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Job Security as a Determinant of Employee Job Satisfaction

Ozor, Tobias Obiora

The Impact of Training and Development on Organisational Performance

Oseghale Vincent

Emerging Trends in the Alternative to Incarceration 'A Shift Towards Probation And Restorative Justice'

Henry A. Akuchie

An Overview of Nigeria's Foreign Policy and its Implications on National Security

Yusufu Abdullahi Yakubu

Impact of Separation of Powers on Administrative System of Local Governments in Nigeria

Mohammed Hashim Yunusa & Timothy Nmadu

Developing Management Competence for Organizational Success: A Theoretical Discuss

Salisu Umar

The Role of Women in Community Development in Ngor Okpala Local Government Area Of Imo State

Ololo Kennedy Okechukwu & Maisamari Grace

Towards Articulating Statement Of Problem in Social and Management Sciences Research

Ochim, Fidelis Ikaade & Chima, Paul

Achieving the Millennium Development Goals (MDGS) Policy and Projects in Nigeria: The Role of the Media

Okpoko John I. & Ogbuagu Matthew I.

Growth And Development Of Private Security Companies in Niger State

Ibrahim Muhammad Hassan

Vulnerability and Adaptation Capabilities of the Rural Poor to Climate Change Effects in Kwara State, Nigeria

Usman, B. A.

Bush Burning And Rural Agricultural Production in Asa L.G.A, Kwara State.

Tunde, A.M & Adeleke, E.A

The Philosophical Analysis of National Youth Service Corps Scheme and its Relevance to National Development

Nwoko Obinna Joshua Ugo & Gift Ile

Reviews

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**ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS (MDGs)
POLICY AND PROJECTS IN NIGERIA: THE ROLE OF THE
MEDIA**

OKPOKO JOHN I. & OGBUAGU MATTHEW I. - - 114

**GROWTH AND DEVELOPMENT OF PRIVATE SECURITY
COMPANIES IN NIGER STATE**

IBRAHIM MUHAMMAD HASSAN - - - - 128

**VULNERABILITY AND ADAPTATION CAPABILITIES OF THE
RURAL POOR TO CLIMATE CHANGE EFFECTS IN KWARA
STATE, NIGERIA**

USMAN, B. A. - - - - 142

**BUSH BURNING AND RURAL AGRICULTURAL PRODUCTION IN
ASA L.G.A, KWARA STATE.**

TUNDE, A.M & ADELEKE, E.A - - - - 163

**THE PHILOSOPHICAL ANALYSIS OF NATIONAL YOUTH
SERVICE CORPS SCHEME AND ITS RELEVANCE TO NATIONAL
DEVELOPMENT**

NWOKO OBINNA JOSHUA UGO & GIFT ILE - - 175

BUSH BURNING AND RURAL AGRICULTURAL PRODUCTION IN ASA L.G.A, KWARA STATE.

By
TUNDE, A.M & ADELEKE, E.A

afolabi@unilorin.edu.ng

Department of Geography & Environmental Management,
University of Ilorin.

Abstract

The common method of clearing agricultural land in Nigeria by small scale farmers is bush burning. However, bush burning has its implication on lands. The survey reported in this study focuses on assessing the implications of bush burning on agricultural production and land in Afon District of Asa Local Government Area, Kwara State, Nigeria. Copies of structured questionnaire were used to sample a total of two hundred (200) farmers. The study employs the use of descriptive statistical techniques such as simple percentages and cross tabulation to present the data collected. The result reveals that 80% of the farmers are engaged in bush burning to clear the land for cultivation and they do so because they believe it is the cheapest and easiest way to clear land. The result further reveals that 95% of the respondents have experienced bush burning destroyed their farms. About 5% claimed bush burning has never destroyed their farmland and believed bush burning is not causing any menace to farmland. The study concludes by given recommendations that there should be adequate awareness created by the government on the menace of bush burning on the agricultural land and that better alternatives to clearing of land for farming should be introduced to the farmers such as the use of tractors at subsidized rate.

Key words: Fire, Agricultural Land, Farming and Crops.

Introduction

Cultivation of land for agricultural production requires clearing of land first before other farm activities can take place. This is simply because most of Nigerian farmers are rural peasants that work with crude implements. The only method employed in preparing their land for cultivation is through bush burning which resulted in the loss of flora and fauna. Another set of people that burn bush are the hunters, they do so in

confirmed that bush is burned in order to hunt for bush meat and to clear the land for farming. According to Birnin-Yauri and Aliero (2008) bush burning has been practiced for a very long time and has been accepted as an integral part of traditional farming system.

Bush burning can be defined as a process of setting ablaze trees, grasses, shrubs and other domesticated plants found in the bush. Bush burning whether as a result of wildlife or a controlled burn affects not only the appearance of the landscape, but the quality of the soil. The landscape may quickly recover after a fire with fresh new growth and emerging seedlings (Tibbits, 2011). Bush burning can further be described as the controlled or uncontrolled combustion of trees, shrubs, grasses and domesticated plants. In some countries including Nigeria fire is a common land management practices used to burn the byproducts of some agricultural crops such as wheat/rice stubble, forest residues and sugarcane waste. The Daily Trust of March 19, 2008 reported that more than half of bush burning throughout Nigeria is deliberately lit; causing damages worth millions of naira annually.

According to Nsiah-Gyabaah (1996), the practice of bush burning is so deeply ingrained in the traditional farming system that trying to suppress it would mean cutting off the means of subsistence of small-scale farmers who do not have adequate funds to employ labour or purchase tractors for land clearing. Bush burning has a lot of impact on both the human and the environment. Some of these impacts include the huge smoke soaring in the air during the heat results in suffocating people, a large proportion of wildlife and small animals are being destroyed and pollution of the ozone layer of the environment. In a study carried out by Hammid, *et.al* (2010) on environmental and health risk of bush burning, it was discovered that bush burning produces air pollutants, such as carbon monoxide, hydrocarbons, hydrogen sulphide, nitrogen oxides, sulphur oxides, ozone and other oxidants all of which are detrimental to the environment and human health. Similarly, Stern (1976) opined that there are major air pollutants emitted during bushfire that affect both environment and human health and these include carbon monoxide, carbon dioxide, oxides of nitrogen, oxides of sulphur, particulates and hydrocarbon as a result of incomplete combustion of cellulose materials

Furthermore, bush burning heat up the soil thereby blazing up its nutrients. Apart from these, bush burning contributed in damaging houses and farm land, thereby causing untold hardships to the people of the

deprivation of the key nutrients elements needed by plants. Iguisi (2012) pointed out that experts have established the fact that bush burning has adverse impact on soil moisture. The intensity of the fire and how long it burns determine the impact of burning on soil. In another opinion Ebii, (2004) noted that bush burning is usually done in order to reduce plant debris after land clearing. People do not only engaged in bush burning to clear land for crop production, but also to drive away bees to aid honey harvesting and to trap animals. Bush burning has its menace in terms of agricultural production. It is this menace that this study intends to examine. Some basic questions are therefore pertinent to this study and these include:

- i. What motivates the people into bush burning?
- ii. What are the effects of bush burning on agricultural lands and produce?
- iii. Are there better ways of clearing land than bush burning?
- iv. What are the problems associated with the practise and the way forward?

Objectives

The aim of this paper therefore is to determine the implications of bush burning on agricultural production and lands while the specific objectives include:

- i. Examine motives behind bush burning by people
- ii. Examine the effects of bush burning on agricultural lands and agricultural production.
- iii. Determine if there are other methods of clearing land apart from bush burning
- iv. Identify the problems associated with the practise and suggest ways of controlling bush burning.

Impacts of bush burning

The negative impacts of bush burning include land degradation, flooding, erosion, deforestation, desertification, drought, environmental pollution, health hazards, and public nuisance among others. Other consequences on agricultural production are soil temperature, nutrients, soil moisture and erosion.

Soil Temperature

Soil temperature increases as a result of bush burning because the topmost layer of the soil would have been open up due to the fire. Soil will be warmer when the fire makes the soil repellent due to lack of moisture. Microbes in the soil on which most plants depend may be killed by the fire or warmer soil.

Nutrients

Bush burning changes nitrogen in organic form in the soil to mobile nitrates. These mobile nitrates can easily be washed away by water runoff despite the fact that plants can use mobile nitrates than organic nitrogen.

Soil Moisture

Soil moisture may be lost due to bush burning because bush burning can cause the soil to lose its ability to absorb and retain water. Hence, after intense fire there is greater chance for the top layer of the soil to be water repellent because the soil cannot absorb water any longer. Plants roots can no longer pull moisture into the soil as a result of the fire.

Erosion

It has been proved by expert that bush burning cause soil erosion. When bushes are burnt, the topmost soil layer may be less stable and this may cause erosion. Much of the soil are been washed off as a result of soil water repelling and loss of root systems. Also, shallow-rooted plants are affected by unstable soil as they depend on vegetation such as shrubs and bushes to hold the soil in place. This is because the lost of root systems coupled with water runoff can allow much of the soil to be washed away.

The Study Area

Afon District (fig.1) in Asa Local Government Area in Kwara, Nigeria is the study area. Asa Local Government Area is one of the sixteen Local Government Areas in Kwara state. It is located in the South Western part of the state and Afon is the local government headquarters. Afon district occupies about 1,525square kilometre. According to KWADP (2007) there are 26,800 farming families in this district. Asa Local Government Area has been estimated to have one of the largest numbers of rural settlements in the state and most of them are domiciled farmers. The area stretches from the peri-urban fringes of Ilorin city to the northern boundary with Oyun Local Government Area in the eastern part and Moro

Local Government Areas towards the North. The primary activities of the inhabitants are farming, trading, pottery, and weaving. Some of their women are involved in market gardening and commercial agriculture especially in the production of shear butter resources and locust bean processing to service mainly the capital city, Ilorin and neighbouring countries. They grow crops such as cassava, maize, guinea corn, yam and few tree crops like coffee and kolanuts in southern fringe

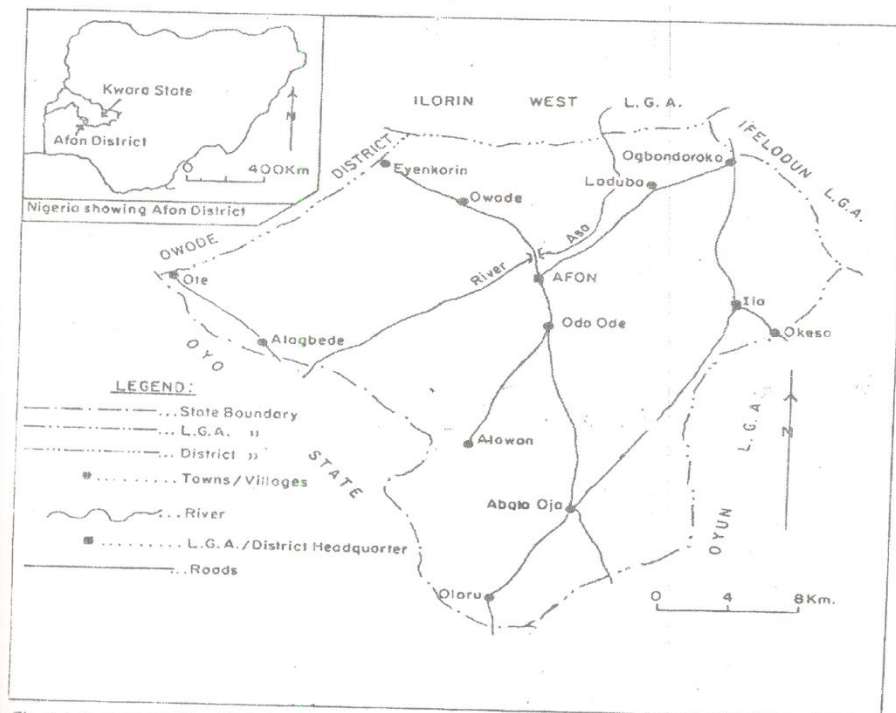


Fig. 1 : A map of Afon District, Asa Local Government Area, Kwara State, Nigeria.
Source :- Kwara State Ministry of Lands and Housing, 2007.

of the local government area. Afon district is characterised by tropical wet and dry seasons with a monthly average temperature of about 29°C. The month of March has the highest monthly temperature of about 32°C while the annual average rainfall record is estimated between 1,200 and 1,400mm (Ajibade, 2002). The major river in the area is Asa River which supplies the largest proportion of potable water to the whole area and Ilorin community. There are also some popular markets in the area they

include those of Afon, Odo-ode, Ogbondoronko, Alawon and Aboto-Oja to mention a few.

Research Methods

Ten settlements were randomly selected for the study and twenty respondents were randomly selected from each village. This makes a total of two hundred (200) respondents that were sampled with copies of structured questionnaire. The settlements sampled include Ogbondoroko, Odo-ode, Afon, Alawon, Aboto-Oja, Eiyekorin, Alagbede, Laduba, Ote and Owode. The data collected were analyzed with the use of descriptive statistics such as simple percentages and cross tabulation as a means of explaining the outcomes of the findings.

Findings and Discussions

Socio-economic Characteristics of Respondents

The socio-economic characteristics (see Table 1) of the respondents revealed that majority (80.5%) fell between age 30 and 49 years and about 73% were married. About 56% of them do not have formal education, and 81% were full-time farmers. Furthermore, 94% had household size of 5 persons and above. Majority (97%) earned below N50, 000 and 88.5% had more than 5 years farming experience. Also, 96% had less than 1ha of farm size indicating that majority of the sampled respondents are small-holder rural farmers.

Methods of Clearing Bush

There are different ways of clearing bush for various purposes as identified by the sampled respondents. In the course of the study, respondents were asked to indicate their opinion about the various methods embarked on in clearing bush. Table 2 shows that 95% indicated that they engaged in bush burning in order to clear their lands for agricultural purposes while the remaining 5% claimed that they made use of simple implements such as hoes and cutlasses in clearing their lands. None of the respondents claimed to have employed the use of tractor in clearing bush. The implication of higher percentage of farmers involved in bush burning in clearing agricultural land is that it is the cheapest method since it does not incur any cost. However, some nutrients are usually lost during the process of burning bush and so farmers need to add either organic or inorganic manure to improve the soil nutrients.

Table 1: Socio-economic Characteristics of Respondents

Characteristics	Frequency	Percentage	Cumulative Percentage
Age			
18yrs- 29yrs	23	11.5	11.5
30yrs-39yrs	85	42.5	54
40yrs-49yrs	76	38	92
50yrs-59yrs	14	7	98
Above 60yrs	2	1	100
Total	200	100	
Marital Status			
Single	34	17	17
Married	146	73	90
Divorced	5	2.5	92.5
Separated	15	7.5	100
Total	200	100	
Educational Status			
No formal education	112	56	56
Primary education	54	27	83
Secondary education	26	13	96
Tertiary education	8	4	100
Total	200	100	
Occupation			
Business	6	3	3
Artisan	15	7.5	10.5
Civil servant	8	4	14.5
Farmers	162	81	95.5
Others(hunters)	9	4.5	100
Total	200	100	
Family size			
Less than 5	12	6	6
5-10persons	89	44.5	50.5
Above 10persons	99	49.5	100
Total	200	200	
Farming Status			
Full-time	162	81	81
Part-time	38	19	100
Total	200	100	
Monthly Income			

Less than N10,000	34	17	17
N11,000-20,000	67	33.5	50.5
N21,000-30,000	58	29	79.5
N31,000-40,000	24	12	91.5
N41,000-50,000	11	5.5	97
Above N50,000	6	3	100
Total	200	100	
Farming Experience			
Less than 5years	23	11.5	11.5
5-10years	87	43.5	55
Over 10years	90	45	100
Total	200	100	
Farm Size			
Less than 0.5ha	101	50.5	50.5
0.51-1.00ha	91	45.5	96
1.01-1.5ha	5	2.5	98.5
1.51-2.00ha	2	1	99.5
Above 2.00ha	1	0.5	100
Total	200	100	

Source: Authors' Research 2012

Table 2: Bush Clearing and Motives for Burning Bush

Bush Clearing	Frequency	Percentage	Cumulative Percentage
Methods			
Burning	190	95	95
Hoe and Cutlass	10	5	100
Tractor	-	-	
Others	-	-	
Total	200	100	
Motives for Burning			
Agricultural purposes	160	80	80
Hunting	16	8	88
Visibility	4	2	90
Honey making	2	1	91
Intruders (Cattle rearers)	8	4	95
Do not burn bush	10	5	100
Total	200	100	

Source: Authors' Research 2012

Motives for Bush Burning

Table 2 further reveals the reasons for engaging in bush burning by the respondents. About 80% of the respondents indicated they engaged in bush burning for agricultural purposes while the remaining 20% were involved in bush burning for hunting, visibility, honey making and to prevent intruders. The implication of this is that larger percentage of the respondents are farmers that burn bush in order to clear land for agricultural purposes.

Effects of Bush Burning on Agricultural Lands

When the rural farmers were asked about the effects of bush burning on agricultural lands, Table 3 reveals that 100% of the respondents indicated that nutrients are being lost, 82.5% gave soil erosion as the effect, 72.5% said it leads to flooding, 61% opined ecosystem are being destroyed, 58% indicated that it leads to land degradation, 56% gave the effect as depletion of soil, 50.5% are of the opinion that soil organisms are killed, 49.5% indicated soil structure and texture are affected, 47.5% said it reduces alkalinity and acidity of the soil, and 22.5% pointed out that it reduces agricultural production. This indicates that bush burning affect agricultural land negatively in one way or the other and this can lead to reduction in crop yield which in turn can lead to reduction in

Table 3: Effects of Bush Burning on Agricultural Lands

Effects	Frequency	Percentage
Farmland		
Depletes the soil	112	56
Nutrients are lost	200	100
Reduce production	45	22.5
Flooding	145	72.5
Land degradation	116	58
Soil erosion	175	87.5
Soil organisms are killed	101	50.5
Ecosystem are being destroyed	122	61
Reduction in Alkalinity and acidity	95	47.5
Soil structure and texture affected	99	49.5
No effect	10	5

Source: Authors' Research 2012

Note: Total not 200 because of multiple responses

Effects of Bush Burning on Agricultural Produce

Respondents were further asked to give their opinions on effect of bush burning on their agricultural produce. Table 4 reveals their responses where about 95% indicated that they had experienced bush burning destroyed their agricultural produce while only 5% claimed that bush burning has never destroy their agricultural produce. This means larger proportion of the respondents had in one period or the other felt the negative impact of bush burning on their agricultural produce as well as on agricultural land.

Table 4: Effects of Bush Burning on Agricultural Produce

Effects	Frequency	Percentage	Cumulative Percentage
Farm Produce			
Destroy farm produce	190	95	95
Never destroyed farm produce	10	5	100
Total	200	100	

Source: Authors' Research 2012

Problems associated with Bush Burning

A lot of problems are associated with burning of bush in clearing of land for agricultural purposes, hunting, honey making, visibility or discourage herdsmen from rearing cattle in the study area. Some of these problems include loss of moisture, depletion of soil nutrients, soil erosion, desertification, loss of organic matter, degradation of soil physical, chemical and biological qualities, loss of soil productivity and crop yield, loss of biodiversity and rising atmospheric temperature and global warming due to the emission of nitric acid, carbon monoxide, hydrocarbons, hydrogen sulphide, nitrogen oxides, sulphur oxides and carbon dioxide gases. All these gases have very great effect on the ozone layer and also formation of acid rain which make worse plant life, damage calcium containing soils and also increase the acidity of surrounding lakes and rivers (Colling, 1991). Burning releases into the atmosphere carbon dioxide and monoxide which reduce the ozone layer and act as blanket escape of ultraviolet rays from the atmosphere. This increases ambient temperature, reduces rate of vegetation, increases water loss and ultimately the tendency for desertification.

Conclusion

The study examined the impact of bush burning on agricultural land. From the study, various reasons for burning bush were identified amongst which include agricultural purposes, hunting and honey making among others. However, majority of the sampled respondents in the study area engaged in bush burning in order to clear land for agricultural purposes more than any other reason. It was discovered from the study that bush burning affect not only agricultural land but also human health. Bush burning has negative impact on agricultural production and land in terms of soil temperature, nutrients, soil moisture and erosion. Other consequences include land degradation, flooding, erosion, deforestation, desertification, drought, environmental pollution, health hazards, and public nuisance among others. Based on these consequences, bush burning should therefore be discouraged and other methods of clearing bush without hazards such as the use of tractor should be encouraged.

Recommendations

Some recommendations made include the following:

- It is therefore recommended that the 'top-down' approach must give way to the 'bottom-up' approach which insists that local people must be fully involved in deciding how to tackle the problem of bushfires.
- Implementation of fire policy and plans should be based on the support of rural people in the study area.
- There should be proper enforcement of rules and regulations by local people. Furthermore, more attention must be paid to preventive measures rather than cure by planners and decision makers in the country.
- There should be harsh penalty and controlled laws on anybody who engages in bush burning in the study area.
- Aggressive awareness campaign to sensitize people about the need to carefully manage soil nutrients right from the land clearing stage should be embarked upon by the government at all levels. Also, the use of media such as radio jingles, posters and handbills in local languages for good understanding of all would provide a better result.

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