

MANAGEMENT OF ANNUAL BUSH BURNING IN THE SAVANNA BELT OF NIGERIA IN THE TWENTY FIRST CENTURY

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Abstract

One of the dreams of any growing nation (of which Nigeria is a part) is the ability to manage her natural resources. Nigeria is naturally endowed with Savanna vegetation, which is a natural vegetation that supports her economy through the important crops it supports e.g. groundnut, millet, sorghum, beans, yams, soya-beans, corn etc. The economy of Nigeria before the oil boom rested on the products from the Savannas i.e. the Northern groundnut pyramid in 1960s was the country's major export (Africa Today, 1991). Three quarters of Nigerian vegetation is Savanna i.e. from Enugu through Maiduguri to Sokoto (Usman, 2000). This paper intends to disclose or highlight the cost-effect of indiscriminate annual bush burning of Nigeria's Savanna and her annual income rehabilitation and self reliance, make suggestions on how to minimize the possible damages done to the ecological system through controlled bush burning, if; "there must be a reliable economic growth in Nigeria.

Introduction

Michael (2000) defines Savanna as grasslands with few trees: typically supporting large herds of grazing animals and their predators. He holds that this vegetation is found within the tropics and is best developed in Sudan. This is why it is also called Sudan climate. The vegetation is also found in West African Sudan, and curves into East Africa and Southern Africa. North of the tropic of Capricorn, it is also found in South America at two distinct regions of the equator i.e. North and South equator, namely, the Lianas of the Orinoco basin and the Campos of the Brazilian highlands. respectively. The Australian Savanna is found in south of Monsoon strip running from West East North to the tropic of Capricorn.

Adelekwu and Goh Cheng Leong (1978) define Savanna as a vegetation of a continuous grass stratum or cover usually with or without trees or shrubs, exhibiting similar structural and functional characteristics of cool dry and hot wet seasons i.e. normally in April - October and May - September respectively in the Northern parts of Nigeria.

In the south, the dry season is from December to January and the remaining part of the year remain cool and wet. Both the length of the rainy season and the annual total rainfall decreases from the equatorial region towards desert fringes. On the whole, the length of wet and dry seasons differs with the locality but slightly. The difference in climate is caused by East trade windblown from the Atlantic Ocean which blows inland with high humidity and the North West trade wind which blows dry hot air down south and brings hamattan.

According to Harris (1980) Geographers describe savanna as that part of tropical world that experiences a dry season of 2.5-7.5 months duration.

Also, Scientific Council for Africa and South Sahara which met in Congo Kinshasha in 1956 defines savanna as the tropical vegetation dominated by herbaceous material with or without woody species, 80% of which is grass that gives the vegetation continuous ground cover.

The world's savanna lies between the tropic of cancer and the tropic of Capricorn, that is, the 23 1/2 ° North and South of the equator worldwide, it covers about one-quarter of the earth's surface, Usman (2004).

A tropical wet and dry climate pre-dominates in areas covered by savanna. The mean monthly temperature is about 17.80c (64°F) and annual precipitation averages between 76,2 to 101.6cm (30-40 inches) for at least five months of the year, during the dry season, less than 10.16cm (4 inches) a month are received (Botkin co Keller, 1995).

The soil types in savanna vary according to the bedrock and edaphic conditions (temperature, humidity, etc). But in general, however, laterization is the dominant soil-forming process and low fertility oxisol (soil with few weatherable minerals and are often rich in iron and aluminum oxides) can be expected, Brown (1972).

Extent of Savanna Vegetation in Nigeria

Map of Nigeria drawn by Keay (1959) quoted by Usman (2004), showing the distribution of vegetation in Nigeria, shows that there are three main types of savanna vegetation in Nigeria, and they occupy about 83% of the total Nigerian surface area. The vegetation belts are Derived savanna (8%), Guinea (40%), and Sudan Savanna (35%), Usman (2004). The Savanna regions, therefore, dominate over two-thirds of the entire Nigerian land mass. It begins around Enugu and extends as far as the Northern borders of the country. Derived Guinea Savanna is found around Lagos area of the country and the Guinea Savanna is found in the middle belt or Northern part of Northern Nigeria.

Nigeria's climate is characterized by strong latitudinal zones becoming progressively drier as one moves Northwards from the coast. Rainfall is the key climatic variable and there is a marked alternation of wet and dry seasons in most areas. Two air masses control rainfall-moist Northward-moving maritime air coming from the Atlantic Ocean and dry intercontinental air mass moving southwards from the African land mass. Topographic relief also plays significant role in local climate e.g. in Jos, Plateau and the high lands near Cameroonian mountains.

The Role of Fire in the Savanna

According to *Oxford Advanced Learner's English Dictionary* 6th ed. (Hornby, 2001), fire is the light, heat, flames often with smoke that are produced when a burning substance is burnt.

There is a history of discovery of fire recorded in Persian literature which states that fire was discovered by man in a fight between a hero and a dragon in a recreation. One of the stones that the hero used as a weapon, missed the monster and struck a rock. Light was produced and man saw light for the first time (Encyclopedia, 1995). By the above history, fire was said to have been discovered by man.

There is an ongoing theory of fire that believes that fire is the originator of savanna (because of the above discovery). But Holocene theory (a recent geological time scale that began in the ice age which is less than 10,000 years ago) states that before the coming of man, savanna had existed for long, and since fire came with man it means that fire is not the original cause of savanna but helps to maintain savanna. An experiment conducted at Olokemeji, Southwestern Nigeria, near Ibadan since 1933 shows clearly that fire keeps savanna, Hopkins (1965).

In this experiment, a large area of plot was cleared and demarcated into three equal portions: they were protected one from fire, another one had early burning i.e. November - December, while the last one had late burning i.e. February - March. It was found out after several years that the fire protected plot had become forest, the early - burned plot has become wood land savanna while the late burned has become grass-land without trees.

This experiment shows clearly that if fire is eliminated from the savanna, it will turn to forest. Therefore it is fire that maintains savanna (Hopkins, 1965).

Savanna vegetation is very important in Nigeria because of its numerous importance to the country's economy. It creates a lot of potentials for agricultural development (plants and animals) and also about 2/3 of Nigerian vegetation is savanna (Usman, 2004). For this reason, there is the need to give savanna a critical understanding or clear vision in the 21st century for a good management.

There is a big controversy among people as to whether fire is to be allowed in savanna or not. The group that argue in favour includes:

Farmers. They need it for easy cultivation, to burn off unwanted organic matters, speed up rate of mineralization, etc.

Herders (Fulanis). They need it for new flush of perennial grasses that are more nutritious and palatable, for free movement and to kill parasites.

Hunters use fire to target their animals easily.

To Savanna dwellers, it is a time they can move freely in burnt areas to pick some important fruits e.g. *Prosopis Africaner* (mesquite) *Parkia biglobosa* (locust bean plant).

The opposers who are foresters, governments and conservationists argue with specific reasons why bush burning should not be encouraged.

For foresters, fire destroys their economic trees they grow under care e.g. *Gmalina arborea*, *Eucalyptus marginuta*, etc. For Government, fire can destroy economic trees like oranges, palm trees, etc. For the conservationists, fire destroys surface vegetation and kills microorganisms. It also encourages global warming, pollution, desert encroachment, soil erosion, volatilization of essential elements etc.

From the above discussions, the opinions of the various groups, for or against have been established. The question now is, do we stop burning or allow it to continue? In an attempt to answer this question, it is better to have the knowledge of the effect of bush - fire on the savanna region of Nigeria.

Human activities, especially, by bush-fires in savanna regions bring about soil and vegetation deterioration. Fire which burn large tree trunks or destroy heaped plant materials at confined spots often reach temperatures in excess of threshold value resulting in serious damages to flora, fauna and neighboring property. Also the effect can be damaging to soil structure, hence can cause erosion.

The issue of bush-fire is important because bush-burning is 'controversial' in savanna belts. Bush burning is embedded in the cultural values and traditional farming systems of the people.

The effects of bush - fire on rural livelihood and on the ecosystem are increasingly becoming extensive and damaging. However, it has been difficult to reduce or completely eliminate bush-fire. Due to the above reasons, there is need for a clear understanding of the causes and effects of bush -fires, so that bush - fire policies can address the undesirable effects with respect to range land, forestry, arable agriculture, soil conservation and wild life protection.

Presently, there is very little in form of published data and information concerning the frequency, intensity, and effects of bush fires on the environment and human welfare in Nigeria.

These factors, undoubtedly, undermine the country's ability to control bush-fires in the fragile savanna ecosystems, which are threatened by drought and desertification.

Recommendations

1. The government should intensify its efforts to educate the local people on the potential dangers of indiscriminate bush-burning to the communities and their responsibilities in preserving the vegetation.
2. The battle to fight indiscriminate bush-fire must be fought at all fronts. Legislative actions must be taken and enforced to ensure that laws are not only made but implemented.
3. In searching for ways of ameliorating indiscriminate bush-fire problems, planners and decision makers must pay more attention to preventive measures rather than cure. Penalties for abusing fire prevention and control laws should be harsh to serve as a deterrent.
4. Farming systems based on prescribed bush burning must be intensified in the country to reduce the hazard of bush-fires. However, effective prevention and control of wild bush-fire, demand proper enforcement of rules and regulation by local people.
5. Two major policies can be pursued to address the problems of bush-fires. The first involves polices to reduce indiscriminate burning through community education and environmental awareness programs. The second involves encouraging prescribed burning which appears to be the most promising and viable option in the long term because it allows local people to use fire in a beneficial way only.

Conclusion

There are many factors and causes of uncontrolled bush fires. Among the natural and man-induced causes of bush -fires, it appears that human activities, especially in agriculture (including handing and livestock production) are the primary causes of indiscriminate and uncontrolled bush-fire in Nigeria.

Although, it is a fact that the Guinea and Sudan Savanna areas are most threatened by wild spread bush-fires. Therefore, policies, strategies and measurers to prevent and control these bush-fires should pay attention to both the savanna and forest zone with active support and commitment from local people.

In developing a bush-fire policy, the aim should be to burn for conservation purposes or to meet clearly defined objectives such as reclaiming unman aged grassland or to prevent the invasion of grassland by trees and shrubs.

The development of good fire policy and plans and their successful implementation will depend on a thorough knowledge of the area through research and also the support of the local people. In the past development, planners, often tended to ignore local people in decision making affecting their environment and well being. 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 bush-fires.

Good management of the savanna will help Nigeria-in sustaining her economy and also achieve self-reliance as more than half of the populace are engaged in agriculture which is a renewable resource. This will boost crop production and of cause improve the economy of the country.

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