

## RESEARCH ARTICLE

### POULTRY FARMERS' PERCEPTION TOWARD CONVERSION OF POULTRY DROPPINGS TO BIOGAS IN IBADAN SOUTH-WEST LOCAL GOVERNMENT AREA OF OYO STATE

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#### ABSTRACT

Waste Material (Droppings) from Poultry Farm is a raw material of the Biogas Plant. Considering the importance of Poultry droppings as valuable resource rather than be an environmental pollutant help to evaluate the Poultry Farmers' Perception toward conversion of Poultry Droppings to Biogas. Simple random approach was employed through questionnaire and interviews to collect information from 82 Poultry Farmers. Descriptive and inferential statistics such as frequency counts, percentages, mean, Chi-square and PPMC were used in data analysis at 0.05 level of significance. Results of analysis revealed that majority (34.1%) of the respondents fell within the age range of 30 years to 39 years. Most of the respondents (69.5%) were married, (82.9%) of them were male, while (59.8%) had education up to tertiary level. Most of respondents' perceived that conversion of Poultry droppings to biogas help to solve environmental pollution while 52.4% of the respondents considered lack of financial support as their major constraints in the study area. Chi-square analysis revealed that, among socio-economic characteristics of the respondents, marital status ( $\chi^2= 45.133$ ,  $p= 0.000$ ), and Years of farming ( $\chi^2=37.837$ ,  $p=0.001$ ) were significantly related to respondents' perception toward conversion of Poultry droppings to biogas in the study area. The empirical findings revealed clearly that male respondents are more involved and their perception is high. It is therefore recommended that government should provide a particular site where dropping would be collected from farmer with certain amount of money given to farmer to avoid environmental pollution, also enlighten Poultry farmer both Method and result demonstration approach of the biogas process by extension agent.

**Key words:** Biogas, Perception, Poultry Droppings, Poultry Farmers.

#### INTRODUCTION

Poultry dropping can be either a valuable resources or an environmental pollutant, this is refers to feace and urine produced by animals and it contains organic matter and nutrients, that has organic fertilizer value when applied on the land and used by crops. The properties of manure depend on several factors including animal species, feed ration digestibility, protein and fibre content, animal age and productivity, management and handling and the environment (Tao and Manel 2008). Poultry dropping has long been recognized as perhaps the most desirable of all animal manures (fertilizers) because of its high nitrogen content (Sloan et al., 2003). The animal production sector is responsible for 18% of the overall greenhouse gas emissions, measured in CO<sub>2</sub> equivalent and for 37% of the anthropogenic menthane which has 23 times the global warming potential of CO<sub>2</sub> (Steinfeld et al., 2006). Biogas is a sustainable renewable energy source which is widely used to produce electricity today in the world (Norman et al., 2009). Biogas is a mixture of different gases produced as a result of organic material digestion by anaerobic microorganisms on domestic and agricultural waste (Maximiliano, 2009), it contain methane in bulk (50-86%) and other gases relatively in low proportions such as CO<sub>2</sub> (25-35%), H<sub>2</sub> (1-5%), N<sub>2</sub> (2-7%) and O<sub>2</sub> (0-1%). It helps to reduce nesting grounds for flies and mosquitoes that could otherwise spread illness to human.

Biogas production from animal waste provides a unique opportunity to migrate the effects of waste produced on farms while producing a cheap and sustainable source of energy (Maximiliano, 2009). It is against this backdrop that this research evaluates the extent of the Poultry Farmers' Perception toward conversion of Poultry Droppings to Biogas in Ibadan South-west Local Government Area of Oyo State.

#### Specific objectives

The specific objectives of this study include to:

- Identify socio-economic characteristics of the Poultry Farmers in study area.
- Determine the Perception of respondents on conversion of poultry droppings to biogas in the study area.
- Determine the perceived constraints associated with the conversion of poultry dropping to biogas by respondents in the study area.

#### Hypothesis of the study

The hypothesis stated in the null form is tested:

**Ho<sub>1</sub>** – There is no significant relationship between selected socio-economic characteristics of the respondents and their perception toward conversion of poultry dropping to biogas in the study area.

#### MATERIALS AND METHODS

The research work was carried out in Ibadan south west local Government. Out of five local Government that made up

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**Table 1. Socio-economic characteristics of the respondents**

Variable	Frequency	Percentage
<b>Age (years)</b>		
Below 20years	1	1.2
20-29	24	29.3
30-39	28	34.1
40-49	16	19.5
50-59	7	8.5
60years & above	6	7.3
<b>Sex</b>		
Male	68	82.9
Female	14	17.1
<b>Religion</b>		
Christian	55	67.1
Muslim	27	32.9
<b>Marital status</b>		
Single	24	29.3
Married	57	69.5
Widowed	1	1.2
<b>Educational background</b>		
No formal	1	1.2
Primary school	13	15.9
Secondary school	19	23.1
Tertiary school	49	59.8
<b>Year of experience</b>		
1-9	53	64.6
10-19	22	26.8
20-29	4	4.9
30-39	3	3.7
<b>Numbers of Poultry Birds</b>		
< 100	15	18.3
100- 200	31	37.8
200-300	15	18.3
Above 300	21	25.6
<b>Total</b>	<b>82</b>	<b>100.0</b>

Source: Field survey, 2014.

Ibadan metropolis, Ibadan South West Local Government was purposively selected with its headquarters at Aleshinloye in Ibadan. it has land area of 4km<sup>2</sup> and a population of 282,585 according to 2006 census.

**Sampling Procedure and Sample size:** Purposive sampling Technique was used to select wards that are predominantly noted for high production of poultry droppings due presence of poultry farmers, those wards are : ward 10 (molete/idi ope), ward 11 (Adeoyo road/ Oni & sons/Elewura) and ward 12 (Akinyemi/ adabeji/Adifase Apata/Odo.ona/Oluyole extension). 50% of Poultry farmers in each wards was randomly selected and this gives a total of Eighty two (82) respondents that was used for the study.

**Analysis of data:** Data Collected were subjected to descriptive and inferential Statistical analysis using Statistical Package for the Social Sciences (SPSS). Descriptive statistical tools used included frequency counts and percentage while inferential statistical used is Chi-square.

**RESULTS AND DISCUSSION**

**Socio-economic characteristics of respondents:** Results of analysis on respondents’ sex in Table 1 revealed that 82.9% are males while 17.1% were females in the study area. This implies that males are more predominant into poultry production than females in the study area. Results in Table 1 also revealed that most respondents 34.1% fell between the age of 30-39years which shows that they are still at the economic active age and this could have positive effect on their production. This finding is in line with that of Akinbile (2007) and Adedeji et al.(2003) who reported with age-range (20-50years) that constitutes the active workforce of the population. Result also revealed that most respondents (69.5%) were married. This implies that marriage institution is still highly esteemed in our society because it is evidence of being responsible.

**Table 2a. Perception of Poultry Farmers on Conversion of Poultry Droppings**

Perceptual Statement	SA	A	U	D	SD	Mean
Poultry dropping has zero value to the industries and consumer	6 (7.3)	5 (6.1)	5 (6.1)	35 (42.7)	31 (37.8)	2.02
Poultry dropping is important for generating power	14 (17.1)	38 (46.3)	20 (24.4)	9 (11.0)	1 (1.2)	3.07
Offensive odour of poultry dropping affect its conversion of biogas	16 (19.5)	20 (24.4)	35 (42.7)	8 (9.8)	3 (3.7)	3.05
Poultry dropping can be converted to biogas	5 (6.1)	1 (1.2)	23 (28.0)	33 (40.2)	20 (24.4)	2.24
Conversion of poultry droppings helps to solve environmental pollution problem	51 (62.2)	19 (23.2)	7 (8.5)	2 (2.4)	3 (3.7)	4.38
Biogas plant should be located from residential area	10 (12.2)	33 (40.2)	32 (39.0)	3 (3.7)	4 (4.9)	3.51
Conversion of poultry droppings to biogas help to generate employment opportunity.	9 (11.0)	39 (47.6)	1 (1.2)	10 (12.2)	23 (28.0)	3.01
Gas from biogas conversion is too poisonous to inhale.	60 (73.2)	12 (14.6)	2 (2.4)	2 (2.4)	6 (7.3)	4.44
Conversion of poultry droppings to biogas gives sustainable solution to poultry waste management.	20 (24.4)	55 (67.1)	1 (1.2)	4 (4.9)	2 (2.4)	4.06
Biogas from poultry droppings poses danger to the environment.	8 (9.8)	53 (64.6)	13 (15.9)	6 (7.3)	2 (2.4)	3.72
Biogas from poultry droppings helps to produce cheap sources of energy.	29 (35.4)	49 (59.8)	1 (1.2)	0 (0)	3 (3.7)	4.23
Biogas from poultry droppings helps to reduce nestings grounds for files and mosquitoes	0 (0)	3 (3.7)	4 (4.9)	14 (17.1)	61 (74.4)	1.38
Poultry droppings cannot be converted to biogas.	18 (22.0)	48 (58.5)	12 (14.6)	2 (2.4)	2 (2.4)	3.95
Biogas from poultry droppings is for complicated to venture in.	4 (4.9)	6 (7.3)	15 (18.3)	57 (69.5)	0 (0)	2.42
Biogas from poultry droppings may be substituted for natural gas.	5 (6.1)	2 (2.4)	6 (7.3)	33 (40.2)	36 (43.9)	1.86
Biogas plants can be placed within the farm house.	44 (53.7)	24 (29.3)	7 (8.5)	1 (1.2)	6 (7.3)	4.21
Biogas from poultry droppings can be used heat and light homes.	12 (14.6)	16 (19.5)	17 (20.7)	21 (25.6)	16 (19.5)	2.84

**Table 3. Perceived Constraints of Conversion of Poultry droppings to Biogas**

Constraint	Major Constraint	Minor Constraint	Not Constraint
Availability of Material	18 (22.0)	17 (20.7)	47 (57.3)
Readily available market For the biogas	18 (20.0)	38 (46.3)	26 (31.7)
Inadequate information about The processing of biogas	32 (39.0)	30 (36.6)	20 (24.4)
Odour of the droppings	12 (14.6)	34 (41.5)	36 (43.9)
Technical know-how	34 (41.5)	35 (42.7)	13 (15.9)
Lack of Training support	41 (50.0)	27 (32.9)	14 (17.1)
Lack of financial support	43 (52.4)	20 (24.4)	17 (20.7)
Health related hazard	21 (25.6)	39 (47.6)	22 (26.8)

**Table 4. Chi-square table showing relationship between respondent's socio-economic characteristics and their perception on conversion of poultry droppings to biogas**

Variables	Chi-square value	P	Decision
Sex	3.802	0.578	NS
Age	18.534	0.819	NS
Marital status	45.133	0.000	S
Educational status	8.947	0.984	NS
Year of farming	37.837	0.001	S
Religion	1.413	0.923	NS

Source: Field survey, 2014.

The results also revealed that majority of the respondents (64.6 %) had one to nine years of experience in poultry farming while (3.7%) of the respondents still stay till thirty to thirty-nine in the study area with majority of them had tertiary education (59.8%) while only few 1.2% had no formal education. Results further showed that most 67.1% of the respondents were Christians and 32.9% were Muslim.

**Respondents' perception toward Conversion of Poultry Droppings to Biogas:** Table 2b revealed that (53.7%) of the respondents had high level of perception in conversion of poultry dropping to biogas while (46.3%) had low perception. This implies that the percentage of perception with high level of perception is more than that of respondent with low level of perception and their level of perception can also be increased in the short run. Also table 2a showed that (73.2% and 62.2%) agreed strongly to Perception that Gas from biogas conversion is too poisonous to inhale and Conversion of poultry droppings helps to solve environmental pollution problem respectively. Also 67.1%, 64.6%, 59.8%, 58.5% and 57.3% agreed to perception that Conversion of poultry droppings to hit gas gives sustainable solution to poultry waste management, Biogas from poultry droppings poses danger to the environment, Biogas from poultry droppings helps a produce cheap sources of energy, Poultry droppings cannot be converted to biogas and Biogas is a sustainable renewable energy sources respectively. This is in line with the findings of Kellcher et al, (2002) who said that poultry litter combustion has received major attention as a method to produce heat and electricity.

**Perceived Constraints of Conversion of Poultry Droppings to Biogas:** Result of analysis in Table 3 revealed that majority (52.4% and 50.0%) of respondents claimed that Lack of Financial support and Lack of Training support respectively are major constraints facing Conversion of poultry droppings to biogas in the study area Availability of materials (57.3%) is not constraints facing Conversion of poultry droppings to biogas in the study area because they are above 50% used as mean point.

**Hypothesis of the study:** This hypothesis was tested with the aid of chi-square  $X^2$ . Result in Table 4 revealed that, among socio-economic characteristics of the respondents, Marital status ( $x^2= 45.133$ ,  $p= 0.000$ ) and Year of farming ( $x^2 = 37.837$ ,  $p= 0.001$ ) were significantly related to respondents perception on conversion of poultry droppings to biogas. Furthermore, the results of hypothesis revealed clearly that respondents' perception on conversion of poultry droppings to biogas does not depend on sex, age, Educational status and Religion.

## Conclusion and Recommendation

This study revealed that most of the respondents are males and they are in their active age, married with majority tertiary education which have positive effect on their production, also so that majority of the respondents have high favourable perception toward the conversion of poultry droppings to biogas. Also, the major constraints faced by the respondents happen to be Lack of training support and Lack of financial support. In order to encourage the production of this biogas by poultry farmers, Government should provide a particular site where these poultry dropping can be deposited and encourage the poultry farmers to deposit their poultry dropping with certain amount to avoid environmental pollution.

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