

# Knowledge Level of Farmers on Agricultural Wastes Utilization in South West Nigeria

Akinmolafe, Abiodun Oladele<sup>1\*</sup>; Akinagbe, Oluwole Matthew<sup>2</sup>  
 Department of Agricultural Extension and Communication Technology,  
 School of Agricultural and Agricultural Technology,  
 Federal University of Technology, Akure Ondo State, Nigeria

Corresponding Author:- Akinmolafe, Abiodun Oladele<sup>1\*</sup>

**Abstract:-** Turning agricultural wastes into wealth is a major focus of every government, supporting the livelihood of millions of households in Nigeria. The study was carried out to determine the knowledge level of farmers on Agricultural Wastes utilization in South West Nigeria. The selected States were Ekiti, Ogun and Ondo. Multi-stage sampling techniques was used for the study to gather 260 farmers as the sample for the study. Interview schedule was used to elicit information on socio-economic characteristics of the respondents, available agricultural wastes in the study area and the knowledge level of the farmers. Data were analysed using, frequency distribution, percentage, mean and correlation analysis. The study revealed that male dominated farming (83.8%), Christianity is the religion of the majority (81.2%), mean age of the farmers stood at 44.8 years, majority (89.6%) were married, majority (80.8%) were adjudged to be literate, the mean household size stood at 6 persons and mean income was ₦870,000.00. Some of the available agricultural wastes were cocoa pods, feathers, maize shafts, cassava peels etc. The knowledge level of farmers on agricultural wastes utilization was low. The results of correlation analysis revealed that there was significant relationship between knowledge level and agricultural wastes utilization. The study concluded that the knowledge level of the respondents on AW utilization was adjudged to be low and thereby recommends that Governmental agencies, NGOs and other stakeholders should sensitize farmers more on potentialities of Agricultural Wastes.

**Keywords:-** Knowledge Level, Agricultural Wastes, Utilization.

## I. INTRODUCTION

It is not a strange sight in rural areas or urban cities in South-Western States of Nigeria to see dunghills or dumping ground, where wastes either industrial, domestic or farm yard are dumped. Waste is defined as any unavoidable material resulting from domestic activities or industrial operation for which there is no economic demand and which must be disposed off. (Benjamin, Okafor, and James, 2019).

If wastes are properly utilized for economic purposes they will reduce the hazardous threats and thus improve the economic standard of the farmers. World Bank Group

(WBG) (2018) reported that, solid waste management is a universal issue affecting every single person in the world. Individuals and governments make decisions about consumption and waste management that affect the daily health, productivity, and cleanliness of communities.

Food and Agriculture Organization (FAO) (2014) described crop residues as the fibrous parts of cereals, sugar cane, roots and tubers, dried fruits, etc. Their common features include the fact that they comprise the parts that are not consumed by humans after the harvest, and also that they have low feed value for animals and a very low or non-existent feed value for monogastric animals.

Agricultural wastes are unusable substances that may be either liquid or solid produced as a result of cultivation process such as fertilizers, pesticides, crop residues and animal waste (Shehrawat, Sindhu & Devi 2015). Oladipo, Olorunfemi, Adetoro & Oladele (2017) submitted that one of the main features of agriculture today is waste, which is inevitable on farmlands. Globally, 2.01 billion metric tons of waste is generated every year from agriculture (WBG 2018). This volume of waste generated by farmers household can be converted to an enormous amount of energy and raw materials.

### ➤ Problem Statement

Baruwa and Omodara (2018), submitted that agricultural wastes in Nigeria have not been properly utilized. This may be due to several factors including ignorance, lack of technical-know-how, high cost of management, unavailability of appropriate technology, and lack of policy initiatives. From this submission Agricultural wastes needs technological-know-how before it can be handled properly. Some farmers do not even know what else can be generated from the residues or leftovers of their harvests, some count it as waste of resources to spend money, time and energy on wastes. Therefore, if waste according to these farmers are useless, why wasting resources on agricultural wastes?

In reality, most of the materials usually regarded as wastes could constitute part of natural assets based within the rural environment that could be converted to important local resources by the rural inhabitants. They should at best be regarded as by-products in which their utilization could enhance sustainable livelihood diversification and facilitate

economic empowerment of the rural populace. Going by the above statement the study attempted to identify gaps on agricultural wastes utilization in the study area in order to proffer recommendations that will guide stakeholders towards waste utilization for attainment of sustainable rural economy.

➤ *Objectives of the study*

The broad objective of the study was to determine the utilization of agricultural wastes in rural areas in South-West, Nigeria.

• *The Specific Objectives were to*

- ✓ Ascertained the Socio-Economic Characteristics of the Farmers in the Study Area;
- ✓ Identified Types of Agricultural Wastes Available in the Study Area;
- ✓ Ascertained the Respondents' Knowledge Level on Utilization of Agricultural Wastes;

➤ *Hypothesis of the Study*

- *H<sub>01</sub>: There is no significant relationship between farmers' knowledge level of agricultural wastes and their utilization.*

## II. THE STUDY AREA

➤ *The Study was Carried out in Ekiti, Ogun and Ondo States, South-West, Nigeria.*

Ekiti State is situated entirely within the tropics. It is located between longitudes 40°51' and 50°451' East of the Greenwich meridian and latitudes 7°151' and 8°51' north of the Equator. It lies south of Kwara and Kogi State, East of Osun State and bounded by Ondo State in the East and in the south, with a total land Area of 5887.890sq km. Ekiti State has 16 Local Government Councils. By 2006 Census, the population of Ekiti State was 2,384,212 people with the capital located at Ado-Ekiti. Ogun State is a state in South-West Nigeria. Created on 3rd February, 1976 from the former Western State. Ogun State borders Lagos State to the south, Oyo State and Osun State to the north, Ondo State to the east, and the Republic of Benin to the west. Abeokuta is both Ogun State's capital and most populous city.<sup>[3]</sup> Ogun state is covered predominantly by rain forest and has wooden savanna in the north west.<sup>[4]</sup> Ogun State had a total population of 3,751,140 residents as of 2006. Ondo State is a state in South Western Nigeria. It was created on 3rd February 1976 from the former Western State.<sup>[4]</sup> It borders Ekiti State to the north, Kogi State to the north east, Edo State to the east, Delta State to the south east, Ogun State to the south west, Osun State to the north west, - and the Atlantic Ocean to the south. The state's capital is Akure.

➤ *Population of the Study*

The population of the study were all farmers in South – West Nigeria.

➤ *Sample and Sampling Techniques*

Multi-stage sampling techniques was used for the study. The first stage involved random selection of three (3) out of the six States in South-West Nigeria. At the second stage, proportionate selection of 23% of Local Government Areas in each of the state which gave approximately 4, 5 and 4 Local Government Areas for Ekiti, Ogun and Ondo States respectively. The third stage involved simple random selection of 2 rural communities from each of the selected Local Government Areas to give 8, 10 and 8 rural communities from Ekiti, Ogun and Ondo States respectively. At the last stage, 10 farming households were randomly selected from each of the selected communities given a total of 80, 100 and 80 farming households for Ekiti, Ogun, and Ondo States respectively. Thus, a total of 260 respondents will constitute the population sample for the study.

The research instrument was validated by experts in the Department of Agricultural Extension and Communication Technology of Federal University of Technology, Akure. Their comments and suggestions were harmonized and utilized in improving and standardizing the research instrument. The instrument's reliability was determined using test-retest method. 20 farming households was selected from the communities not included in the sample. The research instrument was administered on them separately at two weeks interval.

## III. METHODOLOGY

To ascertain the socio-economic characteristics of the farmers (Objective 1) was measured using frequency, percentage and mean.

To identify various agricultural wastes available (Objective 2) was presented using the list gathered during preliminary survey, while farmers tick those that were applicable to them, this was measured using frequency and percentage.

➤ *Knowledge Level on Agricultural Wastes Utilization:*

Respondents were asked to respond to knowledge related questions on a 3 points Likert type scale False (0), Not sure (1) and True (2) for positive statements and vice versa for negative questions. The level was further classified using equal interval. The minimum score per respondent was 0 points while the highest was 84 points. So any scores  $\leq 42$  points is tagged low knowledge and any score  $>42$  is tagged high knowledge.

➤ *Hypothesis*

There is no significant relationship between farmers' knowledge level on agricultural wastes and their utilization was analyzed using Correlation analysis

#### IV. RESULTS AND DISCUSSION

##### ➤ *Socio Economic Characteristics of Respondents*

- *Age:*

The results in Table 1 indicated that above average (45.8%) were between ages 45 and 59 years, followed closely were the age range between 31 to 44 years with 38.5%. The mean age stood at 46.7 years. this implies that the larger percentage of the respondents were still in their active and productive age, thus possessed the necessary strength to carry out tedious farm operations which include converting agricultural wastes to useful products. This corroborates the assertion of Abdulaleem, Oluwatusin and Ojo (2019) who submitted that the mean age of small holders' farmers in South-West Nigeria is 47.7 years. They also concluded that efficiency and productivity of farmers may increase with age, reach maximum level, and then decrease with age. It can be said that farmers in the rural areas were no longer aged parents but in varying categories that can utilize any available opportunity to assist in the home front.

- *Sex:*

The results in Table 1 revealed that the majority (83.8%) were male. This was so because, traditionally, in each household sampled where men are the head of the household women do not talk to stranger unless authorized by their husbands. It can also be established that female in the study area were cultured and respectful. This supported the findings of Abidogun, Olajide, Amujoyegbe, Bamire, Kehinde, and Gaya (2019) that male (73.5%) dominates Cocoa farming in South – West Nigeria.

- *Religion:*

The results in Table 1 revealed that Christianity was the religion of the majority (81.2%) and adherent of Islam were 18.8%. This indicates that Christianity dominates the South Western region of Nigeria, however, it should be noted that traditional religion are facing out as none of the sampled population decided not to associate with this third religion in Nigeria.

- *Marital Status:*

The results in Table 1 showed that majority (89.6%) were married, single (5.8%), Divorced (0.8%), Widowed

(1.5%) and separated (2.3%). This mean marriage is valued in the study area. More so, a married person is tagged as responsible person that is focused and eager to utilize every opportunity that can change their economic status positively. This supported the findings of Muhammad, Adesiji, Tyabo, Muhammed and Loko (2019) that majority (90.0%) of the farmers in Federal Capital Territory, Abuja were married.

- *Educational Level:*

The results in Table 1 revealed that respondents who completed Secondary school (33.1%) were the highest while respondents who completed Tertiary education were 31.5%, Primary school completed (11.9%) Secondary school attended (10.4%), Tertiary education attended (5.8%) Primary school attended (3.8%), No formal education (2.7%) and Koranic Education (0.8%). This indicates that majority (80.8%) could be adjudged to be literate, thus they would be able to interpret and assimilate new ideas and innovations on waste management and utilization. This supported the findings of Adesoji, Fabiyi and Famakinwa (2020) that majority (70.8%) of farmers in Kwara State were literate.

- *Household Size:*

The results in Table 1 showed that a little above half (57.7%) had household size between 5 and 8 persons, below 5 person (35.0%) and 9 and above persons (7.3%). The mean household size was 6. It can be adjudged that farmers in the study area appreciate a fairly large family. This supported the findings of Muhammad et. al (2019) that the mean household size of farmers in FCT Abuja was 7 persons.

- *Annual Income:*

The results in Table 1 revealed that a few above average (43.1%) earned  $\leq$  ₦500,000, annual income between ₦500,001 - ₦1,500,000 (39.2%), earning between ₦1,500,001 - ₦2,500,000 (11.5%), a few (5.4%) earned between ₦2,500,001 - ₦3,500,000 and a minute (0.8%) earned ₦3,500,001 and above. The mean annual income stood at ₦870,000. From the data above it can be adjudged that farmers in the study area earned lower than expected, considering the efforts they put in farming work, therefore, sensitizing farmers to utilize the agricultural wastes generated can either reduce expenses or increase income, which will in one way or the other.

Table 1 Socioeconomic Characteristics of the Respondents

Variables	Frequency	Percentage	Mean
<b>Sex</b>			
Male	218	83.8	
Female	42	16.2	
<b>Religion</b>			
Christianity	211	81.2	
Islamic	49	18.8	
<b>Age (Years)</b>			
≤ 30	10	3.8	
31 – 44	100	38.5	
45 – 59	119	45.8	
≥ 60	31	11.9	44.8
<b>Marital Status</b>			
Single	15	5.8	
Married	233	89.6	
Divorced	2	0.8	
Widowed	4	1.5	
Separated	6	2.3	
<b>Educational Qualification</b>			
No Formal Education	7	2.7	
Koranic Education	2	0.8	
Pry School Attended	10	3.8	
Pry School Completed	31	11.9	
Secondary School attended	27	10.4	
Secondary School Completed	86	33.1	
Tertiary Education Attended	15	5.8	
Tertiary Education Completed	82	31.5	
<b>Household size (Person)</b>			
≤ 5	91	35.0	
5 – 8	150	57.7	6
≥ 9	19	7.3	
<b>Annual Income</b>			
≤ ₦500,000	112	43.1	
500,001 - ₦1,500,000	102	39.2	
₦1,500,001 - ₦2,500,000	30	11.5	
₦870,000			
₦2,500,001 - ₦3,500,000	14	5.4	
≥ ₦3,500,001	2	0.8	

Source: Field survey, 2022

➤ Available Wastes Generated by the Respondents

• Arable Crops

The dominant arable crops cultivated in the study area were cassava, yam, maize, cocoyam, soy bean. As for cassava the root is major focus of cultivation and processing. Other parts of the crop such as the leaves, stem, peels and cassava water after grinding are examples of waste items from cassava. As for maize the grain is the main focus of cultivation and processing. The leaves, the stand, stover, stalk, shaft, cob are examples of waste items from maize. Yam tuber is the major part that farmers focus for cultivation, parts such as leaves, peels, yam ropes are examples of wastes generated from Yam. In case of cocoyam, the tuber is the main focus. Other parts that may be useful are the leaves, peels and the corm. The main focus of Soy bean for cultivation is the bean. The husk, vines, leaves and peels are common waste items.

• Cash Crops

The main cash crops cultivated by the respondents in the study area were; Cocoa, Oil palm tree and Coconut tree. As for cocoa the bean is the major focus of cultivation and processing. Other parts of the crop such as; cocoa pod, bark, cocoa extract, seed pulp, pod gum, leaves, roots and sift are examples of waste items from Cocoa. In case of Oil Palm, the kernel is the main focus for cultivation and processing, other items from the tree are; Palm fronds, the trunk, oil palm flower, kernel shell, premature bunch, mill effluent, palm leaves and sifted shaft that are classified as wastes. As for coconut tree, coconut is the main focus of cultivation and processing, other parts of the tree such as; fronds, coconut shell, stem, shaft, trunk, and peat are examples of waste items from coconut tree.

Table 2a: Showing the Available Agricultural Wastes from Crops

<b>Arable Crop</b>	<b>Freq.</b>	<b>Per cent</b>
Cassava peels	218	83.3
Yam peels	189	72.7
Soybean husk	189	72.7
Maize shaft	180	69.2
Maize cob	173	66.5
Cassava Stem	163	62.7
Cassava leaves	156	60.0
Maize leaves	153	58.8
Cassava water	148	56.9
Maize Stalk	138	53.1
Rotten root	134	51.5
Maize Stover	121	46.5
Yam leaves	119	45.8
Yam ropes	112	43.1
Cocoyam peels	110	42.3
Cocoyam corn	91	35.0
Cocoyam leaves	89	34.2
Soybean peels	79	30.4
Soybean root	63	24.2
Soybean leaves	63	24.2
Soybean vine	61	23.5
<b>Cash Crop</b>		
Palm fronds	180	69.2
Cocoa pods	160	61.5
Sifted shaft	140	53.8
Kemel shell	139	53.5
Cocoa leaves	108	69.2
Palm leaves	121	46.5
Cocoa bark	116	44.6
Oil palm trunks	116	44.6
Cocoa extract	113	43.5
Mill effluent	109	41.9
Seed pulp	101	38.8
Coconut shell	101	38.8
Coconut fronds	97	37.3
Coconut peat	84	32.3
Cocoa sift	83	31.9
Cocoa roots	82	31.5
Premature bunch	82	31.5
Coconut shaft	81	31.2
Pod gum	79	30.4
Oil palm flower	76	29.2
Coconut trunk	71	27.3
Coconut stem	69	26.5

**Source: Field survey, 2022**

- *Livestock Wastes*

The results from preliminary survey revealed that animals that the respondents reared were; poultry, goat, pig and fish. Animals are reared majorly for the meat either to be sold or for consumption. For poultry, the major focus were the meat and eggs, other items that can be categorized as waste are; poultry droppings, bones, feathers, dead birds, egg shell are the examples of waste items from poultry. As

for goat, the meat is the focal point for rearing, however, the faeces, blood, bones, urine and skin were the waste items. in the case of pig, pork meat is the major focus, other parts of the animal regarded as wastes were; faeces, fat, skin, bones. As for fish, the flesh is the major focus. Other items such as; fish bones, dead fish, fish guts and fish pond water are examples of waste items from fish.

Table 2b Showing Available Agricultural Wastes from Livestock

<b>Animal</b>	<b>Freq.</b>	<b>Per cent</b>
Goat faeces	179	68.8
Poultry droppings	170	65.4
Egg shell	132	50.8
Feathers	122	46.9
Fish guts	122	46.9
Dead fish	121	46.5
Fish pond water	119	45.8
Pig faeces	118	45.4
Goat bones	111	42.7
Goat urines	109	41.9
Fish bones	101	38.8
Dead birds	100	38.5
Poultry bones	98	37.7
Goat skin	89	34.2
Goat blood	77	29.6
Pig fat	67	25.8
Pig skin	67	25.8
Pig bones	67	25.8

**Source: Field survey, 2022**

➤ *Knowledge Level on Agricultural Wastes*

The data in Table 3 revealed that among thirty-seven statements to ascertain the knowledge level of the respondents on Agricultural wastes. Respondents had high knowledge in seventeen statements out of the twenty-seven positive statements. The statements were; Oil palm fronds are very useful in weaving baskets and making brooms has the highest mean ( $\bar{x} = 1.90$ ), Animal dung, such as sheep and goat dung can be collected, dried and apply on farm as Farm Yard Manure ( $\bar{x} = 1.89$ ), Animal bones can be useful source of calcium content in poultry feed ( $\bar{x} = 1.85$ ), Yam peel is useful source of livestock feeds and yam flour ( $\bar{x} = 1.82$ ), Animal bones can be carved into plates, cutleries, flutes and other decorating materials ( $\bar{x} = 1.85$ ), Fish bones are good in animal feeds formulation ( $\bar{x} = 1.78$ ) Oil palm kernel can be used to make palm kernel cake useful component of poultry feed and Poultry feathers are used for decoration ( $\bar{x} = 1.77$ ) respectively, Maize leaves for animal feeding ( $\bar{x} = 1.75$ ), Oil production extract (palm kernel oil) when extracted and dried can be used as fuel, especially by the blacksmith ( $\bar{x} = 1.71$ ), Dried cocoa trunks can be used as firewood ( $\bar{x} = 1.70$ ), Maize shafts and stalks are useful source of animal feed ( $\bar{x} = 1.68$ ), Cassava peels can be dried and grinded to make flour (elubo) ( $\bar{x} = 1.41$ ), Yam ropes for sponge and for tying things ( $\bar{x} = 1.39$ ), Coconut shafts can

be used for making brush ( $\bar{x} = 1.33$ ). Respondents had low knowledge in ten statements, among which were; Cassava peels can be used for mushroom production ( $\bar{x} = 1.24$ ), Coconut shell for making activated charcoal for treatment of ailments ( $\bar{x} = 1.22$ ), Cocoa roots not good for chewing stick ( $\bar{x} = 1.17$ ), Maize cobs can be used for making brush ( $\bar{x} = 1.17$ ), Cassava stem for firewood ( $\bar{x} = 1.13$ ), Pig hides is a good raw material for brush making ( $\bar{x} = 1.09$ ), Cassava stem for yam stake ( $\bar{x} = 1.06$ ), Maize stand cannot be used as yam stakes ( $\bar{x} = 1.06$ ), Rotten cassava roots for animal feeds ( $\bar{x} = 1.03$ ), Coconut shell is not useful for household cooking fuel ( $\bar{x} = 0.98$ ), Remains of palm oil processing (ogunso) is a poor source of household cooking fuel ( $\bar{x} = 0.98$ ), Bark of cocoa trees and its roots are poor source of blood tonic and useful for herbal medicine ( $\bar{x} = 0.90$ ), Dried cocoa placenta is not useful in making soap ( $\bar{x} = 0.83$ ), Oil palm leaves when dried and burnt can invite soldier ants ( $\bar{x} = 0.72$ ), Using cocoa leaves to package kolanut is poisonous ( $\bar{x} = 0.70$ ), Animal blood is not good for animal feeding ( $\bar{x} = 0.70$ ), Palm kernel cake can be useful as manure rather than animal feeds ( $\bar{x} = 0.62$ ), Burning of dried cocoa pods cannot be used for black soap making ( $\bar{x} = 0.57$ ), Fried Palm oil residue (Ikete) is not good for eating yam ( $\bar{x} = 0.55$ ).

Table 3 Distribution of Respondents According to Knowledge Level

STATEMENT	FALSE F(%)	Not Sure F(%)	TRUE F(%)	Mean
Oil palm fronds are very useful in weaving baskets and making brooms.	6(2.3)	13(5.0)	241(92.7)	1.9
Animal dung, such as sheep and goat dung can be collected, dried and apply on farm as Farm Yard Manure	8(3.1)	14(5.4)	238(91.5)	1.89
Animal bones can be useful source of calcium content in poultry feed.	11(4.2)	17(6.5)	232(89.2)	1.85
Yam peel is useful source of livestock feeds and yam flour	16(6.2)	16(6.2)	228(87.7)	1.82
Animal bones can be carved into plates, cutleries, flutes and other decorating materials.	8(3.1)	32(12.3)	220(84.6)	1.82
Fish bones are good in animal feeds formulation.	16(6.2)	25(9.6)	219(84.2)	1.78
Oil palm kernel can be used to make palm kernel cake useful component of poultry feed.	11(4.2)	39(15.0)	210(80.8)	1.77
Poultry feathers are used for decoration	11(4.2)	38(14.6)	211(81.2)	1.77
Maize leaves for animal feeding	16(6.2)	33(12.7)	211(81.2)	1.75
Oil production extract (palm kernel oil) when extracted and dried can be used as fuel, especially by the blacksmith.	11(4.2)	53(20.4)	196(75.4)	1.71
Dried cocoa trunks can be used as firewood	17(6.5)	45(17.3)	198(76.2)	1.7
Maize shafts and stalks are useful source of animal feed	27(10.4)	30(11.5)	203(78.1)	1.68
Stem of Palm trees can be can be used to make benches for sitting down to play games and relaxation.	14(5.4)	64(24.6)	182(70.0)	1.65
Cassava leaves for making soup	12(4.6)	75(28.8)	173(66.5)	1.62
Soaked Goat faeces sprinkled on crops prevent other herbivore animals from eating the crops.	14(5.4)	72(27.7)	174(66.9)	1.62
Coconut leaves can be very useful for weaving of mats.	8(3.1)	89(34.2)	163(62.7)	1.6
Coconut fronds for house roofing	25(9.6)	66(25.4)	169(65.0)	1.55
Pectin from fresh cocoa beans as attractant for bees.	13(5.0)	98(37.7)	149(57.3)	1.52
Poultry droppings can be used as fish feed	33(12.7)	66(25.4)	161(61.9)	1.49
Cassava peels can be dried and grinded to make flour (elubo)	40(15.4)	74(28.5)	146(56.2)	1.41
Yam ropes for sponge and for tying things	30(11.5)	99(38.1)	131(50.4)	1.39
Coconut shafts can be used for making brush	22(8.5)	131(50.4)	107(41.2)	1.33
Cassava peels can be used for mushroom production	30(11.5)	139 (53.5)	91(35.0)	1.24
Coconut shell for making activated charcoal for treatment of ailments.	27(10.4)	150(57.7)	83(31.9)	1.22
Yam leaves for animal feeds	54(20.8)	100(38.5)	106(40.8)	1.2
Maize cobs can be used for making brush	42(16.2)	131(50.4)	87(33.5)	1.17
Cocoa roots not good for chewing stick	69(26.5)	166(63.8)	25(9.6)	1.17
Cassava stem for firewood	92(35.4)	42(16.2)	126(48.5)	1.13
Pig hides is a good raw material for brush making	55(21.2)	127(48.8)	78(30.0)	1.09
Cassava stem for yam stake	84(32.3)	77(29.6)	99(38.1)	1.06
Maize stand cannot be used as yam stakes.	87(33.5)	70(26.9)	103(39.6)	1.06
Rotten cassava roots for animal feeds	85(32.7)	82(31.5)	93(35.8)	1.03
Coconut shell is not useful for household cooking fuel.	73(28.1)	90(34.6)	97(37.3)	0.98
Remains of palm oil processing (ogunso) is a poor source of household cooking fuel.	111(42.7)	32(12.3)	117(45.0)	0.98
Bark of cocoa trees and its roots are poor source of blood tonic and useful for herbal medicine.	27(10.4)	181(69.6)	52(20.0)	0.9
Dried cocoa placenta is not useful in making soap	70(26.9)	165(63.5)	25(9.6)	0.83
Oil palm leaves when dried and burnt can invite soldier ants.	97(37.3)	139(53.5)	24(9.2)	0.72
Using cocoa leaves to package kolanut is poisonous	47(18.1)	88(33.8)	125(48.1)	0.7
Animal blood is not good for animal feeding	44(16.9)	94(36.2)	122(46.9)	0.7
Palm kernel cake can be useful as manure rather than animal feeds.	30(11.5)	102(39.2)	128(49.2)	0.62
Burning of dried cocoa pods cannot be used for black soap making?	36(13.8)	76(29.2)	148(56.9)	0.57
Fried Palm oil residue (Ikete) is not good for eating yam	152(58.5)	73(28.1)	35(13.5)	0.55
<b>Grand mean</b>				<b>1.32</b>

Source: Field Survey, 2022

➤ *Knowledge Level Categorization of the Respondents on AW Utilization*

Results in Figure 1 showed that majority (55.0%) of the respondents had low knowledge while a few above average (44.0%) had high knowledge about Agricultural

Wastes utilization. This can be interpreted that farmers in the study area lacked the required knowledge in agricultural wastes utilization. This corroborated the findings of Ahmed et al. (2023) that poultry farmers had low knowledge toward poultry waste management in Bangladesh.

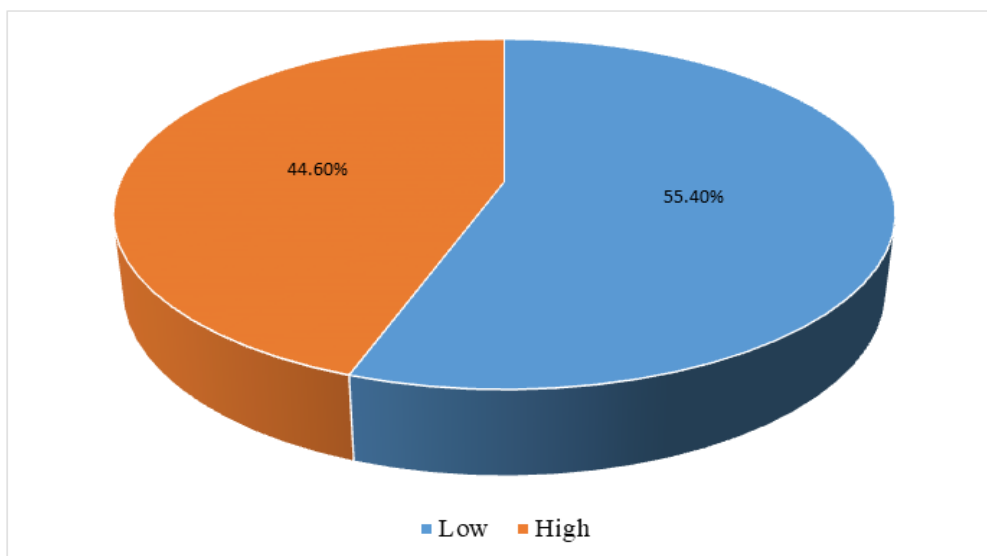


Fig 1 Knowledge Level on Agricultural Wastes Utilization  
Source: Field Survey, 2022

➤ *Hypothesis Testing*

Results of Correlation analysis establishing relationship between farmers’ knowledge level on agricultural wastes and utilization of agricultural wastes

Results in Table 4 indicates that farmers’ knowledge level on agricultural wastes has a positive and significant relationship with the utilization of agricultural wastes ( $r = 0.183$ ). This implies that the higher the knowledge level of farmers on agricultural wastes the higher the extent of utilization of agricultural wastes and vice-versa.

Table 4 Showing Results of Correlation analysis Establishing Relationship between Farmers’ Knowledge Level on Agricultural Wastes and Utilization of Agricultural Wastes

Variable	r-value	p-value	Decision
Knowledge level	0.886**	0.000	Significant
P ≤ 0.01			

**V. CONCLUSION AND RECOMMENDATIONS**

Farmers in the study area were young and had the strength required to convert their wastes to wealth. There were lots of wastes available in the study area in which if adequately utilized they can improve their standard of living. They also have a low knowledge level on agricultural wastes utilization. The study hereby recommends that stakeholders should sensitize farmers to increase their knowledge level on utilization of agricultural wastes through trainings, seminars or workshops on potentialities of the agricultural wastes.

**REFERENCES**

- [1]. Abdulaleem, M. A., Oluwatusin F. M. and Ojo S. O. (2019). Efficiency of Maize Production among Smallholder Farmers in Southwest, Nigeria; *Asian Journal of Agricultural Extension, Economics & Sociology*; 30(4): 1 – 10. AJAEES.46823ISSN: 2320-7027
- [2]. Abidogun, O. G., Olajide B. R., Amujoyegbe, B. J., Bamire, A. S., Kehinde, A. D. and Gaya, I. (2019). Gender involvement in Cocoa Farming Activities in South West Nigeria; *Ife Journal of Agriculture*; 31(1): 53 – 62.
- [3]. Adesoji S. A., Fabiyi E. O. and Famakinwa M. (2020). Adoption of community-based agricultural development project technologies among smallholder farmers in Kwara State, Nigeria *Agricultura Tropica Et Subtropica* 53(3), 127–135, DOI: 10.2478/ats-2020-0013
- [4]. Ahmed, S., Moni MIZ, Begum M, Sultana MR, Kabir A, Eqbal MJ, Das SK, Ullah W, and Haque TS (2023) Poultry farmers’ knowledge, attitude, and practices toward poultry waste management in Bangladesh, *Veterinary World*, 16(3): 554–563.
- [5]. Baruwa O. I. and Omodara O. D. (2018). Poultry Waste Management Practices and Policy Implications for Environmental Sustainability in Urban Areas of Osun State, Nigeria. *Applied Tropical Agriculture* 23(1), 25-34.
- [6]. Food and Agriculture Organization (2014) Waste management opportunities for rural communities: Composting as an effective waste management strategy for farm households and others.



- [7]. Muhammad H. U., Adesiji G. B., Tyabo I. S., Muhammed S. Y. and. Loko A.I. (2019). Assessment of Factors Influencing the Use of Information and Communication Technologies by Small-Scale Farmers in Federal Capital Territory (Fct), Abuja, Nigeria; *Journal of Agriculture and Environment* 15(2); 61-70 ISSN: 1595-465X (Print) 2695-236X
- [8]. Oladipo, F. O., Olorunfemi, O. D., Adetoro, O. D. and Oladele T. O., (2017) Farm Waste Utilization Among Farmers In Irepodun Local Government Area, Kwara State, Nigeria: Implication for Extension Education Service Delivery *Ruhuna Journal Of Science* 8: 1-11, ISSN: 2536-8400 DOI: <http://doi.org/10.4038/rjs.v8i1.22>
- [9]. Shehrawat, P. S., Sindhu, N. and Devi P (2015). Agricultural Waste Awareness and Utilization for Healthy Environment and Sustainable Livelihood. *Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development* 15(2).
- [10]. World Bank Group (2018). *What a waste 2.0: A global Snapshot of Solid Waste Management to 2050*.