



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2019; 8(7): 196-203

© 2019 TPI

www.thepharmajournal.com

Received: 16-05-2019

Accepted: 17-06-2019

Maishanu HM

Department of Biological Sciences, Faculty of Science, Usmanu Danfodiyo University Sokoto, Nigeria

Mainasara MM

Department of Biological Sciences, Faculty of Science, Usmanu Danfodiyo University Sokoto, Nigeria

Dahiru SS

Zamfara State College of Art and Social Sciences, Gusau Zamfara State, Nigeria

Shuni IA

Zamfara State College of Art and Social Sciences, Gusau Zamfara State, Nigeria

Correspondence

Mainasara MM

Department of Biological Sciences, Faculty of Science, Usmanu Danfodiyo University Sokoto, Nigeria

Awareness and perceptions of desertification in Dange/Shuni local government area Sokoto state Nigeria

Maishanu HM, Mainasara MM, Dahiru SS and Shuni IA

Abstract

This research project was conducted to assess the level of awareness and human perspectives regarding desertification in Dange –shuni local government area of Sokoto state, Nigeria. The study was undertaken by the use of structured questionnaire and personal communication (interview) on desertification. Analyses of data showed individual response on desertification with different opinion in the study area. Base on the results, it was recommended that, intensive mass campaign on tree planting to avoid desertification and to determine the deterioration of the physical, chemical and biological or economic properties of the soil. Effective prevention of desertification requires both local management and micro policy approaches that promote sustainability of ecosystem services. It is advisable to focus on prevention, because attempts to rehabilitate desertification areas are costly and tend to deliver limited results.

Keywords: Desertification, awareness, perspectives, Dange-Shuni, Nigeria

Introduction

The phenomenon of desertification involves the loss of biological or economic productivity and biodiversity in arid and semiarid croplands, pastures, rangelands, and sub humid woodlands due mainly to non-sustainable human activities, such as over cultivation, fuel gathering, overgrazing by domestic animals, deforestation, and poor irrigation practices and often triggered or exacerbated by climate variability, mainly drought (Veron, Paruelo, & Oesterheld, 2006) [19].

Desertification is the extension of desert – like condition to areas which are not of desert origin. The United Nations Conference on Environment and Development. Desertification is a change in soil properties, vegetation or climate, which results in a persistent loss of ecosystem services that are fundamental to sustaining life (D’Odorico, Bhattachan, Davis, Ravi, & Runyan, 2013) [6]. desertification as “land degradation in arid, semi – arid and dry sub - humid areas resulting from various factors including climatic variations and human activities (Audu, 2013) [4]. Because of the complexity of the mechanism of desertification, it is quite difficult to identify the exact role of specific variable in the context of the synergistic effect of various driving factors of desertification. In particular, the interaction between economic factors and desertification is still far from being fully understood. As the population increases steadily and the economy continues to grow, the earth's capacity of supporting human beings is diminished (Ge, Li, Luloff, Dong, & Xiao, 2015) [8]. Northern Nigeria is prone to desertification mostly due to its proximity to Sahara Desert. Nigeria is losing about 351, 000 km² to the desert representing 38% of its total landmass. It is also estimated that more than 30 million people in Nigeria live under the hardship of desertification (Audu, 2013; Idris Medugu, Rafee Majid, & Johar, 2011) [4, 11].

Nigeria is the most populous country in Africa with an estimated population of over 140 million and a total land area of 923,773 km². The country is currently losing about 351,000 ha annually to advancing desert and such conditions are estimated to be advancing southwards at the rate of about 0.6 km per year. The dunes are threatening life-supporting oasis, burying water points, and in some cases, engulfing major roads in the affected areas. Trees planted by the government as shelterbelts to check the advancing dunes are withering due to the lack of attention (Audu, 2013; Idris Medugu *et al.*, 2011) [4, 11]. More recently, desertification has been approached from a different conceptual framework, one that strengthens the link between nature and human welfare (Rock, 2006). Thus this conceptualization of desertification focuses primary on the assessment of ecosystems services, local communities’ perception and economic indicators (Verón, Blanco, Texeira, Irisarri, & Paruelo, 2017) [20].

Environmental knowledge is also predictive of the level of adoption of conservation practices showed that awareness positively influences compliance with community regulations related to tree planting and protection in Nigeria (Zhang *et al.*, 2016)^[21].

Materials and method

Study Area

Dange-shuni local government is geographically lies between latitude 12° 40' 08" end 13° 20' 04" North longitude 5° 08' 42" end 5° 40' 31" East. Dange-shuni share boundaries with Sokoto south and kware local government in the north. Shagari and Bodinga in the west and Rabah Local government in the east (M. Abubakar, Ipinjolu, Magawata, & Manga, 2013; Malami & Magawata, 2010; Shinkafi, Bello, Hassan, & Ali, 2015)^[1, 14, 18].

The climate of Sokoto state, is characterized by annual rain fall ranges from 30-40 inches, May/June to September/October with the heaviest rainfall in August and some part of September, in the long dry season (6-8 months) the air is very dry with relative humidity constantly between 40% and the temperature as high as 40° (Ajetomobi & Abiodun, 2010)^[3]. Sokoto state fall within Sudan savannah zone, the natural vegetation is that open shrubs savannah. There are shrubs at varying density with tree rarely exceeding 6m in high. State that, fire-hardy species are among the widest spread. Some common species in the area include *Isoberlinia spp*, *Khaya senegalensis*, *Acacia spp*, *Parkia clappertoniana*, *Butyrosperum paradoyum*, *Adansonia digitata*, *e.t.c.* (M. Y. Abubakar, 2015)^[2].

The major occupation of the natives is farming and grazing. Agriculture is done in small-scale subsistence farming in which cash crops play a small but significant role (Oboho, 1984). They produce such crops as millet, corn, maize, rice, potatoes, cassava, groundnut and beans as sustenance and produce wheat, cotton and vegetable for cash.

Data collection

Data collection for the present study was carried out during late 2015 to collect information related to people's awareness and perceptions on desertification. Both the primary and secondary data (sources) were used for the research. The primary data were collected using a structured questionnaire that aimed at generating demographic information of desertification.

Sampling Procedure and sample size

Purposive sampling was used in selecting village areas; Fajaldu, Majiya, Bodai, Ruggar Kura, Dabagi and Rudu all in Dange-shuni local government. In each village, 20 participants were randomly selected and were interviewed. A total of 120 respondents constituted the sample size for the study.

Data Analysis

The data obtained from the field was analyzed using simple descriptive tools such as percentages and charts.

Results

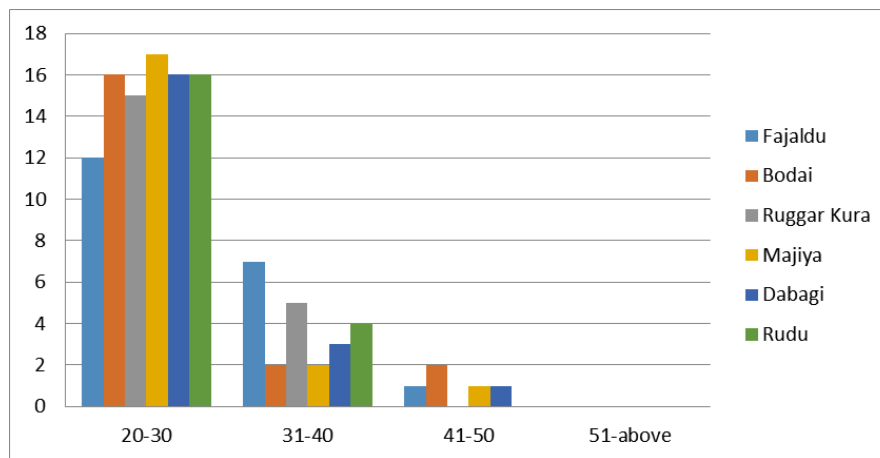


Fig 1: Age of the respondents.

Between (20-30 years) of the respondents, Majiya has the highest number of 17, followed by Bodai, Dabagi and Rudu with 16 each; Ruggar Kura has 15 numbers while Fajaldu has the lowest with 12 numbers of respondents. At the age of between (31-40 years), Fajaldu has the highest number of 7, followed by Ruggar Kura with 5, Rudu has 4 and Dabagi with

3, Bodai and Majiya have the lowest with two numbers each. At the age of (41-50 years), Bodai has the highest number of 2, followed by Fajaldu, Majiya and Dabagi with the number of 1 each while Rudu and Ruggar Kura has no respondents. At the age of 51-above, there is no number of respondents.

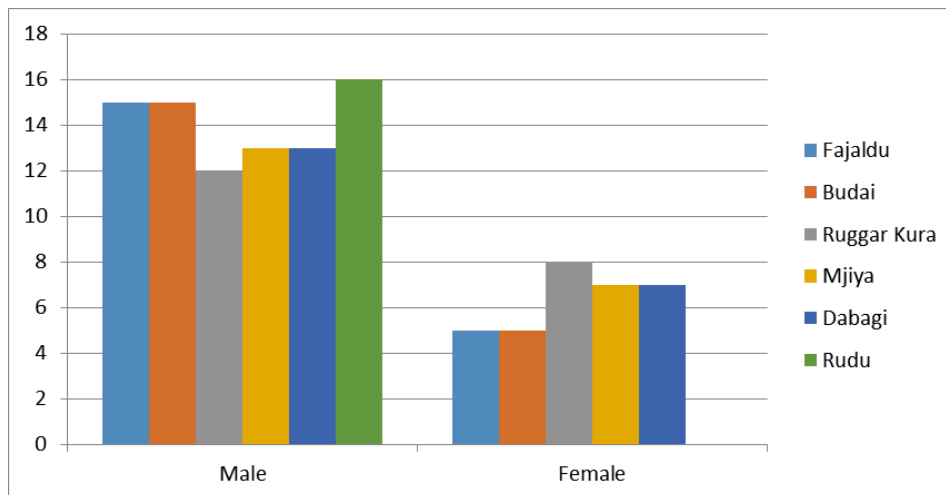


Fig 2: Respondents by gender.

From the male respondents, Rudu has the highest number of 16, followed by Fajaldu and Bodai with 15 each then Majiya and Dabagi with 13 each while Ruggar Kura has the lowest with 12 numbers. Respondents from the female side, Ruggar

Kura has the highest number of 8, followed by Majiya and Dabagi with seven each while Fajaldu and Budai have the lowest with five respondents.

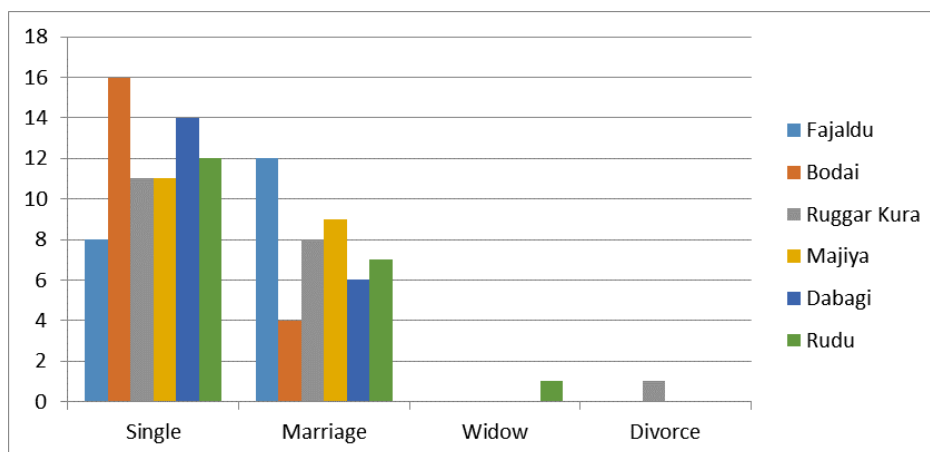


Fig 3: Marital status of the respondents.

Respondents from the singles, Bodai has the highest number of 16, followed by Dabagi with 14, Rudu has 12 also Ruggar Kura and Majiya with 11 each while Fajaldu has the lowest with eight numbers. From the married respondent, Fajaldu has the highest number of 12, followed by Majiya with 9; Ruggar

Kura with 8, Dabagi has six while Bodai has the lowest with four numbers. From the Widow respondent, only Rudu have 1 number of respondents while the rest has no respondent. From the Divorce respondent, only Ruggar Kura have only one respondent while the rest has no respondent.

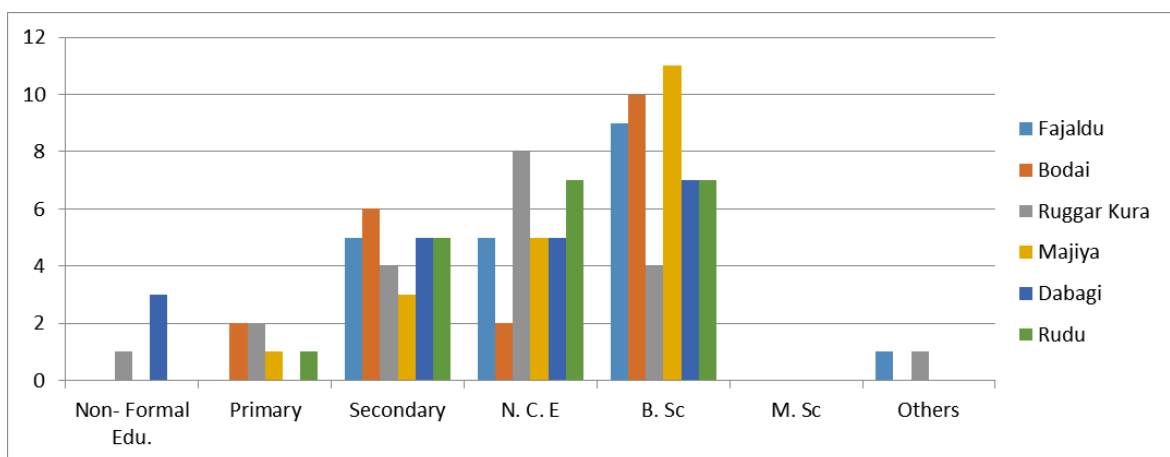


Fig 4: Level of education of the respondents.

Response from non- formal education, Dabagi has the highest number of 3 while Ruggar Kura has the lowest number with 1 number of the respondent. Similarly, the rest has no number of respondents. From the Primary respondents, Bodai and Ruggar Kura have the highest number of 2 each while Majiya and Rudu have the lowest number of 1 each, but in Fajaldu and Dabagi there is no number of respondents. From the Secondary respondents, Bodai has the highest number of 6, followed by Fajaldu, Dabagi and Rudu 5 each, Ruggar Kura has four while Majiya has the lowest number with three

respondents. Respondents from N.C.E, Ruggar Kura, has the highest number of 8, followed by Rudu with 7, Fajaldu, Majiya and Dabagi have five each, while Bodai has the lowest number with two respondents. B.Sc respondents, Majiya has the highest number of 11, followed by Bodai with ten then Fajaldu with 9, Dabagi and Rudu have seven each, while Ruggar Kura has the lowest number with four respondents. No respondents from M. Sc. From others, only Fajaldu and Ruggar Kura have 1 number of respondent each.

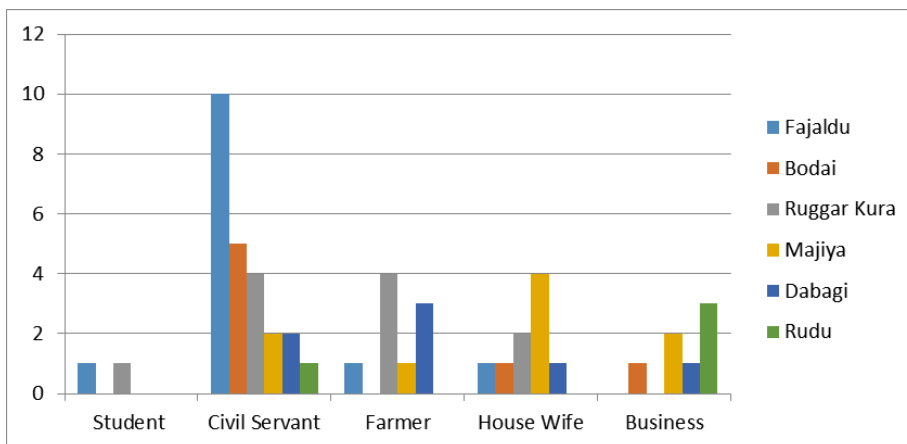


Fig 5: Occupation of the respondents.

Respondents from the Students, Fajaldu and Ruggar Kura have only 1 number of respondents each while the rest has no respondents. From the Civil Servant, Fajaldu has the highest number of 10, followed by Bodai with five respondents, Ruggar Kura has 4, Majiya and Dabagi has two each while Rudu has the lowest number with one respondent. From the Farmers, Ruggar Kura has the highest number of 4, followed by Dabagi with 3, Fajaldu and Majiya have the lowest number

with one respondent each while in Bodai there are no respondents. From the House Wife respondent, Majiya has the highest number of 4, followed by Ruggar Kura with two respondents Fajaldu, Bodai and Dabagi have some one each. While in Rudu there is no respondent. From the Business respondents, Rudu has the highest number of 3, followed by Majiya with 2, Bodai and Dabagi have 1 number each while Fajaldu has no number of respondents.

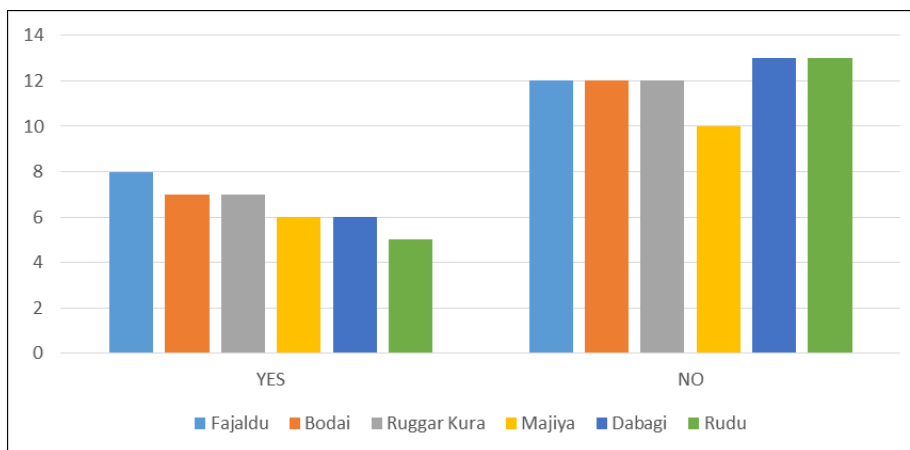


Fig 6: Distribution of the respondents that have heard about desertification.

From the yes respondents Fajaidu has the highest number of 8, followed by Bodai and Ruggar Kura with seven each, then Majiya and Dabagi with six each while Rudu has the lowest number with five respondents. From those that do not hear

about desertification (No), Rudu and Dabagi have the highest number of 13 each, followed by fajaldu, Bodai and Ruggar Kuru with 12 each and finally, Majiya has the lowest number with ten respondents.

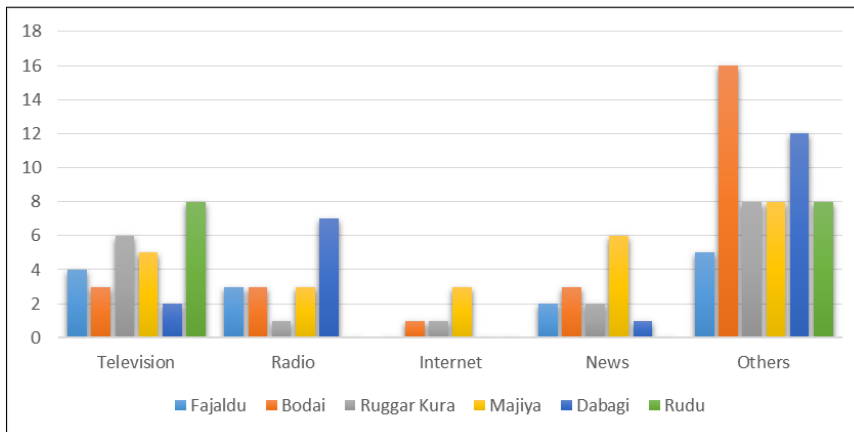


Fig 7: Sources of information about desertification.

Respondents from the Television, Rudu has the highest number of 8, followed by ruggar Kura and Fajaldu with six each, Majiya has 5, Bodai has 3, while Dabagi has the lowest number of 2 respondents. From the Radio respondents, Dabagi has the highest number of 7 followed by Bodai, Fajaldu and Majiya have three respondents each, Ruggar Kura has one respondent, Rudu has no number of respondents. Respondents from the Internet, Majiya has the highest number of 3, Bodai and Ruggar Kura have only 1 number each, while

Fajaldu, Dabagi and Rudu have no number of respondents. Respondents from Newspaper, Majiya has the highest number of 6, followed by Bodai with 3, Fajaldu and Ruggar Kura have two numbers each, Dabagi has the lowest number of 1 while Rudu has no number of respondents. Respondents from the others, Bodai has the highest number of 16 then followed by Fajaldu with eight then Rudu has 7, Ruggar Kura has 5, Dabagi has four while Majiya has no number of respondents.

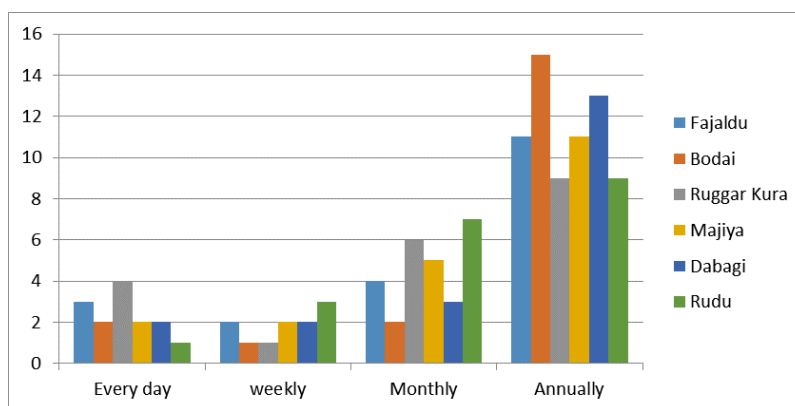


Fig 8: Respondents are cutting down of trees.

Respondents that cut down trees every day, Ruggar Kura have the highest with 4, then followed by Fajaldu 3, Bodai, Majiya and Dabagi has two numbers each while Rudu has the lowest number with one respondent. Weekly respondents, Rudu has the highest number of 3, Fajaldu, Majiya and Dabagi have 2 number each while Bodai and Ruggar Kura has the lowest number of 1 respondent each. From the Monthly respondents,

Rudu has the highest number of 7 then followed by Ruggar Kura with 6, Majiya has 5, Fajaldu has 4, Dabagi has three while Bodai has the lowest number with two respondents. From the Annually respondents, Bodai has the highest number of 15 then followed by Dabagi with 13, Fajaldu and Majiya have 11 number each while Ruggar Kura and Rudu has the lowest number with nine each.

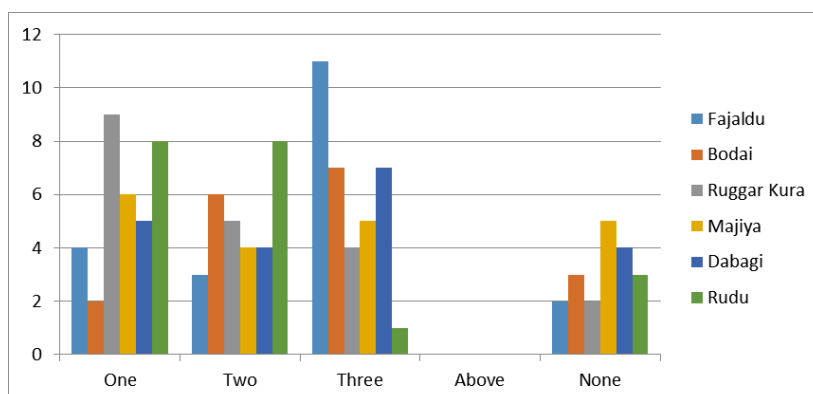


Fig 9: Number of times that the respondents plant a tree per year.

Respondents that plant a tree once in a year, Ruggar Kura has the highest number of 9 then followed by Rudu with 8, Majiya has 6, Dabagi has 5, Fajaldu has 4, while Bodai has the lowest number with two respondents. Respondents that plant a tree twice in a year, Rudu has the highest number of 8 number of respondents, followed by Bodai with six then Ruggar Kura has 5, Majiya and Dabagi have four respondents each while Fajaldu has the lowest number with three respondents. Those that plant a tree three times in a year,

Fajaldu has the highest number of 11 then followed by Bodai and Dabagi with nine numbers each Majiya has 5, Ruggar Kura has four while Rudu has the lowest number with one respondent. Above three times per year, there is no respondent. Respondents that do not plant a tree, Majiya has the highest number of 5 then followed by Dabagi with 4, Bodai and Rudu have three numbers each while Fajaldu and Ruggar Kura have the lowest with two respondents each.

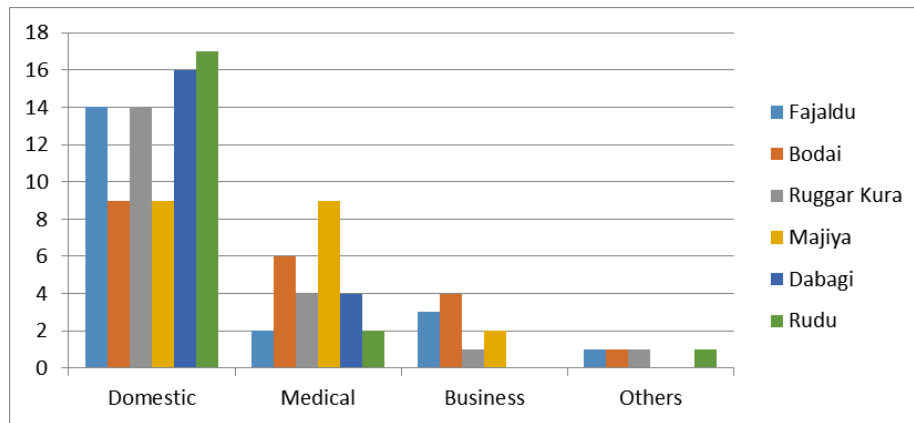


Fig 10: Purpose of cutting down a tree by the respondents.

Respondents for the Domestic purpose, Rudu have the highest number of 17, followed by Dabagi with 16, Fajaldu and Ruggar Kura have 14 each while Bodai and Majiya have the lowest number with nine respondents each. Respondents from the Medical purpose, Majiya have the highest number of 9, followed by Bodai with 6, Dabagi and Ruggar Kura have four each, while Fajaldu has the lowest with two numbers of the respondent. Respondents for business purpose, Bodai has the highest number of 4 then followed by Fajaldu with 3, Majiya has 2, Ruggar Kura has the lowest number with 1 number while Rudu has no respondents. From the purpose of the other, Fajaldu, Bodai, Ruggar Kura and Rudu have only 1 number of respondent each while Dabagi and Majiya have no respondents.

Discussion

Transformation of productive land into desert presents a threat to biodiversity, as well as human survival, in at-risk regions. Rovero (2013) [16] identifies the most commonly attributed components of desertification as agricultural use, increased aridity as a result of changing the climate, and expansion of human infrastructure.

The results among others show that while temperature has been on the increase, rainfall has been decreasing. The continued aridity and pressure on the land from farming, grazing and indiscriminate bush burning have led to southward desert encroachment. Currently, approximately 22.6% of the country's landmass is being affected by desertification. The desertification process has resulted in the southward migration of dunes, water scarcity, reduction in crops' production, ecological degradation and emigration of people and animals. Integrated efforts from the Local Communities, States and Federal Government together with NGOs and International Bodies to combat desertification through massive afforestation, enlightenment campaign, avoidance of indiscriminate bush burning, reduction in deforestation, overgrazing and over cropping among others are recommended (Odjugo & Isi, 2003) [15].

The findings show that about 76.4%, of the respondent, are between the age of 20-30 years, 19.3%, are between the age of 31-40 and only 4.3% are between the age of 41-51 years, while non the respondent was above the age of 50. This implies that respondents with age bracket from 20-50 years of age have been cutting down trees and did not have an awareness of the desert encroachment. This similar with (Chun, Sulaiman, & Samah, 2012; Faleyimu & Akinyemi, 2014; Hassan, 2015; Lazaro, Silas, & Emma, 2013) [5, 7, 10, 13] who found that the majority of the respondents by age groups were in the adult (20-30) followed by youth (30-40). The adult group being the majority, that is many respondents are matured enough to understand and takes part in the decision-making process for a particular community while youth are very energetic, high risk-taking and fast learners (Lazaro *et al.*, 2013) [13]. This implies that majority of the respondents are mature enough to fully understand issues concerning desertification. The sex distribution shows that, out of the 120 total respondents, 27% were males and 28% were females (Figure 2). This finding is similar with (Faleyimu & Akinyemi, 2014; Lazaro *et al.*, 2013; Shan, 2012) [7, 13, 17] who found that Males were the majority of the respondents while the remain was female.

The study shows that about 60% of the respondents responded to the awareness of desertification a survey questionnaire were singles followed by married 38.3%. The rest of the respondents who were very few about 0.83% were a widow and divorced each (Fig 3). This finding is not in line with (Faleyimu & Akinyemi, 2014; Geekiyanage, Vithanage, Wijesekara, & Pushpakumara, 2015; Kirupakaran & Thiruchelvam, 2011) [7, 9, 12] who found that the majority of the responded to the survey questionnaire were married. Understanding of the marital status distribution was of paramount important for this study since it influences decision-making process towards environmental conservation interventions.

On education, the study shows that, majority of the respondents (about 39.2%) had acquired primarily their first

degree then followed by national certificate of education (NCE) with 28 %, secondary school education with 24%, those with primary school education and non-formal education are 5% and 3% respectively (Fig 4). This finding was not found to be similar to previous studies; this may be due to a large number of respondents that ranges between 20-30. However, the few findings were found to be in line with the present study. (Faleyimu & Akinyemi, 2014; Shan, 2012)^[7, 17] Found out that majority of the respondents had acquired a higher degree and tertiary education respectively. This implies that the majority of the respondents had low education level. Also, some studies found that, under constant conditions the higher the level of education the higher is the knowledge on the importance of tree planting and awareness on desert encroachment (Shan, 2012; Lazaro *et al.*, 2012)^[17]. However, some studies found no positive association between level of education and knowledge or attitude to conserve environmental resources in urban areas. On occupation majority of the respondents were civil servants (47.05%), then followed by farmers and house wives with 17.64% each and business with 13.73% and finally student has the lowest with 3.94% (Fig 5). On cutting down the trees, those that cut down a tree annually has the highest respondents with 56.6%, the followed by monthly with 22.5%, then daily with 11.7% and finally those that cut down tree weekly with 9.2%.

On the hand, the remaining questions on the survey questionnaire were used for the first time according to related literature so, were not going to be compared with previous studies. On the distribution of the respondents that have heard about desertification majority of the respondent have not heard the word desertification and its implication to the community (NO) with 61.39%, while the remaining 38.61% said YES they once heard about desertification (Fig 6). Those that answered yes were further asked the sources of their information and base on sources of information about desertification, those that their sources of information are others has the highest percentage of respondents (40.0%), then followed by those that heard about desertification through television (27.23%) then radio (15.5%) and lastly those with internet as source of their information with (4.54%) (Fig 7). From (Fig 8) number of times that the respondents plant a tree in a year, respondents that plant a tree three times in a year have the highest respondents with 32.5% followed by once in a year with 28.3% then twice a year with 25% and lastly those that do not plant a single tree throughout their deforestation activities with 14.2% (Fig 9). on purpose of cutting down the trees domestic uses have the highest respondents with 79% of the total respondents, followed by medicinal purpose with 21.18%, then for business purpose with 8.33% and finally others purposes with 3.3% (Fig 10).

Most respondents in our study were collectively not aware of the consequences and implications surrounding cutting down of trees. These findings highlight the importance of awareness to the rural dwellers regarding a green environment more especially the importance of tree in sub-Saharan areas. Our study demonstrates that much needs to be done to increase awareness and knowledge in rural areas and communities.

Conclusions

This study contributes to fulfilling an important area of knowledge gap for Nigeria, a country where information on local communities' awareness and perceptions of desertification is greatly needed. This study provides a much-needed first assessment of communities' awareness and

perceptions of washing away of vegetation.

Recommendations

Specific recommendations Based on the results and the conclusions above of this study, its recommended that:

1. The government should provide education and explore ways of enhancing the contribution of trees or vegetation to the environment and the local community.
2. The Modalities should be sought to empower and take into consideration the local community's interests in planting and conservation vegetation. The government should initiate a proper way for the local community to participate in conservation or management of plantations.

References

1. Abubakar M, Ipinjolu J, Magawata I, Manga B. Some Physical Parameters of the Sokoto-Rima River System in North-Western Nigeria. *Scientific Journal of Environmental Sciences*. 2013; 2(5):93-100.
2. Abubakar MY. The role of climate, soil properties and vegetation in controlling soil moisture in the Sokoto State Nigeria *Global Change Biology*. 2015; 18(5):1670-1683.
3. Ajetomobi J, Abiodun A. Climate change impacts on cowpea productivity in Nigeria. *African Journal of Food, Agriculture, Nutrition and Development*. 2010; 10(3).
4. Audu E. Fuelwood consumption and desertification in Nigeria. *International Journal of Science and Technology*. 2013; 3(1):1-5.
5. Chun MH, Sulaiman WNA, Samah MAA. A Case Study on Public Participation for the Conservation of a Tropical Urban River. *Polish Journal of Environmental Studies*. 2012; 21(4).
6. D'Odorico P, Bhattachan A, Davis KF, Ravi S, Runyan CW. Global desertification: drivers and feedbacks. *Advances in Water Resources*. 2013; 51:326-344.
7. Faleyimu O, Akinyem M. Socio-Economic Assessment of Urban Forestry Respondents' income in Okiti Pupa, Ondo State, Nigeria. *Journal of Applied Sciences and Environmental Management*. 2014; 18(4):603-607.
8. Ge X, Li Y, Luloff AE, Dong K, Xiao J. Effect of agricultural economic growth on sandy desertification in Horqin Sandy Land. *Ecological Economics*. 2015; 119:53-63.
9. Geekiyana N, Vithanage M, Wijesekara H, Pushpakumara G. State of the environment, environmental challenges and governance in Sri Lanka. *Environmental Challenges and Governance*; Mukherjee, S., Chakraborty, D., Eds, 2015, 92-109.
10. Hassan A. Assessment of community's participation in conservation of open spaces in Dar es Salaam city, Tanzania. *The Sokoine University of Agriculture*, 2015.
11. Idris Medugu N, Rafee Majid M, Johar F. Drought and desertification management in arid and semi-arid zones of Northern Nigeria. *Management of Environmental Quality: An International Journal*. 2011; 22(5):595-611.
12. Kirupakaran S, Thiruchelvam S. Coastal communities' attitudes towards conservation of freshwater Turtle in Ampara District. *Tropical Agricultural Research*. 2011; 21(4).
13. Lazaro M, Silas SR, Emma L. Community perceptions and willingness to accept and execute REDD+ initiative: The case of Pugu and Kazimzumbwi forest reserves, Tanzania. *Cross-Cultural Communication*. 2013; 9(3):48.
14. Malami G, Magawata I. Analysis of Food and Feeding

- Habits of Catfish (*Bagrus bayad*, *Macropterus* (*Daget*) in River Rima and Goronyo Dam, in Sokoto State, Nigeria. *Nigerian Journal of Basic and Applied Sciences*. 2010; 18(2).
15. Odjugo AP, Isi AI. The impact of climate change and anthropogenic factors on desertification in the semi-arid region of Nigeria. *Global Journal of Environmental Sciences*. 2003; 2(2):118-127.
 16. Rovero M. *Nutrient Cycling Causes and Impacts of Desertification*, 2013.
 17. Shan XZ. Attitude and willingness toward participation in decision-making of urban green spaces in China. *Urban forestry & urban greening*. 2012; 11(2):211-217.
 18. Shinkafi TS, Bello L, Hassan SW, Ali S. An ethnobotanical survey of antidiabetic plants used by Hausa–Fulani tribes in Sokoto, Northwest Nigeria. *Journal of Ethnopharmacology*. 2015; 172:91-99.
 19. Veron S, Paruelo J, Oesterheld M. Assessing desertification. *Journal of Arid Environments*. 2006; 66(4):751-763.
 20. Verón SR, Blanco LJ, Texeira MA, Irisarri JGN, Paruelo JM. Desertification and ecosystem services supply: The case of the Arid Chaco of South America. *Journal of Arid Environments*. 2017.
 21. Zhang W, Kato E, Bhandari P, Nkonya E, Ibrahim HI, Agbonlahor M, Cox C. Awareness and perceptions of ecosystem services about land use types: Evidence from rural communities in Nigeria. *Ecosystem Services*. 2016; 22:150-160.