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Short Communication

Effect of Tobacco Farming as a Cash Crop on Forest Cover in Kuria East Sub-County-Migori County

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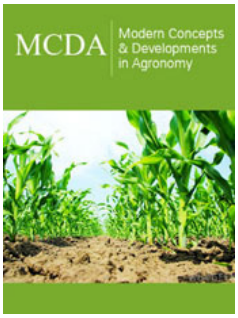

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Abstract

Background: Tobacco growing is one of the major causes, if not the main one of deforestation in the world, especially for crop expansion and for use of wood to cure tobacco.

Objective: The study seeks identification of alternative crops to tobacco according to climate and type of soils, and undertaking sensitization program for farmers in order to make them aware of the problems associated with tobacco farming and assist them in the shift to production of other crops.

Methodology: The study examines the implications of tobacco farming on forestry cover change through determining the number of trees cut to cure tobacco, the number of seedlings planted to replace them and how many seedlings overcome the transplant shock annually. The means of the various stated variables was compared, and it was observed that few tree seedlings survive the transplant shock compared to number of trees cut and also the number planted. Farmers' awareness on tobacco farming and deforestation was also determined by comparing the responses on deforestation and its related effects.

Result: Those who gave positive responses on deforestation were fewer than those who gave negative responses on the same issue. The study indicates that tobacco farming contributes to deforestation and has greatly destroyed the rolling hills once existed in the region A number of indigenous species, among them *Olea capensis*, *Poloscias kikuyensis* among others have been extensively cut for constructing tobacco curing kilns as well as fuel. What currently exists in the area is the exotic eucalyptus.

Conclusion: It was observed that farmers are not aware of the harmful effects of deforestation on the environment.

Recommendations: Farmers can adopt the use of coal fired kilns which require electricity to circulate heat to cure the crop.

Keywords: Tabacco production; Curing; Deforestation; Reafforestation; Environmental degradation

Introduction

Tobacco is a cash crop, native to South and North American continents. It first became known to the rest of the world in the 15th and 16th century when European explorers saw it being used as a medicine and a hallucinogen by Native Americans [1]. The explorers returned to Europe with the newfound plant, and it was quickly adopted as a drug of choice. It was banned at first by kings and popes because of its hallucinogenic effects but due to its economic value and broad popularity with the people forced acceptance among all culture. As a medicine, tobacco leaves could be chewed and applied to cuts or snake bites.

The largest producer of tobacco in the world is China, representing one third of the world production. With nearly one-third of the world's smokers (300 million), and 40% of global tobacco production (2.5 trillion cigarettes), China has the largest tobacco industry in the world [2]. According to the FAO statistics website, 1,345,680 ha were cultivated with tobacco in 2010, compared to 1,600,200ha in 1990 [3]. China is reported to use mostly coal for flue-curing. Also a study published on the USAID website maintains that in China, like in the US and in Europe, petroleum, coal or natural gas are now common alternatives to wood for tobacco curing.jkljklj ;lkkl;nl;on

Tobacco-growing is often portrayed as one of the major causes, if not the main one of deforestation in the world, especially due to deforestation for crop expansion and for use of wood to cure tobacco [3]. According to the India Tobacco Board, growers use coal, wood or other materials like briquettes to cure of tobacco [3]. The stubbles of Eucalyptus, Casuarina, subabul from the social forestry also account for a bulk of tobacco curing materials. In Karnataka, coffee husk, paddy husk, maize cobs and coconut shells are used for tobacco curing. Briquettes made of Agricultural waste are also under usage in Karnataka [4]. Owing to the sharp increase in wood material costs due to competition from bio power plants, the farmers are advised to raise their own wood fuel to meet their requirements for curing tobacco.

The Tobacco Board of India also promotes reforestation among tobacco farmers and research on solar energy to fuel tobacco curing Kilns [3]. In Kenya, especially Kuria East, the case is quite different because wood alone is used as the only source of energy for the curing process. Tobacco farming led to deforestation and soil erosion due to clearing of land for tobacco farming and curing process. This in turn led to ecological disruptions. The government and tobacco companies have tried to address deforestation issues by encouraging reforestation through providing tree seedlings to farmers. This scheme has a little positive impact because the trees planted are non-native and they tend to be the fast-growing type that can then be used in tobacco production. Some trees that are planted such as eucalyptus and cypress absorb a lot of water from the ground adversely affecting the water supply for other food crops. Not all trees planted survive the transplant shock.

Materials And Methods

Study area

Kuria East Sub County is located in Migori county. Its headquarters is Kegonga market, approximately 54km from Migori town. It lies between latitude1.8ºS and longitude 35º E. It covers an area of approximately 235.00sq. Km. Has a population of 93,229 (Kenya Population and Housing Census, 2009).

Topographically, the area has undulating hills with river valleys which run from the south towards the north interspersed with few stretches of flat areas. Soil type is majorly cambisols [5,6].

Sampling of farmers for interview

The study area comprised two Wards, Ntimaru East and West with 30 villages. Out of the two wards, 10 villages were randomly selected from 30 villages. This was done by writing the names of all the 30 villages on small pieces of paper, they were folded and placed in a container after which 10 pieces were randomly picked using random sampling. Out of the ten villages, a farmer was picked using a sampling interval of four farms after every successful interview.

Five farmers were drawn from each village as a representative of the whole village. A sample size of fifty farmers was achieved. The approach adopted involved personal interviews using both structured and open-ended questionnaire.

Data collection

The major source of data was primarily collected from 50 farmers who grow tobacco in the region. The reporting unit for the study was the person in judge of the family farm. Data that was collected included the number of trees cut to cure tobacco seasonally, the number of tree seedlings planted to replace the cut ones and the number of seedlings that survive of the transplanted. Views were also solicited from farmers on a variety of topics, such as perceived environmental risks resulting from deforestation such as changes in rainfall patterns and what they think can be done to minimize the risks and their general views on tobacco farming and deforestation. Data was analyzed using SPSS version 21 and presented in terms of tables and graphs.

Result and Discussion

Documentation of the rate of deforestation

Table 1 below shows the number of trees cut each season to cure tobacco with respective frequencies. Data indicates 25 farmers cut two trees each to cure tobacco annually an equivalent of 50 trees, 8 cut down 1 tree each equivalent to 8 trees (Table 1). The rest cut down more than two trees, with 11 farmers cutting 3 trees each, 3 cutting 4 each and with 1 farmer who had the highest number of trees being 8.

Table 1: Trees cut to cure tobacco with respective frequencies.

No of Trees Cut	0	1	2	>2
Frequency	2	8	25	15

By the end of December 2015, which was the peak of tobacco processing, a total of 103 trees had been cut from the different villages sampled to represent the region under study. The mean number of trees cut being 2.102 (2 trees per farmer). This is because there is no alternative to tobacco curing in the region [7]. This figure may seem negligible when compared to the total number of trees cut down annually in Kenya which translate to 2.04 billion trees Green Africa Foundation [8] but when narrowed down, it has a greater impact.

As indicated in Table 2 above, 14 farmers plant 2 seedlings each. Others planted more than two with 3 farmers planting 3 seedlings each, 12 farmers planting 4 seedlings each,4 farmers planting 6 seedlings each, with one farmer planting one tree and another with the highest number planting 10 seedlings. A total of 141 trees were planted by tobacco farmers that season. Of the 50 farmers sampled, 15 of them did not plan any trees. The number of trees planted was higher because at least each farmer is given 2 free seedlings to plant by the tobacco buying company. Therefore, the study shows that more seedlings are planted than the trees cut. The findings are supported by a study in the region [7].

Table 2: Shows frequency of seedlings planted Kibwege [7] to replace the cut trees.

Frequency	14	21	15
Seedling Planted	2	>2	0

From the data indicated on Table 3, 3 farmers revealed that their seedlings did not survive during that particular season, 13 farmers each having one seedling surviving and other 13 with 2 seedlings surviving each. Only 6 farmers had more than two tree seedlings survival. A total of 60 tree seedlings reached the hardening point. In a sample of 50 farmers, 103 trees are felled yearly to cure tobacco while 60 survive to replace them. The mean number of trees cut is 2.145≈ 2trees per farmer while mean number of trees that survive is1.25≈ 1 tree per farmer. The null hypothesis that every tree cut survive to maturity is rejected. This shows that tobacco farming significantly contributes to deforestation. In comparison, Babere [9] reported that forests in Kuria were significantly declining as a result of tobacco farming. Reasons for low rate of seedlings survival are most farmers do not take care of their seedlings after planting, no follow up from the buying institution, policies regarding deforestation are not implemented locally.

Table 3: Shows the frequency of seedlings that survive the transplant shock.

Frequency	3	13	13	6
Survived	0	1	2	>2

Perceptions of the community on tobacco farming

From Table 4 above, farmers gave their views on changes in rainfall patterns in the region, cases of soil erosion which has contributed to land slope changes and the general look of their farms. Their responses were either positive or negative in relation to tobacco farming and deforestation. Some farmers believed that issues like soil erosion are as a result of frequent floods without associating them with deforestation, they believe such issues are natural calamities that can't be avoided. This implies that information needs to be disseminated to farmers on issues regarding deforestation and possible ways of controlling them.

Table 4: Distribution of respondents on the effects of deforestation.

Perception	Response	
	No. Positive	No. negative
Reduced water availability	6	5
Loss of natural habitats	5	4
Disappearance of wild animals	3	5
Disappearance of wild fruits	4	4
Soil erosion	6	5
Total	24	26

Conclusion

The study compared the number of trees cut annually to cure tobacco to the number of trees planted and survived annually in Kuria East Sub-County, farmer's awareness on deforestation as well as the effects of deforestation on the environment.

A. In total, 103 trees are cut annually while 141 trees are planted to replace them. Of the 141 trees planted, only 60 trees survived the transplant shock. The analysis indicates that tobacco farming contributes to deforestation and has greatly destroyed the rolling hills that once existed in the region. A number of indigenous species like *Olea capensis* and *Poloscias kikuyensis* have been extensively used for constructing tobacco curing bans as well as fuel. What currently exists is the exotic eucalyptus one.

B. In addition, it was observed that a number of farmers are unaware of deforestation and its associated effects. Based on the study, an agenda for action should be taken.

C. A policy of every farmer planting 10 trees for every tree cut should be implemented to increase chances of survival.

Recommendation

A. The study therefore recommends that an agenda for action should be taken. Find ways of increasing the survival rates of tree seedlings need to be identified.

B. The study proposes identification of alternative crops to tobacco according to climate and type of soils.

C. Undertake sensitization program for farmers in order to make them aware of the problems associated with tobacco farming and assist them in the shift to production of other crops.

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