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Bushfires in the Nandom District of the Upper West Region of Ghana : Perpetual Threat to Food Crop Production.

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Abstract
Despite the numerous awareness creation exercises by the Environmental Protection Agency and Forestry Commission on bushfires preventive mechanism on the part of communities who are into cultivation of food crops, there appear to be no appreciation of the efforts of the organizations in question by beneficiary communities in trying to accomplish the goal of nature conservation. Specifically, in the case of Nandom, no formal effective strategies exist to facilitate the prevention of bushfires. This paper evaluates the effects of bushfires on food crop production by focusing on the case of Nandom district in the Upper West Region of Ghana. Apart from relying on primary and secondary sources of data, the study utilized quantitative and qualitative approaches in data collection, Analysis, and presentation. The study classifies the causes of bush fires into human and natural. Human causes as disclosed by the study are burning for farming purposes, burning for hunting, burning out of jealousy and burning to protect ruminants from reptiles. Natural causes on the other hand include lightening and thunder as well as excessive solar intensity. The effects of bush fires as disclosed by the study are reduction in soil fertility, destruction of food crops and reduction in crop yield. It is recommended that Non Governmental Organizations such as Care International and philanthropist should team up with the Environmental Protection Agency and Forestry Commission to intensify awareness creation of the masses on effective preventive measures of bush fires.
Key Words: Bushfires, Food crop, Production, Perpetual, Threat

1.0 Introduction

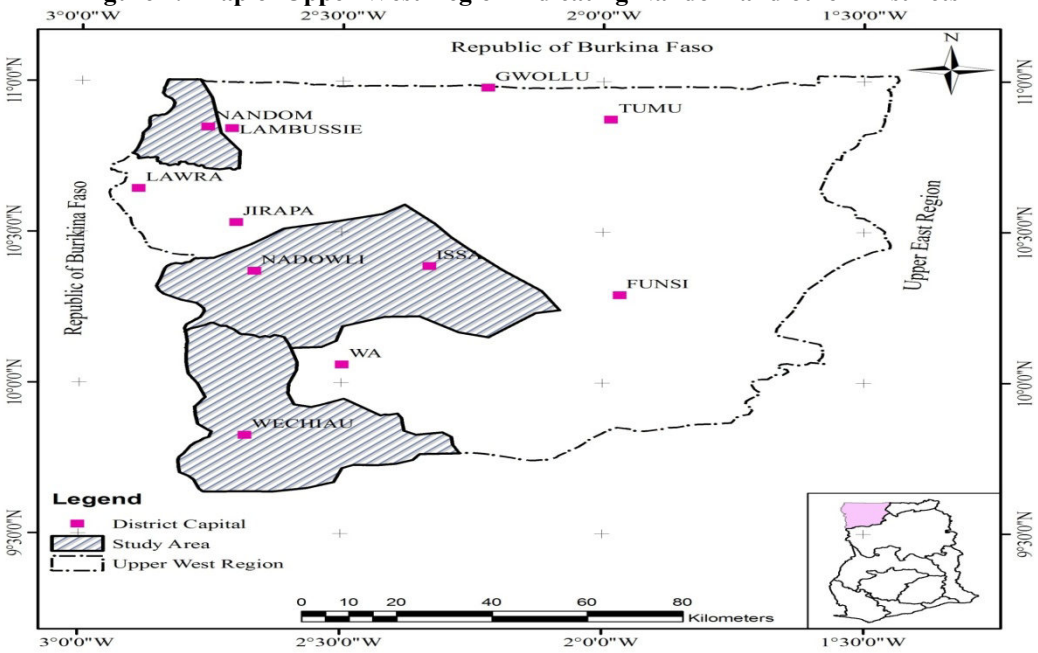
Bush fire as an environmental issue is an impediment to sustainable development. Burning is embedded in cultural values and the traditional farming systems of a pupil (Albin, 1985).
The effects of bush fires on rural livelihoods and ecosystems in Ghana are increasingly becoming extensive and damaging. However, it has been difficult to reduce or completely eliminate bush fires .The difficulties of eliminating bushfire completely means that there is a need for a clear understanding of its causes and so that policies can address the undesirable effects with specific reference to forestry, arable agriculture, rangeland management, as well as soil conservation and wild life.(Gyabaah, 1994).
Bushfires have played a damaging role in agricultural production and in accelerating environmental degradation especially in the fragile savannah ecosystem. This issue has largely been ignored in decisions affecting the physical environment (ibid, 1994).It has become a global environmental issue as its impact on man is enormous. It is believed that, fire was first discovered by pre-historic man perhaps at the beginning, man feared fire but with time man developed ways of employing it to his benefits. Today, fire has become a tool in the hands of man used for many purposes. For instance, historically man discovered that fire could be used as a means of creating more grassland for his animals and also for clearing land for farming purposes. This probably explains why bushfires have become entrenched in the socio-economic and cultural lives of some people (Albin, 1985).
Bushfire may be understood as the controlled and uncontrolled burning of the vegetation. Apart from burning to create grassland and also for farming purposes some bushfires are caused accidentally by careless smokers, hunters, bee tapers, and many others (Ahn, 1970).
In 1983, Ghana experienced what was described by some people as a ''baptism of fire'' by which bushfire literally swept through the length and breadth of the nation (Gyabaah, 1994).
Irrespective of the numerous awareness creation exercises by the Environmental Protection Agency and Forestry Commission in so many districts in the Upper West Region of Ghana with the inclusion of Nandom, bushfires are still rampant with its intended effects on destruction of food crops and the environment in general.
A lot has been done by authorities on the contribution of bushfires to environmental degradation to the neglect of the effects of bushfires on food crop production by means of reduction in soil fertility. As such, the article aims at filling the research gap on the effects of bushfires on food crop production. It also aims at providing baseline data for policy makers and interested parties on the subject matter.

2.0 Materials and Methods

The study made use of the following materials and methods.

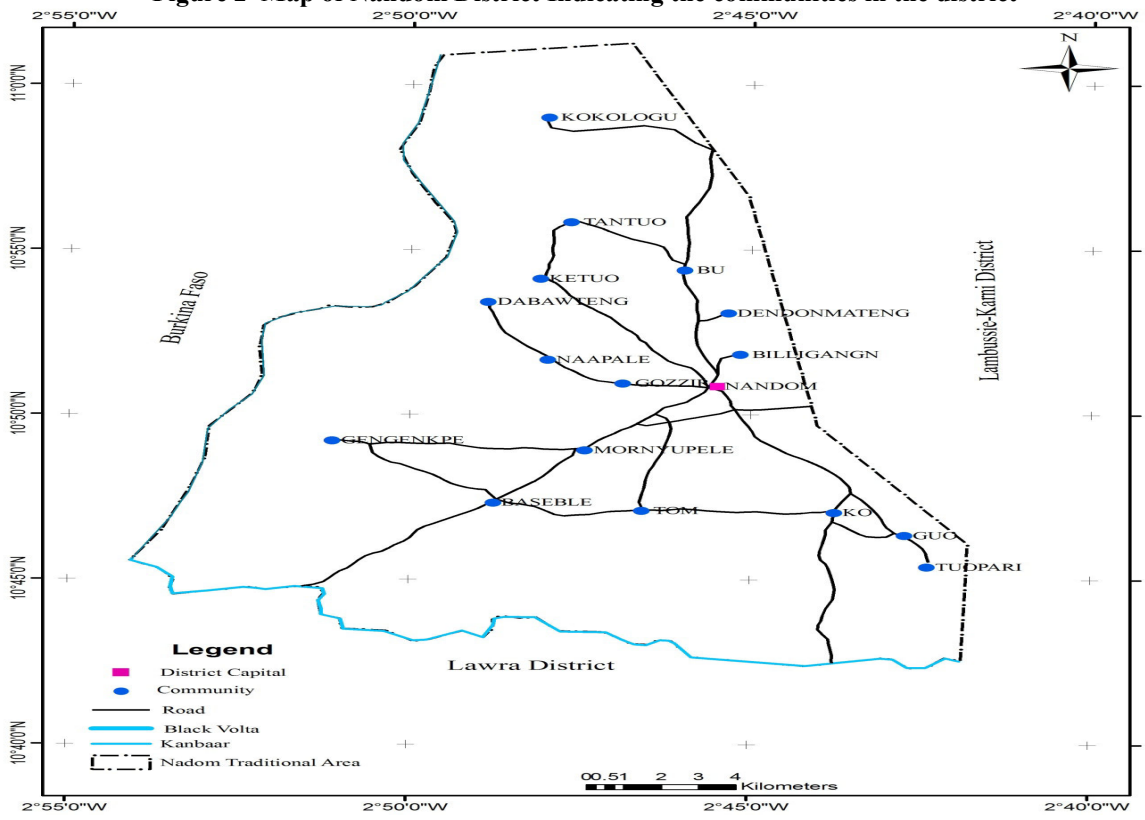
2.1 Materials
Figure 1 and 2 are maps of Nandom district.
Figure 1

Figure 1. Map of Upper West Region indicating Nandom and other Districts



(Source: Constructed from Arc GIS)

Figure 2 Map of Nandom District Indicating the communities in the district



(Source: Constructed from Arc GIS)

2.2 Study Area and Methods

2.2.1Study Area.

Nandom district share boundaries with Burkina Fasso to the west and north, Lawra district to the south, and Lambusie-Karni district to the east. (Nandom District Medium Term Development Plan, 2012)

Methods.

2.2.2 Methods

Apart from the use of documented sources, the study also generated first hand information from the field. Purposive and simple random sampling techniques were also utilized in the study to select interviewees. The study relied on qualitative and quantitative approaches in data collection, analysis and presentation. The study area, Nandom district was purposively chosen by virtue of the fact that it is one of the districts in the Upper West Region where the culture of the natives accommodates bush burning irrespective of its devastating effects. Qualitative tools such as face to face interviews, observation, key informant interviews as well as focus group discussions were used for data collection. Quantitative tools, namely SPSS and Excel as software for data analysis as well as tables and charts were used for data presentation along side descriptive analysis.

2.2.3 Sampling Procedure

The target group is farmers in Nandom district, as such forty farmers in four different communities in the district formed the sample size. The communities are Kokologu, Tantuo, Nandom Township and Goziri. Purposive sampling was used to select these communities by virtue of the fact that they are predominantly farming communities where culture accommodates bush burning.

The number of farmers in each section were selected proportionally based on the population of each community.. The farmers were covered using the systematic sampling technique. Mathematically, proportional sampling is calculated by the following formula:

Total Sample Size divided by total population of the four communities multiplied by the total population of each community. More so the officials of Environmental Protection Agency and the Forestry Commission were also chosen by means of purposive sampling.

3.0 Findings and Discussion

The findings as well as discussion of findings are presented as follows:

3.1 Occurrence of Bush fires

Table 1 is an illustration of the occurrence of bush fires in the Nandom district of the Upper West Region of Ghana.

Table 1

Responses	Absolute Figure	Percentage
Yes	40	100
No	0	0

Source: Field Survey May 2013

Table 1 is an illustration of the opinion of respondents on the occurrence of bushfires in the Nandom district of the Upper West region of Ghana. From table 1, all the respondents agreed to the fact that bush fires in the Nandom district is a reality. This supports the fact that the culture of the people of Nandom district creates a provision for burning irrespective of its devastating effects.

3.2 Causes of Bushfires

The study disclosed two broad causes of bushfires. They are natural and human causes. Natural and human causes of bushfires confirm the literature of Chapman (1932). Table 2 illustrates the responses on the natural and human causes of bushfires.

Table 2 Causes of Bushfire

Causes	Absolute Figure	Percentage
Natural Causes	9	22.5
Human Causes	31	77.5
Total	**40**	**100**

Source: Field Survey, (May 2013)

From Table 2, it is vivid that 22.5% of the interviewees are of the opinion that bushfires are caused by natural factors such as lightening and thunder and excessive solar intensity. However, 77.5% of the interviewees are of the opinion that bushfires are caused by human factors. Probing on the human factors disclosed farming, hunting, out of jealousy, and protection of ruminants against reptiles. Table 3 is an elaboration of the human causes of bushfires.

Table 3 Human Causes of Bushfires

Reasons For Burning	Absolute Figure	Percentage
Burning for Farming Purposes	20	50.0
Burning to Protect Ruminants from Predators	10	25.0
Burning for Hunting	7	17.5
Burning out of Jealousy	3	7.5
Total	40	100.0

Source: Field Survey (May 2013)

From Table 3, 50% of the interviewees identified burning for farming purposes as a human cause of bush burning. They acknowledged the fact that people of Nandom district are predominantly farmers with rice, millet and groundnuts as their major crops. More to the point the farmers resort to the cheapest method of preparing their farmlands for cultivation by means of burning without necessarily resorting to hiring of laborers to work on their farmlands due to inadequacy of their capital. In addition, crop residues such as guinea corn stock and rice straw are burnt after harvest. These factors consequently lead to bushfires.

It is also clear from table 3 that 17.5% of the interviewees identified hunting as human activity which also contributes to bushfires. During the dry season hunters burn bushes to hunt for animals in order to meet their nutritional requirements and to also ensure income security.

25% of the interviewees as indicated in table 3 mentioned that bushes are burnt in order to protect ruminants from reptiles such as snakes and scorpions.

As indicated in Table 3 , 7.5 % of the interviewees disclosed that some people burn bushes out of jealousy. This is normally engineered by the fact that, in instances where the food crops of the perpetrators have failed them in a season , whiles that of some other farmers have flourished, the perpetrators become jealous and set fire on the flourishing food crops some other farmers.

3.3 Effects of Bushfires on Food Crop Production

Literature reveals that the effects of bush burning on food crop production are favorable. For instance Churchill (1931), indicates that burning improves pasture because the ashes temporary enrich the soil. In a similar vain Mary (1974) reveals that with moisture, burning contributes to an increase in population of micro organisms contributing to a better crop yield. More so, Richard (1970), holds that bushfire is very important to the Australian environment because certain plants need heat to release their seeds. Albin (1985) indicates that farmers use fire on land by means of burning to clear, because it is actually the cheapest, fastest and easiest method of clearing. Ahn (1970) is also of the opinion that burning contributes to an addition of ash to the soil which consequently increases the soil ph with a resultant effect of growth in soil microbes and also creates a condition for successful plant growth. However, the forty responses suggest that the effects of bushfires on food crop production are adverse. These are illustrated in Table 4.

Table 4. Effects of Bushfires on Food Crop Production

Effects	Absolute Figure	Percentage
It Reduces Soil Fertility	17	42.5
Fire Destroys Crops	14	35.0
It reduces Crop Yield	9	22.5
Total	40	100.0

Source: Field Survey, (May 2013)

From table 4, it is vivid that 42.5% of the interviewees stated that bush burning reduces soil fertility. Also 35% of the interviewees are of the opinion that bush burning destroys food crops. However 22.5% of the respondents are of the view that bush burning reduces crop yield. Given the scenario in table 4, it is of no doubt to say that bush burning adversely affects farm productivity.

Also, an interaction with the officials of the Environmental Protection Agency as architects in the sensitization of communities on the adverse effects of bushfires reveals that bushfires have devastating effects on soil and vegetation. Its effects on the soil lie in the fact that it serves as a catalyst in the reduction of soil fertility. This confirms the opinion of 42.5% of respondents who mentioned reduction in soil fertility as an effect of bush burning on food crop production. More so, the effects of bush burning on vegetation lies in the fact that it destroys the natural vegetation which goes a long way to affect the rate of evapo-transpiration with a resultant effect of reduction in rainfall, which contributes to crop failure.

4.0 Summary of Major Findings

- The paper reveals that the taxonomy of causes of bushfires is human and natural, with human being the dominant.
- Human causes of bushfires as disclosed in the paper are burning for farming purpose, burning to protect

ruminants from reptiles, burning for hunting, and burning out of jealousy. However, burning for farming purpose is the dominant.

- The paper also indicates that the effects of bush burning are reduction in soil fertility, destruction of food crops, and reduction in crop yield. In this scenario, reduction in soil fertility is the dominant.

5.0 Conclusion

The study concludes that bushfires caused by nature or as result of the activities of man have devastating adverse effects on the physical environment which consequently affects farm productivity.

6.0 Recommendations

The following recommendations are put forward in order to discourage bush burning in the Nandom district of the Upper West region of Ghana so as to minimize its devastating adverse effects on the environment and farm productivity in order to enhance socio-economic development.

- Non Governmental Organizations and philanthropist should team up with the Environmental Protection Agency in the intensification of awareness creation on the adverse effects of bushfires in the Nandom district.
- Also, the Environmental Protection Agency should come out with mechanisms in the form of sanctions to scare people from indulging in the practice of burning.
- More so, the Environmental Protection Agency in collaboration with the forestry commission should come out with an incentive scheme, such that communities within the Nandom district who do not experience bushfires in a year are motivated by means of award.

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