

IMPACT OF WOOD INDUSTRIES ON THE ECONOMIC STATUS OF MINNA NIGER STATE

BY

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2007/1/27276BT

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SUBMITTED TO

THE DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION,

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CERTIFICATION

I Hamman Usman with Matric No. 2007/1/27276BT an undergraduate student of the Department of Industrial and Technology Education certify that the work Embodied in this project is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

.....

Name

.....

Signature

APPROVAL PAGE

This research project has been read and approved as meeting the requirement of the Department of Industrial and Technology Education, School of Science and Science Education, Federal University of Technology Minna, Niger State for the Award of Bachelor of Technology Degree {B.Tech} (woodwork Technology) in Industrial and Technology Education.

Supervisor

sign-Date

Head of Department

Sign-Date

External Examiner

Sign-Date

DEDICATION

This research work is dedicated to God Almighty, my mother Hajiya Kudirat Abdullahi and my Uncle, Alh. Moussa Hamman for their undying moral and financial support.

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Abstract

This study was carried out to find out the impact of wood industries on the economic status of Minna Niger state. The Basic Techniques required in wood based industries, sources of industrial income of the state, challenges facing the wood industries, the operational activities of sawmill, and plywood veneer, particleboard and pulp/paper mills in Nigeria, and the future benefits of the wood industry were reviewed. The effects of tree harvesting and logging operations on forest biodiversity, soil erosion, and soil compaction were reported. Environmental pollution due to wood processing, wood utilization and waste management in forest industries was discussed. Methods of mitigating the detrimental effect of the operations of forest industries in Nigeria on the environment are suggested. A (40) item questionnaire was used to collect data. In order to achieve the aim and objectives of this study, mean scores of the respondents, and standard deviation were used as statistical tools to analyze the data collected. The survey revealed that most wood industries in Minna possess the potentials but, not the facilities and support it requires to make tremendous impacts on the economic status of Minna, as the challenges confronting them were beyond ordinary economic challenges. It is therefore recommended that the government of Niger state create a conducive and growth driven opportunity/environment for investors/industrialist who plan to make impact on the state through the wood industry, as the demand for wood products and wood bye-products are on the increase, also ensure the proper utilization of the available land and forest resources within the state.

CHAPTER I

INTRODUCTION

Background of the study

Wood is a fibrous rigid material of plant origin. It is broadly classified as hardwood and softwood. (Fuwape, 2000). It is a highly synthesized and optimized raw material from nature with load-bearing functions as one of its main functionalities. Wood is one of the most important raw materials, not only because it is used for literally hundreds of products but because it is a renewable natural resource with enormous benefit to the growth and development of any nation.

Looking at “wood and its benefits, it is anonymously presented to the populace of Minna as an unprofitable asset to the progress and development of the state as a whole, which inevitably would be accepted by a “novice as an unimportant material required to overcome the challenges of life in various economic sectors and professions.

As we all know, the entire human race depends on all sorts of energy in which water takes about 70% of such dependency and wood provides close to 40% of the items, energy, and facilities that are used to overcome the day to day human, industrial, economic, and environmental challenges (Gadgil, 2006). Wood industry is a multi-million industry which gives livelihood to millions of people around the globe. This is one of the industries which sustain the economy of every nation, especially those with vast forests to speak of. World statistics have shown that the wood industry contributes largely to the national system of production, distribution, and consumption activities of every nation in the world, (Hyde, 2011). If capitalized efficiently, wood industry will catapult Minna’s wooden resource to the peak of glorious economic condition.

Wood industry is ancillary to many industries. The construction industry, for example is one of the industries which cannot go on without it (Fuwape, 2005). There is no construction site anywhere which is devoid of wooden materials and we know very well how they support every construction project. A towering and majestic building may be covered with glass, a bridge may be seen as an all concrete structure with metal railings, a castle may look grandiose with concrete and steel combined, but all of them could not have been into what they are without wood, (Kathryn, 2009).

Wood-based industries in these part of the country according to (Abisoye, 2012) was established about 40 (forty) years ago, with the objective of tapping rich timber from the forest, and also to provide income and employment to the local people with overall economic development of the state with the increase in demand and encouragement by the government many saw mills and other wood-based industries sprang up.

Minna Niger state consists of two forms of wood-based industry; primary processors (forestry, sawmills) and secondary processors (Construction industry) which are formally and informally organized into cooperatives, self-formed associations and individuals. No tertiary processing industries (plywood unit mills, particleboards) has been established. The wood-based industry and wood products in the sector has not been growing as required to produce high quality product and to venture in competitive market of export, Niger state economic empowerment and development strategy (NSEEDS, 2004).

In Minna there are prospects to expand the sector considering its strategic geographical position, surrounded by richly forest resources as land mass, forest resources, neighboring states, hence can tap the resources. Most of the wood industries in Minna import large quantity of hardwood timber species for making high quality products from the south or western part of the country, of

which they are neighbors. Most of the industries in Minna have challenges unique to their particular operations though most secondary processing units share a number of traits and all primary processor units experience many similar constraints that affect the overall industry. Data on market conditions, importation and trend is virtually absent in the sector.

In the world of business, (Rosé tattoo, 2011) believed the wood industry to be one of the many favorites of businessmen, where to invest their money on. Feasibility studies would reveal that wood is indeed a lucrative activity to engage in. The supply is none of a problem and the demands of processed or non-processed wood products are high which means high profits for the investors.

In terms of technological advancement in the wood industry, this occurs on a monthly to annual basis, Nigeria and definitely Minna, Niger state contributes to the supplies of woods and its products to the international market, but lacks the qualities and standards of major industrial outfits overseas. Focusing more on our area of concentration Minna, Niger state which is believed partly to own the largest land mass in Nigeria with the availability of different kinds of industries, lacks basic technological advancement skills and potential and in essence is expected to provide to a satisfiable extent economic growth and development in different sectors of the capital city and the state.

Due to these essential reasons, this study would be carried out to show the loop-holes that cause the backwardness of wood industries in Minna, Niger state, at the same time highlight the possible solutions, additional value of wood to the economy of the capital city

Minna, state and country as a whole; Thereby showing the impact of wood industries” to the enhancement and economic development of the populace of Minna, the educational system, industrial standardization, energy opportunities, state and country as a whole.

Statement of the problems

As a personal witness and wood worker in the making, through vivid observations and experience, I would say it is an undisputed fact that “wood” as a product resource and major source of livelihood and revenue generator within the minna metropolis is seen as irrelevant. According to (Krafft, 2009) wood to a lay man is not a profitable or an essential product to the challenges of life and the general economy of a community, state, and country at large.

Since my first visit to Minna, over ten (10) years ago, it is shocking that such a state with large land mass and forest resource lacks proper and modern wood industries which could be of immense benefit to the state, economy, people and the nation at large.

Such philosophies are accepted this way because of; lack of basic research on its benefit, poor implementation of development strategies, inappropriate knowledge transfer in various educational/training systems, poor subject matter orientation/mentality, which leads to its discouragement of present and future benefits to the society.

According to (Tunji, 2011) one of the Niger state government vision 3:2020 policy thrust agenda, was adding value to manufacturing services and agriculture to facilitate the development of industrial clusters in the form of higher Technology Park and Industrial parks in the State, in other to enhance the industrial base of the State. Till date nothing of such has existed with strongly any reference to the possibility of the large available forest resource and wooden industrial market.

Purpose of Study

The purpose of this study is to determine the impact of wood industries on the economic status of Minna, Niger state. Therefore this study would specifically be aimed at finding out:

1. The benefit of wood techniques to the employment status of wood industries in Minna Niger state.
2. The extent to which wood is being utilized by wood industries in Minna Niger state.
3. The challenges of wood industries in Minna Niger state.
4. The impact of wood industries on the improvement of the Niger state economy

Scope of Studies

Looking at all the immense benefits of wood, this study shall focus on assessing the required techniques needed by the wood industries in Minna in employing technical and managerial staff, and also focusing on the economical impact of wood production (sawmills), and consumption (Furniture industries) and how it affects the revenue of Minna as a community, industrious region, and state as a whole.

But unfortunately the study will not deal with the further processing aspect of wood products in the wood industries as such activities are not being practiced or in existence around this area, and basically lack any form of referral data.

Significance of Study

The following people and organizations shall be the major beneficiaries of this study;

Educational institutions (Technical colleges, Universities, vocational schools etc)

Niger state Government

Industrialist/investors

Existing wood based industries

Educational Institutions: The educational sector where the future wood workers are being trained shall experience knowledge upgrade, as the draw backs and solutions to the proper utilization of wood technical knowledge shall be highlighted thereby creating an entire different level of mentality to the students under training and showing them the importance of technical/vocational skills management education in the world of wood technology and wood industries thereby equipping such students with skills and experiences that would make them believe in their abilities stimulate their senses of creativity and secure them with great employment as professional wood workers.

Niger state Government: The government of Niger state would benefit from this study as; the Niger state economic empowerment and development strategy (NSEEDS, 2004) declared one of its visions; as that of accelerated exploitation of the state resources for rapid improvement in the welfare of its people, particularly the poor with agriculture being the main focus. Hence, the vision of the state is as follows: to "Develop Niger state as a model of agro-based industrialisation with opportunities for all, and a referral for other states in Nigeria" looking at this statement forestry would be part of the utilized resources for the enhancement of the people of Niger state, and its capital Minna. Due to this reason, this study shall seek to serve as a guide to the Government giving it an outright clue to the major areas and sectors within its resources which need immediate attention and would be of high importance to the growth and development of the state and the resource management system. Thus elevating the economy of the state and creating more jobs for the unemployed and if well managed, attains a stable economic condition. The state's economy shall be affected by this study by bringing to the

recognition of the government, and populace as a whole, the potential and future benefits of the wood industry through, its utilization and how its production can affect the economic domain of the state through tax income, In terms of increased production quality, quantity, and the improvement of the unemployment status within the state and various institutions (manufacturing industries, construction and wood processing industry) if all these areas are being attended too, the production rate of wood based industries shall increase and thereby increase the rate of export and revenue income of Minna metropolis.

Industrialist/investors: being the soul sponsors of such industries within the state, with the aim to ensure that the market ability of wood industries are being realized, but yet are unable to perpetuate their desire due to the challenges that these industries face, for that purpose this study shall be beneficial to the industrialist/investors by exposing them to the solutions and challenges which hinders their ability to establish, grow and develop the wood industries in Minna Niger state.

Existing wood based industries: The major benefit of this study would be to the enhancement of the wood industrial position and function, and woodworkers in the Minna Niger state economy by revealing several activities that are not included in that of the wood industries in Minna. Thus exposing them to the present and future benefits of their industries with major emphasis on the utilization of wood by products and modern techniques used to carry out wood processing and production. All in the bid to enhance the standards and export capability of the Minna wood based industries.

Assumption of study

The basic assumption on which the study is based on is;

1. That the management staff of the wood industries in Minna, Niger state are professionals.
2. That the technical staff in the wood industry do not lack the technical know-how.
3. That the wood industry does not contribute significantly on the development of the state economy.

Research questions

1. What basic technical skills are required to secure a job in wood industries in Minna, Niger state?
2. What are the activities of wood industries in Minna Niger state?
3. What challenges do the wood industries in Minna encounter?
4. What are the future benefits of the wood industry on the Minna Niger state economy?

CHAPTER II

REVIEW OF RELATED LITERATURE

In this chapter, works related to the present study were reviewed under the following subheading:

- i. Basic Techniques required in wood based industries
- ii. Wood Utilisation in wood industries
- iii. Challenges of growth and development of wood industries in Minna Niger state
- iv. The activities of wood industries in Minna
- v. Future benefits of wood industry to the economy of Minna and Nigeria as whole
- vi. Summary of literature review

Basic Techniques required in wood based industries

Wood is one of the most important raw materials of today and the technical methods for the conversion, preservation, and modification of wood are becoming more and more sophisticated by the day.

According to the Bureau of Labor Statistics (BOLS, 2012) some entry-level jobs can be learned in less than 1 year, but becoming a fully trained woodworker requires many skills and generally takes at least 3 years of on-the job training.

Many wood industry employers seek applicants who have a high school diploma or the equivalent, because of the growing sophistication of machinery and the constant need for retraining. Some woodworkers obtain their skills by taking courses at technical schools or community colleges. Others attend universities that offer training in wood technology, furniture manufacturing, wood engineering, and production management. These programs prepare

students for jobs in production, supervision, engineering, and management and are increasingly important as woodworking technology advances.

Education is helpful, but according to a technical staff at one of the wood industries in Minna (Abisoye, 2012) said woodworkers are primarily trained on the job, where they learn skills from experienced workers. Beginning workers are given basic tasks, such as putting a piece of wood through a machine and catching the wood at the end of the process. As they gain experience, new woodworkers do more complex tasks with less supervision. In about 1 year, they can learn basic machine operations and job tasks, and when properly grounded as Skilled workers can read blueprints, set up machines, and plan work sequences.

Bureau of Labor Statistics (BOLS, 2012) identified the following qualities as essential in order to secure a job and grow as a woodworker in any wood industry around the world;

Detail oriented: Woodworkers must pay attention to details to be certain that the products meet specifications and to keep themselves safe.

Dexterity: Woodworkers must make precise cuts with a variety of saws, so they need a steady hand and good hand-eye coordination.

Math skills: Knowledge of basic math and computer skills are important, particularly for those who work in manufacturing, where technology continues to advance. Woodworkers need to understand geometry to visualize how the wood pieces will fit together to make a 3-dimensional object, such as a cabinet or piece of furniture.

Mechanical skills: Modern technology systems require woodworkers be able to use programmable devices, computers, and robots on the factory floor.

Physical strength: Woodworkers must be strong enough to lift bulky and heavy sheets of wood, such as plywood.

Stamina: The ability to endure long periods of standing and repetitious movements is crucial for woodworkers, as they often stand for extended periods when manufacturing parts and products.

Technical skills: Woodworkers must be able to understand blueprints and technical manuals for a range of products and machines.

Troubleshooting skills: To avoid unnecessary and costly waste, woodworkers must recognize mistakes during the manufacturing or finishing process.

Wood Utilisation in wood industries

Wood utilization

Wood utilisation incorporates the concepts of log optimisation, waste minimisation, a safe and healthy work environment, pollution minimisation and the recycling of waste materials.

Wood is the most versatile raw material the world has ever known. Throughout history, people relied on wood for needs varying from farming tools to building materials, from fuel to weapons of hunting and warfare (Hyde, 2009)

Wood remains virtually the most predominant material used for construction and energy generation until the last half of the 19th century (Douglas, 1995). People used timber in the construction of houses, barns, fences, bridges, furniture items and musical instruments. In

contemporary times, wood is still widely used for constructional purposes. It is also a valuable industrial raw material for the production of pulp, paper, paperboard, rayon, cellophane, photographic film, tannin, methanol, ethanol, wood adhesives and chemical derivatives (Hyde, 2009).

Wood utilisation on the Minna environment

Wood has been the major source of livelihood for most Nigerians. (Akindele, 2012) said the forestry sector is one of the main pivots on which the nation's welfare was built.

The wood is not only important for material goods but also as a valuable ecological and cultural resource. The forestry subsector has over the years contributed immensely to the socio-economic development in the country. It ranks among one of the highest revenue and employment generating sectors. It also serves as resource base for many forest industries. The raw materials for the production of timber, pulp and paper are derived from the forest (Fuwape, 2006)

The demand for wood raw material by industries in recent times has out stripped the production capacity of the forest. Thus, exploitation of forest resources for industrial purposes if not well planned may be deleterious to the environment. It is therefore necessary to examine the impact of the activities of forest industries and wood based industries on the environment in order to utilize the goods, services and benefits of the forests. These benefits include: amelioration of weather pattern, provision of clean air, protection of biological diversity, protection of watershed, soil and food crops and provision of recreational facilities (Fuwape, 2000).

Challenges of growth and development of wood industries in Minna Niger state

Minna is dominated by two visible activities- agriculture and governance (public service). The standard of living of the people is low. The absence of a virile private sector and low level of

investment have made Minna one of the least developed capital state in the country (NSEEDS, 2004)

The low level of participation of the private sector and lack of diversification of its economy due to the unfavorable business environment, limited infrastructure deficiencies, low access to funds, high cost of doing business, unstable fiscal policies, bureaucratic systems, and trust of work against business partnerships, Inadequate publicity of investment opportunities “wood industry” for instance and the recent security challenges in the state and cheaper imports have reduced the demand for local products NSEEDS(2004).

Current wood technology issues

Aiming for future technologies many approaches are to be made. Currently technology road mapping is a frequently used tool in order to develop a plan that matches short-term and long-term goals with specific technology solutions to help meet those goals of a company, industrial cluster or a national economy (Garcia and Bray 1997). Besides corporations and wood industry cluster merchants (Kirstof and von Geibler 2008) discovered wood industry associations and governmental institutions had launched and supported several wood technology roadmaps addressing specific forest products industry, value added wood products, nano technology in the forest products industries e.t.c like it is done in the USA, Canada and Europe, but in Minna no such associations or government bodies exist, except on national level e.g. Forestry Association of Nigeria (FAN), Nigeria Conservation Foundation (NCF), etc. which are basically NGO’s and who would find it hard spreading their tentacles to such environments

Private Sector Development; the private sector in the state is dominated by informal activities such as petty trading, transportation, local art and craft, peasant farming and low-scale animal

production. The major sources of funding for these activities are personal savings and informal finance. Factor productivity in this sector is characteristically low and output varies widely with seasons. The challenge is that of diversification and expansion of the structure of production to include more of real production revolving around agriculture (wood) which is the driving force or the bedrock of growth and development of Niger state under NSEEDS (2004)

Investment climate; Although both the government and people of Minna, Niger state are generally hospitable and friendly, potential investors are not only concerned about people's attitude towards strangers but also about some economic and social apparatus such as the level of infrastructure available, security, stability of investment, government policy, tax regime, local demand and the range of available raw materials for processing and production for wooden materials/products.

Attitude of Indigenes; the level of involvement of the indigenes of a state in the organized private/industrial sector is a critical driving force for its development and growth (Tunji, 2011). It creates confidence in the potential investors from other parts of the country and beyond. Although some indigenes of the state are prominent investors elsewhere, the same cannot be said of them in their own state, Niger. The majority of low-middle income earners are perhaps risk averse, not too prepared to take a chance for fear of failure, lack of technical know-how in ensuring industries achieve their aimed goals, and conditions are not considered right or competitive, this has impacted negatively on the growth of the industrial sector in the state (NSEEDS, 2004).

Public service delivery; the quality of public service delivery in Nigeria is generally low. Niger state is not an exception. Public service delivery is characterized by delays, undue bureaucracy

all of which hamper business. A number of support services to the private sector such as issues of delay in license approval, application for land (C of O, and governor's consent), and resolution of disputes (legal and administrative) are hardly done with dispatch. Often, these services are cumbersome and following typically in efficient procedures. The institutions charged with the responsibility of providing services are weak and prefer often to do things at their own pace. Yet the enterprise system must depend on them for those services they provide. Growing the private sector urgently calls for some measure of deregulation accompanied by reforms of relevant institutions of government which constitute key components of the Strategy.

Land use; Land as a key factor in the production process, the state has several other environmental problems like declining soil fertility, desertification, water pollution and loss of biodiversity which are as a result of economic activities like mining, damming, industrial development and urbanization cannot function properly. For a state that is mainly agrarian, these problems combined, pose a serious threat to the welfare of the people. The challenge arising there from is that of changing the approach orientation of human economic activity in order to ensure environmental sustainability NSEEDS (2004).

Security, Law and Order; Niger state, in the past, was relatively peaceful. That is why it was often referred to as the most peaceful state in the federation Tunji (2010). The general level of insecurity has however gradually been on the increase. Recent occurrences of armed banditry, political rampages, and other violent crimes may be blamed on inadequate policing, and predisposing factors such as high level of unemployment, poverty, greed, migration, break down of societal values, which often times lead to fraud and community unrest, increasing income disparity etc. The situation has created serious uncertainty requiring urgent and serious measures.

Security of life and property is a fundamental human right guaranteed under the Constitution. The administration of justice is fundamental to the stability of society.

Education; Education remains the bed rock of any man's knowledge irrespective of their age, ethnicity, position, or philosophy (Fuwape, 2001), but one of the major challenges faced by the indigenes of Minna, and indeed Nigerians as whole Is the in ability of our leaders in every area of power/ authority to proclaim the proper implementation of technical, vocational, and social knowledge appropriately to its youthful and workable persons of the society by providing the necessary resources, materials, equipment, and environment required to carry out this training. There have also been problems with attracting youths to vocational training as exemplified by the facilities established. There is the challenge to re-examine the focus, environment and incentives that will lead to greater patronage of vital institutions which the Strategy plans to replicate the capabilities of the skilled and unskilled youths especially to ensure students are properly trained and equipped with all the required skills and knowledge required to grow, develop and boost the economy.

Public Perception of Government; the society has been made to believe that it is the duty of the government to provide all largesse to the people. As a result, many people look up to the government for their daily needs. This has encouraged rent-seeking and pursuit of government contracts and jobs to the neglect of industrious sectors. The pursuit of industrial sector-led growth which de-emphasizes the role of the government in direct production will require reorientation of segments of society. This partly explains the slow progress on privatization and liberalization. Furthermore, government's role as facilitator rather than direct producer of goods or a 'ruler of the people will also require the reorientation of the civil service and the way it operates and delivers services to potential investors.

Youth and Unemployment; Youth being the future hope of every nation, the need to empower them cannot be over emphasized. Slow growth of the economy, unemployment and emerging value system are leaving the youths in a state of despair. There is rising trend of; Drug abuse, Juvenile delinquencies, Hooliganism, theft, Commercial sex business, bad educational systems etc., all These pose challenges for order, stability and the growth and development of the set of indigenes that are supposed to be the industrious persons of the society.

Based on the above economical limitations mentioned it is obvious that, with such critical situations at hand it is inevitable for any industrial firm/entity to impact the people, it's environment, and the economic status of Minna, Niger state. Below are some failed industries which made use of wood products or resources but eventually collapsed, all established in the state in the 70s and 80's they include:

- The Minna Juice Factory
- Niger State Fertilizer Plant. Zungeru
- Nail and hart, wire company
- Mosquito Coil Company
- Niger Sack Company
- Niger Flour Mill
- Tiles Factory
- State Farm and Ranch etc.

Their failure has been attributed to wasted assets, unskilled workers and skepticism on proper ethics and technical know-how on how to manage, grow and develop industries properly.

The activities of wood industries in Minna

Wood Industries in Minna perform as the manufacturing sector with a wide array of products and services. Private Sector ownership comprises about 95% of the industry with less government involvement. The following are the major products and services which the Minna wood industries are involved in;

- Saw Milling
- Timber preservation and seasoning
- Goods for construction and Furniture industry
- Pulp and paper mills

Sawmills; the sawmill account for 93.32% of the total number of wood based industries in Nigeria in 1997 (Fuwape, 1998). These mills are concentrated in the southwestern part of the country, with Ondo, Ogun and Lagos states having the largest numbers and Minna Niger state having one of the lowest if not the least within the entire country with about 5% (3-5) in totality.

The main type of log conversion machine used in these mills is the CD horizontal band saw. The Lumber recovery factor in most sawmills varies between 45 and 50% (Aliviar 1983, Fuwape, 1998). This implies that about 50 to 55% of log input into the sawmills are left as wood residues. The poor log conversion efficiency of the mills is partly responsible for the high pressure on the forest and the destruction of forest cover.

Timber preservation and seasoning

Merchantable timber is felled and cut into logs for transport to sawmill. Mechanical or hydraulic debarking is the first step in converting a sawlog into lumber (Fuwape, 2004) In conventional sawmills, large logs are placed on a moving log carriage and passed repeatedly through a band or

circular saw, each pass producing boards that normally require further processing on edgers, resaws and trimsaws.

(Hyde, 2011) said In sawmills processing small logs, the primary unit may be a chipper-canter with integrated sawing units, or a system of multiple-band or circular saws, designed to operate at speeds up to 100 m per minute. About three-quarters of the lumber produced in the Minna are further processed in planer mills that smooth the rough surfaces and dimension the pieces. The lumber is dried to remove excess moisture, by air seasoning method for several months.

Plywood is wood reduced to thin sheets of veneer, glued together with the grain direction of adjacent sheets at right angles. This cross-lamination makes the panel stable and redistributes the inherent directional-strength properties. Plywood is an engineered product with so many functionalities, but the wood industries in Minna are yet to achieve the full production scale/standards portrayed by other industries around the world.

Goods for construction and furniture industry

To ensure uniform quality, lumber and plywood are graded into categories by standardized procedures. Most of the lumbers produced in Minna are used in construction, mainly for house building and Furnitures and their accessories; it is classified as dimension lumber and is graded into width and use categories. Other classes of lumber include factory lumber and shop lumber, used to manufacture high-quality moldings, panelling and flooring, or to obtain clear cuttings for components in such items as doors and windows. (David, 2009)

Softwood plywood is produced in 3 grades: sanded (for high-quality finishing), unsanded (for construction use) and overlaid (for special uses). For general construction and other structural

purposes, the most common type of panel is sheathing, the unsanded grade. About half the plywood used in Minna is for house building and agricultural construction; industrial uses take up another third; the balance is consumed in a multitude of miscellaneous uses, or sometimes burnt or destroyed which totally signifies poor utilisation practice of wood by-products.

Pulp and paper mills

In the bid to meet the growing demand for paper in Nigeria, three pulp and paper mills, namely: Nigerian Paper Mill (NPM) Jebba, Nigerian Newsprint Manufacturing Company (NNMC) Oku-Iboku and Nigerian National Manufacturing Company (NNPMC) Iwopin were established. The NPM Jebba was established in 1969 but was expanded in 1983 to produce 65,000MT of Kraft paper, linerboards and corrugated paper per year NEEDS (2003). The NNMC Oku-Ikoku was commissioned in 1982 to produce 100,000MT of printing and writing paper. However, the mills were functional for only very few years before they stopped production in 1993 Akindele (2009). Thus the impact of the mills on the environment in terms of tree harvesting is no longer very significant but the clearing of natural forest for the establishment of *Gmelina arborea* plantation must have disrupted the hydrological cycle of the plantation sites.

Effect of tree harvesting and logging operations on the environment

The indiscriminate logging in the rainforest and uncontrolled felling of trees for fuel wood are reported to have had adverse effect on the environment (Fuwape and Onyekwelu 2001). The adverse effect caused by the operations of forest industries include loss of biodiversity, migration of wildlife, ecological imbalance, soil erosion, flooding, desert encroachment and disruption in hydrological cycle of water catchment area.(Oke and Fuwape, 2005)

Soil Compaction; Unplanned logging operations have resulted in soil compaction (Greacen and Sand 2008, Froehlich and McNabb 2010). Soil compaction adversely affects tree growth, plant

productivity and soil aeration (Gupta and Allmaras, 2007). The movement of wheeled and tracked vehicles on forest soil has been reported to cause increase in bulk density and reduction in air-filled porosity of the soil (Startsev et al 2001).

Desert Encroachment; (Oke, 2005) stated that When trees in an area are removed the rate of evapotranspiration is disrupted this affects precipitation and makes the area become increasingly loose and thereby inducing desertification. (Couzin, 1999) reported that on the average precipitation is 30% lower and temperatures are 1 degree Celsius higher in deforested areas of the Amazon than in forested areas. It was also reported that the indiscriminate felling of trees aggravated the effect of wind erosion and deposition of sand dunes in northern part of Nigeria thereby enhancing desertification (Ezenwa 2000, Gwandu 2011).

Environmental pollution due to operations of wood industries; The environmental pollution problems in wood industries include solid waste disposal, air emission of toxic and non-toxic particulates, veneer dryer emission and glue waste disposal. Noise generated during the operation of machines also constitute serious source of health hazard to workers in the forest industry (Harden, 2010).

Future benefits of wood industry to the economy of Minna and Nigeria as whole

Common belief seems to be that science and technology develops a nation, but (Nwogu, 2009) has shown otherwise. He stated that nations of the world that were early in realising the indispensability of research to overall national development, and accorded it the necessary priority it deserves, and are today reaping bountiful fruits of their foresight. The nations now regarded as scientifically and technologically advanced virtually rule the world and are steadily marching on to control the outer space (Nwogu, 2009).

This simply explains that if the area of research and appropriate discovery is being supported and imbibed by our wood technologist and scholars, and government agencies/ministries within the Minna metropolis it will be impossible for our wood industries and market to lack the substantial qualities it demands and thereby improving all form of production within the wooden industrial sector.

Challenges and a call for improved technologies can be identified along the whole wood supply and process chain which include:

Wood supply: forest resources are being squeezed between growing needs including fast growing demand for wood as an energy carrier and environmental restrictions. This will open the raw material allocation to semi-natural forests, forest plantations, agro-forestry and agricultural resources and new mobilization concepts for wood resources as discussed by (Scarascia, Mugnozza and Pisanelli, 2008). This new raw material spectrum, including the increasing use of recycled material, will have a huge impact on wood technology and material design as well.

Timber in construction: Wood is a highly synthesized and optimized raw material from nature with load-bearing functions as one of its main functionalities. Using wood as timber in construction comes next to the natural features of wood, but man still can improve the mechanic performance of wood by proper grading and excluding natural pattern and in homogeneities and building up engineered material structures. Material (peer-00608725, version 1 - 14 Jul 2011 EJWWP458_source) and building components models and simulation will become a major tool in order to understand and improve the materials and components.

Material engineering: Engineered wood composite materials and structures on all hierarchical levels from nano to macro structures are already a main field of technology research and will become even more important in order to make wood materials more competitive. A strong focus

on resource and eco-efficiency of materials, including raw materials from any renewable sources, will lead us to “Green Composites” as envisaged by (Baillie, 2004).

Wood aesthetics: Morphology and chemical composition including the various extractives create an inimitable surface aesthetic appearance of wood, especially with the various hardwoods (Thomas, 2006). Unfortunately the colour of wood is not UV-stable so is a main challenge to prevent fading and discoloration to a further successful and viable use of wood surface veneer and solid wood in indoor and outdoor application in competition with technical surface structures.

Wood modification: Much emphasis has been put on wood modification in the last years in order to make it more durable and stable etc. Putting new functionalities including multi-functionalities into the wood or onto the wood surface will be necessary in order to create a new wood performance which paves the way to so called smart materials Thomas (2006)

Fractionizing wood: Various mechanical disintegration and chemical decomposition processes are well established in order to break down and fractionize the raw material wood and to re-arrange and re-engineer it to glued components, wood-based panels, paper sheets etc., however, improved and completely new processes of disintegration have to be envisaged.

Machining and processing: Primary and secondary wood processing has improved a lot in the last centuries (e.g. high capacity sawmills, continuous presses for wood based panels, high-performance wood machining), but new process technologies, manufacturing concepts mass customization, tailoring of products etc. have to be developed. Resource and eco-efficient processes have to be envisaged in wood industries by means of improved and new process analytics as discussed by Kessler (2006) and production management systems which in turn are part of a concept of knowledge based production.

Wood refinery : Thermo-chemical processes, and increasingly, biotechnology are used to break down lignocelluloses' feed stocks to their building blocks for the chemical and energy industry the terms “integrated biomass technologies” and “wood bio refinery” became the key-words within the emergence of a new industrial sector of renewable based technologies, which is outlined by (Dewulf and van Langenhove, 2006). Today we are in a labyrinth of different though ambitious approaches to unzipping lignocelluloses to their building blocks so that they can be used for further processes. Even though parts of that concept already exist, a sweeping economic breakthrough is still missing, and with proper management Minna has the capacity to achieve this breakthrough.

Recycling: Even as the majority of wood products are considered as medium- und long-term products, an increased use of wood builds up a huge secondary feedstock to be used as a material and/or energy carrier. The material, industrial and building designs have to be matched to a future demolishing of used structures and the recovery of wood. Wood (peer-00608725, version 1 - 14 Jul 2011)

Sources of generating industrial income in Minna Niger state

Minna is the capital city of Niger state which is dominated by two visible activities- agriculture and governance (public service). The standard of living of the people is low. Subsistence agriculture accounts for about 70% of total employment, while the civil service accounts for the bulk of paid employment. The absence of a virile private sector and low level of investment have made Minna, capital city one of the least developed in the country (NSEEDS, 2003).

(Ngena (1999) observed that The public sector accounts for about 70% of paid employment and consumes about 75% of total government revenues on recurrent expenditures (personnel costs,

overheads, subventions, etc.) and expenditures on General Administration, construction, maintenance of public buildings, leaving a relatively small proportion for capital projects. In effect, very little is available for the development of the other sectors of the city. As a result, virtually all activities in the state revolve around public government sector.

The low level of participation of the private sector and lack of diversification of its economy due to the unfavorable business environment, limited infrastructure deficiencies, low access to funds, high cost of doing business, unstable fiscal policies, bureaucratic systems, and trust of work against business partnerships, Inadequate publicity of investment opportunities in the state and cheaper imports have reduced the demand for local products (Ngena, 1999).

NSEEDS (2004) stated that; there is the pressure for patronage, employment and development projects in constituencies, etc inadequate appreciation of economic fundamentals and political tradeoffs in a market driven economy remain major governance challenges. Corruption and mismanagement of resources has been one of the major impediments to the development and growth of this region. Systematic corruption and low levels of transparency and accountability have serious negative impact on development and growth of every form of economic asset of this capital city Minna. Thus showing that the wood industry which is basically owned by private owners cannot on its own support development of the state economy without the participation of the government since it is obvious that according to the government the wood industry makes no Impact on its Economy which explains why no record of the market trend is being monitored or kept.

Summary of literature review

So far in this chapter we talked about the basic techniques required to carry out operations and secure a job in the wood industry, utilisation of wood and its products, challenges affecting the growth and developments of wood industries with various examples, showed the undeniable employment benefits which wood industries brings to the economy, how the operations of the wood industries affect the economy of the state and nation at large and most importantly highlighted the fact that the impact of wood industries to the present and future growth and development of the industrial sector cannot be over-emphasized.

A good ‘opportunity emerges from the organization of a problem. This opportunity is technological progress in the wood-processing industries, (Hyde, 2011). Going by (Perlin, 1991) Role of Wood in the Development of Civilization “asserted wood’s crucial place in the evolution of civilization, which relates to the fact that technological progress in the industries, is something that clearly benefits consumers, craftsmen, and managerial staff, the environment, forest industry and economy of Minna Niger state as whole.

One can say the evidence is affirmed, as the wood industry has the capability of yielding greater environmental, economic, and educational goals. This study therefore, maintains that it takes more than mere declaration to make any plan work, but the steadiness, drive and moral discipline that will not compromise principles which require certain strength of will towards achieving the industrial and economic goal desired by Minna Niger state and its people.

CHAPTER III

METHODOLOGY

This chapter addresses the research design, Area of study, sampling techniques, methods of data collection, validity of the instrument, Administration of instrument, decision rule and data analysis.

Research Design

The study adopted a survey research, a survey research design is considered most appropriate for the study because it is set to collect relevant data from reputable sources and use it to investigate problems in realistic settings. (Nworgu, 1991) described it as the relevant design where population is large and sampling has to be carried out such that a group or items is studied by collecting and analyzing data from a few people or items considered to be representatives of the entire group. In this study, questionnaire was the main instrument used to gather information from the respondent on the impact of wood industries on the economy of Minna, Niger State.

Area of Study

This study covers; wood industries within Minna, Niger state namely;

1. Sango sawmill/market along paiko road, beside trade fair complex
2. Maitumbi sawmill industry.
3. White heart Furniture Ltd
4. Deco Art Furniture

Population of the Study

The target population used for this research study was the management staff and technical staff of all the wood processing industries in Minna, Niger state.

Sampled Techniques

In order to represent the entire industries within the Minna metropolis a one stage random sampling technique was used, by selecting the (3) major wood processing industries around all the local government areas within the Minna metropolis and (3) management staff, and (6) technical staff from the three locations were obtained respectively through random selection, and were used for the study. There by making total number of (27) respondents.

Administration of the Instrument

A total of (40) items questionnaire was administered to the management staff, and technical staff of the above mentioned industries and area of study. The questionnaires were personally administered to the respondents by the researcher through personal contact.

All the administered questionnaires were duly completed and returned giving a one hundred percent (100%) return rate.

Instrument for Data Collection

The instrument used in this research study was the questionnaires which were designed for the management staff and technical staff of the respective wood industries.

The questionnaires contains (40) items which were administered to the management staff and technical staff of the wood industries, and developed by the researcher for this study.

The questionnaire was divided into four sections:

Section A: contains Personal data of the respondents.

Section B: looks at the basic technical skills required to secure a job in the wood industries in Minna, Niger state.

Section C: deals with the activities of wood industries in Minna Niger state.

Section D: addresses the challenges wood industries in Minna encounter.

Section E: looks at the future benefits of the wood industry on the Minna Niger state economy

Validation of the Instrument

The instrument was developed by the researcher and was validated by two lecturers in the Department of Industrial and Technology Education, woodwork technology Option, at the Federal University of Technology Minna for their suggestion and observation.

Method of Data Analysis

For the analysis of the collected data, a four (4) point rated item is developed with the following response options;

Strongly Agree	(SA) 4
Agree	(A) 3
Disagree	(D) 2
Strongly Disagree	(SD) 1

The statistical tools used to analyze the data collected for the research questions and the null hypothesis stated in the study were the mean, which was used for computing the research question while the standard deviation and the t-test were used for testing the hypothesis formulated

The mean score is calculated using this formula;

$$\bar{X} = \frac{\sum X}{N}$$

Where \sum = Sum of nominal

\bar{X} = mean

X = nominal of value option

N = Number of items

Standard deviation

$$SD = \sqrt{\frac{\sum (X - \bar{X})^2}{N}}$$

Where

SD = Standard Deviation

X = Normal value of each item

\bar{X} = mean of all items

\sum = sum of

N = Total number of item

Decision Rule

To determine the acceptance value, a mean score of 2.5 is computed in line with the 4-point rating scale, any item that attracts between 2.49 to 2.5 and above is considered AGREED and any item that attracts below 2.5 is considered DISAGREED, for the t-test however, the degree of freedom is 25 ($df = n_1 + n_2 - 2$) at 0.05 level of confidence such that any item rated 2.5 and above is ACCEPTED while any items which attracts a rating below 2.00 is considered REJECTED.

CHAPTER IV

PRESENTATION AND ANALYSIS OF DATA

This chapter presents analysis of data in respect to the research questions and the hypotheses formulated and tested for the study. The results are also presented accordingly.

Research questions 1

1. What basic technical skills are required to secure a job in wood industries in Minna, Niger state?

Table 1: Mean score of technical skills required to secure a job in wood industries in Minna,

Niger state

 $N_1=9$ $N_2 = 18$

S/N	ITEM	X ₁	X ₂	X _t	REMARKS
1.	Employees must have managerial skills.	3.22	3.11	3.17	Agreed
2.	The use of simple hand tools in the production of a job	3.11	3.11	3.11	Agreed
3.	Operate wood-working machines	3.11	3.06	3.09	Agreed
4.	Interpret working drawing	3.22	3.39	3.31	Agreed
5.	Lift wood pieces onto machines, either by hand or with hoists	2.67	3.28	2.98	Agreed
6.	Preparing and setting up equipment/machineries for usage	3.33	3.22	3.28	Agreed
7.	Read detailed blueprints	2.89	2.94	2.92	Agreed
8.	Carry out proper maintenance of tools	3.33	2.88	3.11	Agreed
9.	Identify local timber in common use and be able to distinguish good and defective timber	3.00	3.11	3.06	Agreed
10.	Carryout simple processes involved in construction of wood articles.	3.11	2.94	3.03	Agreed

KeyX₁ = Mean score of management staffX₂ = Mean score of technical staffX_t = average mean score of management staff and Technical staff

The table 1 above revealed that both groups of respondent agreed with all items with the mean score ranging from 3.31 – 2.92

Research question 2

2. What are the activities of wood industries in Minna Niger state?

Table 2: Mean score activities on the activities of wood industries in Minna Niger state

$N_1=9$ $N_2 = 18$

S/N	ITEM	X ₁	X ₂	X _t	REMARKS
11.	Conversion of fresh logs	3.33	3.17	3.25	Agreed
12.	Seasoning of converted timber	3.56	3.00	3.28	Agreed
13.	Upholstery designing and construction	3.22	3.22	3.22	Agreed
14.	Furniture construction	3.00	3.22	3.11	Agreed
15.	Bamboo and Rattan based production.	3.33	2.56	2.95	Agreed
16.	Finishing Operations on finished wood articles	3.00	3.22	3.11	Agreed
17.	Various Sawing Operations	3.00	3.11	3.06	Agreed
18.	Sales of planks of various marketable sizes	3.44	3.00	3.22	Agreed
19.	Productions of wood by-products	3.33	3.33	3.33	Agreed
20.	Timber preservation	2.67	3.28	2.98	Agreed

Key

X₁ = Mean score of management staff

X₂ = Mean score of technical staff

X_t = average mean score of management staff and Technical staff

The table 2 above revealed that both groups of respondent agreed with all items with all the items with mean score ranging from 2.95 – 3.33.

Research Question 3:

3. What challenges do the wood industries in Minna Niger state encounter?

Table 3: Mean score on the challenges the wood industries in Minna Niger state encounter

N₁=9 N₂ = 18

S/N	ITEM	X ₁	X ₂	X _t	REMARKS
21.	Poor power supply	3.00	3.39	3.20	Agreed
22.	Inadequate skilled personals/manpower	2.89	3.39	3.14	Agreed
23.	Low patronage by environs and construction workers of local products	2.78	3.06	2.92	Agreed
24.	High tax rates	3.11	3.17	3.14	Agreed
25.	Insufficient wood raw materials	3.56	3.00	3.28	Agreed
26.	Value depreciation of final products and furniture used	3.00	3.22	3.11	Agreed
27.	Lack of commercial labour	3.00	2.72	2.86	Agreed
28.	Health hazards and complications	3.22	2.89	3.06	Agreed
29.	Weather conditions which affect market value of wood products	3.22	2.89	3.06	Agreed
30.	Lack of available and proper transporting facilities (trucks, vehicles e.t.c.)	3.33	3.00	3.17	Agreed

KeyX₁ = Mean score of management staffX₂ = Mean score of technical staffX_t = average mean score of management staff and Technical staff

The table 3 above revealed that both groups of respondent agreed with all items with the mean score ranging from 2.86 – 3.28.

Research Question 4:

4. What are the future benefits of the wood industry on the Minna Niger state economy

Table 4: Mean score of the future benefits of wood industry on the Minna Niger state economy

$N_1=9$ $N_2 = 18$

S/N	ITEM	X ₁	X ₂	X _t	REMARKS
31.	The use of proper preservatives on logs and planks to ensure good stability and usage.	3.22	2.83	3.03	Agreed
32.	The use of high tech machines to ease human ease human fatigue and increase the speed of productivity	3.11	3.00	3.06	Agreed
33.	The availability of proper storage sheds, and facilities.	3.33	2.94	3.14	Agreed
34.	The use of both traditional and modern techniques in processing wood products.	3.67	2.83	3.25	Agreed
35.	Employment opportunities for the upcoming trainees, students and upcoming woodworkers	3.22	2.78	3.00	Agreed
36.	High per capital income due to adequate or enhanced wood industrial performance	3.67	3.39	3.53	Agreed
37.	Controlled energy consumption rate	3.22	3.11	3.17	Agreed
38.	Adequate and proper utilization of wood (chips, sawdust etc.) by products	3.56	3.17	3.37	Agreed
39.	There will be greater use of synergistic	3.22	3.00	3.11	Agreed

	combinations of wood and other materials to meet the durability and other performance requirements of products.				
40.	High level of local demand for homemade furniture and articles	3.67	3.00	3.34	Agreed

Key

X_1 = Mean score of management staff

X_2 = Mean score of technical staff

X_t = average mean score of management staff and Technical staff

The table 4 above revealed that both groups of respondent agreed with all items with the mean score ranging from 3.00 – 3.53.

Findings of the study

The following findings were made:

1. It was discovered that a level of vocational skills was required to secure a job in the wood industries as it will be difficult for a novice to carry out operations with a little skill or knowledge of the trade
2. It was discovered that the ability of recognising a defected wood from a good timber was necessary in order to know its stability level for a desired product.
3. The Bureau of Labor Statistics (BOLS, 2012) identified 8 basic skills expected to be possessed by staff in every wood industry; i.e. they must be Detail oriented, Dexterity, Mathematical skills, Mechanical skills, Physical strength, Stamina, Technical skill, and Troubleshooting skills, all these skill makes a professional wood worker.
4. Asides possessing technical/vocational skills to secure a job in the wood industry it was, discovered that a sound managerial skill was necessary for the managerial and technical

staff of the industry for proper co-ordination of the activities of the wood industry to be carried out.

5. All basic activities which are required in a normal wood industry were discovered to be active and operational except for the production of bamboo and rattan products which were scarce or hardly available.
6. Amongst the activities of the wood industry it was discovered that waste/wood by-product utilization was poor and needed Improvement.
7. One of the most challenging situations the wood industry in Minna Niger state encounters is not just the lack of raw materials, power....etc but the land use policy, high tax rate, and most importantly lack of commercial labour and expected support from the Government.
8. It was discovered that most of the challenges faced by other industries in terms of development and growth also affects wood industry in Minna Niger state.

Discussion of findings

The findings represented in table 1 clearly revealed that the management staffs and technical staff within the wood industries in Minna, Niger state are all professionals and have at least the basic skill required to run, manage, and carry out the operational activities of the industry. Thus giving the impression that the employability status of the state can be improved as far as unskilled craft men, industrial personnel, and potential woodworkers who intend to work in the industry possess all the basic skills required to carry out various operations.

In order to propel the economic state of any community or nation a proper analysis of the activities carried out within the various industries or sector of the said city must be carried out,

and that was done on table 2 and it was discovered that the activities being carried out in the wood industries in Minna did not totally include the production of bamboo and Rattan. This simply implies that some beneficial potential of wood production and processing are yet to be tapped in

The study also discovered that the challenges facing the wood industry in Minna were not only the immediate challenges such as Poor power supply, lack of commercial labour, lack of wood raw materials, e.t.c but those that affect most economies such as land use policies, poor security, within the capital city, poor investment climate, etc. which contributes majorly to the growth and development of any state's economy.

It was also discovered that in the practices/operations being carried out in the wood industry in Minna Niger state, were not adequate enough for example, poor wood waste management, most especially in the management of wood by products such as chips, saw-dust, and other residues which are of great benefits to the energy consumption level, unemployment status and wood fuel demand of the state and economy as a whole.

Hyde (2011) highlighted the fact that the Wood industry is a multi-million industry, which gives livelihood to millions of people around the globe, as it sustains the economy of every nation, especially those with vast forests to speak of. World statistics have shown how the wood industry contributes largely to the national system of production, distribution, and consumption activities of every nation in the world, if capitalized efficiently; this simply explains that if the activities of the wood industries in Minna were to include the production and sales of rattan and bamboo material and products within the industry it will increase the rate of export, production, income, and most importantly boost the Minna economy.

CHAPTER V

SUMMARY, CONCLUSION AND RECOMMENDATION

This chapter comprises of the Summary, Conclusion and Recommendations based on the findings of the study.

Summary of the Study

This chapter attempts to give a summary of the purpose and most important findings of the study. It also outlines some recommendations based on the findings of the study. It is hoped that the recommendations made in this study will be of great value to those concerned. The review of the related literature of the topic covers the objective and benefits of wood industry to the Minna Niger state economy and country as whole in the present state till the future.

In chapter one the background of study was explained and the purpose, statement of problem, scope and significance were stated, and four research questions and two hypotheses were formulated to carry out the research. The following sub heading were reviewed under the following sub-headings; Basic techniques required in wood based industries, wood utilisation in wood industries, challenges of growth and development of wood industries in Minna Niger state, The activities of wood industries in Minna, and the Future benefits of wood industry to the economy of Minna and Nigeria as whole.

A survey research design was adopted, The population of the study consisted of the entire management staff and technical staff of all the wood processing industries in Minna Niger state, and the respondents were selected using the One stage random sampling technique which brought about (3)managerial staff and (9) technical staff from 3 major wood industries within

the Minna metropolis of Niger state given a total of (27) sampled respondents, with the aid of a five sectioned (A-E) Questionnaire which was used as the instrument for data collection, and was validated by two lecturers in the Department of Industrial and Technology Education Woodwork technology option. The collected data was analysed using the following tool; statistical mean which was used to calculate the responses of the research questions. A mean score of 2.50 was a decision point. The table was developed in the presentation of the data relevant to each research question 1, 2, 3.and 4..

Implications of the Study:

The study will enable the government realize the benefits accustomed with the wood industry and how it has the ability to sub-due the unemployment status of the capital city and state as a whole and in general upgrade the economic status of the state and country at large.

The study would help potential investors/industrialist know the nature, philosophy, and rewards of the wood trade, what it encompasses and its impact on the growth and development of a nation at large, and thereby change the orientation of the lay man towards wood ventures.

The study will help wood based industries in Minna realise branch into other wood based productions which shall create a stable market for exportation and better utilisation of wood by-products for various functionalities.

From the findings, it is expected that the management staff and technical staff would understand the reasons why they need to have a foresight towards their trade, and be able to keep up with the innovations that come with them and recognize the loop holes that need to be attended to, for efficient utilization of the wood and its products.

Suggestion for further Research

1. Further research could be carried out on wood-based Industries and their Impact on the Ecology of Niger state.
2. An in depth research should be carried out on the wood conversion and Wood Residue Utilisation in the wood industries in Minna.

Conclusions

Based on the findings and review on the impact of wood industries on the economic status of Minna Niger state it is obvious that the wood industries have made and will continue to make significant contributions to civilisation, industrial development, education, communication, poverty alleviation, labour demand and economic development of Minna Niger state.

According to the findings which are in agreement with Fuwape (2005) who said the high demand for wood products due to the increase in population has induced high pressure on forest resources and shall increase as the years come by, strongly explains the fact that the market for the wood industries would continue to grow irrespective of its shortcomings. Thus it is obvious that the economic impact of wood industries to Minna Niger state cannot be over emphasized as the resources are available only if they are being efficiently utilized and interested individuals and industrialist are being supported with all the resources they desire to make an impact with the wood industry in Minna Niger state, thereby creating employment, export products, fuel substitutes and better production status of the wood industry in Minna. All these goals cannot be achieved without the support of the Government, professionals in the wood technology area, and people of Minna Niger state.

Recommendations

1. Workshop training as a strategy for acquiring modern woodwork technology skills, should be inculcated in the curricular of technical/vocational institutions so as to transfer the necessary knowledge and skills to the future industrialist and wood technologists
2. Off the job training should be introduced the educational system in which extensive practical experience/new skills are acquired.
3. Minna wood industries should encourage the production and usage of bamboo and rattan products so as to create an extra revenue generator for the state and source of employment for the unemployed.
4. Professionals in the wood work field and the government should organize Exhibitions so companies can come and show case the latest machineries used in the wood industries so as to enlighten staff of the wood industries with their operational status and usage. Thereby creating an Avenue for proper interaction between professional colleagues in the woodwork world.
5. More funds should be made available for research in wood technology in order to develop efficient and environmental friendly techniques for extracting and converting wood raw materials to useful products
6. There should be comprehensive impact assessment of the activities of forest industries vis-à-vis, logging harvesting, transportation and wood conversion. Forest concession traders should be involved in forest regeneration. There should be equivalent replacement for every tree removed from the forest.

7. The forest can only meet the increasing demand for its services and products if all the stake holders, i.e. government, people and research scientists are genuinely involved in forest management to ensure sustainable development.
8. Wood technology as an academic discipline has to be further developed and discussed within the wood science and technology community encompassed by rigorous academic curricula in order to provide a profound technology education to the students, which has to create the intellectual backbone of tomorrow's wood and forest based industries and a knowledge-based society as well.
9. The establishment of integrated wood industries should be encouraged while small sawmill holding should be effectively controlled to minimize wastage of wood resources.
10. Students, and technicians with basic qualifications and great potentials should sponsored by government to go abroad and study the proper utilisation of wood by-products, In order to have the capability to challenge the ever growing demand for such by-products as the fuel wood and other wood products and services.

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APPENDIX II

FEDERAL UNIVERSITY OF TECHNOLOGY

DEPARTMENT OF INDUSTRIAL AND TECHNOLOGY EDUCATION

RESEARCH QUESTIONNAIRE

QUESTIONNAIRE FOR THE IMPACT OF WOOD INDUSTRIES ON THE

ECONOMIC STATUS OF MINNA, NIGER STATE

Instruction: Please read the questions and respond appropriately. Indicate your choice with a tick [✓] in the column that best represents your opinion about the topic.

SECTION A

NAME OF WOOD INDUSTRY.....

LOCATION.....

Please tick appropriately. Management staff Technical staff

Response option: Strongly Agree = SA, Agree=A

Disagree = D, Strongly Disagree = SD

SECTION B

QUESTION 1

What basic technical skills are required to secure a job in wood industries in Minna, Niger state?

S/N	ITEM	SA	A	D	SD
1	Employees must have managerial skills.				
2.	The use of simple hand tools in the production of a job				
3.	Operate wood-working machines				
4.	Interpret working drawing				
5.	Lift wood pieces onto machines, either by hand or with hoists				
6.	Preparing and setting up equipment/machineries for usage				
7.	Read detailed blueprints				
8.	Carry out proper maintenance of tools				
9.	Identify local timber in common use and be able to distinguish good and defective timber				
10.	Carryout simple processes involved in construction of wood articles.				

SECTION C

QUESTION 2

What are the activities of wood industries in Minna Niger state?

S/N	ITEM	SA	A	D	SD
11.	Conversion of fresh logs				
12.	Seasoning of converted timber				
13.	Upholstery designing and construction				
14.	Furniture construction				
15.	Bamboo and Rattan based production				
16.	Finishing Operations on finished wood articles				
17.	Various Sawing Operations				
18.	Sales of planks of various marketable sizes				
19.	Productions of wood by-products				
20.	Timber preservation				

SECTION D

QUESTION 3

What challenges do the wood industries in Minna Niger state encounter?

S/N	ITEM	SA	A	D	SD
21.	Poor power supply				
22.	Inadequate skilled personals/manpower				
23.	Low patronage by environs and construction workers of local products				
24.	High tax rates				
25.	Insufficient wood raw materials				
26.	Value depreciation of final products and furniture used				
27.	Lack of commercial labour				
28.	Health hazards and complications				
29.	Weather conditions which affect market value of wood products				
30.	Lack of available and proper transporting facilities (trucks, vehicles e.t.c.)				

SECTION E

Question 4

What are the future benefits of wood industry on the minna Niger state economy?

S/N	ITEM	SA	A	D	SD
31.	The use of proper preservatives on logs and planks to ensure good stability and usage.				
32.	The use of high tech machines to ease human ease human fatigue and increase the speed of productivity				
33.	The availability of proper storage sheds, and facilities.				
34.	The use of both traditional and modern techniques in processing wood products.				
35.	Employment opportunities for the upcoming trainees, students and upcoming woodworkers				
36.	High per capital income due to adequate or enhanced wood industrial performance				
37.	Controlled energy consumption rate				
38.	Adequate and proper utilization of wood (chips, sawdust etc.) by products				
39.	There will be greater use of synergistic combinations of wood and other materials to meet the durability and other				

	performance requirements of products.				
40.	High level of local demand for homemade furniture and articles				

APPENDIX III

FORMULAR

$$\text{Mean } \bar{X} = \frac{\sum fx}{\sum f}$$

\bar{X} = Mean

\sum = The Sum of

X = The Frequency of each point in the scale

Standard deviation

$$SD = \sqrt{\frac{\sum f(x - \bar{x})}{\sum f}}$$

X = Mean

\sum = The Sum of

X = The Score

F = The Frequency

$$\bar{X}_1 = \frac{\sum FX}{\sum F}$$

$$S_1^2 = \frac{\sum f(X - \bar{X})}{\sum F}$$

$$SD_1 = \sqrt{\frac{\sum f(X - \bar{X})^2}{\sum f}}$$

$$\bar{X}_2 = \frac{\sum FX}{\sum F}$$

$$S_2^2 = \frac{\sum f (X - \bar{X})^2}{\sum f}$$

$$SD_1 = \sqrt{\frac{\sum f (X - \bar{X})^2}{\sum f}}$$