



# Appraisal of Tree Planting Programmes in Maiduguri Metropolitan, Nigeria

Mohammed Lawan Shettima<sup>1</sup>, Gwana Adamu Mohammed<sup>2, \*</sup>, Abubakar Musa<sup>3</sup>,  
Mohammed Lawan Marte<sup>4</sup>, Hauwa Lawan Badawi<sup>5</sup>

<sup>1</sup>Department of Forestry Technology, Mohamet Lawan College of Agriculture, Maiduguri, Nigeria

<sup>2</sup>Laboratory Unit, Department of Animal Health and Production Technology, Mohamet Lawan College of Agriculture, Maiduguri, Nigeria

<sup>3</sup>Department of Basic Science and Technology, Mohamet Lawan College of Agriculture, Maiduguri, Nigeria

<sup>4</sup>Department of Geography, Kashim Ibrahim College of Education, Maiduguri, Nigeria

<sup>5</sup>Heritage Unit, Department of Heritage and Monument Sites, National Commission for Museums and Monuments, Maiduguri, Nigeria

## Email address:

mlawanshettima@gmail.com (M. L. Shettima), admuwana@yahoo.com (G. A. Mohammed), abbakmusa@gmail.com (A. Musa),  
martelawan@gmail.com (M. L. Marte), elbadawi@yahoo.com (H. L. Badawi)

\*Corresponding author

## To cite this article:

Mohammed Lawan Shettima, Gwana Adamu Mohammed, Abubakar Musa, Mohammed Lawan Marte, Hauwa Lawan Badawi. Appraisal of Tree Planting Programmes in Maiduguri Metropolitan, Nigeria. *International Journal of Environmental Protection and Policy*. Special Issue: The Role of SLT: Environmental Impact Assessment And Statement Concept. Vol. 5, No. 6-1, 2017, pp. 33-39.

doi: 10.11648/j.ijepp.s.2017050601.15

**Received:** April 5, 2017; **Accepted:** April 6, 2017; **Published:** August 21, 2017

---

**Abstract:** This study was carried out on the appraisal of tree planting programmed in Maiduguri, Nigeria. It examine tree planting project in Maiduguri. Afforestation plays a vital role in the sustainability of semi - arid lands. Trees serve various purposes (tangible and intangible benefits). They help in protecting the land from water and wind erosion. Primary and secondary source of information were employed. Compound structured closed and opened ended questionnaires and verbal interview were used for data and information - ecosystem collection. One hundred and twenty (120) questionnaires were distributed and administered, stratified randomly to field workers, other professionals and farmers within the communities of Maiduguri, retrieved, statistically analysed and were recorded. Data on previous tree planting activities were collected from the forestry divisions and evaluated to ascertain the level of successes. The results obtained revealed that 90 Males (75%) and 30 Females (25%) were involved in the study and falls within the age – group of under 25 years with 6 respondents (5% was least) to 31 – 40 years with 49 respondents (41% was the highest), the seedlings of five (5) tree species (Neem, Eucalyptus, Mango, Guava and Cashew) were planted at ten (10) Locations for over and within twenty three (23) Years; total seedlings planted was 18,500 ( $1027.8 \pm 318.3$ ), total survived was 17,124 ( $951.3 \pm 334.8$ ) with 93%, total lost was 1,376 ( $76.4 \pm 97.5$ ) with 7% and the problems encountered were Poor funding, lack of training of forestry officers and lack of effective monitoring of tree planting projects as the major problems. It thus recommended the needs for improved funding, training and retraining of forestry officers and effective monitoring of tree planting sites.

**Keywords:** Afforestation, Deforestation, Desertification, Ecosystem, Planting Programme, Tree, Survival Rate, Vegetation

---

## 1. Introduction

Vegetation is important to humans as primary sources of food, as building materials in manufacturing industries, as a fuel and as medicine [10]. Major problems are created when humans try to clear domestic animals in region not suited to their lifestyle, especially when they alter the natural

vegetation to grassland. Deforestation not only affects the immediate rainforest and ecosystem, but it may also have drastic consequences on adjacent region. Deforestation is a complex environmental problem and its consequences manifest themselves in several forms such as erosion, flesh

flood, reduced stream flow, drought, fuel wood scarcity, sedimentation and microclimatic changes [3, 10].

Tree planting is undoubtedly the most effective means of halting the advancement of the desert into the arid zone of Nigeria [1]. In the arid zone, hundreds of hectares of farmlands and villages have been overrun by the advancing sand dunes that the increase in the rate of advancement of the desert into the northern parts of the country is brought about by the increased rate of destruction and exploitation of forest by man in the region [1, 22]. It is worth noting the various attempts made over years at local, state national, regional and international levels to find solution to the menace of drought and desertification [17]. Early in 1984, the Secretary General of the United Nation Organization himself toured northern part of Borno State. Impressive programmes such as the arid zone afforestation, drought and or emergency relief committees etc, costing millions of naira, have been drowning up [3, 17]. Thus, as important requirement in determining objectives is that people (both within the organization and outside) should believe and accept those objectives as their own [2]. Another important requirement for objectives is that they should be reviewed in the light of environmental changes which as we have seen, have a great impact on public institution than on private business [2, 3, 17]. Afforestation is therefore a common strategy employed all over the world in rehabilitating land threatened by ecological problems such as land degradation, drought, desertification, erosion, etc. [2].

The supply and demand characteristics of forestry product in Nigeria are such that the demand is far greater than the supply can meet [2, 4]. The estimated annual requirement is about 55 million m<sup>3</sup> of which about 40 million m<sup>3</sup> is for firewood and poles while industrial wood (timber, paper etc.) amount to about 5 million m<sup>3</sup> on the other hands, the estimated annual supply (regeneration) on sustainable basis is only about 45 million cubic meter giving an annual deficit (shortfalls) of about 10 million m<sup>3</sup> [11, 16]. This in - balance between the supply and actual demand for wood is most obvious in the five northern states of Nigeria, especially Borno, Yobe, Kano, Katsina and Sokoto. In these states, land is rapidly being cleared for agricultural purposes and commercial wood supplies must travel several hundred kilometers (Kano for instance, gets its main supply of fuel wood from Borno and Bauchi state) to collect wood for urban markets in Maiduguri, Bauchi, Kano, Katsina, Gusau, Sokoto and similar towns [16, 23].

Thus the ever growing population pressure, the unabating drought in recent years together with excessive deforestation, overgrazing and bush burning required that government must step up efforts to ameliorate the situation, through a well coordinated Afforestation programmes [23]. The effects of this indiscriminate burning can cause a loss of most of the nitrogen, sulphur, and carbon; elimination of seedlings of fire tender tree species to service; destruction of human and adverse soil physical and textural characteristics particularly where intense burning is achieved; adverse effects on macro fauna; and destruction of soil micro flora

[3]. Management of such degraded environments will involve the introduction of leguminous trees on farm lands to help conserve soil nutrients by enhancing the process of nitrogen building up in the soil [3, 16]. The dry land of Nigeria forms an undulating plain at a general elevation from about 450 m to 700 m [14]. According to NAP [14], the average annual rainfall in dry land of Nigeria varies from less than 500 mm in the north - east part to 1000 mm in the southern sub - area, but it is unreliable in many parts.

The classic factors that are responsible for desertification in Borno State are over grazing, desertification through poor agricultural practice and poorly conceived development plans, and climatic factors [4, 12]. Despite its overwhelming state of aridity and sparse tree cover, Borno State was an alarming records of indiscriminate tree cutting in the country, while observation in recent years have indicated a complete absence of regeneration through natural seed dispersal in all known tree species, due largely to genera desiccation of the environment, yet there is a massive rate of indiscriminate tree felling. The concept of urban tree plantation scheme was introduced in 1986 in order to provide green cover to the large towns on margins of the desert [4, 11, 12].

In Nigeria government efforts to achieve sustainability in the management of forest resources or typified by the establishment of department of forestry in Ministry of Agriculture and Forestry, forest research institutes and forestry department in institution of higher learning. In addition, government launches awareness campaign annually to sensitize the public on the subject matter of forestry [16]. Despite the fact, when such programmes are raised in accordance, therefore, the following condition must be considered e. g. proper and suitable sowing medium, growing medium, pot size, and filling of pots [12].

This study appraised tree planting programmes in Maiduguri Metropolitan from 1984-2003 to ascertain types of species planted and their survival and lost rates. The specific objectives are to make inventory of tree planting sites to determine the types of species planted, determine the survival rates of tree species, and examine the purpose and prospect of tree planting programmes in Maiduguri Metropolitan which part of the semi - arid zone. The arid zone is characterized by low rainfall of short duration, poor distribution pattern often punctuated by dry spell or droughts process of desertification by human activities such as overgrazing, indiscriminate tree felling, improper farming activities, wood extraction, which tends to defrost the ecosystem and expose it to accelerated degradation. In the case f role of tree species, in the maintenance of ecological stability and reducing desertification in the semi area has been enumerated by other researchers, this implies that the problems of desertification, and in fact drought can be partly solved through establishment and the scientific management of suitable forest vegetation. This seems to meet with much difficulty in the semiarid region of Nigeria. Thus, this research seeks to appraise tree planting projects in Maiduguri Metropolitan from 1984 - 2003.

## 2. Materials and Methods

### 2.1. Study Area and Location

The study was conducted in Maiduguri; it shares local boundaries with Konduga, Jere and Mafa LGAs. It has an area land mark of 300 square kilometres (300 km<sup>2</sup>), which lies between latitude 12° N to 13° N and longitude 13° E to 15° E respectively. The vegetation is of semi – arid zone and climatic condition in this area is of a hot dry season (27°C to 42°C), and an annual rainfall of 500 mm to 600 mm has been recorded [6]. It has an estimated population of 629,486 people, out of which 340,809 are males and 288,977 are females [15].

### 2.2. Material Used

Compound structured, closed and opened ended questionnaires and verbal interview were used for the purpose of information and data collection on the tree planting programmes from 1984 to 2003 in Maiduguri metropolitan.

### 2.3. Method Used

The method used in this research study and the source of data collection were through primary and secondary sources. The primary source was through questionnaire distribution to the respondents. The secondary source was obtained through the internet, text books, Journals and information media. Compound structured, closed and opened ended questionnaires and verbal interview were used for data and information - ecosystem collection. One hundred and twenty (120) questionnaires were distributed and administered, stratified randomly to field workers, farmers and other professionals within the communities of Maiduguri. Data on previous tree planting activities were collected from the forestry divisions and evaluated to ascertain the level of successes. All the questionnaires distributed to the respondents were retrieved, data obtained were recorded and statistically analysed.

### 2.4. Data Analysis

The data obtained from this research study were subjected to statistical tools of analysis using percentage, mean for the measurement of central tendency, and standard deviations for measurement of dispersion and or discrepancy within the variables being obtained and its' significance, as described by Stroud and Booth [20].

## 3. Results

The results obtained from this study revealed that the appraisal of tree planting programmes in Maiduguri, Nigeria, the demographic characteristics and the statistical information of the respondents were ascertained, which were presented in the tables below as follows:

Table 1 showed the sex distribution of the respondents that were involved in the survey study that males were 90 in number account for 75%, while the females were 30 in

number and account for 25%. Total number of 120 (60 ± 42.4) of respondents were involved and making up to 100 (50 ± 35.4) percent respectively.

Table 2 Showed the age – group distribution of the respondents that were involved in the study that those under 25 years old were 6 with 5%, 26 – 30 years were 35 in number account for 29.2%, 31 – 40 years old were 49 with 40.8% and finally those that falls within the age – group of 41 and above were 30 in number with 25%. Total of 120 (30 ± 17.9) of respondents were involved and making up to 100 (25 ± 14.9) percent.

Table 3 showed the tree planting programmes at various locations in Maiduguri from 1984 to 2003. The trees planted were five (5) comprises species of neem, eucalyptus, mango, guava and cashew, at ten (10) locations for the period of 23 years. Total of 18,500 of the various tree plants' species were planted between the year 1984 to 2003, out of this number, 17,124 (951.3 ± 334.8) were survived with 92.56% and 1,376 (76.4 ± 97.5) were lost account for 7.44% respectively.

Table 4 showed the total number of species type, Planted, survived, lost, and percentages from 1984 – 2003. The number of neem seedlings planted was 11,200, survived seedlings were 11,000 with 98.21% of survival rate and seedlings lost were 200 with 1.79 rate of lost percentage. 5,800 Eucalyptus seedlings were planted, out of which 5,190 (88.25%) were survived and 610 (11.75%) were lost. 500 Mango seedlings were planted, of which 327 (65.4%) were survived and 173 (34.6%) were lost. 500 Guava seedlings planted were, out of which 258 (51.6%) were survived and 242 (48.4%) were lost, and finally, 500 Cashew seedlings were planted and out of this number, 420 (84.0%) survived and 80 (16.0%) were lost. The total number and mean of the trees seedlings as followed; planted were 18,500 (3,700 ± 4,780), survived were 17,195 (3,439 ± 4,721) and the total percentage of survival was 387.5 (77.5 ± 18.7) and the total lost rate was 1,305 (261 ± 204) and total percentage of lost was 112.54 (25.5 ± 18.7) respectively.

**Table 1.** Sex Distributions of the Respondents Involved.

Sex	Number of Respondents	Percentage (%)
Mal	90	75
Female	30	25
Total (Mean ± SD)	120 (60 ± 42.4)	100 (50 ± 35.4)

Keys: % = percentage, M ± SD = Mean Plus or Equal Standard Deviation.

**Table 2.** Overall Age – Group Distribution of the Respondents Involved.

Age – group (Years)	Number of Respondents	Percentage (%)
Under 25	6	5
26 – 30	35	29.2
31 – 40	49	40.8
41 and above	30	25
Total (M ± SD)	120 (30 ± 17.9)	100 (25 ± 14.9)

Keys: % = percentage, M ± SD = Mean Plus or Equal Standard Deviation.

**Table 3.** Tree Planting Programmes at Various Locations in Maiduguri from 1984 – 2003.

Seedlings Specie	Location	Year Planted	Number Planted	Number Survived	Number Lost
Neem	Baga Road	1984	1,000	872	128
Eucalyptus	Baga Road	1984	1,000	920	80
Neem only	Baga Road	1984	1,000	998	2
Neem	Bama Road	1986	1,500	1,498	2
Neem	Gubio Road	1987	1,000	997	3
Eucalyptus	Gubio Road	1987	1,000	882	118
Neem	Jaltur Village	1988	1,000	993	7
Eucalyptus	Jaltur Village	1988	1,000	884	116
Neem	Kano Road	1989	1,000	1,000	0
Eucalyptus	Magumeri S. B. P.	1992	1,000	974	26
Neem	Magumeri S. B. P.	1992	1,000	998	2
Mongo	Alau village	1994	500	327	173
Guava	Alau village	1994	500	258	252
Cashew	Alau village	1994	500	420	80
Neem	Tuba - lawanti Village	1995	1,200	1,164	36
Eucalyptus	Tuba - lawanti Village	1995	1,800	1,459	341
Neem	Kano Motor P. R. S	1999	1,500	1,482	18
Neem	Damboa Road Site	2003	1,000	998	2
Total (M ± SD)	10 Locations	23 Years	18,500 (1027.8 ± 318.3)	17,124 (951.3 ± 334.8)	1,376 (76.4 ± 97.5)
Percentage (%)			100	92.56	7.44%

Keys: N = Number, Spp = Specie, S. P. = Shelter Belt Plantation, P. R. S = Park Road Site, M ± SD = Mean Plus or Equal Standard Deviation.

**Table 4.** Total Number of Species Types, Planted, Survived and Lost and Percentages from 1984 – 2003.

Type of Species	No. of Seedlings Planted	No. Survived	Percentage	No. Lost	Percentage
Neem	11,200	11,000	98.21	200	1.79
Eucalyptus	5,800	5,190	88.25	610	11.75
Mango	500	327	65.4	173	34.6
Guava	500	258	51.6	242	48.4
Cashew	500	420	84.0	80	16.0
Total (M±SD)	18,500 (3700 ± 4780)	17,195 (3439 ± 4721)	387.5 (77.5 ± 18.7)	1,305 (261 ± 204)	112.54 (22.5 ± 18.7)

Keys: No. = Number, M±SD = Mean plus or Equal Standard Deviation.

## 4. Discussions

In recent years, changes in climatic have caused some impacts on human systems and natural, across ecosystems, causes some problems to agriculture and food security, especially in the fields of irrigation, fisheries horticulture, forestry sector. Climate change impacts such as unpredictable and changing seasonal weather variation, etc, is causing lower crops yields, plants due drought and fish production, among others. Controlling this climate change is probably by introducing trees, herbs and shrubs along the water bodies' banks and plain soils, creating more ponds, dams, or basins in order to collect and retain water, through agro – ecological techniques and data collection on environmental water bodies' and pedological parameters in order to ascertain, assess and address the environmental impacts. According to some authors such as Gwana *et al.*, [7, 8, 9] and Umaru *et al.*, [21] who stated that the ecosystem ecology is the interactions between organisms and or their environment as an integrated system. The ecosystem approach is fundamental to managing earths' resources, because it addresses the interaction that links biotic systems, of which people are integral part, with physical system on which they depend. Ecosystem analysis seeks to understand the factors that regulate the pools (quantities) and fluxes (flows) of materials and energy through ecological system. These materials are found in

abiotic (non-biotic or non-biological) pools such as soils, rock, water and the atmosphere, and in biotic (biological) fluxes such as plants, animal and soil microorganism.

Also Chapin *et al.*, [5] and MEA [13] who reported that climate change is occurring as a result of warming of the earth's atmosphere due to human activity generating excess amounts of greenhouse gases. Because of its potential impact on the hydrologic cycle and severe weather events, climate change is expected to have an enormous effect on human health, including on the burden and distribution of many infectious diseases [18, 19]. The infectious diseases that will be most affected by climate change include those that are spread by insect vectors and by contaminated water. The burden of adverse health effects due to theses infectious diseases will fall primarily on developing countries, while it is the developed countries that are primarily responsible for climate change. In general, climate change occurs as a result of imbalance between incoming and outgoing radiation in the earth's atmosphere.

Tree planting programmed in Maiduguri, Nigeria. It examine tree planting project in Maiduguri. Afforestation plays a vital role in the sustainability of semi - arid lands. Trees serve various purposes (tangible and intangible benefits). They help in protecting the land from water and wind erosion. Human activities affect and cause climate change, the ecosystem – environmental ecology; have

dramatically changed the composition and organization of biodiversity, soil, vegetation, the ecosystem – ecology, etc. According to Gwana *et al*, [8] who stated that the extreme ecological condition of the studied area especially the climatic variation could have resultant effect in modifying the soil ecosystem of Maiduguri and its environs, so it is expected that any variation weather seasonal or spatial in physical and chemical characteristic of the soil may be influenced by climatic regime and catchment characteristic, i. e. extent of human activities on the soil and rain water volume fluctuations. Thus, another factors, human activity that effect and cause some impacts to ecosystem – ecological environment is the ever growing population pressure, the unabating drought in recent years together with excessive deforestation, overgrazing, bush burning, etc. The effects of this indiscriminate burning can cause a loss of most of the macro and micro elements; nitrogen, sulphur, and carbon, etc. elimination of seedlings of fire tender tree species to service, destruction of human and adverse soil physical and textural characteristics particularly where intense burning is achieved, adverse effects on macro fauna and destruction of soil micro flora. Management of such degraded environments will involve the introduction of leguminous trees on farm lands to help conserve soil nutrients by enhancing the process of nitrogen building up in the soil. According to NAP [14] which stated that the dry land of Nigeria forms an undulating plain at a general elevation from about 450 m to 700 m, the average annual rainfall in dry land of Nigeria varies from less than 500 mm in the north - east part to 1000 mm in the southern sub - area, but it is unreliable in many parts.

The main classic factors that are responsible for desertification in Maiduguri, Borno State Nigeria are over grazing, desertification through poor agricultural practice and poorly conceived development plans, and climatic factors. Despite its overwhelming state of aridity and sparse tree cover, Borno State of Nigeria was an alarming records of indiscriminate tree cutting in the country, while observation in recent years have indicated a complete absence of regeneration through natural seed dispersal in all known tree species, due largely to genera desiccation of the environment, yet there is a massive rate of indiscriminate tree felling. The concept of urban tree plantation scheme was introduced in 1986 in order to provide green cover to the large towns on margins of the desert. In Nigeria government efforts to achieve sustainability in the management of forest resources or typified by the establishment of department of forestry in Ministry of Agriculture and Forestry, forest research institutes and forestry department in institution of higher learning. In addition, government launches awareness campaign annually to sensitize the public on the subject matter of forestry. Despite the fact, when such programmes are raised in accordance, therefore, the following condition must be considered e. g. proper and suitable sowing medium, growing medium, pot size, and filling of pots, etc.

As a result of these problems stated, study was conducted on the tree planting programmes in Maiduguri Metropolis of which a total of 120 respondents involved in the

programmes, this is in order to ascertain the tree planting programmes progress achievement and the results obtained revealed the following demographic information; males were mostly involved in the tree planting programmes which account for 75%, while the females were only account for 25%, with a total mean of  $60 \pm 42.4$  of respondents as stated respectively. With regard to the age – group distribution of the respondents that were involved in the study that those under 25 years old were 6 in number with 5%, 26 – 30 years old were 35 in number which account for 29%, 31 – 40 years old were 49 with 41% and finally those that falls within the age – group of 41 years and above were 30 in number with 25%. The highest was those that are within the age – group of 31 – 40 years old, then followed by those within the age – group of 26 – 30 years old, then followed by those that are within the age – group of 40 years and above, and the least in age – group were those under 25 years with a total mean of  $30 \pm 17.9$  of respondents involved.

The research study also revealed that a total of the trees planted were five (5) comprises species of neem, eucalyptus, mango, guava and cashew, at different ten (10) locations within Maiduguri and its environs for a period of 23 years. Total of 18,500 of the various tree plants' species were planted between the year 1984 to 2003, out of this number, 17,124 seedlings (with a mean total of  $951.3 \pm 334.8$ ) were survived which accounted for 93%, and 1,376 (with a mean total of  $76.4 \pm 97.5$ ) were lost accounted for 7% respectively. This reveals that Maiduguri Metropolitan Council has done a lot in terms of tree planting programmes given the ranged and compared the survival with the lost rate of the trees seedlings planted.

With consideration to the total number of species type, Planted, survived, lost, and percentages from 1984 – 2003. The number of Neem seedlings planted was 11,200, survived seedlings were 11,000 which accounted for 98% of survival rate and seedlings lost were 200 only which accounted for rate lost of 2 percent. A total of 5,800 Eucalyptus seedlings were planted, out of which 5,190 (accounted for 88%) were survived while 610 which accounted for 12% were lost. Five hundred (500) Mango seedlings were planted, out of which 327 seedlings with a rate of 65% were survived and 173 seedlings which accounted for 35% were lost. About 500 Guava seedlings also were planted, out of this number 258 which accounted for 52% were survived and 242 (which accounted for 48% were lost, and finally, five hundred (500) Cashew seedlings were planted and out of the number stated, 420 which accounted for 84% survived and 80 (which accounted for 16%) were lost.

Summarily, mean total of the trees seedlings in the trees planting programmes were as followed; planted were 18,500 ( $3,700 \pm 4,780$ ), survived were 17,195 ( $3,439 \pm 4,721$ ) and the total percentage of survival was 387.5 ( $77.5 \pm 18.7$ ) and the total lost rate was 1,305 ( $261 \pm 204$ ) and total percentage of lost was 112.54 ( $25.5 \pm 18.7$ ). The different tree species planted between 1984 and 2003 and their survival rates were 98%, 88%, 65%, 52% and 84% for Neem, Eucalyptus, Mango, Guava and Cashew recorded respectively. Also their

corresponding losses rates are 2%, 12%, 35%, 48% and 16% for Neem, Eucalyptus, Mango, Guava and Cashew respectively. Neem and Eucalyptus seedlings accounted for 92% of the total tree seedlings planted within the same period. This may be due to their fast rate of regeneration and ability to adapt to drought conditions.

According to Gwana and Umaru [7] who stated that due to the human activities such as the global warming and contaminations by industries wastes materials to the ecosystem environments may lead to excessive release of some metals to waters and soils, e. g. river, streams, etc. this may lead to bioaccumulation in edible plants which may tend to kill the plant species seedlings depending on the plant type of varieties. Vegetation is important to humans and animals as primary sources of food, as building materials for shelter, in manufacturing industries, as a fuel and as medicine. Major problems are created when humans try to clear domestic animals in region not suited to their lifestyle, especially when they alter the natural vegetation to grassland. Deforestation not only affects the immediate rainforest and ecosystem, but it may also have drastic consequences on adjacent region. Deforestation is a complex environmental problem and its consequences manifest themselves in several forms such as erosion, flash flood, reduced stream flow, drought, fuel wood scarcity, sedimentation and microclimatic changes.

The successive establishment of plantation in the arid zone of Nigeria to meet the growing demand for fuel wood, fodder for livestock and arrest desertification, erosion control etc. has been a top priority to the federal government and states in the arid zone (covering Bauchi, Borno, Jigawa, Katsina, Kebbi, Yobe, Sokoto, Yobe and Zamfara states i. e. some part of the North – eastern Nigeria). Therefore the success of these tree planting programmes have depended largely on the provision of adequate quantities of seedlings of desired species and mostly by the state forestry services of the affected states and local governments, government institutions, individuals, communities as well as the private organization have played a rather negligible role. The survey revealed that species of *Azadiracta indica* (Neem) and Eucalyptus species are the dominant species planted to check drought and desertification. Few other trees like guava, mango and cashew are planted as economic crop no emphasis have been put and on agro forestry trees, which can also fix soil structure and improve soil fertility.

## 5. Conclusion

Tree planting programmed in Maiduguri, Nigeria. It examine tree planting project in Maiduguri were 5 different species of tree seedlings planted at different 10 locations within the period of 23 years with a total number of 18,500, out of which 17,195 survived and the total lost rate was 1,305. The different tree species planted from 1984 to 2003. Afforestation plays a vital role in the sustainability of semi - arid lands. Trees serve various purposes (tangible and intangible benefits). They help in protecting the land from water and wind erosion. Trees planting as a tool in

afforestation restore the vegetation cover, soil fertility, protect against erosion by wind and water. Therefore the strategy for intensive afforestation programmes through establishment of shelterbelt, wind breaks, road site, farm forestry and other forest programmes currently embarked upon by the government should be a continues process. Also this should not be left to the government but private sectors should be encouraged.

## Recommendations

For effective and successful tree planting programmes especially in Maiduguri Metropolitan Council, Borno State at large, therefore the following recommendations are necessary.

We urge for sufficient funds for forestry projects by federal and state government. These should be increased allocation of budget to issues of environmental control concerns. Professional in forestry should be employed base on merit, dedication and hard work. Training and retraining of forestry officers be intensified with visit to other parts of the world where afforestation and proper forest management are actively pursued. Conducting of research work aimed at finding out correct trees species that will be able to survive the climatic condition of the semi-arid region of Nigeria. Let there be an effective monitoring of planted tree seedlings especially those planted during tree planting campaigns. Let there be a sound water resources development at the sites of the planted trees. The trees planted should not be left to undergo the phenomenon of survival of the fittest due to lack of proper care. Regular mobilization of the public on the media channels, like TV, Radio, Newspapers at no cost.

## Acknowledgements

We acknowledge with most honoured, duly respected and most grateful to the department of Agriculture and Natural Resources, Forestry Divisions, Maiduguri Metropolitan Council, Borno State of Nigeria and all persons who have helped and aided us in the course of carrying out this research study successfully.

## References

- [1] Afforestation Programme Coordinating Unit. "Tree Planting Techniques", Bulletin No. 2, APCU Unit, Regional Office of FORMECU, Federal Department of Forestry, Kano, Nigeria, 1991; pp: 4.
- [2] Ali, M. G. "Effective Forestry Management", In: Appraisal of Forestry Management, A Paper Presented for Senior Forestry Official of Borno State Local Governments Held at Lake Chad Hotel, Maiduguri, 1991; pp: 3.
- [3] Ayuba, H. K. "Environmental Science", In: An Introductory Text, 1<sup>st</sup> Edition, Loud Books Publisher Ltd, Kongi – Bodija, Ibadan, 2005; pp: 40 - 50.

- [4] Baba, F. "Desertification and Afforestation in Borno State", A Paper Presented at a Workshop on Conservation of Forestry Resources held at the Musa Usman Secretariat on 9<sup>th</sup> December, 2002; pp: 1- 4.
- [5] Chapin, F. S., III, Kofinas, G. P, Folke, C. "Ecosystem Concept. In: *Principles of Ecosystem Stewardship: Resilience – Based Natural Resources Management in a Changing World*". Springer, New York; Pp: 1–5. 2009.
- [6] Gwana, A. M., Auwal, M. S., Bagudu, B. Y., Gazali, Y. A. "Study Area and Location; In: Comparative Parasitological Diagnostic Techniques in the Survey of Haemoparasites of Camel Slaughtered in Maiduguri Central Abattoir, North – Eastern Nigeria", *Journal of Laboratory Science*, 1, (2), 2013; pp: 57–65.
- [7] Gwana, A. M.; Effiong, E. B.; Halima, B. M.; Muhammed, A. B.; Buhari, B. Y.; Abubakar, M. and Ali, G. "Determinations of Some Heavy Metals and Elements in Moringa oleifera leaves Cultivated in Gulani Town, North – Eastern Nigeria", *Academic Journal of Life Science*, Vol. 2, No. 10, 2016a; pp: 77–83.
- [8] Gwana, A. M.; Umaru, B. W.; Halima, M. B. and Wanas, L. N. "Physico – Chemical Water Analysis of Lake Alau, North – Eastern Nigeria", *Journal of Water Resources and Oceanic Science*, Vol. 6, No. 1, 2017, pp: 14–22.
- [9] Gwana, A. M. and Umaru, B. W. "Biological Water Quality and Condition Factor of Fish (*Clarias gariepinus*) in Lake Alau, North – Eastern Nigeria", In: SciencePG Frontiers, from *International Journal of Natural Resource Ecology and Management*; Published online - June 4, 2016. Retrieved: 06 / 16 / 2016b.
- [10] Kevin, T. P. and Lewis, A. O. "An Introduction to – Global Environmental Issues", Routledge, London and New York, 1990; pp: 251-256.
- [11] Lawan, B. M. "Afforestation Programme in Nigeria", In: The Role of Afforestation Programme Coordinating Unit (APCU) held at Lake Chad Hotel, Maiduguri, Bulletin No. 2, APCU Unit, Regional Office of FORMECU, Federal Department of Forestry, Kano, Nigeria, 1991; PP: 3-4.
- [12] Lawan, M. An Appraisal of Tree Planting Programmes in Borno State, Masters' Thesis, A Paper Presented to the Department of Geography, Faculty of Social Sciences, University of Maiduguri, Maiduguri, Nigeria, 2004; pp: 12.
- [13] (MEA) Millennium Ecosystem Assessment. "*Synthesis: Ecosystem and Human Well-being*": Island Pres, Washington. 2005.
- [14] National Action Programme (NAP). "Toward Implementation of the United Nation Convention to Combat Desertification and Mitigate the Effects of Drought in the Country", 2000; pp: 11.
- [15] National Population Commission. 2006. Census Reports, In: Census De Facto, Vital Statistical Unit, Gidan Madara, Maiduguri, Nigeria.
- [16] Sastawa, B. M. "Conservation of Forest Plantation Through Sustainable Pest Management", A Paper Presented at the Workshop on Conservation of Forestry Resources held at the Musa Usman Secretariat on 9<sup>th</sup> December, 2002; pp: 1.
- [17] Shettima, M. "The Menace of Drought, Desertification and Desert Encroachment in Nigeria", In: Ecological Disaster in Nigeria, Drought and Desertification. V. O. Sagua, E. E. Enchor, P. R. O. Kio, A. U. Ojanuga, M. Mortimore, A. E. Kalu, (Eds), 1985; pp: 304.
- [18] Shuman, E. K. "Global Climate Change and Infectious Disease", International Journal of Occupational and Environmental Monitoring, Volume 2, Number 1; Pp: 11–19. 2011. 2011. www.theijoem.com.
- [19] Patz, J. A. "Climate Change". In: Frumkin H., ed. Environmental Health. San Francisco: Josey-Bass, 238–68.2005.
- [20] Stroud, K. A and Booth, D. J. "Statistical Package", In: *Engineering Mathematics* WWW.Palgrave.Com/Stroud, Palgrave. GB, London, 5<sup>th</sup> Edition; Pp: 1130 – 1139. 2001.
- [21] Umaru, B. W., Gwana, A. M., Wanas, L. N., Halima, M. B. "Assessment of Biological Water Quality and Condition Factor of *Clarias gariepinus* in Lake Alau, North – Eastern Nigeria", *International Journal of Natural Resource Ecology and Management*, 1 (1); Pp: 1–10. 2016.
- [22] Verinumbe, I. "Utilization of Indigenous Tree Species for the Control of Desertification in Northern Borno", A Paper Presented at the National Workshop on Ecological Disaster – Drought and desertification, at Kano Nigeria, 9<sup>th</sup> – 12<sup>th</sup> December, 1985; PP: 3.
- [23] World Bank. "Second Forestry Project Working Paper", Vol. II and Forestry Staff Appraisal Reports, 1986; pp: 2–42.