Asian Journal of Agriculture and Rural Development, 3(7) 2013: 446- 456

Asian Journal of Agriculture and Rural Development

journal homepage: http://aessweb.com/journal-detail.php?id=5005

Impact of Credit Access on Charcoal Productivity: Implication for Sustainable Development, Oyo- State

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Abstract

The impact of credit on charcoal productivity was assessed in Oyo state of southwestern Nigeria. Multi-stage sampling method was used to select 140 respondents. Data used in this study were gathered from traditional charcoal producers that have access and no access to credit with the aid of interview schedule; the analytical techniques used were descriptive statistics, Logit and multiple regression models. It was revealed that about 20% of the charcoal producers used loans from co-operative societies while 55% sourced their funds from personal savings. The model has a sigma square (σ^2) value of 42.741 P<0.01which is an indication of a good fit and a normal distribution of the error term. About 50% of the charcoal farmers had limited access to formal funds due to insufficient collateral securities and this had negative effect on their business hence they recorded low level of farm income. The coefficient of these variables, years of experience in charcoal production, level of education, sources of credit, sources of log and their quantities were positively significant at 5% level. The multiple regression analysis revealed that frequency of extension visit, household size, amount and source of credit had a significant direct relationship with charcoal productivity. The study therefore concludes that credit acquisition by the charcoal producers had a significant impact on the charcoal productivity which brings about a sustainable development in the study area.

Keywords: Charcoal productivity, Credit, Logit regression, Log of wood

Introduction

Background of the Study

It is without doubt that the peasant farmers have very little land on which they sustain their rapid growing family, lack basic inputs and sometimes, they experience decline growth in their agricultural production and yield. The most obvious way of making a change in the welfare of these farmers is the intensification of agricultural production. This will be enhanced if they are able to have access to credit facilities. Economic growth can be accelerated if we focus attention on issues of integrated rural development with respects to farm production agro-industries, facilitative services and marketing of inputs and outputs (Olagunju and Adeyemo, 2007).

Food crop production constitutes the major source of food for the rural population. Most of the problems of small scale farmers stem from poor accessibility to credit and finance. The low output which characterizes Nigerian agriculture stems from the state of poverty of the rural farmers. To break this poverty cycle, credit is

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needed among other things (Ng'eno Vincent *et. al.*, 2011).

The main aim of government all over the world is to break the vicious cycle of poverty among the farmers. This vicious cycle is due to low level of income, low level of output, low level of savings and low level of investment which results in low level of output again. Despite all the efforts of the government in breaking the vicious cycle by providing credit to rural farming households through various agricultural credit sources, most rural farmers still have difficulties in having access to credit or don't have the access at times.

Ike and Uzokwe (2012) opinned that government should mobilize adequate donor support on behalf of the micro credit institutions since it was found to be effective in improving the livelihood of the low income house-holds and thus encourage borrowers to undertake small scale production activities through subcontracting arrangements with large-scale business enterprises who could benefit from the low opportunity cost of labour for the borrower households. This would help increase absorptive capacity of capital and reduce the time needed by borrowers to achieve financial viability.

Natural forest in Nigeria, as in most other African countries is endowed with so many resources that are highly beneficial to human race, but the most significant and most widely used product is the wood. Woods can be used locally in their raw forms without any further processing and they can be made to undergo several different treatments for more advanced utilization.

Smith, *et. al.*, 2000 opined that however, in Nigeria and most other developing countries, the most important utilization of wood is as fuel, principally in form of firewood and charcoal. In studying the over- all energy situations in today's world, the dependence of the greater part of the population in the third world countries on traditional fuels, foremost among them being fuel wood has long been recognized. Tunde *et al* (2013) defined fuel wood as wood and pulp materials obtained from the trunks, branches and other parts of trees and shrub, to be used as fuel for cooking, heating or generating energy through direct combustion, not only in the households but also in rural industries (for curing, smoking e.tc).

It was pointed out that Nigeria is endowed with a wide spectrum of energy sources, which are vital for the national, and international economies, yet about 80% of Nigeria population who are mostly rural dwellers depend solely on traditional fuel wood supply for their energy requirements. Obviously, this percentage must have increased now because of the erratic supply of electricity in the cities and mostly lack of access to electricity supply in the rural areas. (Kalu and Izekor (2007). To substantiate this fact Broadhead et al. 2001, highlights the projection of consumption of charcoal to 2030 in developing regions Table 1. In Africa, consumption of charcoal is estimated to increase to 46.1 million tons by the year 2030. It should be noted that the urban population is increasing on daily basis than the rural areas to the extent that getting fuel energy to feed this population is a problem since most of these people are poor and cannot afford modern cooking fuel. One major means of domestic energy that this population relies on is charcoal. Charcoal is usually produced in the rural areas and transported to the urban areas for consumption. In the developed countries like US, they usually desire charcoal due to the flavours it imparts on the grilled food. In addition it has excellent cooking properties such as easy and even burning, burn for a long time, and can be easily extinguished and reheated.

Table 1: Projections of Charcoal Consumption to 2030 in Developing Regions (Million tons)

Country	1970	1980	1990	2000	2010	2020	2030
South Asia	**1.3**	**1.6**	**1.9**	**2.1**	**2.2**	**2.4**	**2.5**
Southeast Asia	0.8	1.2	1.4	1.6	1.9	2.1	2.3
East Asia	2.1	2.3	2.3	2.2	2.1	2.0	1.8
Africa	8.1	11.0	16.1	23 .0	30.2	38.4	46.1
South America	7.2	9.0	12.1	14.4	16.7	18.6	20.0

Source: FAO (Broadhead et al. 2001)

High demand for charcoal in the urban areas of the country motivated a lot of people especially men both young and old in the rural areas into the business of charcoal production. However, in spite of its benefits, charcoal production has its adverse effects such as desertification, environmental degradation, global warming and climate change. The processes involved in the production of charcoal include; felling trees such as acacia and burning them. In the process of burning trees in an unsustainable way, green house gases are emitted. Also, high increase of carbon-dioxide is experienced in the atmosphere where these trees are being felled thereby causing global warming. Furthermore, at each stage of the life cycle of charcoal there are effect on both the human and environment health. There should be a balance in the needs of society, the economy and the environment through sustainable development. Sustainable development is the ability to improve the quality of human life while living and maintain ecological balance of an area.

It is not a gainsaying that in many developing countries, charcoal is usually produced at a subsistence level. In defining the future of this sector of the industry, economic analysis can be used to reveal its negative and positive features, and its long-term viability. Production of charcoal with adequate provision of credit is therefore an area to be looked into, not only because it provides necessary energy supply and alleviates the problem of fuel supply but also because it tends to improve the producer and Nigeria's economy. One of the perceived effective strategies for improving the agricultural productivity is to ensure adequate supply of credit. Agricultural credit plays an essential role in the process of improving agriculture and changes of the rural economy and this enhances booting of agricultural production. It is usually deliberated that the agricultural sector depends more on credit than any other sector of the economy because of the seasonal variations in the farmers' returns and credit requirement in the transformation of subsistence to commercial farming.

Generally, the study determined the impact of credit use on charcoal productivity in the study area and the specific objectives are to:

1. describe the personal characteristics of charcoal producers;
2.
3. determine the factors affecting access to credit charcoal producers;
4.
5. examine the effects of credit on charcoal producers with and without credit access.
6. analyze the perception of the respondents on the effect of charcoal production on the environment

Research Methodology

Study Area

The study area is Iseyin Local Government Area, located in the transitional zone, between forest and savanna belts in Oke Ogun region of Oyo state. The local government comprises of eleven political wards, made up of various towns and villages, among the towns and villages under the local government are Iseyin, Ado Awaye, Osoogun, Odo-Ogun, Waasinmi, Agelu (Jerusalem), Ikere, Alayin, Apenpe, Igboro and Alibaba e.t.c. The area is mainly an agrarian society, where most of the people are engaged in agricultural production or agricultural related occupations. The local government area is known for production of food crops such as yam, maize and cassava, but as far back as 1964, the area has been identified as one of the charcoal producing areas in Oyo State (Adeyoju, 1975).

Sampling Procedure and Sampling Size

Method of Data Collection

Primary data were collected from small scale commercial charcoal farmers in the study area with the aid of structured questionnaire. The respondents were selected through multi stage sampling technique. In the first stage, random sampling method was used to select five wards out of the eleven existing political wards in the local government. The wards did not have the same number of villages, 40 percent of the villages located in each ward was further selected using a simple random technique. The total number of villages chosen from each ward was 20 (Table 2). List of the charcoal producers from each village was obtained.

The village head made available a list of the charcoal farmers from which a proportional numbers of charcoal farmers were drawn. The farmers were segregated into two groups of farmers that took loans for charcoal production and the farmers that did not. Data were collected based on the socioeconomic characteristics of the charcoal farmers such as educational background, farm size, gender, age, log, chemicals used, experience, output and household size of the farmer among others, their sources and level of access to credit etc. Data used in this study were collected from charcoal producers located in the study area. A sample of eighty (140) charcoal producers was selected based on the sampling procedure. Primary data were gathered through interview schedule, with each of the selected charcoal producer. Such information on demographic characteristics cost of labour incurred per production cycle, cost of log, output per production and selling price among others were collected. Table-2 shows the distribution of explanatory variables used in modeling the factors that influence the charcoal productivity. The socio-economic characteristics of the charcoal farmers' were analysed by using descriptive statistical method such as frequency, tables and percentages. The effect of credit on charcoal productivity was analysed with logit regression while effect of the farmer's socioeconomic and institutional factors on the charcoal productivity were analyzed with multiple regressions.

Model Specification

Logit Regression

Quasi-experiments were used to assess the impact of credit on charcoal productivity in this study. This involved selection of respondents that had access to credit and those who did not obtain any form of loan for charcoal production. The two sets of group have similar observable biophysical and socio-economic characteristics. The dependent variable is an ordinal logit model that is, with credit or no credit access.

$$Y_i^* = \beta' x_i + \varepsilon_i \text{ ---------- (1)}$$

Where Y_i^* is the underlying latent variable that indexes the credit access that a charcoal farmer experiences, x_i is a vector of explanatory variables, β is a column vector of parameters to be estimated, and β_i is the stochastic error term. The latent variable exhibits itself in ordinal categories, which could be coded as 1, 2, 3 .....J. The probability for each of the observed ordinal response, which in our case had only two categories (1, 2) for credit access; no credit access will be given as;

$$P(Y=1) = P(Y^* \leq 1) = P(\beta' x + \varepsilon \leq 1) = F(-\beta' x)$$
$$P(Y=2) = F(\delta_2 - \beta' x) - F(-\beta' x) \text{ ---------- (2)}$$

Where F is the cumulative distribution function (CDF) for the stochastic error term ε.

It is assumed that the functional form of F will determine whether a logit (logistic CDF), probit (standard normal CDF) or other model is used. The study borrow leaf from Occam's razor, where it used the logistic specification although it is expected that the predicted probabilities to should be similar to those of a probit model within the broad range of the data except at the end (see Maddala, 1983).

Multiple Regression Analysis

The effect of the farmer's socioeconomic characteristics and institutional factors on charcoal productivity, were analysed with multiple regression model. The difference in the average net income of the farmers from the charcoal sources before and after credit use was used as a proxy for charcoal productivity for farmers that had access to loan,:

$$CP = \pi_a - \pi_b \text{ ……..…..... (3)}$$

Where
a and b represent after and before, respectively.
This implies that the effect of the credit variable on productivity is already captured by the charcoal productivity proxy in equation (3).
Four functional forms of the specified model were tried: Simple linear, semi-logarithmic, double-logarithmic, and exponential.

Simple Linear Form:

$CP = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\beta_{10}X_{10}+\beta_{11}X_{11}\mu_1$ ..... (4)

Semi-logarithmic Form:

$CP=Log\beta_0+\beta_1LogX_1+\beta_2LogX_2+\beta_3LogX_3+\beta_4LogX_4+\beta_5LogX_5+\beta_6LogX_6+\beta_7LogX_7+\beta_8LogX_8+\beta_9LogX_9+\beta_{10}LogX_{10}+\beta_{11}LogX_{11}\mu_1$ ..... (5)

Double-logarithmic Form:

$Log\ CP = \beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X5+\beta_6X_6+\beta_7X_7+\beta_8X_8+\beta_9X_9+\beta_{10}X_{10}+\beta_{11}X_{11}\mu_1$ .....(6)

Exponential Form:

$Log\ CP = Log\beta_0+\beta_1LogX_1+\beta_2LogX_2+\beta_3LogX_3+\beta_4LogX_4+\beta_5LogX5+\beta_6LogX_6+\beta_7LogX_7+\beta_8LogX_8+\beta_9LogX_9+\beta_{10}LogX_{10}+\beta_{11}LogX_{11}\mu_1$..... (7)

The lead equation was chosen on the basis of correct sign of the explanatory variables, the significance of the regression coefficient and the value of the coefficient of multiple determinations.

Where
CP = Charcoal productivity
β = is the vector of parameters to be estimated
X's = is the matrix of the explanatory variables (Table 2).

Table 2: Description of Explanatory Variables used in Modeling the Factors Influencing Charcoal Productivity

Variable name	Description
Productivity (CP)	Increment in charcoal sales in terms of money value.
Age (X_1)	The age of the farmer (years).
Gender (X_2)	Dummy: male=2. Female=1.
Household size (X_3)	Household members (No)
Education level (X_4)	Number of years spent in school.
Experience (X_5)	Number of years a farmer has been in charcoal production.
Extension (X_6)	Extension visit to disseminate production technology.
Logs (X_7)	This is the monetary value of log of wood.
Chemicals (X_8)	This is the monetary value of chemical used in processing charcoal.
Source of credit (X_9)	The value is 1 if friends and relatives, 2 if money lenders, 3 if Banks, 4 if cooperatives and 5 if personal.
Amount borrowed (X_{10})	This is the monetary value of credit.
Source of supply of log wood(X_{11})	Natural Forest is 1, plantations is 2, farmland is 3, government reserves is 4

Source: Field Survey, 2012

Results and Discussions

The results of the analysis showed that 95% of the farmers were below and equal 60 years of age (Table 3) while the average age was 46 years. This implication of this is that the charcoal farmers are in their active working age bracket. From the results, 41 % of the charcoal producers were 40 years of age and under.. This indicates that in the study area, there are young people who could take up the challenge of looking for logs of wood in the bush not minding the attached risk of life. About 68.0 percent of the charcoal producers had up to 10-year charcoal producing experience. At average, the period of charcoal producing experience was 8 years. An increase in the number of years of experience, improves the ability of the producers in mastering and managing capacity. When production resources are handled carefully, it is usually compensated with higher level of production in the industry. This literally

translates to an increased income level for the producers.

Considering the educational status of the charcoal producers, it was found out that about 15.0 percent of the charcoal farmers had no formal education. Table 3 further shows that 60 percent of the producers had up to secondary school education indicating that charcoal farmers should have good education on tree crop management so that they are able to properly gather and use all available resources to their advantage to improve production process and protect the environment by replanting the necessary trees. This will bring about an increase in the level of charcoal production.

The charcoal producers that had 9 household members accounted for ninety-six (95.7) percent with an average size of 7 in the study area. The implication of this is that charcoal producers in in South Western Nigeria are characterized with a large family size. This creates an opportunity for the producers to have access to cheap family labour. On the contrary, family might incur high expenses on consumption hence have negative effect on the business which can bring about abruption in the business if the producer could no longer provide the required funds for the smooth running of the business. Table-3 showed that Charcoal producers that sourced their finance internally from personal savings accounted for fifty-five (55) percent while 20% obtained loans from co-operative societies. About 10.7 percent of the charcoal producers were able to obtain bank loans as due to their lack or limited possession of collateral securities. Meanwhile, some of the charcoal producing farmers were able to secure loan from a combination of bank loans, personal savings and co-operative societies' loans. Due to a weak financial base, most of the charcoal producing farm operators is constrained in obtaining internal source of finance from owners' equity (personal saving). In other to solidify their financial base with assured increased output level additional sources of funds are therefore required for the charcoal producers.

Table 3: Percentage Distribution of Socio-economic Characteristics of the Respondents

Characteristics	**Frequency**	**Percentage** (%)
Age of charcoal farmer (years)		
20 - 30	23	16.7
31 - 40	34	24.3
41 - 50	58	41.4
51 - 60	18	12.9
> 60	7	5.0
Mean age = 46		
Source of credit		
Personal savings	77	55.0
Cooperatives	28	20.0
Banks	15	10.7
Friends and relatives	14	10.0
Money lenders	6	4.29
Household size		
1 - 4	32	22.9
5 - 9	94	67.1
10 - 14	19	13.6
≥ 15	5	3.6
Marital status		
Married	124	88.6
Single	16	11.4
Educational status (years)		
No formal education	21	15.0
1 - 6	29	20.7

7 - 9	84	60.0
10 - 12	4	2.9
≥ 13	2	1.4
Mean = 7		
Experience (years)		
1 – 5	14	10.0
6 – 10	81	57.9
11 – 15	36	25.7
≥ 15	9	6.79

Source: Field Survey, (2012)

Factors of Credit use on Charcoal Productivity

The effect of credit used by the charcoal producers was analysed by the Logit regression model. It was used to determine the parameters of the conditional probability of those that have access to the required level of loans and the marginal changes in explanatory variables on the financial status of the charcoal units. The charcoal producers were classified into to groups of those with loan and those without loan. Table 4 presents the distribution of the estimated regression parameters and diagnostic statistics by using the Maximum Likelihood Estimation (MLE) technique. From the results, it was shown that coefficients of seven variable had significant influence on the charcoal productivity. The value for the sigma square ($\sigma 2$) was 53.384, with a p-value of less than 0.01 and log likelihood function of -47.384. The model displays a good fit and the test link correctly specified since the sigma square was statistically significant. In addition, the model was suitable for parallelism assumption since the parameters in the subsequent equations are the same.

Table 4: Factors that Determine Credit Access on Charcoal Productivity: Logit Model

Variables	Marginal probability coefficients	Standard error
Age (X_1)	0.068	0.718
Gender (X_2)	6.281*	0.054
Household size (X_3)	7.164***	0.006
Educational level (X_4)	3.423**	0.031
Experience (X_5)	1.065	0.437
Extension visit (X_6)	2.327	0.054
Sources of credit (X_7)	6.317**	0.077
Amount borrowed (X_8)	5.473*	0.063

Source: Field Survey (2012) Chi square value $\sigma^2 = 42.741$ $P<0.01$
Log likelihood value = -53.384. ***sig. at 1%, **sig. at 5%, *sig. at 10%

The following variables with significant co-efficient are household size (X_3), gender (X_2), educational level (X_4), amount borrowed (X_8) and sources of credit (X_7). When a parameter has a positive sign, this indicates that an increase value of the variable coefficient tend to increase the likelihood of credit impact on charcoal productivity. Likewise, a negative value of a variable co-efficient implied a reduction in the probability of credit impact on the charcoal productivity. The coefficient of variable household size (7.164) exhibited a high probability of credit impact on charcoal productivity while the least was shown by the coefficient of variable farmers' age (0.058). The implication of this is that the producers were able to make good use of the cheap family

labour that eventually led to an increase in charcoal productivity. The coefficient of the variable sex of household head showed a significant relationship to the credit impact on charcoal productivity. The probability of 6.281 indicated that all things being equal, the probability of that the charcoal productivity of a particular household will be above any given level, is 6.0 times higher for a male headed household than for a female headed household. Culturally, men have access to land and farm resources than women not only in the study area but applicable to other West African country like Ghana (Agudugu, 2012).

Regression Analysis

Table 5 shows the estimates of the multiple regression models. From the model, six of the included variable had significant coefficients for the charcoal producers that have access to credit. For the charcoal producers without credit, only three of the included variables had significant coefficients. The coefficients of the variables experience, gender and age were not significant for both groups of charcoal producers. The non credit charcoal producers results was very poor, this indicates an inefficient use of the available resource. In addition, they were unable to acquire additional capital production improvement. Charcoal producers with credit had good results which is an indication of efficient utilization of resources. This result is a good pointer to the positive impact of credit on charcoal productivity. This was also corroborated with the study carried out on agricultural Gross Domestic Product (GDP) by Nadeem et al (2012). However, the coefficient of education and extension variables had significant inverse relationships with charcoal productivity; source of log, source of credit, household sizes, quantity of log used and gender variables show direct relationships with charcoal productivity. It was revealed during the course of field survey that some extension agents did not measure up to expectation in discharging their duties hence, the negative relationship with the charcoal productivity. When men have good education, they tend to migrate to the cities and look for white collar jobs, in essence, the higher the level of education, the lower the charcoal productivity. Credit availability plays a significant role in charcoal production since it is required to purchase chemicals, purchase of personal sawing machine, pay for standing trees, and, cutlass, hoe, slicing machine, rubber hose and provision for store.

Table 5: Multiple Regressions Estimate of Factors Affecting Charcoal Productivity

Factors	**Respondents with credit** (n = 70)	**Respondent without credit** (n = 70)
Age	0.299 (1.86)	0.276 (1.34)
Household size	0.556* (2.23)	0.582* (2.42)
Educational level	-0.389** (2.88)	-0.360* (2.98)
Experience	0.137 (1.37)	0.263 (0.98)
Extension	-0.521* (2.19)	-0.662* (2.74)
Source of credit	0.731** (3.60)	0.068 (1.02)
Source of log	0.842** (3.76)	0.042 (1.95)
Quantity of log used per month	0.643** (2.65)	0.086 (1.08)
Gender	0.011 (0.21)	0.025 (0.31)
Adjusted R^2	78.17	71.63
F- ratio	58.5272	43.42178

Source: Field Survey, (2012)

***sig. at 1%; **sig. at 5%; *sig. at 10%. Values in the bracket are the t-values.

Constraints of Credit Access to Charcoal Production

The charcoal producers that lack access to credit are faced with constraints that can be evaluated in four ways. These are causes related to (i) loan utilization (ii) borrowing (iii) lending and (iv) extraneous causes. It was discovered from the study that some respondents recorded low sales due to low or poor yield from poor trees, fall in product prices; low product prices; low demand for product and weather condition (especially too much rainfall). Most of the respondents are faced with high interest rate and late disbursement of loans by the credit institutions. In terms of the borrowers' problems, the respondents are faced with some sickness such as infections, family debt and problems, burden from relations and so on. Other critical but extraneous factors is government policy, poor transportation and communication system, fuel scarcity and high cost of transportation.

Table 6 indicated that the inclement weather condition (especially too much rainfall) system is a major obstacle to charcoal production was considered by 92 percent of the respondents as the reason of their inability to make use of the accessed loan sensibly. They agreed that the unsatisfactory weather condition (especially too much rainfall) is the most crucial production - related problems facing their charcoal production. Other problems that are marketing related need to be taken into consideration to fully understand the effects of credit access on effectiveness of charcoal farmers in the study area.

Table 6: Distribution of Problems Associated with Credit Repayment among Respondents

S/N	RELATED-PROBLEMS	% of RESPONDENTS
1.	Borrowing	
	Ill- health	32
	Burden of some other debt	12
	Family Problems	18
2.	Lending	
	High interest rate	22
	Late Disbursement Lag	36
3.	Loan utilization	
	Low sales	85
	Fall in product prices	74
	Poor yield (poor trees)	67
	Low product prices	65
	Weather condition (too much rain)	92
	Government policy (laying embargo on tree felling)	68
4.	Extraneous issues	
	Fuel Scarcity	64
	Poor Transportation	74
	High Transportation Cost	86

Source: Field Survey, 2012 *Multiple responses

Perception on the Effect of Charcoal Production on the Environment

Table 7 shows the perception of the respondents on the effect of charcoal production on the environment. It was discovered that 120 (85.7%) of the respondents agreed that the weather of the area in which charcoal is produced is getting drier each day. About 110 (78.8%) of the respondents agreed that tree felling is affecting their environment negatively. The implication of this is that there will be high concentration of carbon in the atmosphere because trees that would absorb these carbons are chopped down; hence, this leads to global warming. Deforestation without afforestation is an important aspect of climate change. When trees are cut down and not replanted there will be high concentration of carbon dioxide in the

atmosphere since the plants that are supposed to take in carbon dioxide have been cut down, hence, there will be global warming

Another effect is increase in the erosion process in the area because trees that are supposed to curb the washing away of the topmost soils had been removed. Sustainability of our environment is however crucial while finding cheaper means of cooking. About 86 (61%) of the respondents are in support of this. Furthermore, 115 (82%) of the respondents indicated that during the process of burning trees a lot of smoke in form of carbon monoxide is being released into the atmosphere hence, there will be increase in temperature which is a potential consequence of green house effect causing climate change. Burning releases into the atmosphere carbon dioxide and carbon monoxide which reduce the ozone layer and act as blanket escape of ultraviolent rays from the atmosphere. This increases ambient temperature, reduces rate of vegetation, increases water loss and ultimately the tendency for desertification. Also, 132 (94%) of the respondents agreed that there are no animals in the bush where they use to fetch the trees for charcoal as a result of tree felling. The implication of this is food insecurity. Only 25(17%) indicated that there was no effect on the environment.

Table 7: Perception on the Effect of Charcoal Production on the Environment

Perception	*Frequency	Percentage
Weather is getting drier	120	85.7
Tree felling is affecting the environment	110	78.6
Increase in erosion process	86	61.4
Increase in temperature	115	82.1
No animals in the bush again	132	94.2
No Effect	25	17.9

Source: Field survey, 2012 *multiple responses

Conclusion and Recommendations

Insufficient funding of charcoal production has often caused low level of production output in the industry. The study therefore, investigated the impact of credit on charcoal productivity. This study shows that credit is very important in charcoal productivity and the credit source cannot be overlooked. Farmers shy away from formal lending and depend on personal savings, relatives and friends. Multistage sampling technique was used to select one hundred and forty (140) charcoal farmers from which data were collected. The study revealed that there is need to improve on the charcoal farmers' level of education, years of experience, frequent visitation and training services by the extension agent on establishment of plantations of desired species of wood. A forestation is highly essential since massive and continuous charcoal production would lead to environmental hazard and the potential of its production as an instrument of economic development may not be fully realized. The bottlenecks that hinder formal lending to charcoal farmers should be addressed and solved by the policy makers. The policymakers and operators of credit institutions such as cooperative societies and banks should take up the challenge in making credit available to charcoal producers in the rural areas. With the establishment of plantations and a forestation, charcoal industry could absorb the unemployed and untrained rural labour thereby assisting to check the migration process of rural labour to the cities. Finally, as more funds were made available and accessible to the small scale charcoal farmers at minimal costs, the level of output in industry will improve.

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