

# Perception of the Effects of Charcoal Production on Rural Households in Kwara State, Nigeria

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**Abstract.** This study examined the perception effects of charcoal production on rural households Kwara State, Nigeria. One hundred and four respondents were randomly selected among the respondents in Kwara state. The data was analyzed using Frequency count, Percentage, Mean and Pearson Product Moment Correlation (PPMC). The result reveals that there the highest ranked motivation for undertaking charcoal production was that it's a cheap source of fuel for cooking ( $\bar{x} = 4.90$ ). The highest ranked effect of charcoal production on the household was that charcoal production reduces household dependent on petroleum product ( $\bar{x} = 4.99$ ) was highest ranked perceived effect of charcoal on the household. High health risks in charcoal production and harassment by government agents from the ministry of forestry and environment ( $\bar{x} = 2.00$ ) was the highest ranked constraint affecting charcoal production. The result reveals that there is no significant relationship between the perceived effects and motivation for undertaking charcoal production ( $r=0.008$ ,  $p=0.934$ ). The study recommends that there should be provision of training on sustainable and eco-friendly mean of livelihoods to rural households.

**Keywords.** Perception Effects, Charcoal Production, Enterprise, Rural Households.

## I. INTRODUCTION

Energy is a fundamental necessity for human existence because of its every day reliance by humans for household's requirements. The importance of charcoal as a source of energy cannot be over emphasized when considering its domestic and industrial use. About 2.4 billion people rely on traditional biomass, mainly for cooking and heating (Bada, Popoola, Adebisi, Ogunsanwo and Ajewole, 2009).

Charcoal is largely produced and used in rural and urban areas to meet the various energy needs of both the urban and rural poor, by providing a reliable, convenient and accessible source of energy for heating and cooking at all times and at a relatively stable cost in required proportions (Chaposa, 2002). In addition to its export value, charcoal trade at the local level provides income opportunities for many people in the rural and urban areas through small scale retail and wholesale businesses (Cirad, 1999). Charcoal production is an important and simple means of livelihood for many people in rural areas (Eniola and Odebo, 2018).

Charcoal is the most important commercial fuel derived from wood. Smoke free, capable of controlled use in a small and cheap stove, and also capable of producing greater heat than wood, it is suitable for a wide variety of industrial and domestic uses especially for use in urban environments. In most developing countries, it is the chief form in which wood fuel is used in towns. If charcoal which is obtained from fire wood as energy source is not properly made, it a source of air pollutants such as carbon monoxide, Polycyclic Aromatic Hydrocarbons (PAHs) and others which are detrimental to human health (Oyebanji, Adeofun, Adedeji, Ekpo, Oguntoke, Ojekunle, 2013). The production of charcoal has far-reaching impacts on forest degradation and extends across a range of social-economic and environmental issues of people. Charcoal production has been identified as one of the major causes of deforestation (Mwampamba, Ghilardi, Sander and Chaix, 2013). Any area where there is high level of charcoal production, there is always high incidence of deforestation in the area.

Poverty and inadequacy of alternatives, promotes the use of charcoal despite the negative effects on the environments. The relatively cheap cost and availability could explain the preference for it by rural people. Charcoal is the main source of energy after firewood in most rural communities in Nigeria. The majority of rural dwellers use charcoal as a primary or secondary energy source (Hassan, Mbuli and Dlamini, 2002). Given the popular use despite its hazardous effects, it is imperative that this study be conducted. Also, there is scarcity of information on the perception of the effects of charcoal production on rural households in Kwara State, Nigeria. Therefore, this study seeks to fill this gap. It is against this backdrop that this study therefore aimed to examine the perception of the effects of charcoal production on rural households in Kwara State, Nigeria.

- *The Specific Objectives Were to:*

Determine the motivation for undertaking charcoal production enterprise the respondents in the study area.

Assess the perceived effects of charcoal production on the rural households in the study area.  
 Identify the constraints affecting charcoal production among the respondents in the study area.

• **Hypothesis of the Study**

Ho1: There is no significant relationship between the motivation for undertaking charcoal production enterprise and the Perceived Effects of charcoal production on the rural households.

## II. METHODOLOGY

This study was carried out in Ilorin East Local Government Area of Kwara State, Nigeria. The population for the study consists all household heads who are into charcoal production enterprise. This study involved random selection of one hundred and five (104) rural household heads who are involved in charcoal production enterprise were selected from seven (7) rural communities in Ilorin East Local Government Area of Kwara State, Nigeria. The rural communities are Iponrin, Panada, Apado, Budo Alfa, Alade, Oke Ajia and Agbeyangi. The motivation for undertaking charcoal production enterprise was measured using a 5-point likert typed scale, where Strongly disagreed=1, Disagreed=2, Undecided=3, Agreed=4 and Strongly agreed=5. The perceived effect of charcoal production on rural dwellers was measured using a 5-point likert typed scale, where Strongly disagreed=1, Disagreed=2, Undecided=3, Agreed=4 and Strongly agreed=5 and The constraints affecting charcoal production of the respondents was measured using 3-piont likert typed scale, where Not a constraint=1, Less severe=2, and Highly severe=3. Data were analysed using frequencies, mean, percentages and Pearson Product Moment Correlation (PPMC).

## III. RESULTS AND DISCUSSION

**TABLE 1.** The Motivation for Undertaking Charcoal Production Enterprise.

Motivational factors	Mean Score	S.D	Rank
1. Additional income	4.86	0.35	4
2.Supportive employment opportunity	4.85	0.36	6
3. Availability of good tree species for charcoal production	4.88	0.32	3
4. Availability of market production	4.89	0.31	2
5. To raise money for community project	4.69	0.46	8
6. Off -farming season employment opportunity	4.86	0.35	4
7.Access to information on charcoal production	4.61	0.49	9
8. Every members of the community are into charcoal production	4.14	0.84	11
9. It requires less labor and energy	1.08	0.50	12
10. It is a cheap source of fuel for cooking	4.90	0.30	1
11. Help meets family responsibilities	4.85	1.50	6
12. Use of family labor	4.46	0.56	10

Sources: Field Survey 2020, Likert scale: strongly disagreed = 1, disagreed =2, undecided = 3, agreed = 4 and strongly agreed = 5.

The result in table 1 reveals that the motivation for undertaken charcoal production enterprise. The highest ranked motivation factor was that charcoal is a cheap source of fuel for cooking ( $\bar{x} = 4.90$ ), the second ranked motivational factor was availability of market for charcoal ( $\bar{x} = 4.89$ ), the third ranked motivational factor was Availability of good trees species for charcoal production ( $\bar{x} = 4.88$ ), the forth ranked were Additional income and Off-farming season employment opportunity ( $\bar{x} = 4.86$ ), Supportive employment opportunity and Help meet family responsibilities ( $\bar{x} = 4.85$ ), To raise money for community project ( $\bar{x} = 4.69$ ), Access to information of charcoal production ( $\bar{x} = 4.61$ ), use of family labor ( $\bar{x} = 4.46$ ), every members of the community are into charcoal production ( $\bar{x} = 4.14$ ), It requires less labor ( $\bar{x} = 1.08$ ). This result implies that charcoal is a cheap source of fuel, availability of market for charcoal and availability of good trees species for charcoal was the main motivational factors for undertaking charcoal production enterprise in the study area.

The result in Table 3 reveals the perceived effect of charcoal production on rural households. The highest ranked effect statement was that charcoal production reduces household dependent on petroleum product ( $\bar{x} = 4.99$ ), the second ranked effect was charcoal producers always have burns and cuts injuries ( $\bar{x} = 4.98$ ), the third ranked effect was charcoal production through falling of trees affect plant and animal's biodiversity in the forest and it has health risks such as breathing problem, coughing and irritation to the eyes ( $\bar{x} = 4.96$ ), charcoal production contributes to poverty in rural areas ( $\bar{x} = 4.95$ ), charcoal production enhances the food security of the family, increase income/ lively hood and meets family responsibilities ( $\bar{x} = 4.94$ ), charcoal production exposes the soil to erosion ( $\bar{x} = 4.90$ ), tree cutting for charcoal production leads to deforestation ( $\bar{x} = 4.89$ ). This result implies that the main effects of charcoal production on rural households are that charcoal production reduces household dependent on petroleum product, charcoal producers always have burns and cuts injuries and charcoal

production through falling of trees affect plant and animal's biodiversity in the forest and it has health risks such as breathing problem, coughing and irritation to the eyes.

**TABLE 2.** Perceived Effects of Charcoal Production on Rural Households.

Effects	Mean score	S.D	Rank
1. Has health risks such as breathing problem, coughing and irritation to the eyes.	4.96	0.19	3
2. Increases income/livelihood	4.94	0.23	6
3.Helps meet family responsibilities	4.94	0.23	6
4. Charcoal production helps rural community to get basic infrastructures like water and electricity supply for themselves	4.88	0.35	11
5. Charcoal producers always have burns and cut injuries	4.98	0.14	2
6. Charcoal production cause ill health	2.92	1.59	15
7. Charcoal production contribution negatively to climate change	4.87	0.34	12
8. Tree cutting for charcoal production lead to deforestation	4.89	0.52	10
9. Charcoal production enhances soil nutrient	4.80	0.56	13
10. Charcoal production exposes the soil to erosion	4.90	0.30	9
11. Charcoal production through falling of trees affects plants and animals' biodiversity in the forest	4.96	0.19	3
12. Charcoal production aids desertification	4.75	0.63	14
13. Charcoal production enhances the food security of the family	4.94	0.23	6
14. Charcoal production reduces household dependent on petroleum product	4.99	0.10	1
15. Charcoal production contributes to poverty in rural areas	4.95	0.40	5

Sources: Field Survey 2020; Likert scale: Strongly Disagreed = 1, Disagreed = 2, Undecided = 3, Agreed = 4 and Strongly Agreed = 5.

**TABLE 3.** Constraint affecting Charcoal Production Enterprise.

Constraints	Not a constraint Frequency (%)	Less severe Frequency (%)	Highly severe Frequency (%)	Mean score	Rank
1. High illiteracy among producers	8 (7.7)	61 (58.7)	35 (33.7)	1.26	6
2. Inadequate technical know-how on charcoal production	3 (2.9)	96 (92.3)	5 (4.8)	1.02	7
3.Harrasment by government agent from the ministry of forestry and environment	0 (0.0)	0 (0.0)	104(100.0)	2.00	1
4. High health risk in charcoal production	0 (0.0)	0(0.0)	104(100.0)	2.00	1
5. Scarcity of good tree species for charcoal production	0(0.0)	52(50.0)	52(50.0)	1.50	4
6. Poor government policy on forestry and environment	1(1.0)	53(51.0)	50(48.1)	1.47	5
7. Non-challant attitude of people to afforestation initiatives	0(0.0)	42(40.4)	62(59.6)	1.60	3
8.Transportation challenge	100(96.2)	3(2.9)	1(1.0)	0.05	9
9. Inadequate market for sales of charcoal	102(98.1)	2(1.9)	0(0.0)	0.02	10
10. Scarcity of labour	47(45.2)	57(54.8)	0(0.0)	0.55	8

Sources: Field Survey 2020

The result in Table 3 reveals that high health risks in charcoal production and harassment by government agents from the ministry of forestry and environment ( $\bar{x} = 2.00$ ) was the highest ranked constraint affecting charcoal production among the respondents. Non-challant attitude of people to afforestation initiatives ( $\bar{x} = 1.60$ ), scarcity of good tree species for charcoal production ( $\bar{x} = 1.50$ ), poor government policy on forestry and environment ( $\bar{x} = 1.47$ ), high illiteracy among charcoal producers ( $\bar{x} = 1.26$ ), inadequate technical knowhow on charcoal production ( $\bar{x} = 1.02$ ), scarcity of labor ( $\bar{x} = 0.55$ ), transportation challenge ( $\bar{x} = 0.05$ ), inadequate market for sales of charcoal ( $\bar{x} = 0.02$ ). This result implies that high health risks in charcoal production and harassment by government agents from the ministry of forestry and environment was the main constraint affecting charcoal production enterprise in the study area. This further implies that there were a lot of challenges affecting charcoal production.

**TABLE 4.** The result of correlation between motivation and undertaking and the perceived effect of charcoal production.

Variable	r value	p value	Remark
Motivation Factors and Perceived Effects	-0.008	0.934	Not-significant

The result in table 4 reveals that there is no significant relationship between the perceived effect and motivation for undertaking charcoal production enterprise ( $r=0.008$ ,  $p=0.934$ ). This implies that the motivational factors do not have influence on the perceived effects on charcoal production in the study area.

## CONCLUSION

Based on the findings of this study, the study concluded that charcoal is a cheap source of fuel, availability of market for charcoal and availability of good trees species for charcoal was the main motivational factors for undertaking charcoal production enterprise in the study area. The major effects of charcoal production on rural households are that charcoal production reduces household dependent on petroleum product, charcoal producers always have burns and cuts injuries and charcoal production through falling of trees affect plant and animal's biodiversity in the forest and it has health risks such as breathing problem, coughing and irritation to the eyes. The high health risks in charcoal production and harassment by government agents from the ministry of forestry and environment was the main constraint affecting charcoal production enterprise in the study area.

## RECOMMENDATION

1. There should be provision of awareness on the health and environmental effects of cutting trees for charcoal production.
2. There should be provision of training on sustainable and eco-friendly mean of livelihoods to rural households.
3. Government should provide sustainable alternatives to the use of charcoal for cooking.

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