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# Strategies for Adequate Environmental Management of Sachet Water Waste among Households in Anambra State, Nigeria

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**Abstract**
The environmental problems associated with the indiscriminate disposal of sachet water waste on the soils on which we farm calls for adequate strategies for proper disposal. The study identified strategies for adequate environmental management of sachet water waste in Anambra State, Nigeria. A sample of 161 respondents was randomly selected from 7 purposively selected Local Government Areas. Data were collected with questionnaire and analysed using descriptive statistics including percentage and mean scores. Statistical analysis shows that the majority (40%) of the respondents were between the ages of 30-39. Majority (85%) were married while the mean family size was 5 persons. The respondents were fairly literate. The mean monthly income of the respondents was ₦20, 000. It equally reveals that the major strategies for adequate environmental management of sachet water waste include among others: introduction of 'buy-back pack' (M=4), environmental public awareness strategy (M=3.6), formation of anti water sachet waste clubs in primary and secondary schools (M=3.8), repackaging of sachet water waste (M=2.5), provision of recycling plants (M=2.8), mounting refuse bins and dumpsters strategically (M=4.0) and prompt evacuation of waste bins and dumpsters (M=4.0). As a result of the dangers associated with improper disposal of sachet water waste on the environment, the study strongly recommends that the strategies especially formation of anti sachet water waste clubs be urgently introduced in schools so that these young minds be co-opted early into the crusade of saving our environment.
**Keywords:** Sachet water, waste, management, environmental, strategies, Anambra State.

## 1. Introduction

Sachet water, popularly called 'pure water' was introduced to the Nigerian markets around 1990 but its regulation by the National Agency for Food and Drug Administration and Control (NAFDAC) started in 2001 (Akunyili, 2003). Sachet water gained much popularity in Nigeria because the product is convenient for use, affordable and economically viable. It brought 'potable' water to the doorsteps of many Nigerians. The venture has also given employment to Nigerians which enables them to put food on their table (Ezeokpube, Obiora and Phil-Eze). The sachets are made of non-biodegradable synthetic polyethylene (polythene) which does not decompose and when subjected to burning produces harmful green house gases (GHGs) including carbon monoxide, nitrous oxide and carbon dioxide. Being non-biodegradable means that the polythene sachets are remarkably resistant to biological decay (Albertsson and Ranby, 1975).

The non-biodegradable nature of the sachet makes its disposal a vast problem that needs to be tackled because of the implications it has on biophysical environment such as soil, vegetation air and water. In the soils, sachet waste could compromise the fertility of the soil while in the water causes a lot of pollution. Empirical studies on the problems of the indiscriminate disposal of sachet water waste on the environment include those of Babatunde and Biala (2010), who noted that the problems of indiscriminate disposal of sachet water waste causes land pollution which could result in unsightly, dirty and unwholesome places to live in and infertility of the agricultural soils. They also stressed that sachet waste if not properly disposed could threaten public health because it harbours disease pathogen. In the same vein, Mojekeh and Eze (2011) in their study noted that the problems of sachet water waste included littering the streets and clogging the drainages causing flooding. Toyobo, Oyeleke and Lanrewaju (2013); Ezeokpube, Obiora and Phil-Eze (under review) likewise noted the environmental impact of sachet water waste on the environment. If indiscriminate disposal of sachet water waste posses such environmental problems described by these studies, it becomes pertinent to identify strategies for adequate environmental management of sachet water waste. Such will not only help to preserve our soil but will help keep the beauty of the environment and solve some of our perennial flooding.

The study therefore aims at:

1) describe the socio-economic profile of the respondents and
2) identifying strategies for adequate environmental management of sachet water waste in the study area

## 2. Materials and method

The study was conducted in Anambra State, Nigeria. Anambra State has a total of 21 Local Governments Areas (L.G.As) namely: Aguata, Anambra East, Anambra West, Anaocha, Awka North, Awka South, Ayamelum, Dunukofia, Ekwusigo, Idemili North, Idemili South, Ihiala, Njikoka, Nnewi North, Nnewi

 

South, Ogbaru, Onitsha North, Onitsha South, Orumba North, Orumba South and Oyi.

Seven (7) L.G.As namely Aguata, Awka North, Awka South, Nnewi North, Nnewi South, Onitsha North and Onitsha South were purposively selected because of dense populations in these areas and also high concentration of sachet water factories. Two categories of respondents were used. They were (1) households that consume sachet water and (2) workers in the factories were sachet water is produced. In each L.G.A, 20 households were identified from the communities/wards. The heads of these households served as respondents. This gave a total of 140 respondents (i.e. 20 heads of households multiply by 7 L.G.As). Furthermore, in each L.G.A, 1 sachet water factory was identified and 3 high rank staff in each factory served as respondents. This gave a total of 21 respondents (i.e. 3 respondents multiply by 7 factories). Therefore a grand total of 161 respondents were used for the study.

Questionnaire was used for data collection and was divided into 2 sections based on the objectives of the study. Section 1 sought information on socio-economic profile of the respondents. Respondents were asked to indicate their age, sex, level of education, occupation, etc. Section 2 was devoted to information on strategies for adequate environmental management of sachet water waste in the study area. Respondents responded to a list of variables such as sensitization/enlightenment programmes, placing bins and dumpsites strategically, prompt evacuation of wastes etc. using a four point Likert rating scale of 'to a very great extent (4), 'to a great extent (3)',' to small extent (2)', and 'to no extent (1). The decision rule on the mean perception of the respondents was computed as: 4+3+2+1=10/4=2.5. Any variable with mean of 2.5 and above were regarded as strategies whereas any variable less than 2.5 were not strategies. Data were analyzed using percentage and mean scores and presented in tables.

## 3. Results and Discussion

### 3.1 Socio-economic profile

*Sex*

Majority (60%) of the respondents from the households were males while the rest (40%) were female (Table 1). The Table also shows that majority (65%) from the factory workers females while 35% were males.

*Age*

Entries in Table 1 show that about 16% of the respondents from households were within the age range of 20-29, 25.0% were between 30-39 age range whereas 35.2% were 40-49 and 24% were 50 years and above. The table equally shows that 36% of respondents from the factory workers were within the age range of 20-29. Forty (40) percent of the respondents were within the age range of 30-39. It also shows that 18% and 6.0% were within the age range of 40-49 and 50 and above respectively. The mean age for the respondents is 38 years. This shows that the respondents were very young people.

*Marital status*

Data in Table 1 indicates majorities (80 and 85%) of the respondents from households and factory workers were married respectively while 5% and 15% of households and factory workers respectively were single. Fifteen (15) percent of the household respondents were widowed.

*Family size*

Table 1 shows that majority (50%) of the respondents from the households had a family size of 4-6 persons. Twenty (20) percent each had a family size of 1-3 and 7-9 respectively. It also shows that 10% of the respondents had a family size of 10 persons and above. For the factory workers, majority (45%) had a family size of 4-6 persons. Twenty five (25) percent each had a family size of 1-3 and 7-9 persons. It equals shows that very few (5%) had a family size of 10 and above. The mean family size of the respondents was 5 persons. This shows a moderate family size.

*Educational qualification*

Entries in Table 1 show that majority (45%) of the household respondents had secondary school education, 30% had primary school education, 15% had tertiary education whereas 10% had no formal education. For the factory workers' respondents, majority (40%) had primary school education, 33% had secondary school education, 20% had tertiary education while 7% had no formal education (Table 1). The respondents could be described as literate. Literacy is described as tool that facilitates the adoption of innovation (Obinne 1991). This implies that any innovation focused on better management of sachet water waste will be highly adopted by the respondents.

*Occupation*

Majority (60%) of the household respondents were traders, 40% each were engaged in farming and other works respectively. Twenty five (25) percent were artisans while 20% were civil servants (Table 1). The Table also shows that majority (50%) of the factory work respondents were traders, 40% were farmers, 35% engaged in other works like driving, sewing, carpentry etc, 30% were artisans whereas 5% were civil servants. This findings show that the respondents are very enterprising. They engage in more than one economic activity

 

just to make ends meet.

*Work experience*

Data in Table 1 shows that 25% of the household respondents had working experience of less than 10 years, 58% had between 10-19 years working experience, 10% had between 20 -29 years working experience while 7% had working experience of between 30-39 years. Also, majority (57%) of the factory worker respondents had working experience of 10-19 years, 25% had working experience of less than 10 years. Twelve (12) percent had between 20-29 years working experience whereas 6% had working experience of between 30-39 years (Table 1). The mean working experience of the respondents is 17 years. This implies that the respondents have been in their jobs for a long time of almost two decades.

*Monthly income*

Twenty five (25) percent of the household respondents earned less than 10 thousand Naira, majority (40.0%) earned between 10,000-19,000 Naira, 22% earned between 20,000-29,000 Naira, 5.0% each earned between 30,000-39,000 Naira to 40,000-49,000 Naira respectively. A very few (3%) earned 50,000 thousand Naira and above (Table 1). The Table equally shows that 23% of the factory workers' respondents earned less than 10 thousand Naira, a great number (42%) earned between 10,000-19,000, 20% earned between 20,000-29,000, 7% earned between 30,000-39,000, about 5% earned between 40,000-49,000 whereas only about 4% earned 50,000 and above. The mean monthly income of the respondents was 20, 000 Naira which is equivalent of about $127.388. This result implies that the respondents are low income earners. This may confirm the reason why they engage with many economic ventures at a time.

3.2 Strategies for adequate environmental management of sachet water waste

Entries in Table 2 show the perceived strategies for adequate environmental management of sachet water waste in the study area. The strategies were thus: introduction of 'buy back pack' (M=4.0), repackaging of sachet water waste (M=2.5), environmental public awareness strategy (M=3.6), mounting refuse bins and dumpsters strategically (M=4.0), regularity in the evacuation of waste dumpsters (M=4,0), prosecution of offenders (M=3.8), introduction of environmental health officers (M=2.5), provision of incentives (M=4.0), payment of ANSEPA sanitation levy (M=3.2), timely payment of Anambra State Environmental Protection Agency (ANSEPA) staff salaries (M=3.6), initiation/provision of recycling plants (M=2.8), formation of anti sachet water waste clubs in primary and secondary schools (M=3.8), payment of sanitation levy (M=3.2).

The government agencies concerned with making policies should introduce a policy that would mandate the makers of sachet water to buy-back pack from users. This will serve as incentive to users not to dispose sachet waste indiscriminately rather to see the sachet wastes as valuable material that could be sold to make money (Ezeokpube, Obiora and Phil-Eze).

Government should also make policies that before any company is allowed to start sachet water production, she would have shown her reusing and recycling machines. The machines would be used to recycle the waste when bought from users. This will go a long way in helping to proper disposal of the waste. Babatunde and Biala (2010) in their study emphasized recycling is an important way of minimizing waste.

Environmental public awareness strategy could be done using media such as television, radio, internet. religious bodies e.g. churches and mosques could also be used in the enlightenment programs. Such public awareness programs should be aimed at making the populace understand the gravity of problems these sachet wastes could cause and also correct wrong assumptions by the people. For instance, people should be made to understand that some flooding happens because the drainage systems are blocked with 'blocks' of sachet water waste and not solely because of climate change.

Mounting refuse bins and dumpsters strategically. The government should endeavor to provide sufficient number of bins and dumpsters. These dumpsters should also be strategically placed so that people will have easy access to them. Moreover, when the dumpsters are filled the agencies concerned should be regular in the evacuation of the waste. To achieve this, it is pertinent for government to maintain a timely payment of ANSEPA staff salaries' so that that the workers would always be motivated to do their work.

Indiscriminate disposal of sachet water waste should be made a legal issue so that offenders could be legally prosecuted. It is also important that clubs should be formed at the primary and secondary school levels. This will help to redirect the minds of these youngster early on the need for saving our environment by imbibing the spirit of proper disposal of waste especially sachet water waste. Finally, Anambraians should be ready to pay sanitation levy as this will help the government to raise adequate fund in providing dumpsters and also to pay salaries of Anambra State Environmental Protection Agency (ANSEPA).

## 4. Conclusion

The study was conducted in Anambra State, Nigeria with a sample of 161 respondents randomly selected from 7 purposively selected Local Government Areas. Copies of questionnaire were distributed for data collection. The data collected were analyzed with percentage and mean scores. The findings show that the

 

respondents were young, married and literate. The mean monthly income of the respondents was ₦20, 000. It equally reveals that the major strategies for adequate environmental management of sachet water waste include among others: introduction of 'buy-back pack' (M=4), environmental public awareness strategy (M=3.6), formation of anti sachet water waste clubs in primary and secondary schools (M=3.8), repackaging of sachet water waste (M=2.5), provision of recycling plants (M=2.8), mounting refuse bins and dumpsters strategically (M=4.0) and prompt evacuation of waste bins and dumpsters (M=4.0). The study strongly recommends that the strategies listed should be well incorporated so that the environment be saved from the menace of sachet water waste.

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Table 1: Percentage Distribution of the Respondents Based on Socio-economic Profile

| Variable | Households (%) n=140 | Factory workers (%) n=21 | Mean (M) |
|---|---|---|---|
| **Sex** Male | 60.0 | 35.0 | |
| Female | 40.0 | 65.0 | |
| **Age (years)** | | | |
| 20-29 | 15.8 | 35.8 | |
| 30-39 | 25.0 | 40.0 | 38 |
| 40-49 | 35.2 | 18.2 | |
| 50 and above | 24.0 | 6.0 | |
| **Marital status** | | | |
| Married | 80.0 | 85.0 | |
| Single | 5.0 | 15.0 | |
| Widowed | 15.0 | - | |
| **Family size (persons)** | | | |
| 1-3 | 20.0 | 25.0 | |
| 4-6 | 50.0 | 45.0 | 5 |
| 7-9 | 20.0 | 25.0 | |
| 10 and above | 10.0 | 5.0 | |
| **Educational qualification** | | | |
| No formal education | 10.0 | 7.0 | |
| Primary education | 30.0 | 40.0 | |
| Secondary education | 45.0 | 33.0 | |
| Tertiary | 15.0 | 20.0 | |
| **Occupation** | | | |
| Civil servant | 20.0* | 5.0* | |
| Trading | 60.0* | 50.0* | |
| Farming | 40.0* | 40.0* | |
| Artisans | 25.0* | 30.0* | |
| Others (driving, sewing, carpentry etc) | 40.0* | 35.0* | |
| **Work experience (years)** | | | |
| Less than 10 | 25.0 | 25.0 | |
| 10-19 | 58.0 | 57.0 | |
| 20-29 | 10.0 | 12.0 | 17 |
| 30-39 | 7.0 | 6.0 | |
| **Monthly income (₦)** | | | |
| Less than 10,000 | 25.0 | 23.0 | |
| 10,000-19,000 | 40.0 | 42.0 | |
| 20,000-29,000 | 22.0 | 20.0 | 20,000 |
| 30,000-39,000 | 5.0 | 7.0 | |
| 40,000-49,000 | 5.0 | 4.5 | |
| 50,000 and above | 3.0 | 3.5 | |

*Multiple responses
Source: Field survey, 2013.

 

Table 2. Mean Score on Strategies for Adequate Environmental Management of Sachet Water Waste

| Strategies | Mean (M) |
|---|---|
| Introduction of 'buy-back pack' | 4.0 |
| Repackaging of sachet water waste | 2.5 |
| Environmental public awareness strategy | 3.6 |
| Mounting refuse bins and dumpsters strategically | 4.0 |
| Prompt evacuation of waste dumpsters | 4.0 |
| Prosecution of offenders | 3.8 |
| Introduction of environmental health officers | 2.5 |
| Provision of incentives | 4.0 |
| Payment of Anambra State Environmental Protection Agency ANSEPA sanitation levy | 3.2 |
| Timely payment of ANSEPA staff salaries | 3.6 |
| Initiation/provision of recycling plants | 2.8 |
| Formation of anti water sachet waste clubs in primary and secondary schools | 3.8 |
| Payment of sanitation levy | 3.2 |

Mean=≥ 2.5

Source: Field survey, 2013.