DEPLETION OF VEGETATION FOR FUEL WOOD SOCIO-ECONOMIC IMPLICATIONS CASE STUDY: FARIN DOKI VILLAGE PAIKORO LOCAL GOVERNMENT NIGER STATE

BY

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DECLARATION.

I declare that this project titled depletion of vegetal cover for fuel-wood, socio-economic implications. Case study Jarin Doki Village is my own work and has not been submitted at may institution for wherever reason before.

Information derived from published and unpublished works of others have been duly acknowledged.

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MAL. MOH'D AHMED
STUDENT

1/9/2001

DATE

CERTIFICATION

This is to certify that this project work being submitted by **Mohammed Ahmed (PGD/GEO/99/2001/068)** has not been submitted before by anybody for any purpose and meets the requirement governing the award of PGD in Environmental Management in department of Geography, Federal University of Technology, Minna Niger State.

Dr. M. T. Usman — Date: 24/9/2001
SUPERVISOR

Dr. M. T. Usman — Date: 24/9/2001
HEAD OF DEPARTMENT

EXTERNAL EXAMINER — **DATE**

DEDICATION.

I dedicate this project work to the entire members of my family

ACKNOWLEDGMENT.

My profound gratitude goes to the **ALMIGHTY ALLAH** for sparing my life to attend the course. My regards goes to members of my family for the supports given for the success of the course.

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ABSTRACT.

The increase in population of both the urban and rural areas, poverty, stringent economic conditions of the generality of the populace and lack of proper energy policy in the state, has made it very difficult for the rural populace to shift from the use of biomass (wood(s) for energy needs, to other energy resources. This has increased the dependency on the use of fuel-wood for energy, which is detrimental not only to the ecological world, but to the agricultural sector. Depletion of vegetal cover for energy purposes, have had serious socio-economic effects to the people of Farin-Doki village through the decline of their agricultural products harvests persistently.

The field survey of the environment's vegetal cover reveals a persistent depletion of vegetal cover which are ~~binge~~ being used for their various domestic and economic sectors for energy supply.

Similarly, the questionnaire administered showed a drastic decline in the farmers' products like guinea corn, corn and yam harvests of 1999 compared with those of 1994. This situation which is a threat to the people and the environment, deserves an urgent attention to avoid a disaster that would spread to other areas of the state.

Finally, the researcher proffered suggestions as solution to minimise the use and dependency of fuel-wood for energy purposes, so as to reduce deforestation, improve agricultural and socio-economic situation of the people, to avoid an impending desertification which is advancing southwards at alarming speed and its socio-economic consequence.

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CHAPTER ONE

INTRODUCTION:

The look at the environmental around us as it wear today, is the result of gradual modifications by man since the beginning of life. Man has continuously modifies habitat, either consciously or un-consciously, for a purpose.

It is fundamental that, any organism and its environment, affects each others and evolve together. It is also understood that the environment exists only in relation to man and conversely, it is in relation to man that the environmental problems emerge.

Man since creation, has always associated him self with green fields, for his continued existence in the planet. The first man was created and dwelt in the forest. It was form the forest he collected fire-wood, for his cooking and heating. It was the forest that provided him food and animal protein. From the same forest, he got timber and built his shelter, got leave and animal skin to cover his nudity.

It is ironic that, the man who got all these, from the forest, that is today destabilizing the same forest.

Wood a major resource, obtained from the forest, which is renewable, are used by women as energy source for the preparation of food, bakery, heating and other domestic needs. As such more than 3 billion people, particularly, in Africa and other developing world, rely on wood as a resource for meeting energy needs e.g. for food preparation etc (World Resource Institute 1996).

Fore example, in Africa out of ten people, nine uses fire wood as a major energy source, and for each use of wood, there is a corresponding crisis. (World Resource Institute).

Despite this, because of stringent economic situation, abject poverty, high inflation and cost of living, like of prices kerosine, natural gases, slim chances of employment opportunity, increase in both rural and urban population with increase demands for domestic energy needs, all these compounded the necessities that necessitated the rural women to scout for woods for domestic energy needs and as well as Commercialisation, to fill in the gap of family economic needs. The same stringent condition of living have compelled the urban women to spread into the bush, disrupting the ecosystem life by cutting down trees, indiscriminately, in large numbers to dry, and later use for their domestic energy needs and largely for Commercialisation and for economic needs, since these trees are gift of nature, obtained freely, with out being questioned or cautioned, by any body nor the authority, of such devastating acts and corresponding consequence.

Today, all these activities done unconsciously, have modified the vegetation, the soil, the climate which is being felt through agricultural products, economically, and they the women (particularly in the rural areal are the first to be the victim of all their activities via their husband's agricultural poor harvest.

The need to take the boldest steps to minimise or eradicate these devastating activities by women must hastened by the authority concerned, the entire populace needs be informed that, the inhabitants are the architect of the misfortune, the inhabitant has to re-address itself, to bring back the old glory of the green field; the agricultural reputation for sustainable developments.

4.4 GEOGRAPHICAL LOCATION:

Tarin-Doki village is locate within latitude 9^0 24' 30" and longitude 6^0 27' 30", which is of a distance about 45 kilometre along Minna - Suleja road. Farin-Doki village is part of Kwakuti district in Paikoro local government of Niger State. The village is situated along the High way and it shares boundary with Shaku village in the South West Part, Tunna in South East, Zuru in North West and Shaudna on the North Eastern parts respectively. Its central location and along the high-ways affords the opportunity of a reputable market of economic functions with convenience communication net work.

4.5 HISTORICAL BACK GROUND:

Farin-doki is a village in Kwakuti district of Paikoro Local government Area. The inhabitants migrated from Tuna village in the early 18^{th} century, settled on a high land known in those days, as Jata.

The name Farin-doki, came into being as a result of a development of new market cited where a white horse was then, for easier description of the market by strangers, they the market was named white horse market. The late district head of Paiko (Sarki Mohammadu Bello) formally approved the change of the name from Jata to a more popular name Farin-Doki in 1958.

The village is presently composed of different tribes, like Hausa, Nupe, Tiv, Idoma, Ibo, Kadara etc, who were attracted with the advantages of the market and the high way, for communication and settlement.

Farin-Doki presently, is the head quarters of Farin-Doki Ward area, and is administered by the ward head (Etsu pinze) with his seven council members. Administratively, he report to the village head of Kwakuti, (at Kwatuti village), while the village head too is answerable to district head at Baida. Kwakuti village is the head quarters of the district.

4.6 OCCUPATION:

The indigine of Farin-Doki who are mostly Gwari by tribe are predominantly farmers. Though, by dry season, some of them practices crafts like making baskets, mats (using Rafia stem) and middle-men for the purchase and sell of yam.

The wives engages themselves in different trades, e.g. production of local liquor for sell; production of local solid pap, Zambu, buying and boiling raw rice for sell, for the sustainability of their family life.

While other tribes around are traders e.g. Ibo, Hausa, Yoruba, etc.

4.7 CLIMATE:

Farin-Doki village experiences distinct dry and wet seasons. The wet season lasts about 200 days, starts from April and ends in October, with average high rainfall in July or august.

The temperature of the village falls between 31^0c in the mid day. It rises higher in the mount of March to about 32^0C.

The north east trade winds (Harmattan) set in as from the mouth of November and last till end of January.

Farin-Doki enjoys moderate climate that is fovourable for agricultural scheme.

4.8 WATER SUPPLY:

Farin-Doki village, as to the time of this research has in adequate source of water supply. The bi-water bore holes and tower are not adequate, because of daily increase of population as a commercial village.

The inhabitants treks more than 3 kilometre to fetch water from a stream (Badna) in the south eastern part of the village and (Shiyi-dna) another stream in the north western part of the village. As the time of research, the Bi-water water supply scheme was not function. Besides the long distance for acquisition of water, the water, itself is contaminated the people are vulnerable to different types of water disease.

1.6 SANITATION:

Farin-Doki village has not got any organised sanitation scheme. The entire environment looks untidy, and that make the village inhabitant vulnerable to all diseases, such as fever, lyphord fever, malaria etc. there are evidence that sanitary inspectors does not visit there, and the appropriate authority have not shown any concern about the health and the environment of the village.

1.7 HEALTHF CARE CENTRE:

Fari-Doki village as at the time of research has only one dispensary (Public owned) and one private clinic. Because of poor services as lack of drugs in the government owned dispensary, patience patronise the private clinic than the ill-equipped government one. It was observed that the 2 dispensary are gross in-adequate for such population, and in event of serious case, they have to travel down to Minna for medical care. There would be serious problems if sophisticated cases like snake bite, maternity case are established, chances of survival in such cases are narrowed due to distance of the village to a general hospital.

1.8 SOCIAL STRUCTURES:

Farin-Doki village is a homogeneous society that comprises of the Hauses, Yoruba, Ibos who are settlers and traders generally. The Gwaris have a distinct way of life, like marriage system, (through with Islamic procedure) and largely with traditional way, they also have different traditional ways of socialising together.

Markets serves as meeting points, funeral ceremony (bla) where masquerades are involved, (dancing), Gbunnu, Manda wa, marriage ceremony and naming ceremonies are some of there social activities. The Gwaris also encourages age group rotational farming system to augment each family efforts of agricultural production.

The Hausas, Yoruba, Ibos who are settlers and trader, form a good significant proportion in the population, as such they practice their respective traditional ways of worshiping e.g. (Islam and Christian) Marriage ceremonies, naming ceremonies and other

traditional activities, this adds to socialisation of Fari-Doki village, where occasionally, different tribes features their traditional dances on wedding as marriage occasions.

1.9 PROBLEMS OF VEGETATIONS DEPLETIONS:

The problem that emanates as result of renewable resources such as vegetation, with out corresponding efforts of afforestation are diverse. This ranger from exposing the surface, which the soil left vulnerable to agent of erosion wind or running water. When the rain falls, soil that are left unprotected are eroded, this leads to gully erosion and the land resource which could be used for farming is distengrated and degraded as the rate of infiltration is decreased, the rate of albedos is increased and water retention capacity is reduced, thus deficit in soil moisture for plants growth. This leads to sharp effect on agricultural growth and products, thus poor harvest, famine and economic capacity of farmers is weakened.

Depletion of vegetation cover also lead to loss-of biodiversity, as soil moisture decreases, plants community too decreases and, specials which were formally available would dis-appears, the herbalist would run short of herbs for cure, vegetation cover that serves as habitat for birds, animals would reduce and consequently the animals also will migrate, and the inhabitant are affected by loss of animal that serves for nutrition and species for medicinal preparation.

Depletion of vegetation cover also, is a factor of local climate change, for the vegetation is modified, surface temperature would increase, the use of wood as fuel-energy also added carbon dioxide that affects ozone layer and accelerate the local temperature of

the locality. The cries of rotten yams, flooding, short rain fall, minigities emanate as a result of increase of temperature.

Depletion of vegetation cover also accelerated the effects of strong winds. Vegetation covers serves as not only for wind barker, but direct strong wind. Upon depletion of this vegetation, the area was left vulnerable to destructive, wind. In the area of study, there were cases of destruction of building, properties even the primary school in 1996, which the P.T.F. have just renovated last year.

Economically, there have been gross declination of agricultural produce. This led to serious economic disruption of the farmers, which led many families to migrate to other areas. Many farmers have to buy supplimentary food, before the next harvesting seasons. This triggers both famine and hunger to the in habitants, social problems, emanates as result of poverty e.g. constant disputes on land, family issues, divorce case for in-ability to meet family needs leading decline of standard of living.

Most of the women who contributes to this social and economic menace by deforestation, are still ignorant that their activities contributed largely to the migration, famine, structural destruction, divorce, withdrawal of pupil from school for marriages and social and economical problems of the village.

The unfortunate event is that, the deforestation is still going on increasingly because cost of wood for energy is hiking like that of kerosine and gases. The population of the farmers is increasing and those of settlers is increasing, this shows increasing demands of wood for energy, as the wood is one of the most lucrative venture by women, it is cutted free, transported and sold with out any authority noticing or caution.

It becomes necessary to expose this phenomenon to the authorities, though looks tangible and unnoticeable, the effect is crippling the economy, particularly, the farmers that are supposed to generate this food resources, are massively migrating and would eventually meet or cause the same problems there. There are needs to promote public awareness on the danger of deforestation particularly, women, and of forestation to bring back the glories of greens and rejuvenate the soil facility.

1.10 JUSTIFICATION OF THE STUDY:

Environmental problems are problems that once identified needs to be tackled to avoid multiplications into other problems. Particularly, problems that relates to natural resources that louches not only the socio-economic life of the locality involve, but that could affect the general economy of the nation in general.

Depletion of vegetation for fuel-wood is an activity that has been as old as the mankind himself. It started a devastating roles in a minute scale, unnoticed, until when it began to manifests itself in different ways like changing the climate of the environment, thus leading to destruction of some natural resource e.g. agriculture that the economy of vast majority of people are tied to, increase in temperature that affects health of the people, the land resource, the vegetation, the plants, and water resource for man and plants community.

Depletion of vegetation as it affects the socio-economic life of Farin-Doki is used as a case study to show the impact of this phenomenon that has led to sharp declination of an area that leads other neighbouring community in agric production.

Today, more than 140 people (farmers) have been forced to migrate to other areas of the state in the last 5 years this is because, it got to a point that they had to buy food to supplements those they farm which is un-usual, there are cases of divorces, cases of withdrawal of children from both primary and secondary schools against the popular campaign to get all citizens educated.

This activities of depletion of vegetation is not only limited to Farin-Doki alone, it is problem that cutted across the state particularly in the Northern Western parts and the North Eastern parts, but the degree of effect are higher than other.

Generally, this problem has had indent effects as agricultural producing area, where there economy is tied to agriculture and the rate of poverty is high, thus leading to destruction of vegetation for energy needs and to supplement means of sustainability, with out knowing that afforestation for the those depleted oner means compounding the poverty problems.

Living the situation as it is like this, means in the next 10 years the desertification activities that is moving at alarming rate from the Northern parts of the country to the south will now invade this area.

It is necessary and important to figure out this imminent environmental dauger to the proper Authority to take an urgent solution. This is because, the mass exodus of farmers moving to other area with out solution, the same problem will be re-surfaced there in the nearest future, which mean more stringent agricultural and economic problems are expected.

There ought to be an environmental officers who should be collating report of environmental problems that affects the environment, the farmers who produce this food that the entire populace depends on, and other natural resource that are being affected drastically. This if have been done, world have minimised or eradicated most of the menace, the entire community of Farin-Doki and other related areas are faced with today.

1.11 AIMS AND OBJECTIVE:

The aims and objective of the project is to study and document the social, cultural, economic and environmental characteristics of vegetal cover depletion in a rural setting. Specifically, the objective is to show the following.

1) Study and document the state of the vegetal cover and land use of the environment, in other to determine the extent of depletion of the vegetal cover.
2) Determine those responsible for the depletion of the vegetal cover, areas of use and pattern of use of the fuel-wood for energy supply.
3) Study the impacts of the depletion exercise on the agricultural product harvests of the farmers.
4) Study the socio-economic effects of the harvests on the generality of farmers of the village.
5) Proffer possible suggestions to minimise the use and dependency of fuel-wood for energy and regulate the irrational felling of trees to avoid impending desertification and economic woes.

1.12 SCOPE AND LIMITATION:

This project covers only Farin-Doki village and the environment. The case study covers only six kilometers radius within the jurisdiction of Farin-Doki village. Giving a cross section view of how the vegetation of the area has been tampered with, the socio-economic effects on the people and the environment. Though, there are some neightbouring villages that shares the same effects of this phenomenon, the research is only limited to Farin-doki village only.

CHAPTER TWO.

REVIEW OF RELATED LITERATURE.

2.0 ENERGY RESOURCES:

Energy which is described as a force, vigour and capacity to do things or get things done, and also powers available for working, have been the back bone of many countries technology, industrial and socio-economical developments. Every human action requires the use of energy, be it eating moving or lifting loads. In addition to muscular energy, which has proved insufficient, human kind has harnessed the environment to provide other sources of energy. Fire for cooking, steam for travel and transport, electricity, petroleum in almost all fields because of its efficiency and convenience as well as frequently, its lower costs.

A sudden and unexpected changed occurred in energy planning and use, as a result of the first petroleum crisis brought about by October 1973 Isreal-Arabwar. After the second petroleum (rises in 1979, energy conservation, energy planning and policy gained their importance. In that framework, the United Nation Conference on New and renewable energy resources was held in Nairobi in 1981. During the conference, countries resolved to review their respective energy policies to consider other sources of energy such as (natural gas, biomes and solar energy) The aim of these new policies was the best use of energy resources in order to promote socio-economic development and improve the well-being of the world population. Self sustaining and durable socio-economic development: Energy is engine of economic development.

These are different types of resources that are harnessed as primary energy source, these includes, biomass (wood, charcoal, crop residues etc) and fossil fuels such as (oil, gas coal, electricity, LPG), solar energy, wave energy, and wind energy.

2.1 WOOD AND CHARCOAL:

This is the simplest, the cheapest and most widely used for energy by the poor, particularly in developing countries, where planning, policy, management of energy resources is not or still being developed. This wood resource is used for cooking, lighting, heating, bakery, social centre and even for defence against wild animals. The growth in population, poor economic strength and lack of forestry management and energy planning accounts for deforestation by the use of wood for energy (Howe and Gulick, 1980).

Crop residues:

In New Zealands, Ethanol production for purpose grown crops such as potates, grain, sugar or fodder beet (brown 1981). But has the greatest potential in terms of yields of fuel and lower processing casts. Ethanol can be used in various proportions in modified petrol engines, but is not particularly well suited for diesel substitution.

Coal:

Is another source of primary energy, but requires move sophisticated and expensive plant, if the in efficiency in using it is not more then offset, its long term greater availability and lower price.

Solar energy is another primary energy source:

But relatively too expensive to develop, and is only used by large, and developed countries.

Natural gas:

This forms another source of energy supply used by particularly developed and industrilased country, its cost of transformation from primary to end use is very high.

Crude Oil, diesel, gasoline, Kerosine, fuel oil and auto diesel all plays important role in primary energy supply for transportation of all classes of vehicles, small scale electricity generation, lighting, cooking, hydro-electrical power schemes industrialisation, technological developments and a good substitutes for gas, coal and nuclear energy. The affordability of these resources largely depends on the countries economical strengths, as the costs of importaitons of these resource are not stabilised. The constant rise of the importation costs have had a significant impact on the ecosystem. Thus making it difficult for substitution from biomass energy system to commercial fuel by the rural areas who depends largely on the use of fuel wood. Thus, increasing the dependence on biomass energy demand by the rural and urban poor, whose income makes it difficult to switch to commercial energy.

Hydro-electricity:

Hydro electric power gamete energy that are most used in both developed and developing countries. The significant of this energy development is much felt in industrialisation, technological and even in residential use. This is because the end use is more largely spread and cheaper then other sources to the end user.

Hydro electricity accounts for 30% New Zealand's primary energy supply. Micro-hydro electric systems (under 250KW, are used on some many small streams) They are economical where national electricity grid is not available. Over 50 schemes are presently in the country (Blakely and O'connor, 1981). Firms in New Zealand produce and sell turbines, water heels and even hydraulic rams. Micro Hydro turbines have been built by enthusiasts (Harrison smith 1981).

In Nigeria, Hydro Electric Power generates 80% of energy used in all industrialised and house needs in urban centres.

Direct Solar Utilisation:

Dairy farms have a well specified (in time, location, quantity and temperature) demand for hot water which can be met by solar waters heaters . In New Zealand a test using 18 solar panels of $0.75m^2$ as a pre heaters for an electric heating system, 30% of the heat requirements was obtained from the sun (Raine and Isaacs, 1981). Electric fences have been powered by the sun suing photo-electric cells (Sangster 1981a). This makes electric fencing far more postable than before. Commercial solar energisers are used and have proved reliable.

Utilising the winds:

Despite Cherry's (1976) findings there are no plans for large scale electricity generation from wind energy (New Zealand Min. of Energy, 1982). However, numbers of small windmills are used through out the country. They have traditionally been employed to provide mechanical power (pumping water for stock or irrigation) but move recently for electricity generation to power electric fences and navigational lights. Unit of both

functions are available commercially (Isaacs and Mowbray, Eds, 1981). Wind mills are also being built be enthusiasts.

Research on wind energy conversion systems has been undertaken at the Universities of Auck land and Canterbury. A 10 KW system is scheduled for installation on Chalham Island off New Zealand Coast, but problems in operation have been experienced during testing. Wind appears to be a competetive proposition only for remote locations.

Finally, energy resources availability depends on locations, technological development, planning and managerial efforts of such country. According to Dessai 1978) he illustrated that poor countries do not grow simply by using fuel as they develop economically. If the economies of poor countries are to grow, they will need to use commercial energy and the cheaper this can be provided, the better, and this largely depends on the country's energy policy, planning technological managerial efforts and economical strength.

Rural Energy Availability and use:

Biomas energy which essentially are (woods, vegetable oil animal dung. Ethanol crop residues etc) is an important source of energy not only for the rural areas, but for 75% of the population living in the developing world's total energy consumption (Hall, 1991, Karenzi 1994).

In sub-Saharan Africa (excusing South Africa) this source of energy constitutes 73% of total energy consumption (Ardayfio - Sschandorf, 1993; Davidson and Karezi 1993; O Penshaw, 1990) the use of biomass ranges from as low as 43% and 46% of total

energy consumption in countries such as Zimbabwe and Mauritus to as high as 86%, 94%, 95% and 97% in Kenyan, Mozambique, Sudan and Rwanda respectively (Hall and Rossilo-Calle, 1993).

Wood fuel is undoubtedly the most important source of biomass energy and its increasing scarcity is a subject of major concern in Africa and the rest of the developing world. This problem is caused by rapid increase in human population, as well as market and policy failures. Market failure is refers to the failure to price a resource at full social cost of production, whereas, policy failures means none intervention by government when it is necessary to do so, or introduction of distorted policy (Panayatou 1993; Soussan et al 1992; Openshaw and Feinstein, 1989).

According to (Nyirendra et al 1994) population growth is a driving force behind the process of deforestation, which is linked directly with the wood fuel problem because it leads to an increase in agricultural land clearing and woodfuel demand. On the other hand, market and policy failure are 'accelerating forces' mainly because of lack of property rights in the open access regimes of most developing countries, which encourages over exploitation of wood land resources.

Though biomss is widely consumed in the rural areas of sub-sharan Africa, it also provides energy for the urban poor as well as for small scale industries like bakery, clay pot maing, black smitts etc (Rosillo-Calle and Hall 1992). For Millions of families in the rural areas depends on this cheapest means of energy for cooking, warming, light producing alcohol and defence against wild animals. Except of the governments of developing countries initiate policy and action programmes to transform the use of there renewable

energy to a sustainability scale, the environmental problem and health and the depletion of these resources would lead to further socio-economic crises.

Problems of fuel wood:

Biomass fuels plays an important role in most low and middle income in developing countries. Yet they are often overlooked by energy statistician and more importantly by energy planners. According to (F.A.O 1982) reported that as many as 16 out of 45 countries in sub Saharan in Africa are faced with fire wood deficit in these territory. The unsustainable use of fuel wood may lead to socio-economic problems, increase in the labour time spent on its collection, an increase in real price and switch to the less proffered fuel wood species or to other energy sources (Kgathi 1992). As the price of fuel wood or labour time of its collection increases, the economics of cooking may change as house holds reduce the number of meals cooked or develop strategies for using this energy more efficiently (Leach, 1987; Kgathi 1992). The increase in labour time spent on wood collection may also affect the labour budget for its collection and hence house hold activities such as child care, cooking, food preparation and fetching of water (Wisner 1988). The crises of increasing labour time for fuel wood collection is described as a crises of women (Wisner 1988; Agarwa 1986; Munslow et al 1998; Genapathy, 1981).

The unsustainable use of biomas may lead to such environmental problems such as reduced biodiversity and increase deforestation. Reduced biodiversity of fuel wood species may be caused by the over exploitation of the most preferred species and may have many detrimental effects according to World Commission on Environmental and Development 1988: Species diversity is necessary for the functions of the ecosystems and the biosphere

as a whole. Deforestation is associated with the emission of carbon dioxide, since trees sequesters carbon, and may contribute to the global problem of the green house effects.

One of the major problem associated with the scarcity of this renewable energy resources is population increase. Evidence suggests that while population growth is constant or even declining in other parts of the world, in sub-saharan Africa, the population have increased from 2.5% per annum in 1960 to 3% in 1983 (Pearce et al, 1991) The world's population shows that the natural increase of population was 3% in Africa and 2.3% in the developing countries, and only 0.5% in the developed world. In Africa this estimate was lower in Northern Africa (2.6%) and higher in western Africa (3%) Easter Africa (2.6%) and higher in Western Africa (3%) Eastern Africa (3.2%) and southern Africa (2.7%).

As population increases, the availability of renewable resources such as fuel wood declines. For example increase in human population is associated with expansion of crop land and the increasing demand for forest products, thus deforestation particularly in Africa (Pearce at al 1991 - 125) fuel scarcity too.

Similarly, the use of cow dung and crop residues has adverse effects on the environment, because it withdraws important nutrients and organic matter from the soil (Barnard 1990; Pearce and Turner, 1990: 349; Hallet al, 1982: 36 - 41).

Another problem that associates scarcity is costs of transporting the wood-fuel, because increase in cost of petroleum fuel, the cost of collecting the fuel increases as distance increases due to declination of resource, this of course accelerate the price of the fuel wood for the consumer or end uses. Instability in the fuel energy in developing world have increased the cost of procurement of fuel wood.

CHAPTER THREE

METHODOLOGY.

3.0 DESCRIPTION OF DATA:

For the purposes of obtaining a detailed information of the state of the vegetal cover, the impacts of depletion of vegetal cover on the agricultural products and the socio-economic effects of the people of the environment. The following methods were used for the various data.

1) Field observation:

Visual assessment method was adopted for the acquisition of the various field data.

2) Questionnaire:

Was administered for the acquisition of agricultural data of farmers harvests, data from sectors that uses woods for energy purposes and data of socio-economic effects to the people of the environment.

3) Pictorial Method:

Were used to further illustrate the various field data; the process of the use of such data and Commercialisation scenes.

4) **Graph method:**

Were further used to augment the depiction of the various agricultural products harvests.

3.1 METHOS OF ANALYSES:

In the field observation exercise the entire environment under study was divided into 4 quadrants and described as N.E, N,W, SE, and SW for easy coverage. Covering a distance of 6Kh radius to avoid encroaching into another village.

The field data were analysed as tree for full grown trees, and those still growing as shrubs, grass, area under cultivation or cultivated as farm land and bare ground for streams; rock, output; roads; paths or buildings which are devoted with vegetation covers.

At each of the two points in each of the 4 quadrants, a visual assessment of each data e.g trees, shrubs, grasses, farm land and bare grounds percentages were recorded.

The mean of each data in the quadrants was calculated e.g. the mean of the trees in the first and second points in N.E. Quadrants were calculated as, percentages of trues in the 1st point of NE quadrants e.g. 10% NW; 15%NE; 15% SW; and 20% = 60/4 = mean of 1st point of observation in N.E quadrants = 15% trees.

Mean of 2nd point of observation in NE quadrant = 21%NW; 18%N.E; 17% SE and 20% SW = 76/4 mean f 2nd point in NE 19/4%

The entire mean of trees in N.E Quadrants = 19 + 15 = 34/4 = 8.5%

Pictorial data:

Pictorial aerial data revealing parts of the depleted vegetation in the south west, south east, North west and North eastern parts of the study area was obtained to further illustrate the state of the vegetation cover. Photographs of heaps of woods arranged by different house holds wives and those arranged for commercialisation were taken. See appendix.

Also for illustrations are photographs of logs of woods in pieces, of different sites, awaiting to be transported to Minna for commercialisation. A photograph of a pick-up van conveying woods procured by one of the commercial wood dealers at destination.

Pictorial scheme of market where local liquor producers assembles of for commercialisation is also shown in appendix

Questionnaire:

For the purposes of obtaining a cross sectional information in the environment. a questionnaire was designed to extract information, about extraction of woods for energy, distance, frequency of extraction, mode of evacuation, destination, quantity of woods used at a time, marketing and economic profits obtained.

The questionnaire also covers effects of depletion of vegetation on agricultural yields, as felt by farmers, within the interval of 5 years harvests (1994 - 1999). Specifically, on yam, guinea corn and corn, bearing in mind their ages, experiences, mode of farming, implement used. Zumbui producers, local liquor producers were consulted and

statistical records of woods used for energy were obtained. a sample of the questionnaire is attached in appendix.

Contents of the questionnaire:

The questionnaire was designed to extract the difference of 1994 harvests of agricultural produce of yam, guinea corn, and corn. Having age differentiation of 5 years apart, experience of 5 years interval, this is with the aim of comparing similarities of yields, experience and age. E.g. ages of above 20 - 25 years with 15 years experience, 30 - 35 years with above 20 years experience, 40- - 45 years with above 30 years with above 30 years experience and ages within the ranges of 50 - 55 years as peak and have over 40 years experience. This data would reveal either it was a defect in individual system of farming base on yield, or a defect of soil fertility that contributed to declination of yield in comparison.

The questionnaire also extracted the quantity of woods used for energy by local liquor producer; Zambu produces; and those that specialises in extracting vegetation for commercialisation, based on their ages, experiences amount incurred and amount realises, so as to as certain weather their economic gains commesurates with each tree-fell for commercialisation.

The questionnaire also revealed the distance, mode of evacuating and period of extracting the fuel wood by individual.

Graph data:

Graph was used to further show the variation of agricultural yields harvests of yam, guinea corn and corn produced in 1994 and those of 1999. The graph also depicts their

ages, experiences year of produced and turn over produce. This is aimed at facilitating the comprehension of rate declination of agricultural product as a result of detorration of soil fertility.

Mode of administering the questionnaire:

For convenience of acquiring the data, Farin-Doki village was divided into 6 wards, namely, Gona ward; Pamgbe ward; Pampi ward; Wokili ward and Lapunshia wards respectively. a random sampling method of questionnaire was adopted.

In each ward, 2 compounds were chosen and in each compound 2 house holds that their ages, experience, and occupation that fitted with the questionnaire were chosen. At times of problems of short coming of either ages, or experiences that does not fits, the next nearest compound and house hold is chosen, to complete the requirements of the questionnaire exercise.

Farmers

A total of 16 house hold farmers were interviewed. Data of their 1994 yam seeds harvests; 1999 yam seeds harvests; 1994 big yam tuber harvests and 1999 big yam tuber harvests were obtained. Similarly data of their 1994 and 1999 guinea corn and corn harvests were obtained. the differences of yields in 1994 and 1999 harvests are the consequence of loss of soil fertility.

Zambu producers:

A total of 6 women that specialises in producing Zanbu (Local Solid pap) were interviewed. the research revealed that each of these women uses not less than pieces of log of wood daily, for energy supply that lasts more than 5 hours. they also gets profits of not less than N1,000.00 at each production.

Local Liquor producers:

Local Liquor is one of the sectors that consume woods for energy. a total of 8 women that specialises in the production were interviewed. The research revealed that some of the women uses not less than 90 log of woods for energy in the production exercise which lasts between 12 to 15 hours energy supply summary results attached in appendix.

Commercial wood dealers:

Only 3 women that specialises in extracting woods for commercialisation were available. Their activities which are weekly, involves extracting of woods and evacuating them with pick-up vehicle to Minna for comemercialisation to bakers and other uses of fuel-wood for energy. Detail is attached in appendix.

Markets:

The producers of local liquor, Zambu, produces there items daily, which reveals daily uses of fuel-wood which are taken to Kwakuti, Farin-Doki, Paiko, Lambata and Izom markets.

Time of extraction of fuel wood:

The research reveals that 95% of the Zambu, Local liquor and commercial wood dealers extract the vegetation weekly.

Mode of transportation:

The statics of women that evacuate fuel-wood manually is higher than those that uses vehicle to transport it. Detail is attached in fig.

CHAPTER FOUR

4.0 ANALYSIS AND DISCUSSION OF DATA:

This chapter analysed and discussed the raw data obtained from the field work, the results of the questionnaire conducted on the farmers agricultural products, data obtained from questionnaire in the various areas where woods are used for energy purposes, which are shown from figure 1 to 16.

4.1 ANALYSIS AND DISCUSSION OF OBSERVATION OF NORTH EAST QUDRANTS (I) OF FARIN-DOKI ENVIRONMENT:

At the first observation point of figure 1 of this quadrant, it was observed and recorded that the percentages of shrubs are higher than the full-grown trees. Figure 1 reveals that farming activities is more concentrated at the N>W parts, and extraction of woods are higher, the result shows that tees are not allowed to reach maturity age, thus, grown trees have 10% while shrub has 40% and farming areas have 38%. this also showed that small area are left to fallow as the grass area shave only between 8% to 11% and smaller portion for road and foot paths.

In the second observation point of this quadrant, farming activities are higher than the first observation point. Hence, farming activities are concentrated at N.E and S.E parts with 45% and 46%, depletion exercise is lesser in this part as the percentages of full grown trees is between 18% to 21% higher then the first observation point and the percentages of shrubs are lesser than the first observation point e.g. 20% at SW and 29% of NW parts. Similarly, uncultivable areas that is made up building, road, river and highly areas accounts

for the Bare ground pertion which is smaller in percentages between 3% to 10% at the SW where the river, building and the hilly areas are situated.

FARIN DOKI VILLAGE DIVIDED INTO FOUR QUADRANTS 2 OBSERVATION POINTS IN EACH QUADRANT.

NW Zuru-shodna side	NE Boku side
Butigi village side SW	Tuna village SE

1st N.E. FARIN-DOKIat chengado Kunun (Hill) - Boku side

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	10%	15%	15%	20%	Depletion of woods and erosional hazards. Road and foot path
2	Shrub	40%	35%	38%	36%	
3	Grass	9%	10%	8%	11%	
4	Farm land	38%	30%	35%	35%	
5	Bare ground	3%	10%	4%	8%	

Nupa Kunkun (Hill) Lavungbe village side

2nd Observation in N.E. part of Farin-Doki 2Kl away from the 1st.

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	21%	18%	17%	20%	Uncultivable hilly area Erosion Building, road, river.
2	Shrub	29%	26%	23%	20%	
3	Grass	8%	7%	10%	15%	
4	Farm land	39%	45%	46%	25%	
5	Bare ground	3%	4%	5%	10%	

Figure 1

NORTH EASTERN SIDES QUADRANT I.

First N.E. part of Farin-Doki at Chengado Kunkun (Hill)

Trees	10% + 15% + 15% + 20% = 66/4 = 15%
Shrub	40% + 35% + 38% + 36% = 149/4 = 37.25%
Grass	9% + 10% + 8% + 11% = 38/4 = 9.5%
Farm land	38% + 30% + 35% + 35% = 138/4 = 34.5%
Bare ground	3% + 10% + 4% + 8% = 25/4 = 6.25%

Observation an Napa Kunkun at lumigbe village side

Trees	21% + 18% + 17% + 20% = 76/4 = 19%
Shrub	29% + 26% + 23% + 20% = 98/4 = 24.5%
Grass	8% + 7% + 10% + 15% = 40/4 = 10%
Farm land	39% + 45% + 46% + 25% = 155/4 = 38.75%
Bare ground	3% + 4% + 5% + 10% = 22/4 = 5.5%

Table 1

4.4 ANALYSES OF OBSERVATIONS IN SOUTH EASTERN PART OF THE ENVIRONMENT:

From the field observation, the full grown trees are more available in the NW and N.E parts of the 1st observation points of quadrant 2 (Fig II). Example 30% and 33%NE, this revealed that greater depletion of vegetation occurred slightly at the S.E & S.W parts. This is also revealed in the shrub percentage as the NW and NE have lesser percentage of shrubs 28%, 25% while the SW & SW which vegetation are tampered with more, have greater percentages of shrubs e.g 32% & 30% respectively.

Farmland:

Like the North Eastern part, farm land dominates the greater percentages, the North East part has the highest of 3%, SW 34% while SE and NW have 32% and 30% farmland areas.

Grass and bare ground:

Because of farming activities, not much land was left for fallow, this occulted for the lesser percentages of grassland and bare ground which are mainly road, rock out put and rivers.

Similar situation was recorded at 2nd observation. Point Farmland dominates and have higher percentage than the 1st observation, example 50% area of the SW point of the 2nd observation is farm land. This decreases towards the north 48% SE, 45%NE and 40%NW part. While the percentages of full-grown trees are 32% in SE and the lowest 26% at the SW parts. The farmland being the dominant accounts for the lesser

percentages of shrubs to be 16% and the highest percentage of grass area in the NE part to 9% only. While the bare ground which are mainly river, and footpath are 8% NW, 6% NE, 5% in the SE and 9% in the SW part of the 2nd observation the point.

First observation at South Eastern part of Farin-Doki

Tunna Kunkun (Hill) Tunna village side

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	30%	33%	29%	28%	Hilly uncultivable area and hazards erosion River and foot path
2	Shrub	28%	25%	32%	30%	
3	Grass	8%	4%	4%	6%	
4	Farm land	30%	35%	32%	34%	
5	Bare ground	4%	3%	3%	2%	

2nd Observation at South Eastern part of Farin-Doki 3Klm from the 1st observation (Pamgbe Kunkun) Hill Shaku village side

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	31%	29%	32%	26%	Signs of erosion
2	Shrub	15%	16%	10%	9%	
3	Grass	6%	9%	5%	6%	
4	Farm land	40%	45%	48%	50%	River, road, rock output
5	Bare ground	8%	6%	5%	9%	

Figure 2.

SOUTH EASTERN SIDES I.

SUMMARIED RESULTS OF OBSERVATIONS

First observation at South Eastern Part of Farin-Doki Tunna Kunkun (Hill)

Trees	30% + 33% + 29% + 28% = 120/4 = 30% average
Shrub	28% + 25% + 32% + 30% = 115/4 = 2875% average
Grass	8% + 4% + 4% + 6% = 22/4 = 5.5% average
Farm land	30% + 35% + 32% + 34% = 131/4 = 32.75% average
Bare ground	4% + 3% + 3% + 2% = 12/4 = 3% average

2nd Observation in South East Pambge Kunkun (Hill) Shaku village side

Trees	31% + 29% + 32% + 26% = 118/4 = 29.5 average
Shrub	15% + 16% + 10% + 9% = 26/4 = 12.5 average
Grass	6% + 9% + 5% + 6% = 26/4 = 6.5 average
Farm land	40% + 45% + 48% + 50% = 183/4 = 45.75% average
Bare ground	8% + 6% + 5% + 9% = 28/4 = 7% average

Table 2.

4.3 ANALYSES OF FIELD OBSERVATIONS AT SOUTH WESTERN PART QUADRANT 3 S.W.

The field observation of 1st point revealed that, because of increase of population limited land resources, Farming activities accounts for more that 40% of these environment Example at the NW part, farmland has 44%, NE 46%, SE 42% and 40% at the SW. Trees that have been depleted badly have 26% at the SW part of this point and depletion increase towards SE 20%, and NE 20% while NW has 22%.

Similarly because of human activities in tampering with vegetation, farming and lesser time for fallow, the grass land accounts for small percentages e.g. 10% in NW, 7% NE 9% SE and 8% grass in the SW part of the observation point. While little percentage is left for road and building e.g. 7% in both NE & SE and 4% bare ground in NW and 6% in SW.

In the 2nd observation point, of the South Western part of Farin Doki, like the 1st point, farm land dominates, SE part of this point has the highest of 47% farm land, SW has 45% and farm land areas decreases to wards the North with 42% NE and NW 40%. Greater depletion of vegetation occurred here, as percentages of full grown trees are less in northern parts e.g. NW 15% and NE 17% while SE parts have 20% and SW part have 19%.

This is also reflected in the higher percentages of shrubs 32% in the NW parts against (Tree 15%) NE 23%, SE 18% and 16% for SW which has (19% trees) too.

The situation led to decrease in percentages of both grass and bare ground, (grass 16% and 4% for bare ground).

1st Observation atSouth West part of Farin-Doki environment (Tunna Kunkungbe side)

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	22%	20%	20%	26%	
2	Shrub	24%	20%	22%	20%	
3	Grass	10%	7%	9%	8%	
4	Farm land	44%	46%	42%	40%	Roads building
5	Bare ground	4%	7%	7%	6%	

2nd Observation at South Western part of Farin-Doki

2 Kilometre from the first one (Shaku Village side).

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	15%	17%	20%	19%	
2	Shrub	32%	23%	18%	16%	
3	Grass	8%	10%	10%	16%	
4	Farm land	40%	42%	47%	45%	River road
5	Bare ground	5%	8%	5%	4%	

Figure 3.

SOUTH WESTERN SIDES 3

First Observation at South Western side (Tunna Kunkungbe side)

Trees	22% + 20% + 20% + 26% = 28/4 = 22% average
Shrub	24% + 20% + 22% + 20% = 86/4 = 21.5% average
Grass	10% + 7% + 9% + 8% = 34/4 = 8.5% average
Farm land	44% + 46% + 42% + 40% = 172/4 = 43% average
Bare ground	4% + 7% = 7% + 6% = 24/4 = 6% average

2nd Observation at South Western side (Shaku Village side)

Trees	15% + 17% + 20% + 19% = 71/4 = 17.75% average
Shrub	32% + 23% + 18% + 16% = 89/4 = 22.25% average
Grass	8% + 10% + 10% + 16% = 44/4 = 11% average
Farm land	40% + 42% + 47 + 45% = 174/4 = 43.5% average
Bare ground	9% + 9% + 14% + 10% = 42/4 = 10.5% average

Table 3.

4.4 ANALYSES OF OBSERVATION IN NW PART QUADRANT 4 N.W.

From the first observation point of this quadrant, the survey revealed that farm land had the greater percentages in all observed points example, in the North West farmland has 39%, NE has 40% farm land while 45% is for SE and 40% accounts for farm land in south west part. Trees have 22% in the NW, 18 % in the NE, while 23% has SE, and 21% for SW. Thus is reflected in the shrubs with 20% NW, 22% and 18% the least in the SE part.

The percentages of bare ground is higher in this case because of large rock output, building and rivers that are in this part. Thus giving 9% of bare ground in the NW and NE parts, while 14% is accounted to where the large rock out put is located and 10% where the large rock out put is located and 10% where some building and rivers are located.

A similar situation was observed in the 2nd observation point of the quadrant. Here in the South Eastern part, grown trees have 33% and 35% as bare ground because of small isolated forestry/hill area, that the vegetation was not tampered with. And farming activities fell to 38% lesser than other areas. Farm land generally have higher percentages 42%NW, 40%NE and 43%SW. The Northern parts had average percentage vegetation e.g. 20% for both NW & NE and 28% of trees at the SW parts. Shrubs are almost evenly spread 16% to 22% cross section photograph of NW. Environment is on appendix 5.

1st Observation at North West part of Farin-Doki Village - Lolitapi Village Side.

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	22%	18%	23%	21%	
2	Shrub	20%	22%	18%	20%	Rock output
3	Grass	10%	8%	7%	9%	Building, rivers,
4	Farm land	39%	40%	45%	40%	road
5	Bare ground	9%	9%	14%	10%	

2nd Point: NW (Gwam side)

S/N	Observed Quadrant	1st NW	2nd NE	3rd SE	4th SW	Remark
1	Trees	20%	20%	33%	28%	
2	Shrub	18%	22%	185	]16%	Hilly area
3	Grass	9%	10%	7%	10%	
4	Farm land	42%	40%	39%	43%	
5	Bare ground	11%	8%	35%	3%	

Figure 4.

PLATE 1C: Part of aerial view of N.E. part of Faria-Doki village environment

PLATE 2C: Part of aerial view of S.E. part of Faria-Doki village environment

PLATE 3C: Part of aerial view of S.E. part of Faria-Doki village environment

PLATE 3C: Part of aerial view of N.E. part of Faria-Doki village environment

Fig. 1b: Part of Aerial view of N.E. part of Farin-Doki Environment

Fig. 1b: Part of Aerial view of S.E. part of Farin-Doki Environment

Fig. 2b: Part of Aerial view of N.E. part of Farin-Doki Environment

Fig. 2b: Part of Aerial view of S.E. part of Farin-Doki Environment

4.4.1 GENERAL DISCUSSION OF THE WHOLE EXERCISE FIELD OBSERVATIONS GENERALLY.

From the field observations, of all the a quadrants, it was observed that more than 45% of each quadrants land surface have been cultivated for farming and that followed clearances of vegetal cover.

Shrub regions covers more than 20% in earth quadrants due to shuffling cultivations and depleted woods for fuel energy

As result of the above, shrub and trees percentages, it becomes evident that the ecosystem life have been tampered with in greater proportion, this was necessitated by man's needs for substance agriculture, energy and economics end. The grass and bare ground areas emanated as uncultivable rocky areas, rivers, roads or buildings.

There are signs of erodable area and these emanated as a result of depletion of vegetable covers.

The streams found which serves for domestic needs had already gone dry due to rapid evapo-transpiration, increase surface run-off, increase abed so at the surface discrease of infiltration and consequent local climate change.

From the heaps of woods found in the N and SE parts (Shown in the photograph) the women fell down trees indiscriminately, not allowing the trees to reach maturity age of 30 years and economic trees like sheabutter tree which was said to be highly energy supply were depleted due to being tree and back of Authority to caution.

SUMMARY RESULTS OF ALL OBSERVATIONS OF VEGETATIONAL COVERS

TREES	SHRUB	GRASS	FARM LAND	BARE GROUND	QUADRANTS
14.9%	10.31%	3%	19.6%	2.5%	S.E.
9.9%	10.9%	4.9%	21.6%	4.1%	S.W
8.5%	15.43%	4.9%	18.3%	2.9%	NE
11.6%	9.6%	4.4%	20.6%	6.3%	NW
44.9%	46.24%	17.2%	80.0%	15.8%	

4.5 ANALYSES OF OBSERVATIONS IN AGRICULTURAL YEALDS.

This further analyses socio-economic impacts on agricultural yield.

For proper verification, the research was conducted on 16 farmers yields of 1994 and 1999 harvests of yam seeds; big yam tuber, guinea corn and corn, bearing in mind their ages and experiences which contributes a lot in farming, if the soil fertility have not shot coming. The ages that starts from 25 years, which in most cases are either unmarried or married with a child as two, which can not contribute effectively in labour supply, to the ages of 55 years as a peak; which in normal situation have family farms, with grown up children that can contribute to family farming and again engage in rotational syndicate farming that adds to advantage. (Rotational farming is a system where youths of the same generation e.g. 10 youths engage to cultivate farm for one and the another in an agreed date on rotational basis). It has the advantage of not only faster both cheaper and easier method of farming.

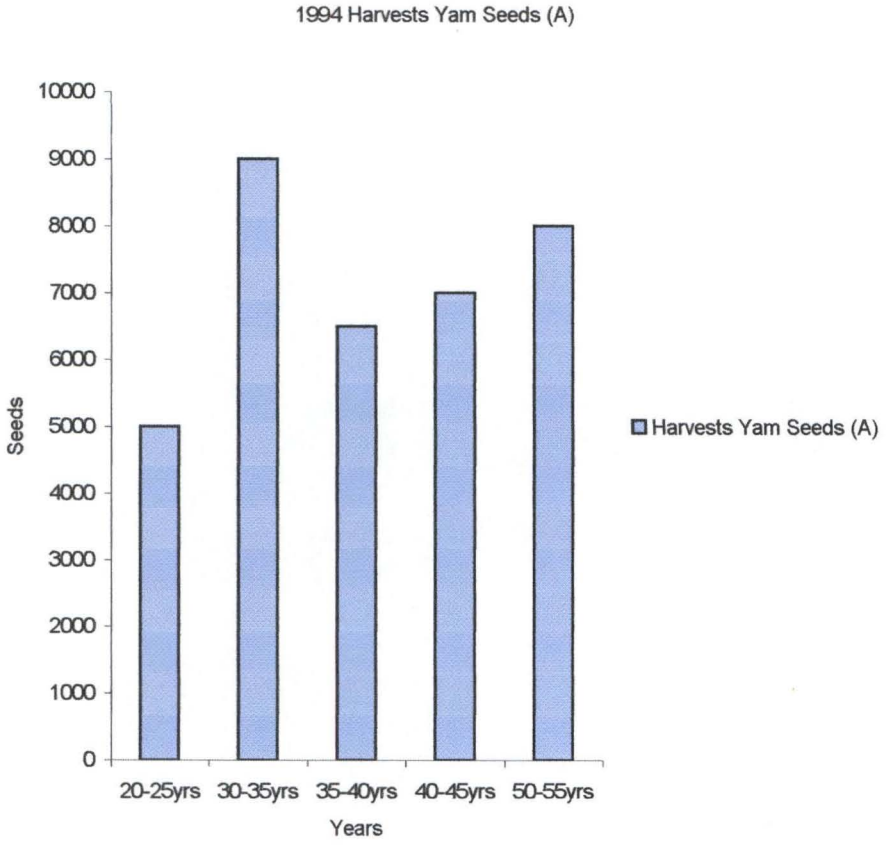
4.5.1 ANALYSES OF YAM HARVESTS OF 1994 AND 1999

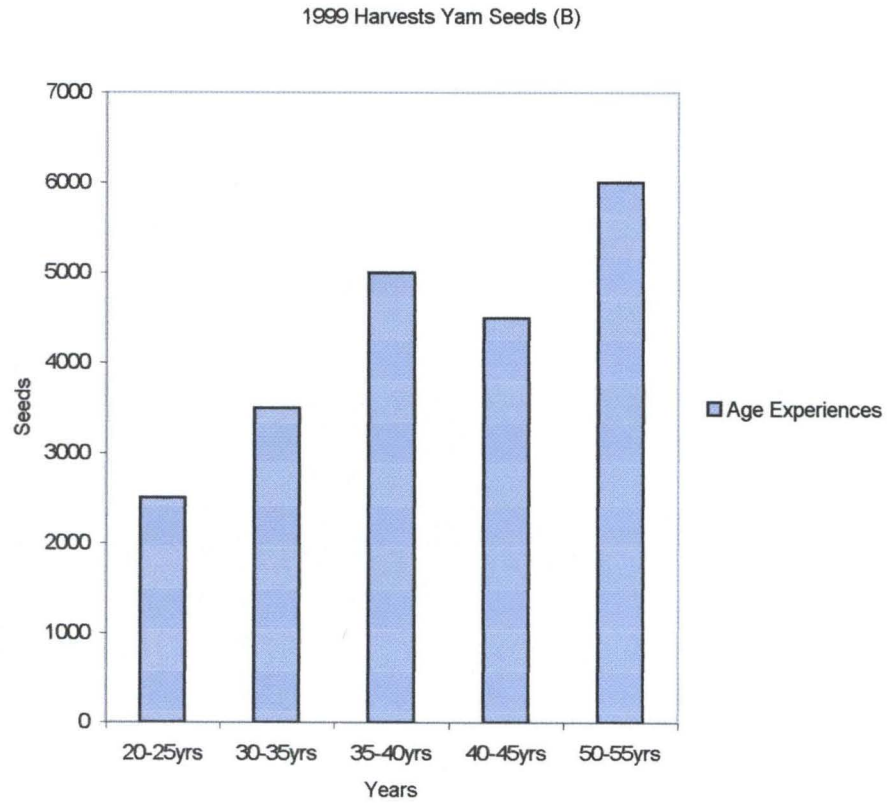
Table I shows the summary of 1994 yam harvests of 16 selected farmers from various wards, and compounds in Farin-Doki village. Graph 1a and b shows the differences of 1994 and 1999 yields.

In table 1 4 selected farmers of about the same age mates of 20 - 25 years and having experience of above 15yrs had an average of 3,500 yam seeds in 1994 and in 1999 got 2,500 yam seeds, having a decline of 1000 seeds. The got 3,500 big yam tuber in 1994.

Similarly 3 farmers of 35 - 40 years of age and 25 years of farming experience had over 6,500 yam seeds in 1994 and the figure dropped to 4500 having a declination of over 2000 yam seeds. The same group got big yam tubes of above 5000 in 1994 and 1999 these reduced to 2500, thus having a difference of 2,500 big yam tuber.

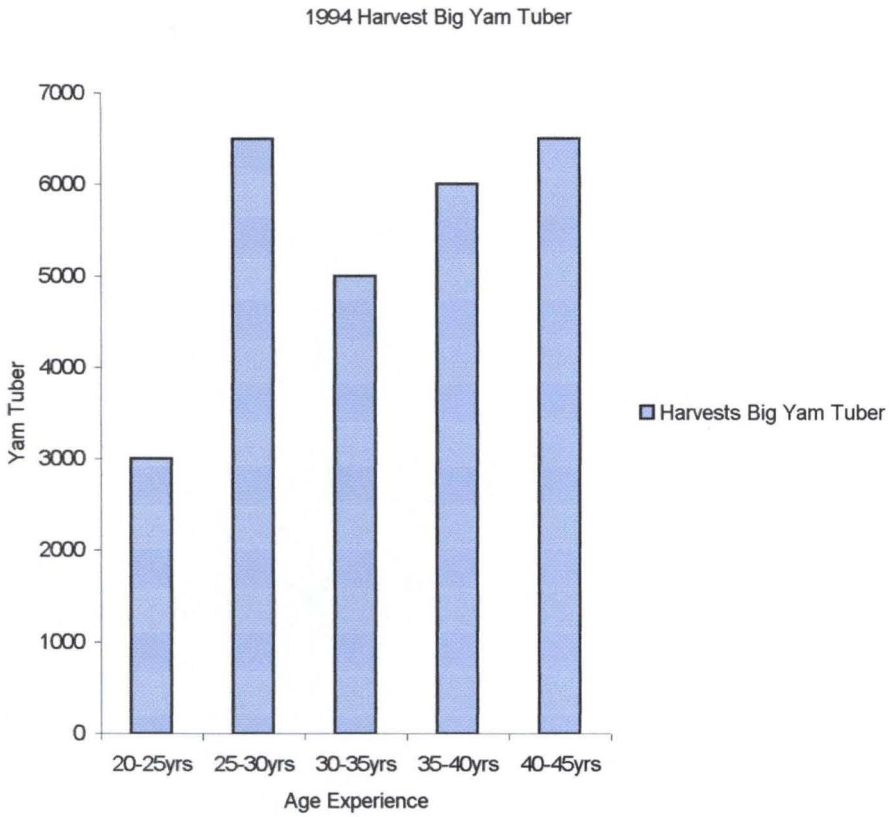
Selected 2 farmers of above 50 years of ages and all farming experience of not less than 40 years got 7000 yam seeds in 1994 and got reduced to 5,500 seeds in 1999. The same people got big yam tuber of about 6000 in 1994 and the harvests dropped to 4000 in 1999. Graph 1a and 1b shows the differences of yields in both 1994 and 1999 harvests.

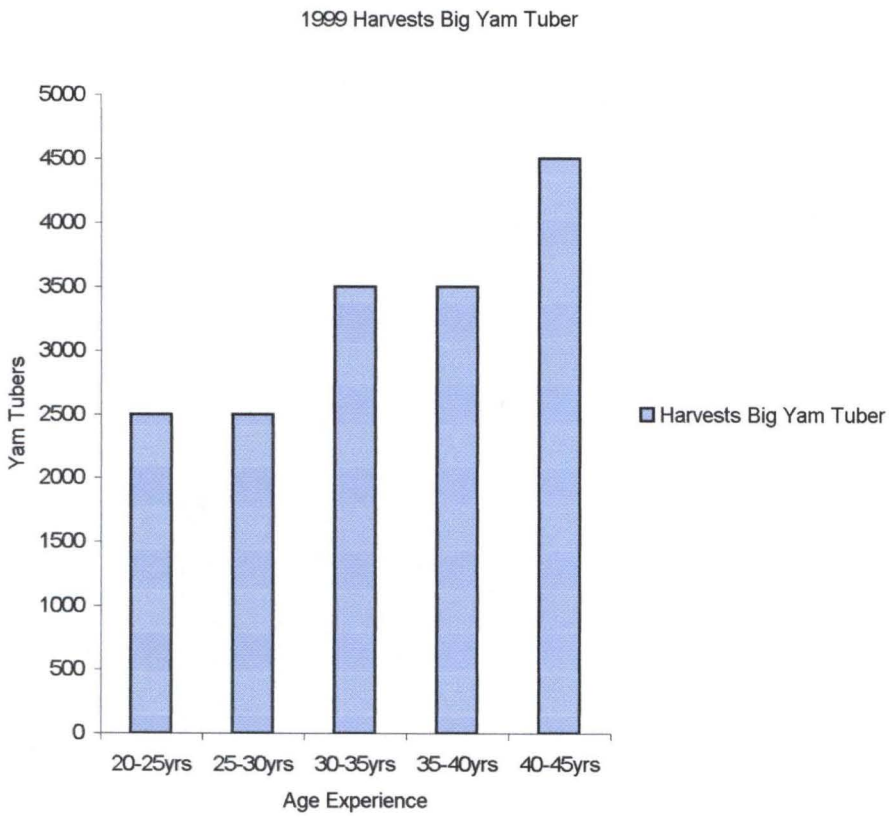

1994 Harvests Yam Seeds (A)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Seeds
20-25yrs
30-35yrs
35-40yrs
40-45yrs
50-55yrs
Years
Harvests Yam Seeds (A)


1999 Harvests Yam Seeds (B)
7000
6000
5000
4000
3000
2000
1000
0
Seeds
20-25yrs
30-35yrs
35-40yrs
40-45yrs
50-55yrs
Years
Age Experiences

NO	AGE GROUP	EXPEREICNE	1994 SEEDS	1999 SEEDS	DIFFERENCE OF SEEDS	1994 BIG YAM TUBER	1999 BIG YAM TUBER	DIFFERENCE OF BIG YAM TUBER
1	50 - 55yrs	Above 40yrs	Over 7000	Over 4500	- 2500	Over 5500	Over 3500	- 2000
2	"	"	Over 8000	Over 6000	- 2000	Over 7000	Over 4500	- 2500
3	"	Above 35yrs	Over 6500	Over 2500	- 4000	Over 3500	Over 1500	- 2000
4	"	"	Over 5500	Over 2500	- 3000	Over 4500	Over 1500	- 3000
5	40 - 45yrs	Above 30yrs	Over 7000	Over 4500	- 2500	Over 6500	Over 3500	- 3000
6	"	"	Over 5500	Over 4500	- 1000	Over 5000	Over 2500	- 2500
7	"	"	Over 7500	Over 4500	- 3000	Over 5000	Over 3500	- 1500
8	35 - 40yrs	Above 25yrs	Over 6500	Over 5000	- 1500	Over 4500	Over 3500	- 1000
9	"	"	Over 4500	Over 3500	- 1000	Over 3500	Over 1500	- 2000
10	"	"	Over 6500	Over 4500	- 2000	Over 5000	Over 3500	- 1500
11	30 - 35yrs	Above 20yrs	Over 9000	Over 3500	- 5500	Over 5000	Over 2500	- 2500
12	"	"	Over 5000	Over 3500	- 1500	Over 6500	Over 2500	- 4000
13	20 - 25yrs	Above 15yrs	Over 3500	Over 2500	- 1000	Over 2500	Over 1500	- 1000
14	"	"	Over 3500	Over 2500	- 1000	Over 2500	Over 2500	
15	"	"	Over 4500	Over 2500	- 2000	Over 3500	Over 1000	- 2500
16	"	"	Over 2500	Over 1500	- 1000	Over 1500	Over 1000	- 50

Table 6.


1994 Harvest Big Yam Tuber
7000
6000
5000
4000
3000
2000
1000
0
Yam Tuber
20-25yrs
25-30yrs
30-35yrs
35-40yrs
40-45yrs
Age Experience
Harvests Big Yam Tuber


1999 Harvests Big Yam Tuber
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Yam Tubers
20-25yrs
25-30yrs
30-35yrs
35-40yrs
40-45yrs
Age Experience
Harvests Big Yam Tuber

4.5.2 ANALYSES OF 1994 AND 1999 GUINEA CORN HARVEST.

Table II and graph II shows the summary of 1994 and 1999 guinea corn harvests of the same 16 farmers in the previous paragraphs.

The group of 4 farmers 20 - 25years and 15 years experience had over 15 boundless as guinea corn harvest sin 1994 and got only bellow to boundless in 199 harvests.

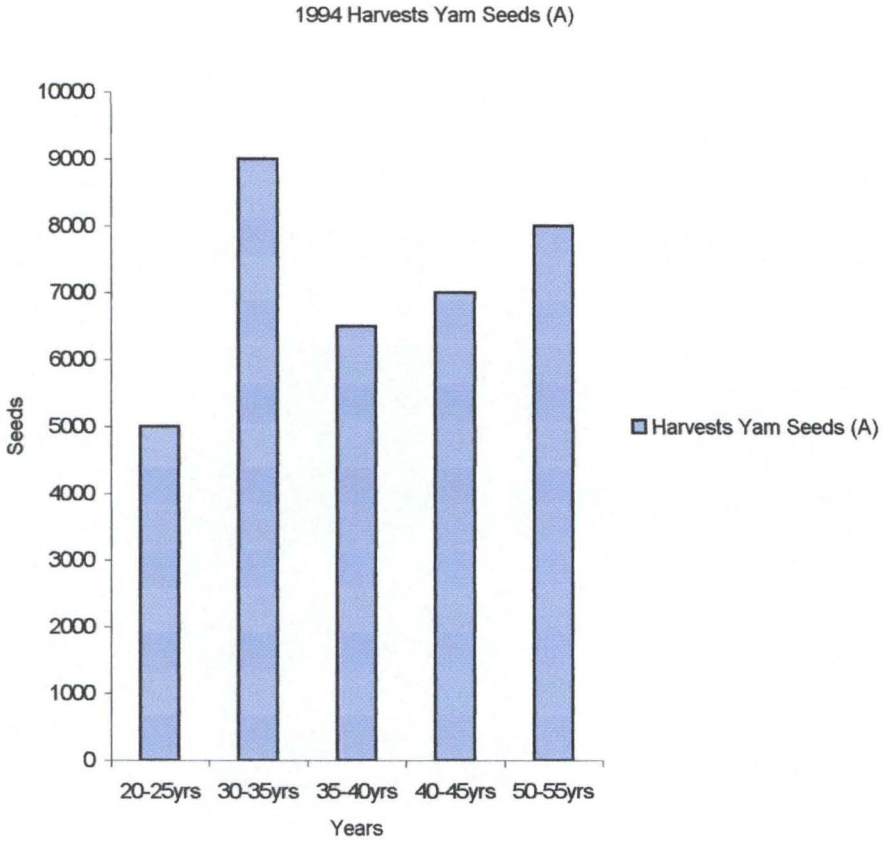
Research reveals that the same farmers of 35 - 40years and above 25 years had above 30 boundless in 1994 harvest and in 1999 got only below 20 boundless as guinea corn harvests.

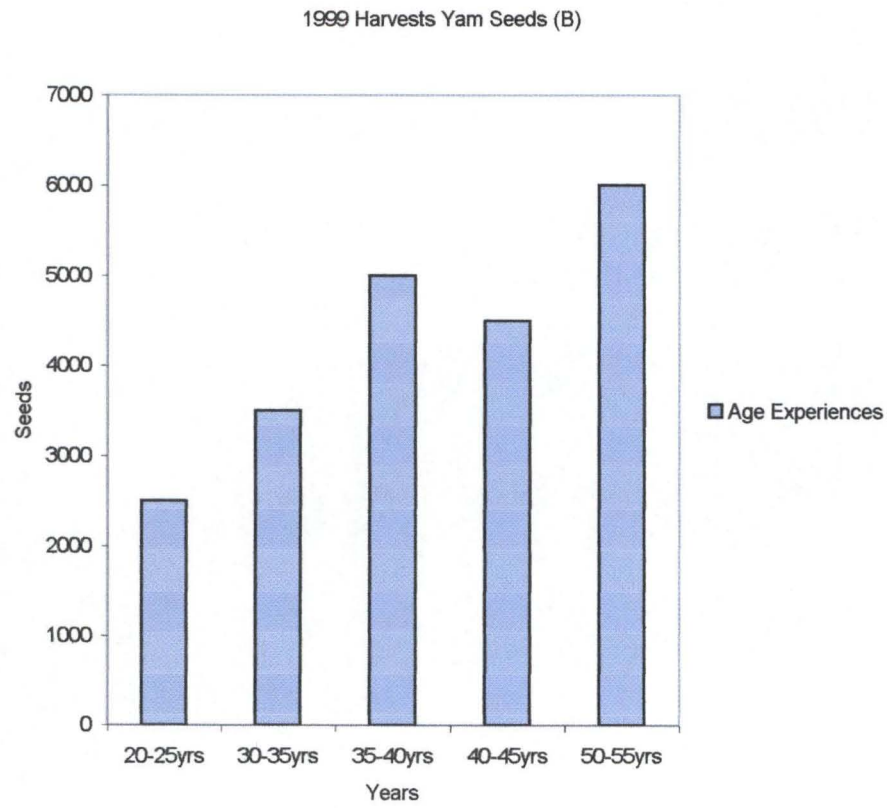
The same graph of 50 - 55 years of age and have over 40 years experience had above 40 boundless of guinea corn in 1994 and the figure of the boundless of guinea corn harvested in 1999 dropped to below 30 boundless.

SUMMARY OF 1994 AND 1999 GUINEA CORN HARVESTS.

NO	AGE GROUP	YEARS OF EXPERIENCE	1994 HARVESTS (BOUNDLESS)	1999 HARVESTS (BOUNDLESS)	DIFFERENCE OF BOUNDLESS
1	50 - 55yrs	Above 40yrs	Over 55 Boundless	Over 40 Boundless	15
2	"	"	Over 35 Boundless	Over 20 Boundless	15
3	"	Above 35yrs	Over 20 Boundless	Over 15 Boundless	5
4	"	"	Over 20 Boundless	Over 5 Boundless	15
5	40 - 50yrs	Above 30yrs	Over 30 Boundless	Over 20 Boundless	10
6	"	"	Over 45 Boundless	Over 25 Boundless	20
7	"	"	Over 35 Boundless	Over 20 Boundless	15
8	35 - 40yrs	Above 25yrs	Over 40 Boundless	Over 25 Boundless	20
9	"	"	Over 15 Boundless	Over 5 Boundless	10
10	"	"	Over 30 Boundless	Over 15 Boundless	15
11	30 - 35yrs	Above 20yrs	Over 25 Boundless	Over 10 Boundless	15
12	"	"	Over 20 Boundless	Over 15 Boundless	5
13	20 - 25yrs	Above 15yrs	Over 15 Boundless	Over 10 Boundless	5
14	"	"	Over 15 Boundless	Over 5 Boundless	10
15	"	"	Over 15 Boundless	Over 10 Boundless	5
16	"	"	Over 10 Boundless	Over 5 Boundless	5

Table 7.


1994 Harvests Yam Seeds (A)
10000
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Seeds
20-25yrs
30-35yrs
35-40yrs
40-45yrs
50-55yrs
Years
Harvests Yam Seeds (A)


1999 Harvests Yam Seeds (B)
7000
6000
5000
4000
3000
2000
1000
0
Seeds
20-25yrs
30-35yrs
35-40yrs
40-45yrs
50-55yrs
Years
Age Experiences

4.5.3 ANALYSES OF 1994 AND 1999 GORN HARVESTS:

Table III and graph II shows the summary of both 1994 and 1999 corn harvest of the same selected 16 farmers in Farin-Doki village.

This table shows the harvests of 4 farmers of 20 - 25 years of age and with above 15 years experience who got only above 2 bags of corn in 1994 and harvested about a bag in 1999.

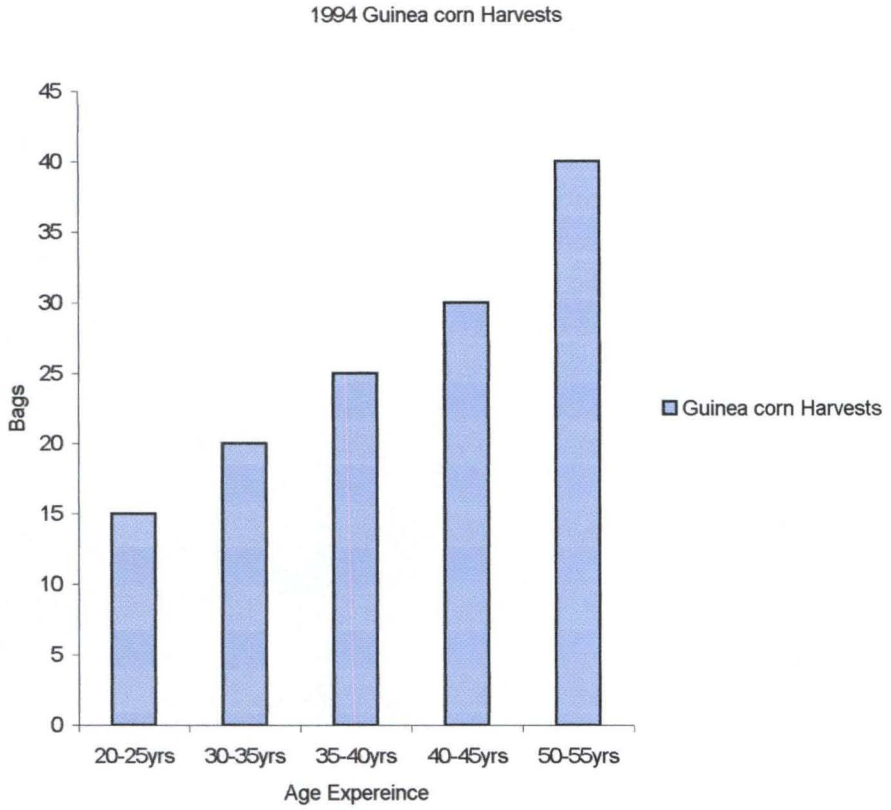
The research revealed the harvest of farmers with the ages within 35 - 40 years and experiences of over 30 years who got about 4 bags of corn in 1994 harvests and the harvested corn declined to about 3 bags in 1999.

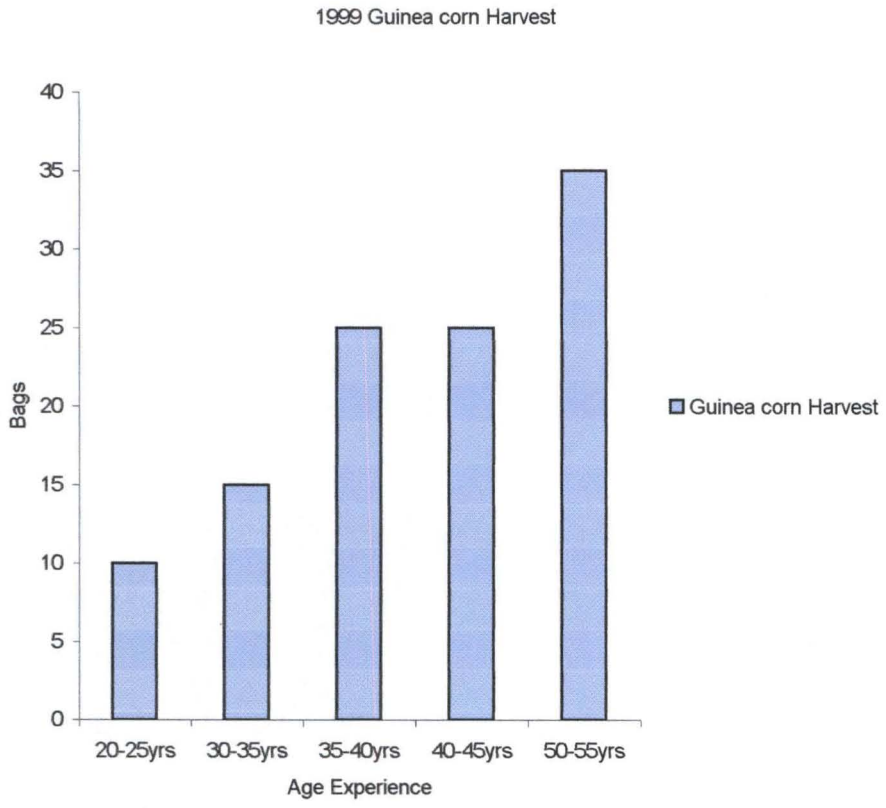
Two farmers of ages between 50 - 55 years who have experiences of more than 40 year farming exercise had over 4.5 bags in 1994 and this went down to about 3 bags in 1999 respectively.

SUMMARY OF 1994 AND 1999 GUINEA CORN HARVESTS.

NO	AGE GROUP	YEARS OF EXPERIENCE	1994 HARVESTS (BAGS)	1999 HARVESTS (BAGS)	DIFFERENCE OF BAGS
1	50 - 55yrs	Above 40yrs	Over 6.5 bags	Over 3.5 bags	3 bags
2	"	"	Over 4.5 bags	Over 1.5 bags	3 bags
3	"	Above 35yrs	Over 3.5 bags	Over 2.5 bags	1 bag
4	"	"	Over 3.5 bags	Over 1 bags	2 bags
5	40 - 45yrs	Above 30yrs	Over 5.5 bags	Over 3.5 bags	2 bags
6	"	"	Over 4.5 bags	Over 2.5 bags	2 bags
7	"	"	Over 4.5 bags	Over 3 bags	2 bags
8	35 - 40yrs	Above 25yrs	Over 4.5 bags	Over 1 bags	1.5 bags
9	"	"	Over 3.5 bags	Over 3 bags	2.5 bags
10	"	"	Over 3.5 bags	Over 1 bags	0.5 bags
11	30 - 35yrs	Above 20yrs	Over 2 bags	Over 1 bags	1 bag
12	"	"	Over 2.5 bags	Over 1 bags	1.5 bags
13	20 - 25yrs	Above 15yrs	-	-	-
14	"	"	Over 2 bags	Over 1 bags	1 bag
15	"	"	Over 3 bags	Over 0.5 bags	2.5 bags
16	"	"	-	-	-

Table 8.


1994 Guinea corn Harvests
45
40
35
30
25
20
15
10
5
0
Bags
20-25yrs
30-35yrs
35-40yrs
40-45yrs
50-55yrs
Age Expereince
Guinea corn Harvests


1999 Guinea corn Harvest
40
35
30
25
20
15
10
5
0
Bags
20-25yrs
30-35yrs
35-40yrs
40-45yrs
50-55yrs
Age Experience
Guinea corn Harvest

4.5.4 DISCUSSIONS OF ALL THE OBSERVATIONS MADE IN AGRIC YIELD GENERALLY.

From the field observation in paragraph 4.4.1 It was discovered that more than 45% in each of the 4 quadrants of Farin- Doki land surface is committed to farming. As such farming activities is still on the increase.

The summary results of yam seeds; big yam tuber, guinea corn and corn of 1994 reflects a sharp reduction in harvest in the 1999 harvests generally. This shows that despite the techniques, experiences, ages and impute by farmers their efforts did not commercustates with turn-over harvests generally.

The general declination of harvest of all crops are due to increase in population, and large scale depletion of vegetable cover of the over 60% land surface. This led to not over exposed of the soil and lack of protection, which led to surface run-off, erosional hazards and increase in soil temperature, decrease of infiltration, which had adverse effect on agricultural product and socio-economic problems of the people.

This agricultural yields declination has led to famine hunger and social problems. Most of the farmers complained that they had to buy supplementary food stuff before the next harvesting seasons, despite their age and experiences in farming.

The survey revealed that about 70 farmers have migrated to other local government specifically Gurara and Lapai. Most of the 16 farmers randonity interviewed, have the plans to migrate also thus, compounding the social problems.

The survey also reveals that lots of the farmers have economical problems, the problems sustaining the family and maintaining the farm and other ill health problem as a result famine.

The research reveals that due to change of local climate, e.g. the increase of surface temperature and lack of proper storage facility led large decay of yam seeds and big yam tuber, this added to the economic problem of the farmers.

4.6 ANALYSES OF SECTORS THAT USES WOODS FOR ENERGY.

This section of the paragraph analyses sectors that uses a lot of woods for energy supply for their economic purposes. The research reveals that production of local liquor involves only a lot of woods, but extensive energy supply for at least 14 hours.

Zanbu which is a food, prapared and wroth in a leave as local solid pap, requires intensive energy supply of more than 4 hours to becomes a finished product for consumption.

While, commercial wood dealers extract woods in large quantity almost weekly and transports them to bakers in Minna, or sell them in the market in pieces for domestic energy supply for food preparation in the metropolis.

4.6.1 ZAMBU PRODUCERS:

For the evaluation of quantity of woods used daily for the production of Zambu, the research was conducted on six women of different age groups and experiences back ground, to extract correct data of usages of woods for energy supply in the production.

Table 4a graph 4a shows the summary of research administered on the six women.

The first woman of the age within 25 - 30 years has experience of more than 5 years, fetches and transport fuel wood manually at the distance of about 5 kilometres, and weekly. She uses about 25 woods for each production, expends N450.00 and profits about N1000.00

A 35 year old woman, with about 15 years experience, evacuate her fuel wood manually for distance of 4.5km weekly, uses about 25 woods for production and profit N1,500.00 apart of her expenses of N5,500.00

A woman of the region of 40-45 years, travels about 5 km and uses truck to evacuate her fuel-wood monthly, she also uses about 25 pieces of wood and expend about N400.00 for production of Zambu and finally profits N1,000.00

4.6.2 LOCAL LIQUOR PRODUCTION:

The survey was conducted for 8 women with different year of experience and ages, mode of evacuation of woods, amount of woods utilise for energy supply, expenses incurred, profit and period of extraction and distance involved.

Two women of the region of 25 - 30 years of ages and 10 years experiences of productions, travels about 5km for fuel woods, the two women uses more than 85 woods at a production. They expends between N450 to N750 and profits more than N1,500.00.

The research also revealed a set of 3 women about the ages of more then 30 years and have above 15 years experiences, they travel a distance of about 4 kilometre by foot to fetch fuel wood and evacuate then manually and weekly. After expenses of about N500.00 they profits N1,500.00.

The move elderly and experienced 3 women of about 40 - 45 years ages and above 25 years experiences, felches woods at distance of about 4.5km but uses vehicle to evacuate the woods, after deduction of expenses of about N650.00 they profits N1,000.00.

The research conducted for commercial wood sellers met 3 women all of ages above 30 years with over 5 years experience, they extract woods and transport them weekly to Minna, after expenses of more then N600.00 they profits about N1,500.00.

4.6.3 DISCUSSIONS OF ANALYSES OF SECTORS THAT USES WOODS FOR ENERGY.

From the analyses of Zambu producers it was noticed that due to woods deficit, all the women travels for more than 5 kilometre for fuel-wood. The danger noticed is that, in the nearest future the women world be forced to encroach into other villages territory, and that would cause inter-village disputes.

Apart from the elderly woman of 40 - 45 years of age who not only uses vehicle to evacuate her woods, they period of extraction is monthly. Other women extracts the wood resource weekly, and evacuate the woods manually.

Not fever than 25 woods are used at each production which is almost daily, apart from the daily meal preparation woods. An average of over 145 woods are used by only 6 selected women per a time.

Despite their ages, and experiences most of then uses at least 25 woods and the profits margin does not exceed N1,500.00.

For local liquor producers, most of them travels move them 5 kilometre too. Only the experienced, elderly ones economise the use of woods as 50 per production and expend less amount. The rest other women utilises between 60, 70, 80 and 90 woods at each production alone, this shows a gross mis use of wood resources.

From the research it is shown that most of the local liquor producers extract the vood resource weekly this accounts for the rapidity of the depletion, wood deficit and high ost of wood resource.

From the table 4a it is estimated that about 550 pieces of log woods are used by 8 elected local liquor producers daily, a part from other meals preparation.

The commercial wood settlers extract woods, weekly and transport them for ommercialisation weekly too. This shows that the trees are cutted down and left to dry efore transportation, example, those cutted down this week may be transported after 2 eeks later.

A truck loads a minimum of 1,500 pieces of log woods, for 3, women to be xtracting over 4000 log of woods weekly means a lot to the ecological world.

The total amount of profits obtained by the 17 selected women amount to 24,000.00 weekly. Does this amount commiserates the destruction to the ecological orld that has resulted into loss of soil fertility and a great threat to the agricultural roduction of their husbands?.

Most women, particularly the local liquor maintained the in ability to buy gas ylinder which costs N10,000.00 and refill of N3,000.00. for their products requires about 4 hours intensive energy supply. Which means a gas cylinder would be refilled 2 times r a production which would cost N6,000.00, while their profit, with the use of woods are nly N1,500 or N2,000.00 at worst.

On the other hand, the depletion of wood resource has caused a local climate hange, the loss of soil moisture and fertility, which resulted in exodus of migration of

many farmers to other local government area as a result of persistent declination of agricultural produce for substance and economical needs.

Most of the women could not submit to the suggestion by the researcher to use stove and kerosine as substitute to minimise or avert the impending dangers of imminent desertification due to declination of vegetation. The women complained of high cost of Kerosine and stove can not be substituted for use, because of quantity and drum used for preparing local liquor and Zambu.

Fig. 10

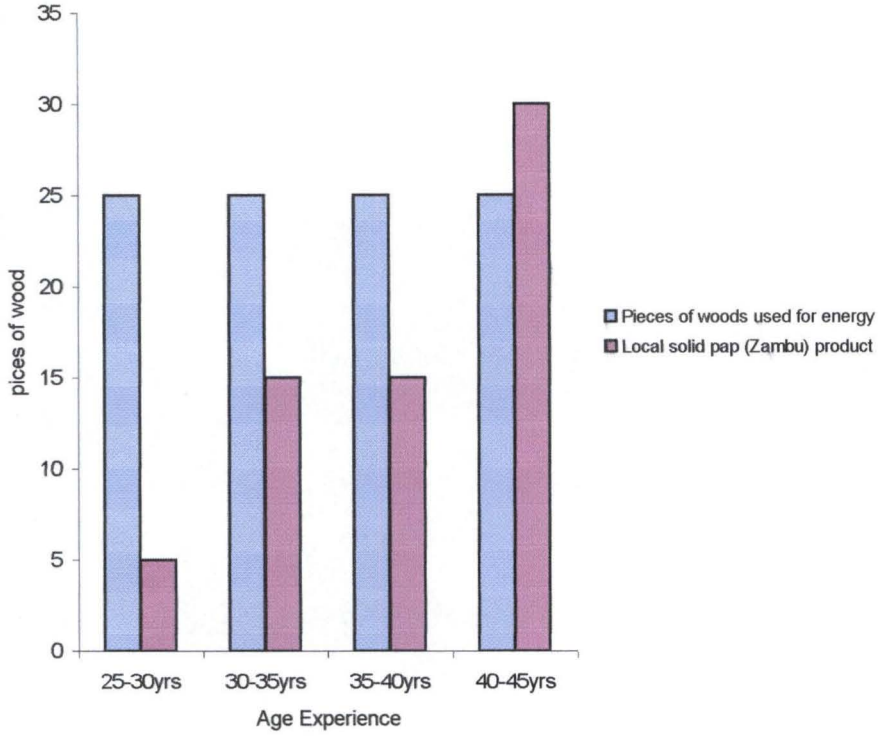


Fig. 11: Distance in Kilometres

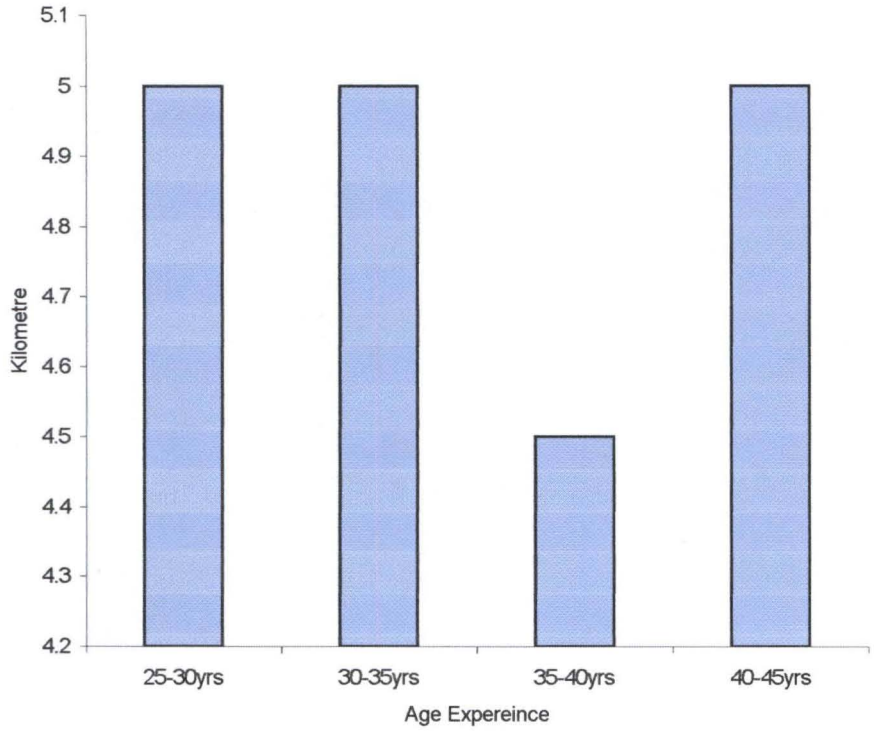


Fig. 16: Period of extraction and methods transportation

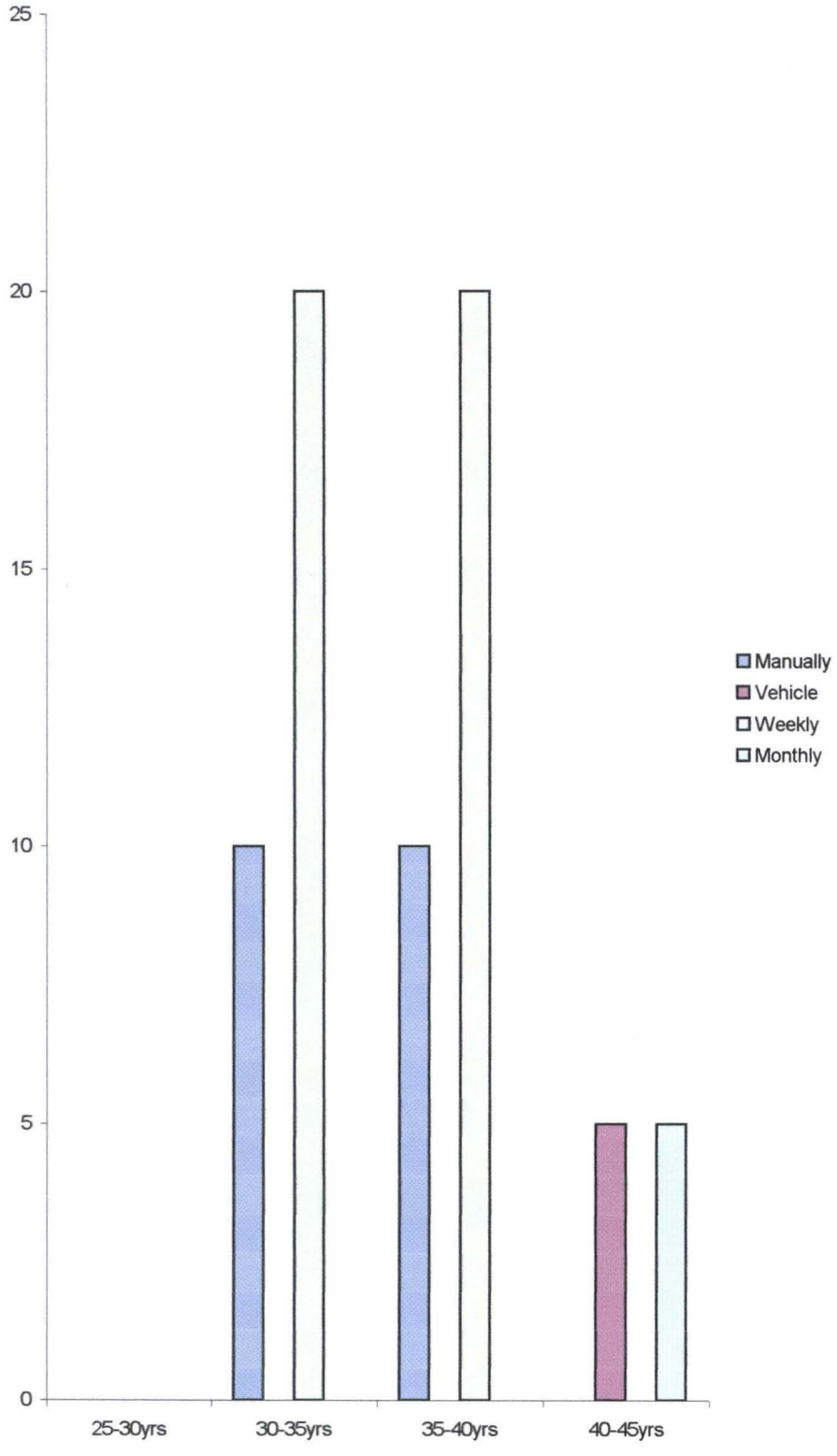


Fig. 14: Woods used for energy

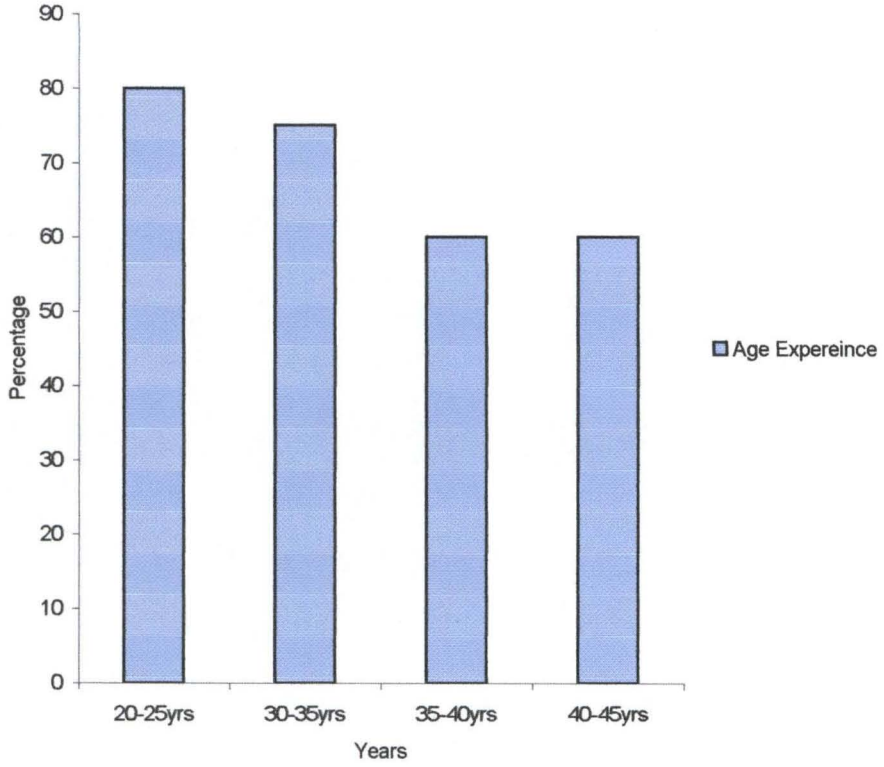


Fig. 15: Distance for fire wood

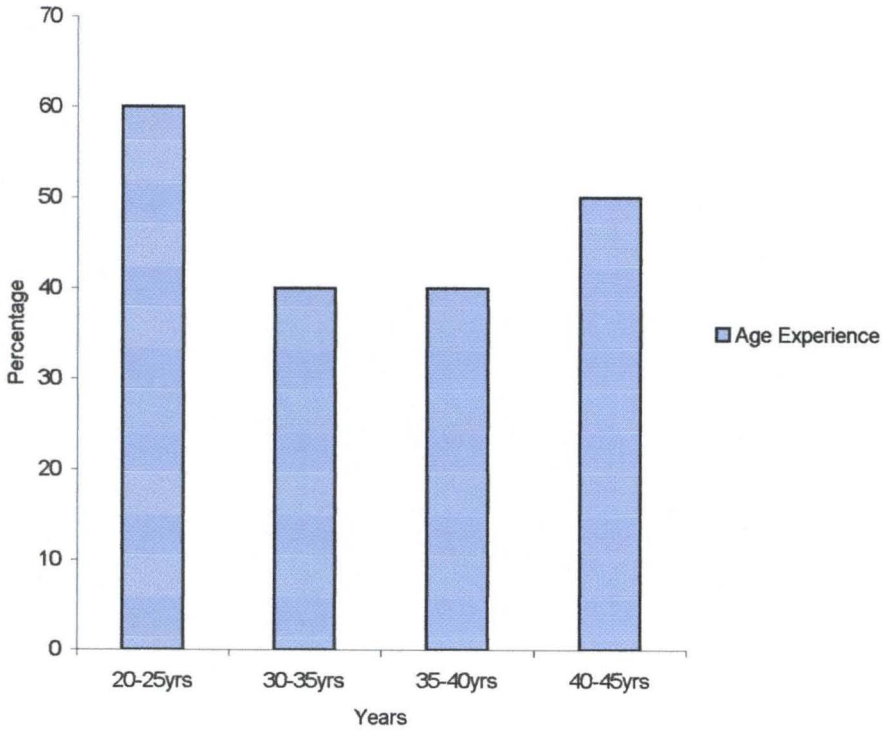


Fig. 9d: Depleted vegetation to be transported and used as energy resource

Fig. 9E: Depleted vegetation area and cultivated heaps

Fig. 9C: Parts of the wood resources extracted from the forest at the site to be transport

Fig. 9b: Arranged fuels wood for sell

Fig. 9b: Arranged different house hold wives heaps of fuel wood

Fig. 9b: Some house hold individuals heaps of fuel wood

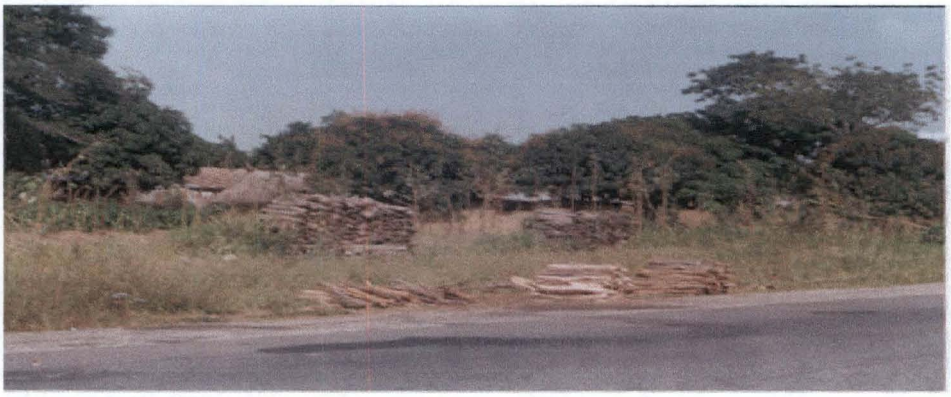


Fig. 9b: Different house hold heaps of fuel wood in front of compound

Fig. 9F: Woods for commercialisation being off-loaded from vehicle

Fig. 9F: Local liquor producers at market scene

Fig. 10a: Local liquor being prepared in the kitchen

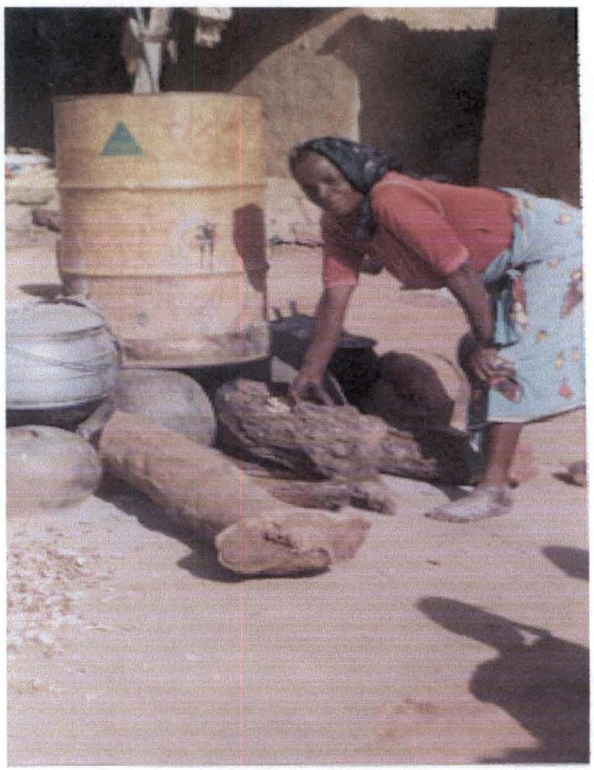


Fig. 10a: Local liquor being prepared in the compound

WOODS FOR ENERGY
ZANBU RPDUCERS.

S/N	AGE GROUP	EXPERIENCE	DISTANCE FOR FETCHING FUEL WOOD	METHOD OF EVACUATION	TIME OF EXTRACTION	NO. OF WOOD USE FOR ENERGY DAILY	AMOUNT INCURRED	PROFIT
1	40 - 45	30yrs	Over 5Km	Vehicle	Monthly	25 woods	Above N400	N1000
2	35 - 40	15yrs	Over 5Km	Manually	Weekly	25 woods	Above N500	N1,500
3	35 - 40	15yrs	Over 4.5Km	Manually	Weekly	25 woods	Above N550	N1,500
4	30 - 35	15yrs	Over 5Km	Manually	Weekly	20 woods	Above N350	N1,000
5	"	"	Over 5Km	Manually	Weekly	25 woods	Above N350	N1,000
6	25 - 30	5yrs	Over 5Km	Manually	Weekly	25 woods	Above N450	N1,000

WOODS FOR ENERGY
LOCAL LIQUOR PRODUCERS.

S/N	AGE GROUP	EXPERIENCE	DISTANCE FOR FETCHING FUEL WOOD	METHOD OF EVACUATION	TIME OF EXTRACTION	NO. OF WOOD USE FOR ENERGY DAILY	AMOUNT INCURRED	PROFIT
1	40 - 45	25yrs	Over 4Km	Vehicle	Monthly	50 woods	Above N400	N1000
2	"	"	Over 5Km	Vehicle	Weekly	50 woods	Above N650	N1,000
3		"	Over 4.5Km	Vehicle	Weekly	50 woods	Above N750	N1,500
4	30 - 35	10yrs	Over 3.5Km	Manually	Weekly	50 woods	Above N500	N1,500
5	"	"	Over 4Km	Manually	Weekly	65 woods	Above N450	N1,500
6	"	15yrs	Over 4Km	Manually	Weekly	80 woods	Above N750	N2,000
7	25 - 30	10yrs	Over 6Km	Manually	Weekly	90 woods	Above N750	N2,000
8	25 - 30	10yrs	4.5Km	Manually	Weekly	55 woods	Above N450	N1,500

WOODS FOR ENERGY
COMMERCIAL WOOD DEALERS

S/N	AGE GROUP (ABOVE)	EXPERIECE	PERIOD OF EXTRACTION	PERIOD OF COMERCIALISATION		AMOUNT INCURRED (ABOVE)	PROFIT (ABOVE)
1	35 - 40	10yrs	Weekly	Weekly	Minna	N850	N2000
2	30 - 35	5yrs	Weekly	Weekly	Minna	N700	N2000
3	35 - 40	10yrs	Weekly	Weekly	Minna	N400	N1000

Table 9

5.2 RECOMMENDATION:

Based on the result of this case study, it is recommended that Niger State Government and particularly, Paikoro Local Government Authority, should set up an enlightenment programme within the rural populace to educate the rural populace the importance of vegetal cover for agricultural production and effects of depletion of vegetal cover on agricultural products which their economy is tied to.

This could be easily disseminated with educational schemes through lectures in primary school, secondary schools in the locality. Furthermore, the programme can be successfully done in farmers Association, various villages Association who are predominantly not only youths but farmers generally. Enlightenment schemes would play a great role, since the rate of ignorance of environmental problems and conservation is about 90% of the entire populace of the study area.

5.2.1 SPECIAL FOREST RESERVE:

A special forest reserve for manila tree should be introduced to various location in the rural areas. This if successfully achieved would temporality be used for energy purposes, pending a long time solution of shift from bio-mass to other energy resources. All demands for wood for energy would be confined to these forests reserves only.

5.2.2 AFFORESTATION:

The state and local government should set up schemes with incentives that would encourage the farmers to grow both economic and other trees within and outsides their

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QUESTIONNAIRE ON TURN-OVER HARVEST OF FARMERS & USAGES OF WOODS (VEGETATION) FOR ENERGY SUPPLY FROM 1994 TO 1999 IN FARIN DOKI VILLAGE

1. Name:.....
2. Ward:.....
3. Compound:.....
4. Household:.....
5. Age: 15-20 ☐ 20-25 ☐ 25-30 ☐ 30-35 ☐ 35-40 ☐ 40-45 ☐ 45-50 ☐ 50-55 ☐ 55-60 ☐
6. Occupation: Farmer ☐ Local liquor brewer ☐ wood seller ☐ F/A ☐
   FIT ☐ Harbalists ☐ Zambu producer ☐ Rice seller ☐
7. Experience: 0-5 Yrs ☐ 5-10 ☐ 10-15 ☐ 15-20 ☐ 20-25 ☐ 25-30 ☐ 30-35 ☐ 35-40 ☐ 40 above ☐
8. No of wive(s) ☐ Children ☐ Males above 10 ☐ female above ☐
   under ☐ under ☐
9. Type of crop produced and animal: Yam ☐ Corn ☐ Guinea corn ☐ g/nut ☐
   Rice ☐ goat ☐ cow ☐
10. Method of farming: Individual ☐ family level ☐ Rotational group ☐
11. 1994 harvest: Yam seeds 0-500 ☐ 1000-1500 ☐ 1500-2000 ☐ 2500-3000 ☐ 3500-4000 ☐ 4500-5000 ☐
    5000-5500 ☐ 5500-6000 ☐ 6500-7000 ☐ 7000-7500 ☐ 7500-8000 ☐
    8000-8500 ☐ 8500-9000 ☐ 9000-9500 ☐ 9500-10000 ☐ 10000 above ☐
    1994 harvest: big Yam tuber 0-500 ☐ 1000-1500 ☐ 1500-2000 ☐ 2500-3000 ☐ 3500-4000 ☐ 4500-5000 ☐
    5000-5500 ☐ 5500-6000 ☐ 6500-7000 ☐ 7000-7500 ☐ 7500-8000 ☐
    8000-8500 ☐ 8500-9000 ☐ 9000-9500 ☐ 9500-10000 ☐ 10000 above ☐
12. 1999 harvest Yam seeds tuber 0-500 ☐ 1000-1500 ☐ 1500-2000 ☐ 2500-3000 ☐ 3500-4000 ☐ 4500-5000 ☐
    5000-5500 ☐ 5500-6000 ☐ 6500-7000 ☐ 7000-7500 ☐ 7500-8000 ☐
    8000-8500 ☐ 8500-9000 ☐ 9000-9500 ☐ 9500-10000 ☐ 10000 above ☐
    1999 harvest: big Yam tuber 0-500 ☐ 1000-1500 ☐ 1500-2000 ☐ 2500-3000 ☐ 3500-4000 ☐ 4500-5000 ☐
    5000-5500 ☐ 5500-6000 ☐ 6500-7000 ☐ 7000-7500 ☐ 7500-8000 ☐
    8000-8500 ☐ 8500-9000 ☐ 9000-9500 ☐ 9500-10000 ☐ 10000 above ☐
13. Guinea corn 1994 harvest: in bundle 0 –5 ☐ 5-10 ☐ 10-15 ☐ 15-20 ☐ 20-25 ☐ 25-30 ☐ 30-35 ☐
    35-40 ☐ 40-45 ☐ 45-50 ☐ 50-55 ☐ 55-60 ☐ 60-65 ☐ 65-70 ☐
    70-75 ☐ 75-80 ☐ 80-85 ☐ 86-90 ☐ 90-95 ☐ 95-100 ☐ above 100 ☐
14. G/corn 1999 harvest – 0 –5 ☐ 5-10 ☐ 10-15 ☐ 15-20 ☐ 20-25 ☐ 25-30 ☐ 30-35 ☐
    35-40 ☐ 40-45 ☐ 45-50 ☐ 50-55 ☐ 55-60 ☐ 60-65 ☐ 65-70 ☐
    70-75 ☐ 75-80 ☐ 80-85 ☐ 86-90 ☐ 90-95 ☐ 95-100 ☐ above 100 ☐

15. Corn 1994 harvest- 0-1/2 bag, ☐ ½-1 ☐ 1-1½ ☐ 1½-2 ☐ 2-2½ ☐ 2½-3 ☐ 3-3½ ☐ 3½-4 ☐ 4½-5 ☐
5½-6 ☐ 6-6½ ☐ 6½-7 ☐ 7-7½ ☐ 7½-8 ☐ 8½-9 ☐ 9½-10 ☐ above10 ☐

16. Corn 1999 harvest : 0-1/2 bag, ☐ ½-1 ☐ 1-1½ ☐ 1½-2 ☐ 2-2½ ☐ 2½-3 ☐ 3-3½ ☐ 3½-4 ☐ 4½-5 ☐
5½-6 ☐ 6-6½ ☐ 6½-7 ☐ 7-7½ ☐ 7½-8 ☐ 8½-9 ☐ 9½-10 ☐ above10 ☐

17. Rice 1994 harvest = from 0-1 bag ☐ 1-2 ☐ 2-3 ☐ 3-4 ☐ 4-5 ☐ 5 and above ☐

18. Rice 1999 ☐ ☐ ☐ ☐ ☐ ☐

19. G/nut 1994 harvest from 0-1 bag ☐ 1-2 ☐ 2-3 ☐ 3-4 ☐ 4-5 ☐ 5 and above ☐

20. G/nut 1999 ☐ ☐ ☐ ☐ ☐ ☐

21. Millet 1994 = from 0-1 bag ☐ 1-2 ☐ 2-3 ☐ 3-4 ☐ 4-5 ☐ 5 and above ☐

22. Millet 1999 ☐ ☐ ☐ ☐ ☐ ☐

23. Use of fertilizer : Yes ☐ No ☐

24. Animals reared in 1994: Cow 1-5 ☐ 5-10 ☐ 10-15 ☐
Goat ☐ ☐ ☐
Chickens ☐ ☐ ☐

25. Animals reared in 1999: Cow 1-5 ☐ 5-10 ☐ 10-15 ☐
Goat ☐ ☐ ☐
Chickens ☐ ☐ ☐

26. Migration of farmer before 1994: Total No. ☐ In a compound

27. Migration of farmers up to 1999: Total No. ☐

28. Quantity of decayed crops in 1994: Yam ☐ G/corn ☐ Corn ☐ Rice ☐ G/nut ☐ Cassava ☐

29. Intention of migration: Yes ☐ No ☐

30. Other problems: Health ☐ Labour ☐ Land dispute ☐ Finance ☐ Farming ☐
shortage of food ☐ Poor harvest ☐ Improved harvest ☐
Buy supplementary food before next harvest
Yes ☐ No ☐

Woods

2ND ~~VEGETATIONS~~ USED FOR ENERGY AND COMMERCIALISATION

31. Distances of fetching fuel-wood: Less than 1 kilo ☐ 1.5 kilomentre ☐ 2 kilometre ☐
2.5 kilometres ☐ 3 kilometres ☐ 3.5 kilometre ☐
4 kilomentre ☐ 4.5 kilometre ☐ 5 kilometre ☐ 5.5 kilometre ☐ More than 6 klm ☐

32. Periodic extraction: Daily ☐ weekly ☐ monthly ☐

33. Method used for evacuation: Use of vehicle ☐ Manually ☐

34. Destination of transportation of wood: Minna ☐ Farin doki ☐

35. Approximate no woods used for energy: 0-5 log of wood ☐ 5-10 wood ☐

10-15 ☐ 15-20 ☐ 20-25 ☐ 25-30 ☐ 30-35 ☐ 35-40

40945 ☐ 45-50 ☐ 50 above ☐

36. Usages of wood: Preparing meat ☐

Local liquor ☐

Boiling rice ☐

Preparing zambu ☐

Commercialization ☐

Other ceremonies ☐

37. Market for commercialization: Paiko ☐ F/Doki ☐ Kwakuti ☐ Chimbi ☐ Lambata ☐ izom ☐

38. Produce: Liquor ☐ Zambu ☐ Rice ☐ Fuel wood ☐

39. Amount incurred: ₦0-100 ☐ 100-150 ☐ 150-200 ☐ 200-250 ☐ 250-300 ☐ 300-350 ☐ 350-400 ☐ 400-450 ☐

450-500 ☐ 500-550 ☐ 550-600 ☐ 600-650 ☐ 650-700 ☐ 700-750 ☐ 750-800 ☐ 850-900 ☐

900-950 ☐ 950-1000 ☐ above 1000 ☐

40. Profit: ₦ 0-500 ☐ 500-1000 ☐ 1000-1500 ☐ 1,500-2,000 ☐ 2,000-2,500 ☐

2,500-3,000 ☐ 3,000-3,500 ☐ 3,500-4,000 ☐ 4,000-4,500 ☐ 4,500-5,000 ☐

41. Problems: Eye ☐ Labour ☐ Transport ☐ Finance ☐ Other health problem ☐

42. Other alternatives for fuel wood used: None ☐ Coal ☐ Kerosine ☐ Bio-gas ☐

Financial incapability for these alternative ☐