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Full Length Research Paper

Evaluation of Commercial Woodfuel Harvesting in Nigeria's Kaduna State's Jema'a Local Government Area

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In any state or country, energy is the key component or instrument for socioeconomic development and a measure of prosperity. Although Nigeria has several clean energy resources, including geothermal, wind, solar, and hydropower, both rural and urban communities rely significantly on biomass fuels like charcoal, wood fuel, and manure to meet their energy demands. In order to provide information for decision-making, this article evaluates commercial woodfuel harvesting in Jema'a Local Government, Kaduna State, Nigeria. The questionnaire, focus groups, in-depth interviews, and direct field observation were used to gather data for this study. In order to analyze the data, descriptive statistics were used. The findings indicate that the elements that contribute to the rise in commercial woodfuel harvesting in the research region include poverty, unemployment, seasonality of employment, the availability of wood fuel resources in the area, the sufficiency of food, and a source of revenue. In Jema'a local government, the most popular tree species for commercial woodfuel harvesting are Madobiya, Baushe, Kashin awaki, Kafaffago, Marke, Jan yaro, and Kujeme. Due to their flammability, ability to convert wood fuel to charcoal after use, low smoke generation, and ease of resizing, the majority of these species are the most popular. It is advised that individuals in every region of the nation have access to reasonably priced clean and alternative energy sources.

Key words: Commercial wood fuel, Harvesting, Business, Energy.

INTRODUCTION

The Every element of our socioeconomic existence is significantly impacted by energy. In any state or country, energy is the key component or instrument for socioeconomic growth and a measure of wealth (Akuru and Animalu, 2009). The quality of life is negatively impacted by an inadequate energy supply, which also inhibits economic growth and socioeconomic activities (Energy Commission of Nigeria [ECN], 2003). Both rural and urban households in Nigeria rely significantly on biomass fuels like dung, woodfuel, and charcoal for their energy needs, despite the country's abundance of clean energy sources, including hydropower, geothermal, wind, and solar. For instance, according to ECN (2003), more than 60% of Nigerians rely on wood fuel for cooking and other household tasks. This is a sign of energy and income poor. The extensive use of ineffective cooking techniques, the most popular of which is still open fire, has made wood fuel use worse and given rise to commercial woodfuel collection, particularly in developing nations. For instance, due to the range of activities and employment opportunities it generates, the current status of woodfuel gathering has shifted from subsistence to commercial (Naibi, 2015). [11]. In rural parts of developing nations, the commercial production and distribution of charcoal and woodfuel creates a substantial amount of revenue and jobs (WEO, 2006) [17]. For instance, the production and distribution of biomass produces over 200,000 employment and brings in over $50

million annually.

High levels of illiteracy, underdevelopment, unemployment, social and economic poverty, and increased migration are all consequences of an economy's insufficiency or lack of energy (Hermann, N.D., in Ajayi, 2013). [3]. Despite the existence of forest reserves and national parks, the amount of woodfuel produced seems to be increasing (Ewah, 2014) [7]. Trees are cut down for woodfuel and sold throughout Nigeria's ecological zones, including Northern Nigeria. Due to the undefined rural-to-urban movement in northern Nigeria, the need for wood fuel is rising daily. The market for woodfuel is constantly expanding, which is why the amount of trees being taken is rising (Adewuyi and Olofin, 2014). [2]. To raise the level of living for the people, Nigeria's energy industry needs to be improved with purposeful and persistent effort. Making decisions about the production and distribution of our energy requires having accurate and sufficient information about the factors driving the growth of commercial woodfuel harvesting and enterprises. Considering that Jema'a Local Government area is the center of Southern Kaduna, with a high rate of population growth and a variety of commercial activities, no comprehensive study on the commercialization of woodfuel harvesting has been documented to determine why people are involved in the woodfuel industry. This is an important tool to gauge our level of income and energy distribution. In order to give information for decision-making, this article evaluates commercial woodfuel harvesting and companies in Jema'a Local Government, Kaduna State, Nigeria.

MATERIALS AND METHODS

Study Area

The study area is Kaduna State's Jema'a Local Government Area. The local government of Jema'a is situated east of the Greenwich Meridian between latitudes 9 ¸ 11′ and 9o 30′ N and longitudes 8 00′ and 8o 30′. According to Koppen, it has an AW climate, which is distinguished by two distinct seasons: wet and dry. While the dry season lasts from November to March, the rainy season lasts from April to October, with the highest amount of rainfall occurring in August. The tropical continental and tropical maritime air masses have an impact on these seasons. The average monthly temperature is 250°C, the average annual rainfall is approximately 1800 mm, and the relative humidity is roughly 62% (Abaje and Giwa 2007, as mentioned in Ishaya and Abaje 2008). Guinea savanna vegetation is found in the research region (Buba, 2015) [6]. Approximately 20–40 m tall trees, bushes, and long grasses up to 3 m tall are characteristics of this savanna forest. In addition to common grasses like elephant grass, Pennisetum purpureum, Andropon gayanus, and Tridax procuben, the area is home to a number of tree species, including Ceiba petandra, Parkia biglobosa, Khaya senegalensis, Mangifera indica, Vitex doniana, Anogeissus leiocarpus, Borrasus aethiopum, Piliostigma thonningii, and Prosopis Africana. Human activities such bush burning, woodfuel logging, farming, timber extraction, and animal grazing have significantly altered the study area's natural plant coverings (Abdul, 2010) [1]. It was noted, for example, that the research area contains a variety of woodlands, including the Nindem and Sanga forest reserves, which have been deteriorated by human activity.

2.2. Procedure for data Collection and Analysis

2.2.1 Type and Sources of Data

The questionnaire, focus group discussions (FGD), in-depth interviews, and direct field observation were the key sources of the data used in this study. The study's target demographic consists of local forest officials, wholesalers, traditional leaders, and wood fuel cutters and producers. The availability sampling approach was used to conduct the questionnaire, which included closed-ended questions. The demographic details of the respondents, the most popular tree species and the reasons behind their popularity in the study region, and the factors influencing the commercial harvesting of wood fuel in the study area are among the data gathered from the questionnaire. Additionally, periodicals, unpublished dissertations, and theses were used as documentary sources.

2.2.2 Sampling Technique

To gather the study's primary data, a field survey was conducted in the study area. Direct field observation, in-depth interviews, focus group discussions, and questionnaire surveys were used to gather the study's primary data. Using the availability sampling approach, 195 questionnaires were sent to respondents throughout the study area. Because the majority of respondents combine commercial wood fuel enterprises with farming and other civic tasks, making them unavailable at all times, the availability sampling technique was used. The availability of commercial wood fuel companies in the study area determined the sampling strategy. Woodfuel cutters/suppliers and wholesalers made up the two groups of respondents to the inquiry. The population of registered members of woodfuel cutters/producers (320) and wholesalers (20) comprised the sample size of 195 respondents for the questionnaire administration (Krejcie and Morgan, 1970). The sample villages were chosen using a purposeful sampling technique. Woodfuel cutters and distributors who did not take part in the questionnaire survey were included in two focus groups for the study. Every participant in the focus group was specifically chosen to participate as a discussant. To address concerns and questions enumerated for the study, a group of six to ten participants from a certain category were chosen in one location, followed chronologically by another category. The purpose of the FGD was to supplement the findings from the questionnaire survey. In order to identify the most popular tree species in the research area, direct field observation was also conducted to sites where trees were being harvested for the production of commercial woodfuel and the selling points. Traditional leaders and representatives of the local government's forest department were among the key informant officers in the study region who were interviewed in-depth.

2.2.3 Procedure for Data Analysis:

There were two types of data gathered from the field

survey: qualitative and quantitative. While the quantitative data was evaluated using descriptive statistics like tables and percentages, the qualitative material was transcribed and presented in a narrative fashion to support the quantitative data.

Results and Discussion

Respondents' Demographic Details in the ssssResearch Area

About 66.7% of the participants in this survey were farmers, 3.6% were artisans, 5.6% were traders, and 24.1% were both farmers and traders. Small-scale agricultural pursuits including raising cattle and growing crops were practiced by even those who denied being farmers. About 36% were men and 64% were women. According to this report, women are at the top of the commercial wood fuel production ladder. 77% were married, 1% were single, 20.5% were widowed, 1.5% were divorced, 3.6% were between the ages of 20 and 29, 28.2% were between the ages of 30 and 39, 51.3% were between the ages of 40 and 49, and 16.9% were above the age of 50. Here, the majority of those working in commercial wood fuel companies are young, highly motivated individuals between the ages of 30 and 49 who should be employed to support national growth but instead cause major harm or improper management of the environment's resources. Regarding education, 33% have completed primary school, 39.4% have completed secondary school, 15% have completed tertiary school, and 20% possess additional education or knowledge.

1.1 Commercial wood fuel harvesting factors in the Jema'a local government region

The Jema'a local government's commercial wood fuel harvesting is caused by a wide range of circumstances. These characteristics include poverty, unemployment, job seasonality, food sufficiency, income source, population growth, and the availability of wood fuel resources in the research area. They also involve the wood fuel company being inherited from parents.

According to the results, 58.5% of respondents strongly agreed and 40.5% agreed that the Jema'a local government's increased commercial woodfuel collection is a result of poverty (table 1). They asserted that the majority of the important players are obliged to work in the woodfuel industry due to poverty. By supplying jobs, cash, and other necessities for the family, commercial woodfuel harvesting lowers the poverty level. This is in line with Bashir (2015) [5] and the United Nations Development Programme (UNDP) (2008) [14], which found that the woodfuel industry helps many young people who work in the fields of cutting, resizing, transporting, loading, and offloading, as well as selling woodfuel. Additionally, marketing biomass, such as woodfuel and charcoal, may help achieve the Sustainable Development Goals (SDGs) of eradicating poverty and unemployment. For many low-income families in third-world countries, biomass harvesting and sales could be a major source of income. However, 1% and 0.5% contended that commercial woodfuel harvesting cannot be attributed to poverty. They pointed out that because there are no other energy sources available in the research location, they capitalize on the large market for commercial woodfuel. It was noted that a large number of people work in the environmentally unfriendly commercial woodfuel industry in order to make a living. Nonetheless, one of their sources of income is the woodfuel industry. Because of the extreme poverty in the area, they became interested in the woodfuel industry. Their family necessities, such purchasing food and ingredients, covering their children's tuition, and purchasing books, are met by the woodfuel business. Eating three times a day is challenging for many of them. However, they are able to meet the majority of their family's demands because to their involvement in the woodfuel industry. The head imam of Dangwa Village provides a clear illustration of this view: The extreme poverty in our community is the reason we engage in commercial woodfuel collection. Due to our poverty, we struggle to eat three times a day, but our participation in the commercial woodfuel industry has allowed us to meet our family's needs, including purchasing food, paying for our children's tuition, and purchasing books (Mohammed, Per. Com, August, 2017). [18].

Many people are compelled to participate in commercial woodfuel harvesting since the woodfuel industry generates a lot of revenue. However, people won't go into the forest for commercial woodfuel harvesting once poverty is reduced enough for them to be able to provide for their family's needs, such as paying for their children's school fees, providing food and clothing, and paying medical bills without having to visit their stores. A woman in Bade village provided an example of this: Even though we make money from the woodfuel business, we won't go to the forest for commercial woodfuel harvesting if poverty is reduced to the point where we can no longer go to our stores to pay for our children's school fees, clothes, or medical bills (Joseph, Per, Com, August, 2017) [22]. Due of poverty, a large portion of the impoverished in emerging nations will actually continue to rely on wood fuel as a source of employment and income.

Table 2: Unemployment is Responsible for Commercial Woodfuel Harvesting in Jema'a LGA

SA	A	SD	D	Total
130	60	3	2	195
66.7%	30.8%	1.5%	1.0%	100%

According to Table 2, 6.7% and 30.8% of respondents strongly agreed and agreed that commercial woodfuel harvesting in Jema'a local government is caused by unemployment. Due to a shortage of employment, the majority of important figures in the local government of Jema'a engaged in commercial woodfuel collection. They choose to work in the woodfuel industry because it allows them to make a living by extracting vegetative resources and selling them. Because it creates jobs for people like wood cutters, transporters, resizers, and salespeople, the woodfuel industry lowers young unemployment. The woodfuel is loaded and unloaded from trucks by others. These groups of people receive compensation for the services they provide to their owners. However, since many of the important players in the commercial woodfuel harvesting industry have advanced degrees such diplomas and NCEs but are unemployed, unemployment is one of the main reasons of this industry. Nobody would complete their education and want to remain jobless. This has compelled them to search for an other source of income, which is the commercial woodfuel industry. They will be deterred from entering the forest for commercial woodfuel gathering, which has a negative impact on the vegetation, soil, and wildlife, if jobs or loans are offered. According to a woman from Tafan village, many of us have advanced degrees such diplomas and Nigeria Certificates of Education (NCE), but we only work in agriculture, which is the only source of our year-round food. Keep in mind that nobody wants to get their education and then sit around doing nothing in society. In order to benefit ourselves, we entered the commercial woodfuel industry (Yohanna, Per. Com. August, 2017) [25].

Table 3: Seasonality of Job is Responsible for Commercial Woodfuel Harvesting in Jema'a LGA

SA	A	SD	D	Total
130	58	4	3	195
66.7%	29.7%	2.1%	1.5%	100%

Table 3 shows that 66.7% of respondents strongly agreed and 29.7% agreed that commercial woodfuel harvesting is caused by work seasonality. In contrast, 1.5% and 2.1% disagreed and strongly disagreed that commercial woodfuel harvesting in the Jema'a local government region cannot be attributed to job seasonality. The findings indicate that commercial woodfuel harvesting in the Jema'a local government region is similarly influenced by the seasonality of jobs. The majority of important players, particularly those in rural areas, take advantage of the dry season to start a woodfuel company, which helps them meet some of their family's expenses like purchasing groceries, clothing, and school fees for their kids. This result is consistent with Al-Amin (2014), who claimed that the woodfuel economy has grown to be a well-liked part-time employer of rural workers, particularly in the off-season. With the seasons, the majority of them operate in shifts. In order to raise money to address other issues they have, they participate in commercial woodfuel collection during the dry season when they have more time on their farms. The proceeds from the sale of wood fuel during the dry season are used to buy food and clothing for the family, fertilizer, and other agricultural inputs like insecticide and herbicide in preparation for the rainy season. Additionally, it helps them avoid problem of any kind throughout that dry season. A guy in Dangwa village describes how we engage in commercial woodfuel collecting during the dry season, when we have more time on our farms, in order to make money for other issues we had during that time, such returning to our farms when the rains return. In order to boost our yield during the wet season, we use the funds to purchase fertilizer and other agricultural inputs like insecticide and herbicide. Participating in the dry season woodfuel collection process also helps to avoid potential problems. This is due to the fact that inactivity might lead to questionable social activities (Mohammed, I. Per. Com. August, 2017)[18]

Table 4: Adequacy of Food is Responsible for Commercial Woodfuel Harvesting in Jema'a LGA

According to Table 4, 76.9% of respondents strongly agreed and 20% agreed that the Jema'a local government's commercial woodfuel collection is caused by a lack of food. Food is necessary for human survival. However, a shortage of food drives many people to engage in any type of business in order to survive. Due to their occasional food shortages, the majority of the main players were compelled to engage in commercial woodfuel gathering. They are able to purchase more food for their families thanks to the woodfuel sale. This is in line with the Regional Wood Energy Development Programme in Asia (1997) [12], which claimed that the ability to make money from a woodfuel business offers impoverished people a safety net during difficult times or when crops are insufficient for subsistence. To save or preserve their farm produce for later use or for a long time, they also engage in commercial woodfuel collection. Since they are peasant farmers who cannot produce enough for their family, the money raised from the sale of wood is used to purchase extra food, easing the strain on the product from their farms. Food is therefore saved for the upcoming rainy season. According to Gidan Waya, a man in New-York Village, I run a commercial woodfuel business because it spares my store from further strain because the money I make from selling the woodfuel helps me buy more food for my family and keep what I've produced for a long time because I don't produce much that would sustain my family for a long time because of financial constraints (Danladi, Per. Com. August, 2017)[20].

Table 5: Income generation is Responsible for Commercial Woodfuel Harvesting in Jema'a LGA

SA	A	SD	D	Total
119	41	14	21	195
61%	21%	7.2%	10.8%	100%

Table 5 shows that 61% and 21% of respondents, respectively, stated that commercial woodfuel harvesting in Jema'a local government is primarily responsible for income generating. However, 10.2% disagreed and 7.2% strongly disagreed. According to this result, commercial woodfuel harvesting in the Jema'a local government region increases as a result of income generating. This is due to the fact that the majority of the major players take advantage of the high cost of alternative energy sources to reduce the amount of wood fuel available for sale in order to make money. This finding is comparable to that of the Regional Wood Energy Development Programme in Asia (1997) [12], Feka and Manzano (2008) [9], and USAID (2006) [16], which found that the woodfuel industry provides roughly 10% of rural households with their primary source of income and 40% of their cash earnings, and that the money raised from the sale of woodfuel enables them to meet basic and urgent needs like purchasing children's books and household rationing. Approximately 90% of the impoverished rely on forests for at least a portion of their income, and three out of four of them reside in rural areas where they rely on natural resources for their livelihoods. In order to provide for their families, they engage in commercial woodfuel collection. Without depending on anyone else, they raise money for themselves through the woodfuel company. Even in metropolitan areas like Kafanchan, Keffi, and Jos, the woodfuel industry employs a large number of people. Some of these individuals work as transporters, vendors, dealers, distributors, and others who resize woodfuel. The money earned from the woodfuel business is utilized to meet their family's needs, including purchasing ingredients, paying for their children's school fees, and health care, which has lessened tension between family members, particularly those who formerly relied on one another for a living. The reason for this is that it has allowed them to get money in advance to meet their family's needs, and when the woodfuel is available, they invite their clients to come get it without upsetting their relationships to give them money as they used to. As said by a woman at Dangwa: The woodfuel company has helped me and my in-laws have less friction because I used to bother my brothers for food, money, and other necessities, which occasionally caused strife in the family. However, since I established the woodfuel business, I have had every opportunity to collect money from my clients whenever I need it, and they will come for the woodfuel whenever it is available, so I no longer require money from anyone to meet my family's needs (Barde, Per. Com. August, 2017).

Table 6: Availability of Woodfuel Resources is Responsible for Commercial Woodfuel Harvesting in Jema'a LGA

SA	A	SD	D	Total
77	107	11	0	195
39.5%	54.9%	5.6%	0%	100%

Table 6 shows that 39.5% and 54.9% of respondents strongly agreed and agreed that the Jema'a local government's commercial woodfuel harvesting is a result of the availability of woodfuel resources. However, 11 people (5.6%) disagreed vehemently. The study area is located in northern Nigeria's Guinea savanna, which is home to a variety of woody species. The majority of the major players take advantage of this chance to harvest vegetative resources for wood fuel. Because of this, persons in the research region are engaged in commercial woodfuel harvesting due to the abundance of woodfuel resources. Due to the abundance of trees and the sizeable market for woodfuel in the study area, the majority of people participate in commercial woodfuel collection. For instance, they used to have a lot of wood fuel when they opened a new farming area, which could be lost from bush burning if it isn't cut for sale. As demonstrated by a woman in Jagindi:

We started this business because there are wood fuel resources all around us that, if not harvested for the market, would be wasted by bush burning because our consumption

in the forest would not be sufficient to finish them (Yakusak, Per. Com. August, 2017).

They have the chance to harvest vegetation for the market because there is wood fuel available nearby, which is similarly scarce in other places where it is needed. Because trees are found in the jungle or forest, people are cutting them down and selling them as a result of population growth, rising kerosene prices, and other energy sources that they cannot afford for domestic use. There are many opportunities for people to get involved in the commercial woodfuel business in Jema'a local government because of the bakeries in Jagindi Tasha, Godogodo, Gidan Waya, and Kafanchan, as well as hotels, Suya spots, and Akara vendors who also require woodfuel.

Table 7: Increase in population is responsible for commercial woodfuel harvesting in Jema'a LGA

SA	A	SD	D	Total
40	125	21	9	195
20.5%	64.1%	10.8%	4.6%	100%

Competition brought on by population growth causes people to put more strain on the resources that are available. Table 7 shows that 20.5% and 64.1% of respondents strongly agreed and agreed that commercial woodfuel harvesting in Jema'a local government is a result of population growth. However, 4.6% disagreed and 21 (10.8%) strongly disagreed. A larger market for goods and services is created by population growth. Nigeria's recent population growth has made room for a variety of enterprises, including the commercial woodfuel industry. People are now forced to use wood fuel and charcoal because they are readily available, inexpensive, and more affordable than other energy sources like liquefied natural gas and kerosene. The producers can now harvest woodfuel for the market thanks to this. This result is consistent with the United Nations Sudano-Sahelian office (1992) [15], which found that the demand for wood fuel has been increasing, particularly in large towns, as a result of population expansion, poverty, and the high cost of alternative energy sources.

Table 8: Parents are Responsible for Commercial Woodfuel Harvesting in Jema'a LGA

SA	A	SD	D	Total
89	81	14	11	195
45.64%	41.54%	7.18%	5.64%	100%

According to the results in Table 8, 45.64% and 41.54% of respondents, respectively, strongly agreed and agreed that parents should be in charge of commercial woodfuel gathering in the Jema'a local government. However, 5.64% disagreed and 7.18% strongly disagreed. Children whose parents work in the commercial woodfuel industry are more likely to follow in their footsteps. As they get older, they may be encouraged by their parents to pursue the same line of work. It was noted that some parents encouraged their kids to work in the commercial woodfuel industry. They inherited the woodfuel company from their parents, who were also involved in the harvesting and marketing of wood. Some of the kids learned that their parents make a lot of money from commercial woodfuel harvesting, which is what makes the majority of them want to work in the woodfuel industry. When they were young, their parents used it to pay for their school fees, food, and clothing, which led them to do the same for their own kids.

1.2 Preferences for Tree Species in the Jema'a Local Government Area

The most popular tree species in the research region are examined in this section. The reasons why people favor them over alternative woodfuels are also covered.

Table 9: The most preferred tree species in Jema'a LGA

Kafaffago, Madobiya, Baushe, Marke, Jan yaro, Kashin awaki, and Kujeme	Kafaffago, Madobiya, Baushe, Marke, Kashin awaki	Baushe, Marke, and Kashin awaki	Kafaffago, Madobiya, Baushe, Marke, Jan yaro	Total
95	21	21	58	195
48.7%	10.8%	10.8%	29.7%	100 %

Several tree species, including Daniellia oliveri, Vitex doniana, and Parkia biglobosa, are known to be used for woodfuel in the Jema'a local government area. However, during the rainy season, these trees absorb excessive amounts of water, producing a lot of smoke that deters customers. However, the most favored tree species include Terminalia avicenioides (Baushe), Pterocarpus erinaceus (madobiya), Crossopteryx febrifuga (Kashin awaki), Anogeissus leiocarpus (Marke), Hymenocardia acida (Janyaro), Lophira alata (Kujeme), Terminalia macroptera (Kandere), and Uapaca togoensis (Kafaffago). The most preferred tree species were identified by 95 (48.7%) of the respondents as Kafaffago, Madobiya, Baushe, Marke, Jan yaro, Kashin awaki, and Kujeme; 21 (10.8%) as Kafaffago, Madobiya, Baushe, Marke, and Kashin awaki; another 21 (10.8%) as Baushe, Marke, and Kashin awaki; and 58 (29.7%) as the most preferred tree species (table 9). However, it was noted that due to its flammability, Pterocarpus erinaceus has great market patronage. The majority of the species that the respondents listed are woody species that are easy to resize, emit little smoke, absorb little water, and catch fire well. Producers in the study area now have the chance to harvest those species for the market. No one wants to purchase woodfuel from other tree species when these woody species are available. This conclusion runs counter to that of Isma'il et al. (2015) [10], who found that the most popular tree species for woodfuel in the Ikara local government area of Kaduna state were locust beans, acacia, tamarindus,

baobab, and neem. Because of its spongy nature, which makes it difficult to maintain fire, baobab is rarely utilized as wood fuel.

1.2.1 Reasons for the Study Area's Favorite Tree Species

The causes of some of these tree species becoming the most popular in the research region are covered in this section. However, the majority of people favored wood fuel from the aforementioned tree species for a number of reasons, including its flammability, the smoke it produces, its ability to be easily resized, and its conversion to charcoal after usage.

Table 10: Flammability of the Woodfuel as a Reason for the most preferred Tree Species

SA	A	SD	D	Total
137	41	0	17	195
70.3%	21%	0%	8.7%	100%

According to the results in Table 10, 70.3% of respondents strongly agreed and 21% agreed that people prefer wood fuels over other species because of their great flammability. Because they absorb little to no water throughout the wet or dry seasons, the majority of the tree species mentioned above are extremely combustible (catch fire). But the most flammable wood fuel is Pterocarpus erinaceus. Even though Anogeissus leiocarpus is a very good fire starter, it is quite difficult. Because of its minimal water absorption, which allows them to easily prepare meals and last longer or sustain fire for a very long time, there are no difficulties for users. Compared to other wood in the market, this draws more people to look for them. Particularly during the rainy season, tree species like Daniellia oliveri, Vitex doniana, and Parkia biglobosa are hard to keep fire going because they absorb too much water. The majority of the tree species we choose in the bush are ones that burn very well and endure longer when cooking, as one woman in Gwaska made clear.

They are the ones that users require in order to consume. We would waste time and energy if we used wood fuels like Maje and Dinya's because they absorb too much water, especially during the rainy season. (September 2017, Gabo, Per. Com.) [21] Even during the rainy season, the plants that the respondents indicated absorbed little to no water, which is why people preferred them over other woody species. However, 17 (8.7%) contended that the most popular tree species in the study area are a matter of preference rather than the high flammability of the woodfuel. Some people choose the ones that are readily available rather than those that are flammable.

Table 11: Smoke Produced by the Woodfuel as a Reason for the most preferred Tree Species

SA	A	SD	D	Total
158	37	0	0	195
81%	19%	0%	0%	100%

According to the results in Table 11, 81% and 19% highly agreed and agreed that the most chosen species in the Jema'a local government is because woodfuel produces less smoke. According to the responses, one of the reasons why individuals favor woody species over others is their low smoke production. There is less smoke since they absorbed less water. Unlike woodfuel from Daniellia oliveri (Maje/Kadarwa), Parkia biglobosa (Dorawa), and Vitex doniana (Dunya), which are not good for cooking, especially during the rainy season when the woodfuel absorbs too much water and produces a lot of smoke, most woodfuels do not produce a lot of smoke because they are good for cooking. People dislike them because they produce excessive amounts of smoke, which poses a major risk to their health by causing respiratory conditions including asthma and eye problems.

Table 12: Conversion of the Woodfuel to Charcoal after use as a Reason for the most preferred Tree Species

SA	A	SD	D	Total
165	25	4	1	195
84.6%	12.8%	2.1%	0.5%	100%

According to the results in Table 12, 84.6% and 12.8% of respondents, respectively, stated that individuals are more likely to seek out wood fuels that are converted to charcoal after consumption than other types of wood fuel. After cooking, customers douse it with water to put out the fire and save charcoal for subsequent use, which lowers their daily woodfuel costs. Because they create a lot of ashes, species like Daniellia oliveri, which don't sustain fire, are more likely to produce charcoal, which is what draws customers to them than woodfuel from other trees. The majority of them pointed to the utilization of woody species for charcoal, which is made from wood fuel. They benefit from the conversion of wood fuel to charcoal, which lowers the cost of purchasing wood fuel for daily consumption.

Table 13: Easy to resize as a Reason for the most preferred Tree Species

SA	A	SD	D	Total
96	91	3	5	195
49.2%	46.7%	1.5%	2.6%	100%

According to Table 13, 49.2% and 46.7% of respondents, respectively, stated that they preferred woodfuels that were easier to resize. In this instance, the wholesalers seek out wood fuel that is easily resized because tougher wood makes it difficult for the people they employ to resize it. For example, it is simple to resize

woodfuels like those from Kafaffago, Madobiya, and Baushe. Those that are hired to resize them can complete the task quickly and efficiently. Because they would complete their work on time, those who resize the woodfuel are always pleased to see woodfuel from Kafaffago, Madobiya, and Baushe.

Conclusion

Resources found in vegetation are utilized to advance human progress. The human population relies on vegetative resources for shelter, food, and therapeutic benefits. Due to insufficient electricity supplies and other alternative energy sources, people in poor nations, particularly those in Sub-Saharan Africa, engage in commercial woodfuel collecting and business. This has encouraged a lot of individuals, particularly the impoverished in rural areas, to engage in commercial woodfuel collection. According to this study, the commercial woodfuel harvesting and companies in Jema'a local government can be attributed to a number of factors, including poverty, the availability of woody resources, and a source of revenue. This primarily happens as a result of the rural population's disregard for the authority's duty to provide them with the necessities of existence. The needs of the consumers determine the harvesting of wood fuel for commercial use, enabling producers to harvest tree species with strong market demand. Requesting that people refrain from entering the forest to harvest wood for commercial purposes will result in job losses, a rise in poverty, and an increase in crime. Therefore, it is advised that woodfuel collectors be permitted to trim tree limbs rather than eliminating the entire stand. In every region of the nation, individuals should have access to reasonably priced clean and alternative energy sources.

Reference

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