



Research Article

The Impact of Uncontrolled Bush Burning in Ewulu, Aniocha South Local Government Area, Delta State, Nigeria

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Abstract

The study was undertaken to evaluate the impact of uncontrolled bush burning on farming and agricultural production, potential causes of bush burning as well as its effect on the environment, biodiversity and possible ways of mitigating the effects in the agrarian community of Ewulu. The study found out that indiscriminate precarious discharge of cigarette remains, deliberate act of burning the bush by herdsmen for the purpose of having green grass for their cattle and the recent deliberate uncontrolled burning by some farmers as a means of clearing the bush in preparation for planting as the leading cause of bush burning in Ewulu. Copies of structured questionnaire were employed in obtaining data from the respondents using a systematic - random sampling technique. Descriptive statistics were used to analyse the data. The study discovered that uncontrolled bush burning has detrimental effects on soil fertility thereby affecting farm produce. Bush burning has adverse effects on forest vegetation, loss of medicinal plants, loss of economic plants, loss of food sources, loss of raw material that can be useful for several art work, construction and shelter materials. It equally affects the economy of the farmers through the loss of their farm produce. In concluding the work, the researcher suggested strengthening, enactment and implementation of bush burning laws, environmental, ecological and forest laws and punishment for offenders. The use of extension workers in educating the farmers and the populace on the adverse effect of uncontrolled bush burning and mitigating its effect on local farmers by compensating those whose farms and farm produce are burnt/destroyed.

Keywords: Uncontrolled, Bush Burning, Farm, Ewulu and Farming

INTRODUCTION

Ewulu which is an agrarian community over the years has been practicing controlled bush burning in preparing the land for planting which has not resulted into wildfire and destruction of crops/farm produce and the ecosystem until recently when the community started experiencing uncontrolled bush burning. According to Hamid et al. (2010); Unanaonwi and Amonum (2014), bush burning appears to be traditional farming practices of the people with cultural values associated to it in third world nations. Sanyaolu (2015) reported that bush burning have been in practice in several parts of the world and it has been a vital part of traditional agriculture. Also, Ezekwesili-Ofili and Okaka (2019) noted that in every part of Nigeria, bush burning represents a useful cultural tradition that cannot be done away with. However, in recent years in Ewulu the impact of uncontrolled bush burning on farming activities is becoming alarming.

According to Ogamba et al. (2016) that in recent times, the severity of environmental degradation has increased. This has led to challenges in the sustainability of the ecosystem including its living (biotic) and non-living (abiotic) component (Ohimain et al., 2014a; Izah and Angave, 2015; Izah et al., 2015, 2016, 2017a, b).

According to Ambe et al. (2015), bush burning is the unsystematic setting ablaze of the vegetation cover of grassland and forest resources by fire. According to Jamal et al. (2012), there are two types of bush burning which are; controlled and

wildfire. However, Hamid et al. (2010) further stated that prescribed or controlled bush burning is the intentional use of fire for management purposes. According to them wild fire is often uncontrolled, causing damage to the ecosystem including its biotic component. Jamal et al. (2012) simply said that bush burning causes severe catastrophes in many areas such as constituting public nuisance. Uncontrolled bush burning equally affects farming activities. It causes soil destruction, desert encroachment and contribute to global warming through the release of emissions which have impact on the ozone layer (Hamid et al., 2010; Jamal et al., 2012).

Apart from the soil destruction and desert encroachment caused by bush burning, it has also had a marked increase in global warming due to the emission of toxic gases which have a tremendous effect on the ozone layer and also the formation of acid rain which deteriorate plant life, damage calcium-containing soils and also increase the acidity of surrounding lakes. (Judge, 1991). Bush fires can have significant impacts on individuals, communities, and on public and private assets, by threatening to damage or destroy human life and property, agricultural and forest production, animals, biodiversity, air and water quality, cultural heritage, as well as infrastructure (Ellis et al., 2004).

Indiscriminate discharge of remains of cigarette could cause bush burning especially in the rural areas, where cigarette remains is highly discharged in an unsafe manner (Nigeria Fifth National Biodiversity Report, 2015). According to Ambe, et al. (2015), some uncontrolled bush burning have been traced to indiscriminate discharge of cigarette remains by careless smokers. In a study done by Tunde and Adeleke (2013), it was reported that bush burning is mainly associated with agricultural purposes, accounting for about 80%, while other activities such as hunting and intruders (cattle rearers) account for about 8%, and 4% respectively of total bush burning in Asa Local Government Area of Kwara State, Nigeria. In the same vine, a study carried out by Ofuoku and Isife (2009) in Delta State identified indiscriminate bush burning as the major cause of conflict between nomadic herders and farmers. Bush burning by nomads is probably carried out to kill the browning vegetation cover in the dry season and give room for regrowth of green vegetation (Ofuoku and Isife, 2009; Nigeria Fifth National Biodiversity Report, 2015). During this process of burning, the fire may spread into adjoining farms (Ofuoku and Isife, 2009). This type of bush burning is uncontrolled and will have serious negative impact on biodiversity of both secondary and virgin forest.

According to Ibimilua, (2013) loss of biodiversity could lead to environmental degradation, disturbance of hydrological balance, deforestation, coastal erosion, loss of medicinal plants, climate change, reduction in ecosystem adaptability, loss of soil fertility, pollution, desertification, loss of natural habitat, as well as threat to vulnerable species and extinction of rare ones. In a study carried out by Ezihe et al. (2020) in Makurdi Local Government Area, Benue State, Nigeria, it was observed that land clearing and weed control are major reasons for bush burning. They equally reported the loss of crops as one of the major negative effects of bush burning.

Bush burning especially the wild fire affects total organic carbon found in the soil (Unanaonwi and Amonum, 2014), which comprises of living organisms including flora and fauna. (Jamal, et al., 2012). This in turn affects the fertility of the soil. Bush burning also decreases the density of biodiversity on an area and could also lead to loss of organic matter in soil and have stimulatory effects which could serve as a tool to enhance the growth of some plants in directed succession (Sanvaolu, 2015).

Soil harbours several microorganisms including the ones that play essential roles in nutrient cycling (carbon, sulphur, nitrogen) that support all forms of life on earth (Unanaonwi and Amonum, 2014). These cycles play essential role in food production. Therefore, the killing of microbes that play essential role in agriculture could also have adverse impact on humanity who depends majorly on food from vegetation for survival and energy. These microorganisms are impacted negatively by annual fire that burns the forest/bush. According to Ambe et al. (2015), fire causes superficial depressive effect on soil microbes such as fungi and animal populations in general. Bush burning leads to loss of nutrients and organic matter from the soil and much of the nitrogen and carbon in the soil is volatilized into the atmosphere as oxides of nitrogen and carbon dioxide respectively (Ambe et al., 2015). Unanaonwi and Amonum (2014) also reported that changes in vegetation composition resulting from uncontrolled bush burning which often results to changes in flora and fauna populations of the forest ecosystem. As such secondary forest is changed to grass land.

Despite the yearly occurrence of wildfire/uncontrolled bush burning in Ewulu and its effect on the people as well as the soil, farming activities, forest vegetation, ecosystem etc no study has been done on it. Hence, this study is aimed at assessing the impacts of uncontrolled bush burning in Ewulu.

MATERIALS AND METHODS

Study Area

Ewulu is a community in Aniocha South Local Government Area, Delta State, Nigeria. It lies within latitude $6\frac{1}{8}^{\circ}$ N of the Equator and longitude $6\frac{1}{4}^{\circ}$ E of the Greenwich Meridian. Ewulu is bounded in the East by Abala Community, in the West

by Ebah-Unor and Ogwashi-Uku Communities, on the South by Olodu Community and on the North by Isheagu Community.

The people of Ewulu are predominately farmers with few traders and civil servants who also engage in subsistence farming. Some of the people are also engaged in fishing. The major crops that are grown by Ewulu people are cassava, yam and plantain. They practice mixed cropping as well as mono-cropping. Shifting cultivation is equally practiced in the community. The community has cash crops like rubber plantations. Ewulu people are of the Enuani ethnic group with a population of about 15,000 (NPC, 2006).

Sample Collection

The research made use of survey method. The survey sampled the opinion of the people of the community on the impact of uncontrolled bush burning in Ewulu especially as it affects farming and agricultural activities. The method involved the use of structured questionnaires which were administered to the respondents by the researcher. The research obtained its information or data from primary and secondary sources of data collection. The primary source of data collection includes questionnaires, personal observation and oral interview. On the other hand, secondary source of data collection includes the use of relevant materials from journals, text books, internet, periodicals etc

Target Population

The total population of Aniocha South Local Government Area of Delta State was put at 142,045 (NPC, 2006) and that of Ewulu was 15,000 (NPC, 2006). Out of this figure, the adult population of both males and females were used for the study which were those mainly involved in farming activities. A total of 200 respondents were used. These include Ewulu indigenes and the Igbo farmers who are in camps or farm settlements. However, out of a total of 200 questionnaires that were administered, 180 were retrieved and used.

Sampling Procedure

This research work made use of stratified random sampling techniques. This is used in the administration of questionnaires to the respondents. Ewulu is made up of four quarters which are: Ogbe Uchi, Ogbe Achi, Ogbe Ose and Ogbe Ani. The four quarters were administered with 35 questionnaires each. While 60 questionnaires were administered to those in the farm settlements/camps. This is because they have more farmers. The questionnaires were administered randomly to the respondents in the study area. The questionnaire was divided into two sections A and B. section A was based on personal profile while section B was based on the impact of uncontrolled bush burning in Ewulu. The respondents were asked to state their opinion on the impact of bush burning on farming and possible causes of uncontrolled bush burning using very high, high and low these responses were rated 3, 2, and 1 respectively using the Likert scale of measuring attitude.

Data Analysis

The data that were generated for the study were graphically and statistically analysed. The use of tables were employed to present data. The rated responses from the questionnaire were calculated using percentages to obtain the perception of the respondents on the impact of uncontrolled bush burning on farming activities.

Impacts of Uncontrolled Bush Burning

Table1. Effect of Bush Burning on Soil

Response	No of Respondents	%
Very High	105	58.3
High	55	30.6
Low	20	11.1
Total	180	100

Table 1 shows the effect of uncontrolled bush burning on the soil as analysed using the questionnaire. 58.3% of the respondents agreed to the fact that uncontrolled bush burning affects the soil at a very high rate. 30.6 % said it high while 11.1% said that the effect is low.

Table 2. Effect of Bush Burning on Soil Fertility

Response	No of Respondents	%
Very High	110	61.1
High	60	33.3
Low	10	5.6
Total	180	100

Table 2 above shows the impact of uncontrolled bush burning on soil fertility. From the analysis, 61.1% of the respondents attest to the fact that bush burning has very high effect on the fertility of the soil. 33.3% agreed that the effect is high and 5.6% said that the effect is low.

Table 3. Effect of Bush Burning on Crop Yield

Response	No of Respondents	%
Very High	118	65.6
High	50	27.7
Low	12	6.7
Total	180	100

Table 3 shows the impact of bush burning on crop yield from the analysis of the questionnaire. The result shows that 65.6% of the respondents said that the effect is very high while 27.7% said that it has high effect and 6.7% agreed that it is low.

Table 4. Crop Affected Mostly by Bush Burning

Crops	No Of Respondents	%
Cassava	108	60.0
Yam	42	23.3
Plantain	30	16.7
Total	180	100

The analysis from table 4 above shows that cassava is the most effected with uncontrolled bush burning with 60% agreeing to that fact. This is followed by yam with 23.3% attesting to it and plantain with 16.7%.

Table 5. Effect of Bush Burning on Medicinal Plants

Response	No of Respondents	%
Very High	95	52.8
High	60	33.3
Low	25	13.9
Total	180	100

Table 5 shows the impact of uncontrolled bush burning on medicinal plants as analysed using the questionnaire. 52.8% of the respondents agreed that its effect on medicinal plants is very high while 33.3% said that it is high and 13.9% said that its effect is low.

Table 6. Effect of Bush Burning on Economic Plant (Rubber Plantation)

Response	No of Respondents	%
Very High	99	55.0
High	64	35.6
Low	17	9.4
Total	180	100

As can be seen from table 6, 55% of the respondents agreed bush burning affects economic plants especially rubber plantation at a very high rate while 35.6% attest that its effect is high and 9.4% said that is low.

Table 7. Effect of Bush Burning on Forest Vegetation

Response	No of Respondents	%
Very High	107	59.4
High	54	30.0
Low	19	10.6
Total	180	100

Table 7 above shows 59.4% of the respondents agreed to the fact that uncontrolled bush burning affects forest vegetation at a very high rate while 30.0% said that it is high and 10.6 % said that it is low.

Table 8. Causes of Bush Burning

Causes of Bush Burning	No of Respondents	%
Discharge of Cigarette remains	35	19.4
Headsmen	75	41.7
Deliberate Burning by some Farmers for Planting	70	38.9
Total	180	100

Table 7 above shows that headsmen rank highest in the cause of bush burning with 41.7%. This is followed with deliberate burning by some farmers for planting with 38.9% and discharge of cigarette remains with 19.4%.

RESULT AND DISCUSSION

The data obtained from the analysis of questionnaire show that uncontrolled bush burning has negative impact on the farming activity and farm produce of the people of Ewulu affecting the soil, soil fertility, crop yields, medicinal plants which are used for traditional treatment as attested by the respondents with very high and high percentages. Economic plants are affected negatively also as can be seen in table 6. It also seen that the mostly affected crop by bush burning is cassava (Table 4). Bush burning equally affects the forest vegetation negatively with 59.4% attesting to it. The analysis in table 8 shows that headsmen account for highest cause of uncontrolled bush burning in the community with 41.7%. This is followed by deliberate burning of bush by some famers with 38.9% which is a recent practice in Ewulu and discharge of cigarette remains which also accounts for 19.4%. Oral interview reveals that uncontrolled bush burning in the community is annually.

CONCLUSION

Conclusively, the study reveals that uncontrolled bush burning which in recent years are annually has negative impact on the agrarian community of Ewulu. This affects the soil and soil fertility as well as their farm produce. In Ewulu, the secondary forests are not just under threat but destruction due to uncontrolled bush burning reducing it to grassland. This may also have an impact on the ecology of the ecosystem as well as the biodiversity composition. Uncontrolled bush burning has impacted negatively also on medicinal plants that the community is known for. Hence, there is the urgent need to preserve the farm land, soil, farm produce and secondary forest and protect it against uncontrolled bush burning. To this end, environmental, ecological and forest laws should be strengthened through legislation and offenders be made to face the full weight of the law. The use of extension workers in educating the farmers and the populace on the adverse effect of uncontrolled bush burning and mitigating its effect on local farmers by compensating those whose farms and farm produce are burnt/destroyed.

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