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EVALUATION OF PEOPLE'S PERCEPTION ON PLASTIC WASTE MANAGEMENT, A STUDY OF NNAMDI AZIKIWE UNIVERSITY IN AWKA ANAMBRA STATE

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ABSTRACT: *This study evaluated people's psychology, perception and awareness about plastic waste and the process of pyrolysis otherwise refered to as waste to wealth or reuse, using survey method. Three hostels in Nnamdi Azikiwe University were sampled and studied for peoples, perception on the subject matter to be harnessed. It was discovered that there is no significant difference on people's psychology towards plastic wastes in the three hostels. There is no significant difference in the perception of people about plastic wastes in the study area and they are not aware that waste can be converted to wealth, thus they handle waste anyhow. The study therefore recommends that there should be public awareness programmes on the role of the masses in efficient waste management, the practicability and gains of waste to wealth projects, among others.*

KEYWORDS: Peoples' Perception, Plastic Waste Management, Waste Utilization

INTRODUCTION

Background to the study

Waste is defined as "substances or objects which are disposed off or are intended to be disposed off or are required to be disposed off by the provisions of national law (Basel Convention in 1989). The presence of waste is an indication of overconsumption and that materials are not being used efficiently. The problem of plastic waste is that it continues to escalate with increase in population, industrialization and urbanization.

Agunwamba (1998) noted that the waste management sector in Nigeria is still underdeveloped because of the lack of adequate funding, ineffective waste management practices and recycling. These plastic wastes are also found in general waste stream comingling with other wastes that can be recycled into useful forms. These include organic waste, tyre, glass, papers and metals etc. These materials are separated by the waste pickers/sorters. It is also paramount that, the recyclables particularly plastic wastes are separated and sorted according to their types and aggregated together, because of different polymer resins used in their production. Since each type has its own chemical makeup, different plastic wastes cannot be recycle together, thus separation of different plastic wastes before recycling is necessary unlike organic wastes. The understanding of the importance of this separation process or sorting of waste by the populates determines their attitude towards waste disposal and is a factor of how easy the waste manager will carry out their activities and record success.

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Statement of Problem

In Nigeria, the level of poverty is high; and many people live below one dollar per day, which is the poverty level set by UN (2005). Medina (1997) cited in Mustapha (2014) , observed that, as long as poverty and garbage exist in combination, waste scavenging and recycling are likely to prevail and the reality of these system can be seen as basis for development.

In Awka, Anambra State, particularly Ifite-Awka, waste management is very poor and plastic wastes, especially low density poly-ethylene (LDPE) pose a great challenge on the effort of achieving clean and safe environment. These wastes pollute the environment, exhaust the dumpsites, clog drainage channels in turn adding to flood menace in Ifite-Awka. LDPE wastes has reduced the aesthetic beauty of the environment, encouraged breeding of mosquitoes, litter everywhere and there in the study area. These wastes are one of the major causes of the road spoilage because, they normally clog the drainage channels of the area, resulting in stagnation of runoff water on the road whenever it rains in turns creating pot holes.

In addition, different types and qualities of polythene keep evolving as technology for improving them keep evolving day by day. Moreover the uses to which polythene are put are too many thereby, explaining why they are frequently used; and following people wrong attitude towards waste as indicated above, polythene is rampantly dropped anyhow by students and other residents of Ifite-Awka. We are so dependent on them that it seems that without plastics, we would have a hard time managing normal living. Therefore, enormous volumes of plastics composed of bags, dishes, packing materials, etc., after daily use, generate large volume of non-degradable wastes in Ifite-Awka.

Unfortunately, these wastes that have been left to litter and damage the environment could be converted to wealth. Petroleum resources are decreasing day by day whereas this plastic wastes can be used and yet because people lack the knowledge on how it can be done. This issue having lingered for so long made studies of this sort essential for there to be an improvement in the management of waste in the study area in particular and in Nigeria at large.

Aim of Study

The aim of this study is to evaluate peoples perception on the management of plastic waste with a view to proffering solution to create better awareness of this type of solid waste and the role of the masses in ensuring better waste management.

To achieve this aim, the following objectives will be pursued:

1. to determine the population of the hostels under study,
2. to extract the sample population, administer a well structured questionnaire and possibly harness people's perception as targeted,
3. to collate and analyze the data so generated and
4. to establish the perception of the various groups to know if there is significant difference in their perception.

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Conceptual or Theoretical Framework

To address the topic of this study, the concepts that are embodied include waste to wealth and sustainable waste management system. These concepts constitute the conceptual frame- work of the study. Egun (2012) defined waste to wealth concept as the transformation of waste from an exhausted utility to a valuable commodity as a mechanism for effective and efficient solid waste management. Waste management technologies such as material recovery facility, compositing, anaerobic digestion, gasification, pyrolysis, incineration with energy recovery and even landfill with biogas extraction are employed to bring value to the wastes (wealth). However, bringing value to waste leads to sustainable waste management.

A sustainable waste management system incorporates feedback loops, focused on processes, embodies adaptability and diverts wastes from disposal. Transitioning to a sustainable waste management system requires identification and application of leverage points which effect change (Jeffrey, 2010). Monica Pianosi (2012) defines sustainable waste management as using material resources efficiently to cut down on the amount of waste produced; and where waste is generated, dealing with it in a way that actively contributes to the economic, social and environmental goals of sustainable development. This study adopted these concepts in order to best understand waste management system and to reveal the benefits associated with holistic waste management. In addition, careful planning and implementation of these concepts adds to job creation; reduce poverty level, resource recovery and substitution, benefits the environment and fosters the principle of sustainable development.

Study Area

This study is based in Awka, a capital city in Awka South Local Government Area of Anambra State. It is located 6.21^{0}N latitude and 7.07^{0}E longitude. It has a total land area of 120 Sqkm (Geological survey Awka, 2000).

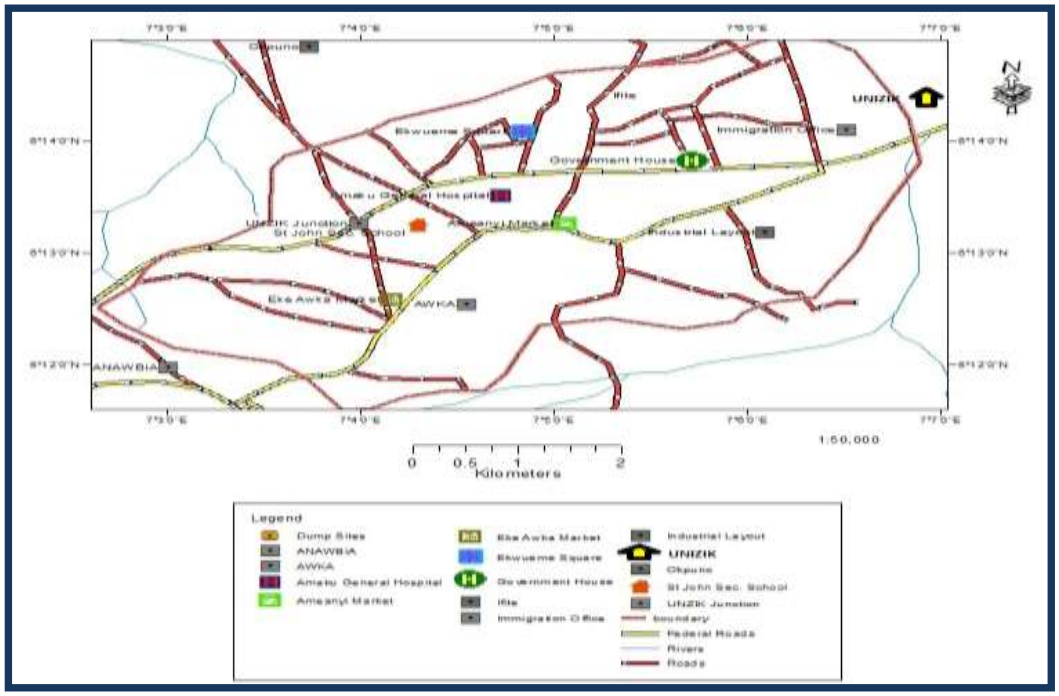

Fig. 1:Awka City Map Showing Nnamdi Azikiwe University (Source: Excel GIS Lab. Awka)

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There are six local Government Areas that make up the Awka Capital Territory is with a total population of 1,003, 911, according to the 2006 census and an average annual growth of 3.17% per annum recorded during the past sixteen years. Awka Territory has rapidly developed into a mass of urban areas growing to merge with each other. Having the state capital and one of the biggest institutions of higher learning in the southeastern Nigeria (Nnamdi Azikiwe University) situated in it, it is rapidly being urbanized and this rapid urbanization due to population increase has its attendant challenges, one of which in drastic increase in waste generation.

LITERATURE REVIEW

Although waste is seen as a problem in Awka, waste can actually be used as a resource through the composting of organic waste such as food wastes, animal wastes, yard/garden trimmings, etc and the recycling of inorganic wastes such as plastics, metals and glasses. In addition, wastes can be combusted and the heat energy captured to produce electricity.

Recycling of inorganic waste

Otitoju (2014) studied individual attitude towards recycling of municipal solid waste in Lagos, Nigeria, using survey method. The study shows that gender is significant towards waste recycling practice in Lagos. His study also revealed that knowledge is the major limiting factors preventing individuals from waste recycling in Lagos.

Benneth (2016) posited that Lagos state generates an estimated 13,000tons of municipal solid waste per day. Out of the 13,000 tons West African Energy, a privately owned material recovery facility in Lagos state process around 600tons per day. Between 30% - 35% of the 600tons processed is recyclable which is equivalent to 210tons. This company through its recycling activities employs over 300 people.

Lee, (2003) notes that, Waste watch calculated that recycling bags, rather than making them from virgin polythene, reduces energy consumption by two thirds , produces two thirds less sulphur dioxide, and 50 percent less nitrous oxide, and reduce carbon dioxide generation.

Nzeadibe and Ajaero, (2010) in their Handbook of Environmental Policy cited that waste picking has been identified as a major driver of informal sector recycling in developing countries (Wilson, 2007). Unfortunately, early research on informal recycling systems considered waste picking as a social problem to be eliminated and waste pickers as marginal groups and poor subjects who needed help ostensibly to exit the recuperative activity (Birkbeck, 1978; Furedy, 1984; Tevera, 1994). Oftentimes, such research contained recommendations oriented towards modernization of the waste management system. In addition, development interventions have often been instituted to improve the working and living conditions of the informal recycling sector and in relieving their daily needs and problems, and sometimes to empower them (Anschütz et al., 2004; Scheinberg et al., 2006).

Mbeng, (2013) studied informal waste recovery and recycling: Alleviating poverty, Environmental pollution and Unemployment in Douala, Cameroon, using survey method. The study revealed that poverty tends in Cameroon is high in the rural than in the urban areas, a major cause of rural- urban migration. The study also revealed that in Douala, a real migration hub for the unemployed, the recovery and recycling of four waste fractions; scrap metals,

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plastics, bottles, papers and cardboards was found to be very profitable. This was said to be because, the minimum wage of Cameroonians, 746 FCFA (US$2) per day was found to be lower than the daily income, 1000FCFA-1500FCFA (US$3.2.90-US$ 3.3) of the informal waste sector workers at the Douala landfill. In an attempt to put waste pickers on the map, the study recommended alliances based on best practices found in other countries as well as the government to design programmes that will guarantee health, safety, identification and the creation of veritable markets for waste.

According to the California Environmental Protection Agency in Economic Impacts of Recycling in Montana, (2004) waste diversion of any type, including recycling, was reported to create twice the economic activity per ton of conventional waste disposal. Recycling also reduces pollution and conserves natural resources, which leads to cleaner air and water, and it increases open space and reduces greenhouse gases.

Matt and Scott, (2005) conducted a survey to examine recycling impact on jobs and the North Carolina economy in their work. This survey followed up a similar effort conducted in 1994 and documents the growth of the recycling industry over the past decade. Some of the findings include:

- Recycling employs approximately 14,000 people across the state.
- In 1994, recycling employed 8,700 people, rising 60 percent in ten years to reach its current level.
- Recycling jobs as a percentage of the state's total employment has increased 40 percent in ten years, from 0.25 percent of the total labor force in 1994 to 0.35 percent in 2004.
- Fifty-four percent of the businesses surveyed forecast creating more recycling-related jobs in the next two years.
- Recycling employs more people than the biotech and agricultural livestock industries in North Carolina.
- The number of companies listed in the state's recycling markets directory has increased from 306 in 1994 to 532 in 2004, a 74 percent increase.

A 2011 report prepared by the Tellus Institute, "*More Jobs, Less Pollution*," cited in Natural Resources Defense Council (2014), found out that if Americans can increase the national recycling rate to 75 percent by 2030, she would reduce greenhouse-gas emissions by 515 million metric tons carbon dioxide equivalent, which is equal to shutting down about 72 coal-fired power plants or taking 50 million cars off the road.

The U.S. Recycling Economic Information (REI) in Colorado Association for Recycling, (2011) reported that the recycling and reuse industry sector of the United States economy employed 1.25 million people while the solid waste disposal sector employed only 250,000. This translates into 56,061 establishments, more than 1.12 million workers, $37 million in annual payroll and more than $236 million in estimated receipts. On average, the recycling sector pays higher than the waste processing industry.

Muhammad and Manu, (2013) researched on gender role in informal solid waste management in Kaduna metropolis of Nigeria using primary data collection method. The study revealed that at household level, women and children play a very dominant role in collection and sell of

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recyclable materials to Itinerant waste collectors. Distinct gender division of labour was also observed as women are almost conspicuously absent at the higher levels of solid waste recycling processes as a result of cultural constraint, poor coordination and lack of capital. The study recommended for women integration into the mainstream policy as a poverty reduction strategy.

More recently, however, the informal waste management sector, in general, and waste pickers in particular are gradually being recognized as active participants in urban socio-economic and environmental governance (Van de Klundert and Anschütz, 2001). Under this later conception, the place of scavenging and informal recycling in modern waste management and contributions of scavengers to the economic aspects of the recycle trade, poverty reduction, job creation and social inclusion of people often excluded in society, is emphasized over and above the health, social and economic problems associated with waste picking (Nas and Jaffe, 2004; Wilson et al., 2006; Medina, 2007; Gutberlet, 2008).

METHODOLOGY

This study adapted survey

In the survey design adopted, questionnaire method, interview and visual observation method were employed in collecting information on people's perception on plastic wastes in the study area.

The study made use of students in the three different hostels sampled in Ifite-Awka. The target population of this study is as analyzed below

Table 3.4: analysis of number of students in each hostel and target population for each hostel

Hostels	No of Students in each Hostel	Target Population for each Hostel
First hostel	120	40
Second hostel	75	30
Third hostel	80	35
GRAND TOTAL	275	105

Source: researcher's field survey, 2016

Sampling Size and Sampling Techniques

The sample of this study was determined using the Taro Yamane's formula. The formula is as expressed below:

n = N

Where n = sample size, (83)

N= population size

E = error margin which for the purpose of this research is 0.05 and

1 = constant number.

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For the purpose of this study, our level of significance is 5% that is 95% confident level.

$$n = \frac{N}{1+N(e)^2}$$

Where e =error of margin (0.05)

$$n = \frac{105}{1+105(0.05)^2}$$

$$n = 83.168 \approx 83$$

Method of data collection

For questionnaire data collection, the researcher administered a total number of 83 questionnaires to the respondents chosen from the students of the selected hostels.

Questionnaire Analysis

The analysis from the questionnaire used to generate data for this study involves the use of statistical tools in the presentation of information. Simple percentages were used in qualifying the relationship in one datum to another. The Likert type sides were used for the four options to most of the questions in the questionnaire and were given 4, 3, 2, 1 weighting respectively. Also, chi-square statistical tool was featured in testing the hypotheses of the research.

DATA PRESENTATION / ANALYSES

Questionnaire Distribution and Response Rate

Table 4.4 shows the total number of questionnaire distributed, the number of questionnaire retuned and percentage return. From the 83 questionnaire distributed to the respondents, 75 were returned. These represent 100% of the questionnaire returned.

Table 4.4: Distribution and Return of Questions

respondents	Number distributed	Number returned	Number unreturned	Percentage return (%)
First hostel	35	32	3	42.67%
Second hostel	23	20	3	26.67%
Third hostel	25	23	2	30.67%
Total	83	75	8	100%

Source: researcher's field survey (2016)

Analysis of Bio-data of Respondents

Table 4.5 shows the percentage of sex among the respondents. 32 respondents representing 43% of the sample size were male, while 43 respondents representing 57% of the sample size were female.

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Table 4.5: Distribution According to Sex

Respondents	Frequency	Percentage (%)
Male	32	43%
Female	43	57%
Total	75	100%

Source: Source: researcher's field survey (2016)

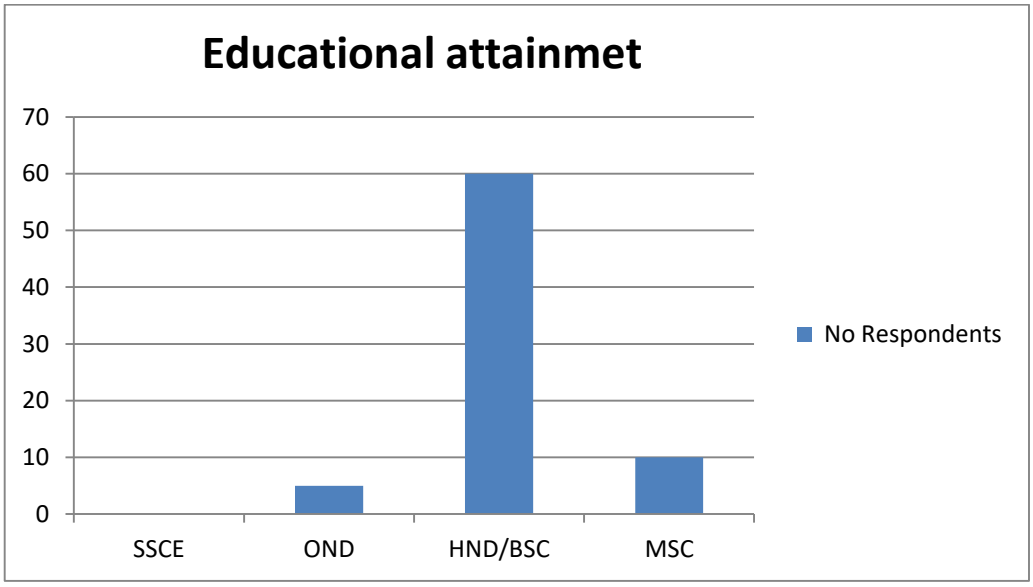
Table 4.6 shows the distribution according to academic qualification among the respondents. 7% of the respondents had OND, 80% respondents had HND/BSC, while 13% had MSC, and none with SSCE.

Table 4.6: Distribution According to Academic Qualification

Respondents	Frequency	Percentage (%)
SSCE	-	0%
OND	5	7%
HND/BSC	60	80%
MSC	10	13%
Total	75	100%

Source: researcher's field survey (2016)

Fig. 4.1: Chart Representing the Academic Attainment of the Respondents in Ifite-Awka



Source: researcher's field survey (2016)

Table 4.7 shows the respondents distribution according to their age bracket. 37% of the respondents were within the age of 18-20 years, 51% within the age of 21-30 years, 12% are within the age of 31-40 years, while 1% have were 40years and above.

Table 4.7: Distribution According to Age Bracket

Respondents	Frequency	Percentage (%)

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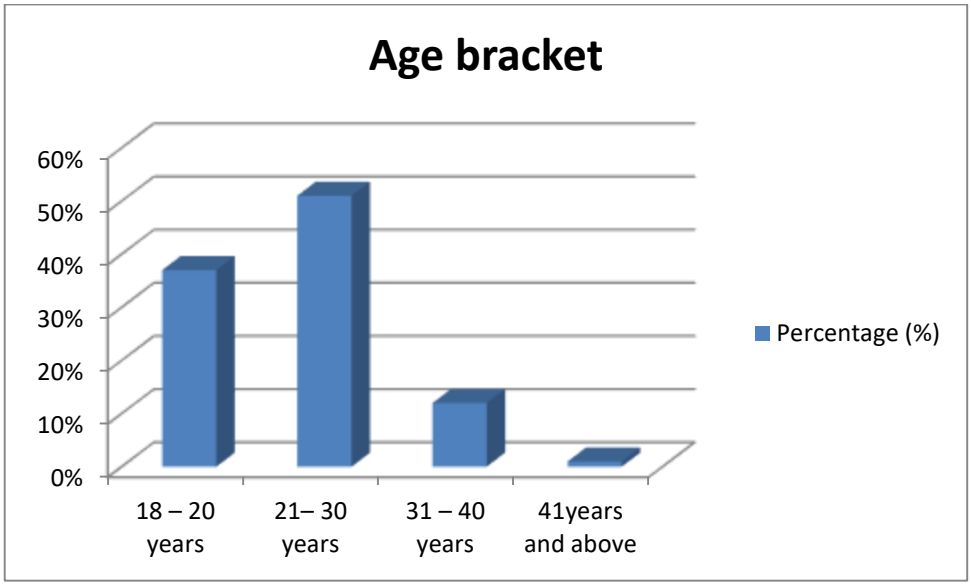
18 – 20 years	28	37%
21– 30 years	38	51%
31 – 40 years	9	12%
41years and above	1	1%
Total	75	100%

Source: Source: researcher's field survey (2016)

Fig. 4.2: Chart Representing the Percentage Age Bracket of the Respondents in Ifite-Awka



Source: researcher's field survey (2016)

Analysis of Responses by the Respondents

In analyzing the responses of the respondents, the individual questions raised in that section were treated separately. Hence, the responses of each of the questions from the three hostels were presented in separate tables as shown below.

Table 4.8 shows the responses of the respondents in the three different hostels sampled. 35persons agreed to the fact that waste generated in Ifite-Awka were more of food wastes, while 40persons were in disagreement. 50persons agreed that the waste generated were more of plastic wastes and 25persons disagreed. 15agreed that the wastes generated were more of paper wastes, while 60persons were in disagreement. None of the respondents agreed that waste generated in the study area were more of metal wastes.

Table 4.8: Types of Waste Generated in Ifite-Awka

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Question	SA	A	SD	D	Total		SA	A	SD	D	Total		SA	A	SD	D	Total	Sum
1st hostel							2nd hostel						3rd hostel					
1	4	10	10	8	32		3	8	3	6	20		4	6	3	10	23	75
2	8	14	4	6	32		6	6	2	6	20		2	14	3	4	23	75
3	3	4	10	15	32		2	3	5	10	20		1	2	5	15	23	75
4	0	0	5	27	32		0	0	10	8	20		0	0	18	5	23	75
Total	15	28	29	56	128		11	17	20	30	80		7	22	29	34	92	300

Source: researcher's field survey (2016)

Table 4.9 shows the responses of the respondents on the impact of plastic wastes in the three hostels sampled. 54 persons agreed to the fact that, littering of the environment mostly by plastic wastes was the most impact of plastic wastes in the study area while 21 persons were of disagreement. 66 persons agreed that, clogging of drainage channels was the most impact of plastic wastes in the study area, while 9persons disagreed. 49 persons agreed that, accelerating of flooding problems was the most impact of plastic wastes in the study area, while 26 persons were in disagreement. 44 persons agreed that, polluting the air when burned in the open was the most impact of plastic wastes in the study area, while 31persons were in disagreement. 64 persons agreed to the fact that, encouragement of breeding of mosquitoes was the most impact of plastic wastes in the study area, while 11persons disagreed.

Table 4.9: Impacts of Plastic Wastes in the Study Area

Question	SA	A	SD	D	Total		SA	A	SD	D	Total		SA	A	SD	D	Total	Sum
1st hostel							2nd hostel						3rd hostel					
1	15	10	0	7	32		8	6	2	4	20		10	5	1	7	23	75
2	20	10	1	1	32		6	10	0	4	20		12	8	0	3	23	75
3	7	15	3	7	32		6	8	2	4	20		2	11	2	8	23	75
4	8	16	4	4	32		4	3	5	8	20		4	9	1	9	23	75
5	12	14	0	6	32		8	10	1	1	20		8	12	3	0	23	75
Total	62	65	8	25	160		32	37	10	21	100		46	45	7	27	115	375

Source: researcher's field survey (2016)

Table 4.10 shows the percentage of environmental cleanliness through pyrolysis in the study area. 5 students among the 75 students sampled in the three different hostels responded that the removal of LDPE wastes from the environment for pyrolysis, increased environmental cleanliness by 10-20 %. 26 students rated it to be 30-40%, 30 students rated it to be 50-60%,

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11 students rated it to be 70-80% and 3students rated it to be above 80% and above. This proves that if plastic wastes are removed from our environment particularly in the area studied, the cleanliness of the environment will be high.

Table 4.10: Environmental Cleanliness through Pyrolysis

Percentage of Environmental cleanliness when plastic bags were removed	10-20%	30-40%	50-60%	70-80%	80% and above	Total
First hostel	1	10	14	5	2	32
Second hostel	0	10	6	4	0	20
Third hostel	4	6	10	2	1	23
Total	5	26	30	11	3	75

Source: researcher's field survey (2016)

Table 4.11 shows the responses of the respondents in the three hostels sampled on their perception towards plastic wastes.15 persons agreed to the fact that, littering of the area with plastic wastes causes irritation as a result of its non-biodegradable nature, while 60 persons were in disagreement to that fact. 56 persons were of the fact that, littering of the area with plastic wastes causes irritation as a result of its capacity to breed mosquitoes, while 19 persons were in disagreement. 58 persons were of the agreement that littering of the area with plastic wastes causes irritation as a result of reduction in aesthetic beauty of the study area, while 17 persons were in disagreement.

Table 4.11: If plastic wastes causes irritation and why?

Question	SA	A	SD	D	Total		SA	A	SD	D	Total		SA	A	SD	D	Total	Sum
1st hostel							2nd hostel						3rd hostel					
1	1	5	12	14	32		4	1	8	7	20		0	5	4	14	23	75
2	8	16	2	6	32		4	14	0	2	20		10	4	1	8	23	75
3	10	15	2	5	32		7	8	0	5	20		5	13	2	3	23	75
Total	19	36	16	25	96		15	23	8	14	60		15	22	7	25	69	225

Source: researcher's field survey (2016)

Table 4.12 shows the responses of the respondents in the three hostels sampled on their perception towards the enormity of plastic wastes.4 persons agreed to the fact that, there has been a day that they don't come in contact with plastic wastes while 71persons were of disagreement. 6 persons agreed of being aware that plastic wastes could be converted to wastes, while 69 persons are ignorant of it. This implies that, many people especially the teaming unemployed youths are unaware of waste- to-wealthness (the possibility of converting plastic wastes to wealth).

Table 4.12: Perception on Plastic Wastes Enormity and Awareness on Waste to Wealth

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Question	Yes	No	Total		Yes	No	Total		Yes	No	Total	Sum
1st hostel					2nd hostel				3rd hostel			
1	1	31	32		3	17	20		0	23	23	75
2	5	27	32		1	19	20		0	23	23	75
Total	6	58	64		4	36	40		0	46	46	150

Source: researcher's field survey (2016)

Hypothesis Testing

Hypothesis Statement

H_0: There is no significant difference in the perception of people towards plastic wastes in the three different hostels sampled

H_1: there is significant difference in the perception of people on plastic wastes in the three different hostels sampled

Table 4.5: Test statistics

Chi square	$\frac{(O-E)^2}{E}$
Critical value 1	43.77
Critical value 2	7.81
Computed values (1)	31.561, 30.956, 25.917
Computed values (2)	2.942, 0.333, 0
Significant level	5%
Degree of freedom (1)	33
Degree of freedom (2)	3

Source: researcher's statistical computation (2016)

PEOPLE PHYCHOLOGY ON PLASTIC WASTES

First hostel

S/N	O	E	O– E	$(O-E)^2$	$\frac{(O-E)^2}{E}$
1	1	6.333	-5.333	28.441	4.491
2	5	12	-7	49	4.083
3	12	5.333	6.667	44.449	8.335
4	14	8.33	5.667	32.115	3.854
5	8	6.333	1.667	2.779	0.439
6	16	12	4	16	1.333
7	2	5.333	-3.333	11.109	2.083
8	6	8.33	-2.333	5.447	0.653
9	10	6.333	3.667	13.447	2.123
10	15	12	3	9	O.75
11	2	5.333	-3.33	11.109	2.083

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12	5	8.33	-3.333	11.109	1.333
TOTAL	96	96			31.561

$X^2 = \frac{(O - E)^2}{E} = 31.561$

Calculation of expected frequency (F_e)

$Ef = \frac{(\sum Oij) x \sum Oji}{\sum\sum Oij} = \frac{\text{(Row total for the row of that cell) x(column total for that cell}}{\text{(Grand total)}}$

Second hostel

S/N	O	E	O– E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
1	4	5	-1	1	0.2
2	1	7.667	-6.667	44.441	5.797
3	8	2.667	5.333	28.441	10.664
4	7	4.667	2.333	5.443	1.166
5	4	5	-1	1	0.2
6	14	7.667	6.333	40.107	5.231
7	0	2.667	-2.667	7.113	2.667
8	2	4.667	-2.667	7.113	1.524
9	7	5	2	4	0.8
10	8	7.667	0.333	0.111	O.015
11	0	2.667	-2.667	7.113	2.667
12	5	4.667	0.333	0.111	0.024
TOTAL	60	60			30.956

$X^2 = \frac{(O - E)^2}{E} = 30.956$

Third hostel

S/N	O	E	O– E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
1	0	5	-5	25	5
2	5	7.333	-2.333	5.443	0.742
3	4	2.33	1.667	2.779	1.191
4	14	8.333	5.667	32.115	3.854
5	10	5	5	25	5
6	4	7.333	-3.333	11.109	1.515

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7	1	2.33	-1.333	1.777	0.762
8	8	8.333	-0.333	0.111	0.013
9	5	5	0	0	0
10	13	7.333	5.667	32.115	4.380
11	2	2.33	-0.333	0.111	0.048
12	3	8.333	-5.333	28.441	3.413
TOTAL	69	69			25.917

$$X^2 = \frac{(O - E)^2}{E} = 25.917$$

Calculation of the degree of freedom (df)

$df = (r - 1)(c - 1)$

Where df = degree of freedom

c = number of column

r = number of rows

$df = (12 - 1)(4 - 1)$

$= (11)(3) = 33$

$df = 33$

Critical value for X^2 for 33 df at 0.05= 43.77

Finding: the computed Chi-square values is lower than the critical value

PERCEPTION ON PLASTIC WASTES ENORMITY AND AWARENESS ON WASTE TO WEALTH

First hostel

S/N	O	E	O– E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
1	1	3	-2	4	1.333
2	31	29	2	4	0.138
3	5	3	2	4	1.333
4	27	29	-2	4	0.138
total	64	64			2.942

$$X^2 = \frac{(O - E)^2}{E} = 2.942$$

Second Hostel

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S/N	O	E	O– E	$(O – E)^2$	$\frac{(O – E)^2}{E}$
1	3	2	1	1	0.083
2	17	18	-1	1	0.083
3	1	2	-1	1	0.083
4	19	18	1	1	0.083
total	40	40			0.333

$X^2 = \frac{(O – E)^2}{E} = 0.333$

Third Hostel

S/N	O	E	O– E	$(O – E)^2$	$\frac{(O – E)^2}{E}$
1	0	0	0	0	0
2	23	23	0	0	0
3	0	0	0	0	0
4	23	23	0	0	0
total	46	46			0

$X^2 = \frac{(O – E)^2}{E} = 0$

Calculation of the degree of freedom (df)

$df = (r – 1)(c – 1)$

$df = (4 – 1)(2 – 1)$

$= (3)(1) = 3$

$df = 3$

Critical value for X^2 for 3 df at 0.05= 7.81

Finding: the computed Chi-square value is lower than the critical value

Decision rule: since the computed Chi-square value is lower than the critical value, the null hypothesis is accepted and the alternative rejected. Hence it is concluded that, there is no significant different in the perception of people towards plastic wastes in the three different hostels sampled.

CONCLUSION AND RECOMMENDATION

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The study therefore concludes that:

1. There is no significant difference in the perception of people about plastic wastes in the study area. This explains the reason why plastic wastes are handled anyhow in the study area.
2. The people in the study area do not know that plastic wastes can be converted to diesel and char.

The study therefore recommends that:

1. There should be public awareness programmes on the role of the masses in efficient waste management, the practicability and gains of waste to wealth projects, among others.
2. Waste sorting should be encouraged using specified government policies and possibly the application of special enforcement agents / agencies for appropriate implementation.
3. Large scale waste to wealth projects should be launched to create employment and commercialize the products that result from such activities.

REFERENCES

Agunwamba, J. C. (1998). Solid waste management in Nigeria: Problems and Issues. *Journal of Environmental Management*, 22, 849-856.

Egun, N.K (2012). The Waste to Wealth Concept. *Greener Journal of Social Sciences*, 2 (6), pp. 206-212.

Jeffrey, K.S (2010). Sustainable Waste Management Systems. *Journal of cleaner production*, 18 (16): 1639-1651.

Murugan, S., Ramaswamy, M. C., and Nagarajan, G. (2009). Assessment of pyrolysis Oil as an Energy source for Diesel Engines. *Journal of Fuel Processing Technology*, 90 (1): 67–94.

North West Region Waste Management Group (NWRWMG) (n. d.). Improving waste management practices though a voluntary grouping of seven local authorities in Northern Ireland. Available at: http://www.northwestwaste.org.uk/future-of-waste-resource-management/advanced-energy-recovery/pyrolysis/. Accessed 4 July, 2016.

Tippayawong, N., Kinorn, J. and Thavornun, S. (2008). Yields and gaseous composition from slow pyrolysis of refuse-derived fuels. *Energy Sources*, 30, 1572-1580.

Williams, P. T. (2005). *Waste Treatment and Disposal: Second Edition*. John Wiley & Sons, Ltd, West Sussex, England.

Wilson, C. D. and Scheinberg, A. (2010). What is good practice in solid waste management?. *Journal of Waste management and Research* 28(12): 1055-1056.

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