to invest back to the root of its success which is education, science and technology, innovation, infrastructure and the cycle goes on and on.

Government must recognize the role of the universities, that the universities, in effect, in all developing countries, constitute the engine for generating new ideas. Consider that a student after the bachelor's degree has certain basic knowledge about how to function in a chosen field of study. But the universities when they operate post-graduate studies essentially have qualified graduates, say engineers, who work at severely reduced pay to produce new products.

In America, a lot of companies grow out of the universities. They will evolve because professors and post graduate students work on ideas and the post graduate students who have been properly trained in entrepreneurship take this product out of the university environment and establish companies. When a company is being formed, it is entirely possible that other students who studied business administration could be involved in doing market plan for the product. In America, the government encourages such small companies through what is called *small business innovation research* program. The idea is to give those small companies a period of time where they are partially supported by government to fully commercialize the product. During this period, venture capitalists step in to invest in this great idea. You will find that most of the giant companies in America were formed this way. But it requires the realization that it may take a few years

to start making a product. In fact, some medical products take 10 years to make profit. But it is only people who invest this way that become stupendously rich because they are not investing in now but in tomorrow. As a company grows, the government continues to support the company by providing infrastructure and incentives. It is not only through the universities that ideas can come from. It is the national institutes that produce the most product prototypes for commercialization in Nigeria. Unfortunately, they have not had takers for their ideas in spite of all their advertisement of their new products.

So the national laboratories or institutes are in fact veritable sources of new products. Another source tends to be company laboratories. Unfortunately, in Nigeria Company laboratories don't make new products because all the new ideas come from the mother companies in Europe or America or such far flung territories. But Nigerian companies must develop the spirit of advancement of their products and creation of new ones and the only way this can be done is to have company laboratories. The final source of new ideas tends to be the citizens. But they have to be the educated citizens, the ones who know that a particular idea fills a void that does not exist in the market, the global market. So, what we say here is that the government can provide grants and guarantee loans and, to some extent, enabling laws to universities and individuals and national laboratories who then generate enterprises by using their professors, post graduate students, quality laboratories. Now a government program that awards grants must completely be structured to ensure transparency and to ensure that

corruption cannot set in. Without getting into the details of this, I would say that the government needs to establish an agency that merely makes research and development awards. But it should also empower the major ministries, like science and technology, the major institutes and the ministry of defense to have the ability to support basic research and operate a small business innovation research and development program.

I am pleased that the government has announced plans to set up exactly this type of agency to be called the National Science Foundation (NSF). The proposal calls for the Foundation be endowed with US\$5 billion or 650 billion NAIRA.

Sampling of other areas:

In the area of agriculture, universities, national laboratories and private sector must work to evolve industries for production of farm equipment, for the improvement of seedlings, example, grains that are resistant to certain insects which cripple our farm grain product, tubers that are larger, yet healthy for consumption. We must have a program to check erosions. Right now there are parts of the country that are eroded by water and desertification. But it is not so difficult to check these problems of nature. We should work to add value to our agricultural produce so that we don't ship the raw materials to developed countries in Europe and America and they ship back the finished products to us. We should be able to ship finished products to them as well. The infrastructure needs in this case

would include equipment manufacturing and maintenance companies, research in seedling production and preservation, erosion and desertification control program, etc.

In medicine and pharmacology we should capture the fast disappearing healing traditions of our ancient ones. It seems that it is something that we have that those other countries of the world do not have. There must be certain originality about us. I am happy to note that the country made a recent break through with the development and testing of a drug to control sickle cell anemia. We should have infrastructure in the form of well equipped laboratories to encourage this type of research and product evolution.

Concluding remarks

Ladies and Gentlemen, we are certainly living in interesting times, although you cannot predict tomorrow, we know that tomorrow will be bright! We know that when you do the right thing, the final outcome will be right. We know that if we are consistent in advancing the building blocks for infrastructure, that we will unleash the creative instincts of Nigerian humanity that our people's drive to achieve success in productive ventures will overtake the drive for corruptive ventures. We know that basically our people are good but they need to be taught how to fish and be given the fishing tools. This is what infrastructure will bring.

Infrastructure will provide the tools with which our great people will apply their ingenuity to create numerous industries that will diversify the economy. We know that infrastructure can help turn the informal sector into formal sector in Nigeria. That shoe producers who make inconsistent quality of shoes and stamp them “made in Italy” instead of “made in Aba” will now produce consistently made shoes no matter the number that the whole world will be proud to wear their shoes, and they will proud to stamp “Made in Nigeria” on them. We know that the garment makers who produce inconsistent quality of fabrics and clothes can be converted into manufacturers of seamlessly sown clothes to be worn in America, Europe and Africa. We know that Nigeria can easily become a vast workshop of entrepreneurs brushing by each other in trains and motor ways as they head to the next business opportunities, provided by efficient working infrastructure of Nigeria. We know that this is a place where all Black people can suddenly be so proud to be part of, all because we CHOSE to do the correct thing, we CHOSE to be consistent. It will be because John CHOSE to stay and face the challenges of Nigeria in spite of its intrigues rather than flee to “greener pastures”. It will be because you and I CHOSE to follow that example. I ask you to do all in your God given power to make your presence felt on this earth. Ensure that you contribute something towards the upliftment of your fellowman. Let us as a people work together regardless of ethnicity to build the infrastructure that will lift Nigeria into an industrialized nation. Let us teach ourselves how to fish, and provide the tools for fishing.

Once more, I thank the Governing Board of the Nigerian National Merit Award for this honor. I also thank the Vice Chancellor, the staff and the students of Kogi State University for hosting us.

Thank you for listening.